

Appendix J

Data Validation Memoranda

Appendix J
Data Validation Memoranda
Groundwater Remedial Investigation Report
Garfield Avenue Group Sites
PPG, Jersey City, New Jersey

Lab SDG	Date
4602478531	11/23/2021
4602491481	12/14/2021
4602492051	12/15/2021
4602492741	12/16/2021
4602493661	12/17/2021
4602496041	12/21/2021
4602567051	4/21/2022
4602580871	5/13/2022
4602593611	6/3/2022
4602613181	7/5/2022
4602632541	8/4/2022
4602633361	8/5/2022
4602831932	6/27/2023
4602832532	6/28/2023
4602833322	6/29/2023
4602833942	6/30/2023
4602835472	7/3/2023
4602849651	7/26/2023
4602867531	8/23/2023
4602887311	9/21/2023
4602888091	9/22/2023
4602889531	9/25/2023
4602890021	9/26/2023
4602890621	9/27/2023
JD78984	12/15/2023
JD79185	12/19/2023
JD79285	12/20/2023
JD79443	12/22/2023
JD79684	12/27/2023
JD80633	1/16/2024
JD82442	2/14/2024
JD84684	3/18/2024
JD84758	3/19/2024
JD84853	3/20/2024
JD84943	3/21/2024
JD85454	3/29/2024
JD88834R	5/20/2024
JD88878	5/21/2024
JD88951	5/22/2024

Lab SDG	Date
JD89297	5/28/2024
JD89297R	5/28/2024
JD89361	5/29/2024
JD89452	5/30/2024
JD89525	5/31/2024
JD89648	6/3/2024
JD89884	6/6/2024
JD90312	6/12/2024
JD90605	6/17/2024
JD90728	6/19/2024
JD90731	6/19/2024
JD90827	6/20/2024
JD90886	6/21/2024
JD90888	6/21/2024
JD91036	6/24/2024
JD91283	6/27/2024
JD91702	7/5/2024
JD91859	7/9/2024
JD91932	7/10/2024
JD92936	7/26/2024
JD93902	8/12/2024
JD93987	8/13/2024
JD94597	8/21/2024
JD96195	9/16/2024
JD96274	9/17/2024
JD96352	9/18/2024
JD96459	9/19/2024
JE2642	12/13/2024
JE2768	12/16/2024
JE2865	12/17/2024
JE2940	12/18/2024
JE4228	1/15/2025
JE4326	1/16/2025
JE4369	1/17/2025
JE5758	2/14/2025
JE5836	2/17/2025
JE5874	2/18/2025
JE5940	2/19/2025

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock	
Laboratory:	Eurofins TestAmerica, Edison	
Laboratory Job No.:	460-247853-1	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926	
Prepared by:	Allison Warnness /AECOM	Completed on: 01/24/2022
Reviewed by:	Kristin Rutherford/AECOM	File Name: 460247853_2022_01_24 DVReport-F

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on November 23, 2021 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW-52D-104-20211123	460-247853-1	Groundwater	Hexavalent Chromium, Chromium
114-MW-52D-104-20211123-X (Field duplicate of 114-MW-52D-104-20211123)	460-247853-2	Groundwater	Hexavalent Chromium, Chromium
114-BEDROCK RI-FB-20211123 (Equipment blank)	460-247853-3	Aqueous	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Matrix Spike

Sample 114-MW-52D-104-20211123 (460-247853-1) was selected for the matrix spike (MS) analysis. The MS recovery (%R) was 120% which did not meet QC criteria of 85-115%. The hexavalent chromium results in the groundwater samples were qualified (J+) as estimated and may be biased high.

Total Chromium

Matrix Spike

Sample 114-MW-52D-104-20211123 (460-247853-1) was selected for the matrix spike analysis. The MS %R of chromium did not meet QC criteria. Since the parent sample concentration was greater than four times the spiked amount, no qualifications were required.

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

Results for hexavalent chromium that were estimated due to high MS recoveries are useable with a high bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date November 23, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-247853-1 (J247853-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs 114-Bedrock RI-FB-20211123

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-52D-104-20211123	460-247853-1	Total	CHROMIUM (HEXAVALENT)	U	5860	5860 J+	500	Qualify	1
114-MW-52D-104-20211123-X	460-247853-2	Total	CHROMIUM (HEXAVALENT)	U	6150	6150 J+	500	Qualify	1

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

- 1) MS and/or MSD recovery exceeded upper acceptance limit.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date November 23, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-2478531 (J247853-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs 114-Bedrock RI-FB-20211123

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-52D-104-20211123	460-247853-1	Total	CHROMIUM	U	5500	5500	4.0		
114-MW-52D-104-20211123-X	460-247853-1	Total	CHROMIUM	U	5630	5630	4.0		

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-247853-1		Project Number: 60667926.GW.BR.DATA	
Validation Level: Full		Date: 1/12/2021	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Allison Wamness	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Kristin Rutherford	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.3°C below 2-6C criteria. No qualification since samples were received in good condition on ice.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	70 ug/L
Dilutions	Yes	No	Up to 50x. See table below
Initial Calibration	Yes	No	11/24/2021
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	114-Bedrock RI-FB-20211123 ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW-52D-104-20211123MS recovery exceeded upper acceptance limit. Estimate J+ all GW samples.
Laboratory Duplicate	Yes	No	114-MW-52D-104-20211123
Laboratory Control Standards	Yes	No	460-815202/11
Field Duplicate	Yes	No	114-MW-52D-104-20211123 and 114-MW-52D-104-20211123-X criteria met
Method 7196 Sample Prep	Yes	No	
Total vs Dissolved Results	Yes	No	Total Cr vs Total Cr6 criteria met
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW-52D-104-20211123	460-247853-1	5500	4.0	5860	500	6	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW-52D-104-20211123-X	460-247853-2	5630	4.0	6150	500	9	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

SR – sample result**Matrix Spike**

Sample ID	Lab Sample ID	Analyte	% Recovery	Lower Limit	Upper Limit
114-MW-52D-104-20211123	460-247853-1	CHROMIUM (HEXAVALENT)	120	85	115

460-247853-1**Batch: 815202**

Cr+6 ICAL - 11/24/2021

Groundwater

(p 385 of data pkg)

x - concentration	y - response
0	0
10	0.008
50	0.042
75	0.068
100	0.085
200	0.172

(p 385 of data pkg)

AECOM Calculated Intercept	0.0087	OK	Reported intercept	0.008702
AECOM Slope	1159.9	OK	Reported Slope	1160
AECOM Calculated r	0.9996	OK, rounding	Reported r	0.9995

LCS calculation**460-815202/11****P. 383, 402**

Background absorbance	0
Sample absorbance	0.07
Total absorbance - background	0.07
Instrument Concentration (ug/L)	81.209
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	81.21	OK, rounding	Reported Result (ug/L)	81.2087

%R = Found/True*100**460-815202/11****P. 383, 402**

True Value (ug/L)	79.4

AECOM Calculated %R	102.3	OK	Reported %R	102.3

MS calculation**batch 815202****P. 381, 402****460-247853-1 MS (Total)**

Background reading	0
Total absorbance	0.086
Total absorbance - background	0.086
Instrument Concentration (ug/L)	99.757

Sample aliquot (L)	0.05			
Final volume (L)	0.05			
Dilution Factor	200			
AECOM Calculated MS Result (ug/L)	19951	OK	Reported Result (ug/L)	19950
%R = Found/True*100	batch 815202	P. 381, 402	460-247853-1 MS (Total)	
True Value (ug/L)	11700			
Native concentration (ug/L)	5860			
AECOM Calculated MS Result %R	120.4	OK	Reported %R	120
Reporting Limit	460-247853-2	P. 7, 403	114-MW-52D-104-20211123-X (Total)	
Low Standard(ug/l)	10			
Initial volume (L)	0.05			
Final volume (L)	0.05			
Dilution Factor	50			
AECOM Calculated Reporting Limit	500	OK	Reported RL (ug/L) =	500
<u>Sample Calculations</u>	460-247853-2	P. 7, 403	114-MW-52D-104-20211123-X (Total)	
Background reading	0			
Total absorbance	0.106			
Total absorbance - background	0.106			
Instrument Response (ug/L)	122.954			
Sample volume (L)	0.05			
Final Volume (L)	0.05			
Dilution Factor	50			
AECOM Calculated Result (ug/L)	6148	OK, rounding	Reported Result (ug/L)	6150

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-247853-1		Project Number: 60667926.GW.BR.DATA	
Validation Level: Limited		Date: 1/12/2022	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Allison Wamness	
Analysis: Total Chromium 6020B		Reviewer and Date: Kristin Rutherford 01/23/22	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.3°C below 2-6C criteria. No qualification since samples were received in good condition on ice.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	70 ug/L
Dilutions	Yes	No	No dilutions
Method Blanks	Yes	No	MB 460-815923/1-A ND
Field Blanks	Yes	No	114-Bedrock RI-FB-20211123 ND
Matrix Spike	No	No	114-MW-52D-104-20211123 MS recovery exceeded upper acceptance limit. No qualifications required since sample concentration is >4X spiked amount.
Matrix Spike Duplicate	NA	NA	MSD not performed on site sample

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Post Digestion Spike	NA	NA	PDS not performed on site sample 1
Laboratory Duplicate	Yes	No	114-MW-52D-104-20211123
Laboratory Control Standards	Yes	No	460-815923/2-A
Field Duplicate	Yes	No	114-MW-52D-104-20211123 and 114-MW-52D-104-20211123-X RPD 2.3%, criteria met
Total Metals vs Dissolved Metals Results	NA	NA	Not analyzed for dissolved Cr
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	Total Cr vs Total Cr6 criteria met

Matrix Spike

Sample ID	Lab Sample ID	Analyte	% Recovery	Lower Limit	Upper Limit
114-MW-52D-104-20211123	460-247853-1	CHROMIUM (TOTAL)	440	75	115

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock	
Laboratory:	Eurofins TestAmerica, Edison	
Laboratory Job No.:	460-249148-1 (J249148-1)	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926, Task GW.BR.DATA	
Prepared by:	Allison Warnness /AECOM	Completed on: 01/07/2022
Reviewed by:	Kristin Rutherford/AECOM	File Name: 460249148_2022_01_07 DVReport-F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016).

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 December 14, 2021 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-MW-66D-118.5-20211214	460-249148-1	Groundwater	Hexavalent Chromium, Chromium
114-MW-66D-121.5-20211214	460-249148-2	Groundwater	Hexavalent Chromium, Chromium
114-MW-66D-124.0-20211214	460-249148-3	Groundwater	Hexavalent Chromium, Chromium
FB-20211214	460-249148-4	Aqueous	Hexavalent Chromium, Chromium
114-MW-71D-119.0-20211214	460-249148-5	Groundwater	Hexavalent Chromium, Chromium
114-MW-71D-132.5-20211214	460-249148-6	Groundwater	Hexavalent Chromium, Chromium
114-MW-71D-126.0-20211214	460-249148-7	Groundwater	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Total Chromium

All quality control (QC) criteria were met. No qualifiers were applied.

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 14, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249148-1 (J249148-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-66D-118.5-20211214	460-249148-1	T	Chromium (Hexavalent)	U	55700	55700	5000		
114-MW-66D-121.5-20211214	460-249148-2	T	Chromium (Hexavalent)	U	56800	56800	5000		
114-MW-66D-124.0-20211214	460-249148-3	T	Chromium (Hexavalent)	U	54000	54000	5000		
114-MW-71D-119.0-20211214	460-249148-5	T	Chromium (Hexavalent)	U	17.3	17.3	10.0		
114-MW-71D-132.5-20211214	460-249148-6	T	Chromium (Hexavalent)	U	19.5	19.5	10.0		
114-MW-71D-126.0-20211214	460-249148-7	T	Chromium (Hexavalent)	U	25.2	25.2	10.0		

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 14, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249148-1 (J249148-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-66D-118.5-20211214	460-249148-1	Total	CHROMIUM	U	58600	58600	20.0		
114-MW-66D-121.5-20211214	460-249148-2	Total	CHROMIUM	U	61300	61300	20.0		
114-MW-66D-124.0-20211214	460-249148-3	Total	CHROMIUM	U	62100	62100	20.0		
114-MW-71D-119.0-20211214	460-249148-5	Total	CHROMIUM	U	42.9	42.9	4.0		
114-MW-71D-132.5-20211214	460-249148-6	Total	CHROMIUM	U	54.8	54.8	4.0		
114-MW-71D-126.0-20211214	460-249148-7	Total	CHROMIUM	U	53.5	53.5	4.0		

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

Attachment B

Data Validation Report Form

Client Name: PPG Industries			Project Number: 60667926, Task GW.BR.DATA	
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ			Project Manager: Shannon Gleason	
Laboratory: Eurofins TestAmerica, Edison			Type of Validation: Full	
Laboratory Job No: 460-249148-1 (J249148)			Date Checked: 01/04/2022	
Validator: Allison Wamness			Peer: Kristin Rutherford	
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?		X		1.4° C, OK
Signed COCs included?	X			
Date of sample collection included?	X			12/14/2021
Date of sample digestion included?			X	Aqueous samples
Holding time to digestion met criteria?			X	Aqueous samples
Date of analysis included?	X			12/15/2021
Holding time to analysis met criteria?	X			
Method reference included?	X			EPA SW-846 Method 7196A
Laboratory Case Narrative included?	X			
Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			MBs and FB non-detect.
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?		X		MS not performed on sample in this data set.
1) Soluble Matrix %R criteria met? (85-115%R).			X	
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?			X	NA for aqueous samples
1) Insoluble Matrix %R criteria met? (85-115%R).			X	
2) Was the spike concentration around 400 to 800 mg/Kg?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Post Spike			X	NA for aqueous samples
1) Post Spike %R criteria met? (85-115%R).			X	
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Sample Duplicate Data Included in Lab Package?		X		Lab dup not performed on sample from this data set.
1) RPD criteria met? ($RPD \leq 20\%$) if both results are $\geq 4 \times RL$ or absolute difference $\pm RL$ if either or both results are $< 4 \times RL$			X	
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		None with this SDG
1) Were Field duplicate RPD criteria met?			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids $> 50\%$?			X	NA aqueous samples
2) Were any samples analyzed or reported with dilutions?	X			Up to 500x (see table below)

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?			X	NA aqueous samples
2) For aqueous or soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?			X	NA aqueous samples
5) For 7199, was each sample injected twice and was the RPD <20?			X	
Total vs Dissolved and Cr vs Cr6 Fraction Agreement Reviewed	X			
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			X	
Chromium result and corresponding hexavalent chromium result met QC criteria?	X			

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW-66D-118.5-20211214	460-249148-1	58600	20.0	55700	5000	5	T Cr>T Cr6, Accept
114-MW-66D-121.5-20211214	460-249148-2	61300	20.0	56800	5000	8	T Cr>T Cr6, Accept
114-MW-66D-124.0-20211214	460-249148-3	62100	20.0	54000	5000	14	T Cr>T Cr6, Accept
FB-20211214	460-249148-4	ND	4.0	ND	10.0	NC	Both ND, Accept
114-MW-71D-119.0-20211214	460-249148-5	42.9	4.0	17.3	10.0	85	T Cr>T Cr6, Accept
114-MW-71D-132.5-20211214	460-249148-6	54.8	4.0	19.5	10.0	95	T Cr>T Cr6, Accept
114-MW-71D-126.0-20211214	460-249148-7	53.5	4.0	25.2	10.0	72	T Cr>T Cr6, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW-66D-118.5-20211214	460-249148-1	CHROMIUM (HEXAVALENT)	500
114-MW-66D-121.5-20211214	460-249148-2	CHROMIUM (HEXAVALENT)	500
114-MW-66D-124.0-20211214	460-249148-3	CHROMIUM (HEXAVALENT)	500

460-249148-1**Batch: 818983**

Cr+6 ICAL - 12/15/2021

Groundwater

(p 602 of data pkg)

x - concentration	y - response
0	0
10	0.009
50	0.044
75	0.07
100	0.089
200	0.176

(p 602 of data pkg)

AECOM Calculated Intercept	-0.8624	OK	Reported intercept	-0.8624
AECOM Slope	1134.5	OK	Reported Slope	1134
AECOM Calculated r	0.9997	OK	Reported r	1.000

LCS calculation**460-818983/11****P. 597, 623**

Background absorbance	0
Sample absorbance	0.068
Total absorbance - background	0.068
Instrument Concentration (ug/L)	76.250
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	76.25	OK	Reported Result (ug/L)	76.25

%R = Found/True*100**460-818983/11****P. 597, 623**

True Value (ug/L)	79.4

AECOM Calculated %R	96.0	OK	Reported %R	96.0

MS calculation**batch 818983****460-249111-6 MS (Total)**

Background reading	0
Total absorbance	
Total absorbance - background	0
Instrument Concentration (ug/L)	-0.862
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

Not assessed - not a sample in this data set

Raw Result (ug/L)

AECOM Calculated MS Result (ug/L)	-0.86	OK, <MDL	Reported Result (ug/L)	NA

%R = Found/True*100**batch 818983****0****460-249111-6 MS (Total)**

True Value (ug/L)	
Native concentration (ug/L)	0

Not assessed - not a sample in this data set

AECOM Calculated MS Result %R	#DIV/0!		Reported %R	NA

Reporting Limit**460-249148-1****P. 580****114-MW-66D-118.5-20211214**

Low Standard (ug/L)	10
Initial volume (L)	0.05
Final volume (L)	0.05
Dilution Factor	500

AECOM Calculated Reporting Limit	5000	OK	Reported RL (ug/L)=	5000

Sample Calculations**460-249148-1****P. 580****114-MW-66D-118.5-20211214**

Background reading 0

Total absorbance 0.099

Total absorbance - background 0.099

Instrument Response (ug/L) 111.450

Raw Result (ug/L)

111.4036

Sample volume (L) 0.05

Final Volume (L) 0.05

Dilution Factor 500

AECOM Calculated Result (ug/L)	55725	OK, rounding	Reported Result (ug/L)	55700

Client Name: PPG Industries		Project Number: 60667926, Task GW.BR.DATA		
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ		Project Manager: Shannon Gleason		
Laboratory: Eurofins TestAmerica, Edison		Type of Validation: Limited		
Laboratory Job No: 460-249148-1 (J249148-1)		Date Checked: 01/07/2021		
Validator: Allison Wamness		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?		X		1.4° C, OK
Signed COCs included?	X			
Date of sample collection included?	X			12/14/2021
Date of sample digestion included?	X			12/19/2021
Date of analysis included?	X			12/20/2021
Holding time met Method QC criteria?	X			
Method reference included?	X			EPA SW-846 Method 6020B
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation ;Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			Up to 5x. See table below.
Method Blank Included in Lab Package?	X			MB 460-819740/1-A
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples?	X			
3) MB results nondetect?	X			
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			460-249148-5 (MS and sample dup, no MSD)
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met?	X			
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike			X	Not required
1) %R criteria met? (75-125%R) - %R>125			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			460-249148-5
Aqueous - RPD is >20%?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?		X		None with this SDG

ITEM	YES	NO	N/A	COMMENTS
Aqueous - RPD is <30%?			X	

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW-66D-118.520211214	460-249148-1	CHROMIUM	5
114-MW-66D-121.5-20211214	460-249148-2	CHROMIUM	5
114-MW-66D-124.0-20211214	460-249148-3	CHROMIUM	5

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock	
Laboratory:	Eurofins TestAmerica, Edison	
Laboratory Job No.:	460-249205-1	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926, Task GW.BR.DATA	
Prepared by:	Allison Warnness /AECOM	Completed on: 01/24/2022
Reviewed by:	Kristin Rutherford/AECOM	File Name: 460249205_2022_01_24 DVReport-F

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 December 15, 2021 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW-66D-128.0-20211215	460-249205-1	Groundwater	Hexavalent Chromium, Chromium
114-MW-66D-128.0-20211215X Field duplicate of 114-MW-66D-128.0-20211215	460-249205-2	Groundwater	Hexavalent Chromium, Chromium
114-MW-72D-103.5-20211215	460-249205-3	Groundwater	Hexavalent Chromium, Chromium
114-MW-72D-113.5-20211215	460-249205-4	Groundwater	Hexavalent Chromium, Chromium
FB-20211215 (Field blank)	460-249205-5	Aqueous	Hexavalent Chromium, Chromium
114-MW-71D-137.0-20211215	460-249205-6	Groundwater	Hexavalent Chromium, Chromium
114-MW-61D-117.3-20211215	460-249205-7	Groundwater	Hexavalent Chromium, Chromium
114-MW-61D-120.8-20211215	460-249205-8	Groundwater	Hexavalent Chromium, Chromium
114-MW-61D-125.8-20211215	460-249205-9	Groundwater	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Field Blank

Hexavalent chromium was detected in the field blank. Associated sample results less than three times the blank concentration were negated (UB) at the reported concentration, and results greater than three, but less than 10 times the blank concentration were qualified as estimated (JB) and may be biased high.

Total Chromium

All quality control (QC) criteria were met. No qualifiers were applied.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in Attachments A and B below.

Results negated (UB) due to blank contamination are useable as non-detect values at the concentration indicated. It is the policy of NJDEP-DPFSR to negate the reported value as due to probable foreign or laboratory contamination unrelated to the actual sample. The end-user, however, is alerted that a reportable quantity of the analyte was detected.

Results qualified as estimated (JB) due to blank contamination are useable with a potential high bias.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 15, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249205-1 (J249205-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211215

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-66D-128.0-20211215	460-249205-1	Total	CHROMIUM (HEXAVALENT)	U	54500	54500	5000		
114-MW-66D-128.0-20211215X	460-249205-2	Total	CHROMIUM (HEXAVALENT)	U	50700	50700	5000		
114-MW-72D-103.5-20211215	460-249205-3	Total	CHROMIUM (HEXAVALENT)	U	2400	2400	200		
114-MW-72D-113.5-20211215	460-249205-4	Total	CHROMIUM (HEXAVALENT)	U	2490	2490	200		
FB-20211215	460-249205-5	Total	CHROMIUM (HEXAVALENT)	U	12.0	12.0	10.0		
114-MW-71D-137.0-20211215	460-249205-6	Total	CHROMIUM (HEXAVALENT)	U	21.9	21.9 UB	10.0	Negate	2
114-MW-61D-117.3-20211215	460-249205-7	Total	CHROMIUM (HEXAVALENT)	U	37.4	37.4 JB	10.0	Qualify	1
114-MW-61D-120.8-20211215	460-249205-8	Total	CHROMIUM (HEXAVALENT)	U	53.9	53.9 JB	10.0	Qualify	1
114-MW-61D-125.8-20211215	460-249205-9	Total	CHROMIUM (HEXAVALENT)	U	31.9	31.9 UB	10.0	Negate	2

Note: A "U" under Method Blank column indicates a non-detect result.

NJDEP Validation Footnote

- 1.) Sample result was $\geq 3x$ and $<10X$ the associated blank result. Sample result was qualified as estimated and may be biased high.
- 2.) Sample result was $>RL$ and $<3X$ the associated blank result. Sample result was negated at the reported concentration.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 15, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249205-1 (J249205-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211215

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-66D-128.0-20211215	460-249205-1	Total	CHROMIUM	U	49600	49600	20.0		
114-MW-66D-128.0-20211215X	460-249205-2	Total	CHROMIUM	U	50900	50900	20.0		
114-MW-72D-103.5-20211215	460-249205-3	Total	CHROMIUM	U	2200	2200	4.0		
114-MW-72D-113.5-20211215	460-249205-4	Total	CHROMIUM	U	2250	2250	4.0		
114-MW-71D-137.0-20211215	460-249205-6	Total	CHROMIUM	U	44.2	44.2	4.0		
114-MW-61D-117.3-20211215	460-249205-7	Total	CHROMIUM	U	42.9	42.9	4.0		
114-MW-61D-120.8-20211215	460-249205-8	Total	CHROMIUM	U	40.8	40.8	4.0		
114-MW-61D-125.8-20211215	460-249205-9	Total	CHROMIUM	U	35.0	35.0	4.0		

Note: A "U" under Method Blank column indicates a non-detect result.

Attachment B

Data Validation Report Form

Client Name: PPG Industries			Project Number: 60667926, Task GW.BR.DATA	
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ			Project Manager: Shannon Gleason	
Laboratory: Eurofins TestAmerica, Edison			Type of Validation: Full	
Laboratory Job No: 460-249205-1 (J249205)			Date Checked: 1/05/2022	
Validator: Allison Wamness			Peer: Kristin Rutherford	
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.0° C
Signed COCs included?	X			
Date of sample collection included?	X			12/15/2021
Date of sample digestion included?			X	Aqueous samples
Holding time to digestion met criteria?			X	Aqueous samples
Date of analysis included?	X			12/16/2021
Holding time to analysis met criteria?	X			
Method reference included?	X			EPA SW-846 Method 7196A
Laboratory Case Narrative included?	X			
Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.				

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			1.0000 (7196A)
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.		X		MB non-detect, FB 12.0 ug/L – see table
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			460-249205-1
1) Soluble Matrix %R criteria met? (85-115%R).	X			
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?	X			Spiked at 2x concentration
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?			X	NA for aqueous samples
1) Insoluble Matrix %R criteria met? (85-115%R).			X	
2) Was the spike concentration around 400 to 800 mg/Kg?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Post Spike			X	NA for aqueous samples
1) Post Spike %R criteria met? (85-115%R).			X	
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Sample Duplicate Data Included in Lab Package?	X			460-249205-1
1) RPD criteria met? ($RPD \leq 20\%$) if both results are $\geq 4 \times RL$ or absolute difference $\pm RL$ if either or both results are $< 4 \times RL$	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			460-249205-1/-2
1) Were Field duplicate RPD criteria met?	X			
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids $> 50\%$?			X	NA aqueous samples
2) Were any samples analyzed or reported with dilutions?	X			Up to 500x (see table below)

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?			X	NA aqueous samples
2) For aqueous or soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?			X	NA aqueous samples
5) For 7199, was each sample injected twice and was the RPD <20?			X	
Total vs Dissolved and Cr vs Cr6 Fraction Agreement Reviewed	X			
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			X	No data for dissolved Cr and Cr6
Chromium result and corresponding hexavalent chromium result met QC criteria?	X			Criteria met for GW samples.

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW-66D-128.0-20211215	460-249205-1	49600	20.0	54500	5000	9	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW-66D-128.0-20211215X	460-249205 -2	50900	20.0	50700	5000	0	T Cr > T Cr6, Accept
114-MW-72D-103.5-20211215	460-249205 -3	2200	4.0	2400	200	9	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW-72D-113.5-20211215	460-249205 -4	2250	4.0	2490	200	10	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW-71D-137.0-20211215	460-249205 -6	44.2	4.0	21.9	10.0	67	T Cr > T Cr6, Accept
114-MW-61D-117.3-20211215	460-249205 -7	42.9	4.0	37.4	10.0	14	T Cr > T Cr6, Accept
114-MW-61D-120.8-20211215	460-249205 -8	40.8	4.0	53.9	10.0	28	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW-61D-125.8-20211215	460-249205 -9	35.0	4.0	31.9	10.0	9	T Cr > T Cr6, Accept

Field Blank- Hexavalent Chromium

Sample ID	Lab ID	Sample Result (ug/L)	Field Blank Result (ug/L)	3x Field Blank Result (ug/L)	10x Field Blank Result (ug/L)	Action
114-MW-66D-128.0-20211215	460-249205-1	54500	12	36	120	None - SR >10x FB result
114-MW-66D-128.0-20211215X	460-249205-2	50700	12	36	120	None - SR >10x FB result
114-MW-72D-103.5-20211215	460-249205-3	2400	12	36	120	None - SR >10x FB result
114-MW-72D-113.5-20211215	460-249205-4	2490	12	36	120	None - SR >10x FB result
114-MW-71D-137.0-20211215	460-249205-6	21.9	12	36	120	Negate (UB) at sample concentration, SR <3x FB
114-MW-61D-117.3-20211215	460-249205-7	37.4	12	36	120	Estimate (JB), SR >3x, <10x FB
114-MW-61D-120.8-20211215	460-249205-8	53.9	12	36	120	Estimate (JB), SR >3x, <10x FB
114-MW-61D-125.8-20211215	460-249205-9	31.9	12	36	120	Negate (UB) at sample concentration, SR <3x FB

SR – sample result

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW-66D-128.0-20211215	460-249205-1	CHROMIUM (HEXAVALENT)	500
114-MW-66D-128.0-20211215X	460-249205-2	CHROMIUM (HEXAVALENT)	500
114-MW-72D-103.5-20211215	460-249205-3	CHROMIUM (HEXAVALENT)	20
114-MW-72D-113.5-20211215	460-249205-4	CHROMIUM (HEXAVALENT)	20

460-249205-1**Batch: 819261**

Cr+6 ICAL – 12/16/2021

Groundwater

(p 868 of data pkg)

x - concentration	y - response
0	0
10	0.008
50	0.043
75	0.066
100	0.092
200	0.180

(p 868 of data pkg)

AECOM Calculated Intercept	0.9662	OK	Reported intercept	0.9662
AECOM Slope	1103.3	OK	Reported Slope	1103
AECOM Calculated r	0.9998	OK, rounding	Reported r	1.000

LCS calculation**460-819261/11****P. 863, 890**

Background absorbance	0
Sample absorbance	0.068
Total absorbance - background	0.068
Instrument Concentration (ug/L)	76.000
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	75.97	OK	Reported Result (ug/L)	75.97

%R = Found/True*100**460-819261/11****P. 863**

True Value (ug/L)	79.4

AECOM Calculated %R	95.7	OK	Reported %R	95.7

MS calculation**batch****P. 861****460-249205-1 MS (Total)**

Background reading	0
Total absorbance	0.079
Total absorbance - background	0.079
Instrument Concentration (ug/L)	88.131
Sample aliquot (L)	0.05
Final volume (L)	0.05

Dilution Factor	2000		
AECOM Calculated MS Result (ug/L)	176262	OK, rounding	Reported Result (ug/L) 176200
%R = Found/True*100	batch	P. 861	460-249205-1 MS (Total)
True Value (ug/L)	109000		
Native concentration (ug/L)	54500		
AECOM Calculated MS Result %R	111.7	OK, rounding	Reported %R 111
Reporting Limit	460-249205-3	P. 849, 891	114-MW-72D-103.5-20211215 (Total)
Low Standard(ug/l)	10		
Initial volume (L)	0.05		
Final volume (L)	0.05		
Dilution Factor	20		
AECOM Calculated Reporting Limit	200	OK	Reported RL (ug/L) = 200
<u>Sample Calculations</u>	460-249205-3	P. 849, 891	114-MW-72D-103.5-20211215 (Total)
Background reading	0		
Total absorbance	0.108		
Total absorbance - background	0.108		
Instrument Response (ug/L)	120.128		
Sample volume (L)	0.05		
Final Volume (L)	0.05		
Dilution Factor	20		
AECOM Calculated Result (ug/L)	2403	OK, rounding	Reported Result (ug/L) 2400

Client Name: PPG Industries		Project Number: 60667926, Task GW.BR.DATA		
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ		Project Manager: Shannon Gleason		
Laboratory: Eurofins TestAmerica, Edison		Type of Validation: Limited		
Laboratory Job No: 460-249205-1 (J249205-1)		Date Checked: 1/7/2021		
Validator: Allison Wamness		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.0° C
Signed COCs included?	X			
Date of sample collection included?	X			12/15/2021
Date of sample digestion included?	X			12/21/2021
Date of analysis included?	X			12/21/2021
Holding time met Method QC criteria?	X			
Method reference included?	X			EPA SW-846 Method 6020B
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			Up to 5x. See table below.
Method Blank Included in Lab Package?	X			MB 460-819969/1-A
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples?	X			
3) MB results nondetect?	X			
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			FB-20211215
1) FB/EB result non-detect?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			460-249205-1 (MS and sample dup, no MSD)
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met?		X		%R high, native concentration > 4x spike, no action required
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike		X		Not analyzed on site sample
1) %R criteria met? (75-125%R) - %R>125			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			460-249205-1
Aqueous - RPD is >20%?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?	X			460-249205-1/2

ITEM	YES	NO	N/A	COMMENTS
Aqueous - RPD is <30%?	X			

Matrix Spike

114-MW-66D-128.0-20211215MS (460-249205-1)

Analyte	SR	MS SR	Spike Added	MS % Rec	Lower Limit	Upper Limit	Action
CHROMIUM	49600	50650	50.0	2198	75	125	SR>4x spike amount, no action

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW-66D-128.0-20211215	460-249205-1	CHROMIUM	5
114-MW-66D-128.0-20211215X	460-249205-2	CHROMIUM	5

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock	
Laboratory:	Eurofins TestAmerica, Edison	
Laboratory Job No.:	460-249274-1 (J249274-1)	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926, Task GW.BR.DATA	
Prepared by:	Allison Warnness /AECOM	Completed on: 01/07/2022
Reviewed by:	Kristin Rutherford/AECOM	File Name: 460249274_2022_01_07 DVReport-F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 an associated blank. The presence of the analyte in the sample is negated (UB) due to possible laboratory or field contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in an associated blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to possible laboratory or field contamination, and may be biased high.
- 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 December 16, 2021 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-MW-72D-125.0-20211216	460-249274-1	Groundwater	Hexavalent Chromium, Chromium
114-MW-4D-106.3-20211216	460-249274-2	Groundwater	Hexavalent Chromium, Chromium
114-MW-4D-112.3-20211216	460-249274-3	Groundwater	Hexavalent Chromium, Chromium
114-MW-61D-130.8-20211216	460-249274-4	Groundwater	Hexavalent Chromium, Chromium
114-MW-61D-130.8-20211216X	460-249274-5	Groundwater	Hexavalent Chromium, Chromium
FB-20211216	460-249274-6	Aqueous	Hexavalent Chromium, Chromium
114-MW-61D-135.8-20211216	460-249274-7	Groundwater	Hexavalent Chromium, Chromium
114-PZ-66WR-82.2-20211216	460-249274-8	Groundwater	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Matrix Spike

Matrix spike analysis was performed on sample 114-MW-61D-130.8-20211216 (460-249274-4). The total hexavalent chromium recovery was 133%, which exceeded the QC criteria of 85-115%. The positive results in all groundwater samples were qualified as estimated (J+) with a possible high bias. Nondetect results were accepted without qualification.

Total Chromium

All quality control (QC) criteria were met. No qualifiers were applied.

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

Sample results estimated due to high MS recoveries are considered useable with a high bias.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 16, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249274-1 (J249274-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211216

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-72D-125.0-20211216	460-249274-1	Total	CHROMIUM (HEXAVALENT)	U	2480	2480 J+	200	Qualify	1
114-MW-61D-130.8-20211216	460-249274-4	Total	CHROMIUM (HEXAVALENT)	U	58.6	58.6 J+	10.0	Qualify	1
114-MW-61D-130.8- 20211216X	460-249274-5	Total	CHROMIUM (HEXAVALENT)	U	68.6	68.6 J+	10.0	Qualify	1
114-MW-61D-135.8-20211216	460-249274-7	Total	CHROMIUM (HEXAVALENT)	U	45.3	45.3 J+	10.0	Qualify	1
114-PZ-66WR-82.2-20211216	460-249274-8	Total	CHROMIUM (HEXAVALENT)	U	198000	198000 J+	10000	Qualify	1

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

NJDEP Validation Footnote

- 1) The MS and/or MSD recovery was above the acceptance criteria.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 16, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249274-1 (J249274-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211216

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-72D-125.0-20211216	460-249274-1	Total	CHROMIUM	U	2580	2580	4.0		
114-MW-4D-106.3-20211216	460-249274-2	Total	CHROMIUM	U	2.5J	2.5J	4.0	Qualify	1
114-MW-4D-112.3-20211216	460-249274-3	Total	CHROMIUM	U	3.0J	3.0J	4.0	Qualify	1
114-MW-61D-130.8-20211216	460-249274-4	Total	CHROMIUM	U	67.3	67.3	4.0		
114-MW-61D-130.8- 20211216X	460-249274-5	Total	CHROMIUM	U	88.3	88.3	4.0		
114-MW-61D-135.8-20211216	460-249274-7	Total	CHROMIUM	U	59.8	59.8	4.0		
114-PZ-66WR-82.2-20211216	460-249274-8	Total	CHROMIUM	U	195000	195000	80.0		

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

NJDEP Validation Footnote

- 1) The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

Attachment B

Data Validation Report Form

Client Name: PPG Industries			Project Number: 60667926, Task GW.BR.DATA	
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ			Project Manager: Shannon Gleason	
Laboratory: Eurofins TestAmerica, Edison			Type of Validation: Full	
Laboratory Job No: 460-249274-1 (J249274)			Date Checked: 01/06/2022	
Validator: Allison Wamness			Peer: Kristin Rutherford	
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?		X		1.0° C, OK
Signed COCs included?	X			
Date of sample collection included?	X			12/16/2021
Date of sample digestion included?			X	Aqueous samples
Holding time to digestion met criteria?			X	Aqueous samples
Date of analysis included?	X			12/17/2021
Holding time to analysis met criteria?	X			
Method reference included?	X			EPA SW-846 Method 7196A
Laboratory Case Narrative included?	X			
Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			MBs and FB non-detect.
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			
1) Soluble Matrix %R criteria met? (85-115%R).		X		460-249274-4, qualified J+. See table below.
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	460-249274-3 spiked 30ug/L & 460-249274-4 spiked at twice the sample concentration.
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?			X	NA for aqueous samples
1) Insoluble Matrix %R criteria met? (85-115%R).			X	
2) Was the spike concentration around 400 to 800 mg/Kg?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Post Spike			X	NA for aqueous samples
1) Post Spike %R criteria met? (85-115%R).			X	
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Sample Duplicate Data Included in Lab Package?	X			
1) RPD criteria met? ($RPD \leq 20\%$) if both results are $\geq 4 \times RL$ or absolute difference $\pm RL$ if either or both results are $< 4 \times RL$	X			
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?	X			114-MW-61D-130.8-20211216 (460-249274-4) and 114-MW-61D-130.8-20211216X (460-249274-5)
1) Were Field duplicate RPD criteria met?	X			RPD 15.7%
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids $> 50\%$?			X	NA aqueous samples
2) Were any samples analyzed or reported with dilutions?	X			Up to 1000x (see table below)

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?			X	NA aqueous samples
2) For aqueous or soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?			X	NA aqueous samples
5) For 7199, was each sample injected twice and was the RPD <20?			X	
Total vs Dissolved and Cr vs Cr6 Fraction Agreement Reviewed	X			
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			X	No results for dissolved hexavalent chromium
Chromium result and corresponding hexavalent chromium result met QC criteria?	X			

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW-72D-125.0-20211216	460-249274-1	2580	4.0	2480	200	4	T Cr > T Cr6, Accept
114-MW-4D-106.3-20211216	460-249274-2	2.5	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW-112.3-20211216	460-249274-3	3.0	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW-61D-130.8-20211216	460-249274-4	67.3	4.0	58.6	10.0	14	T Cr > T Cr6, Accept
114-MW-61D-130.8-20211216X	460-249274-5	88.3	4.0	68.6	10.0	25	T Cr > T Cr6, Accept
FB-20211216	460-249274-6		4.0		10.0	NC	Both ND, Accept
114-MW-61D-135.8-20211216	460-249274-7	59.8	4.0	45.3	10.0	28	T Cr > T Cr6, Accept
114-PZ-66WR-82.2-20211216	460-249274-8	195000	80.0	198000	10000	2	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Matrix Spikes

14-MW-61D-130.8-20211216MS (460-249274-4)

Analyte	SR	MS SR	Spike Added	MS % Rec	Lower Limit	Upper Limit	Action
CHROMIUM (HEXAVALENT)	58.6	215.2	133	118	85	115	J+, all samples in batch

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW-72D-125.0-20211216	460-249274-1	CHROMIUM (HEXAVALENT)	20
114-PZ-66WR-82.2-20211216	460-249274-8	CHROMIUM (HEXAVALENT)	1000

460-249274-1

Batch: 819442

Cr+6 ICAL – 12/17/2021

Groundwater

(p 642 of data pkg)

x - concentration	y - response
0	0
10	0.009
50	0.045
75	0.07
100	0.089
200	0.180

(p 642 of data pkg)

AECOM Calculated Intercept	-0.3191	OK	Reported intercept	-0.319
AECOM Slope	1111.7	OK	Reported Slope	1112
AECOM Calculated r	0.9998	OK, rounding	Reported r	1.000

LCS calculation

460-819442/11 P. 637, 664

Background absorbance 0
 Sample absorbance 0.068
 Total absorbance - background 0.068
 Instrument Concentration (ug/L) 75.297
 Sample aliquot (L) 0.05
 Final volume (L) 0.05
 Dilution Factor 1

AECOM Calculated LCS Result (ug/L)	75.30	OK	Reported Result (ug/L)	75.30

%R = Found/True*100

460-819442/11 P. 637, 664

True Value (ug/L) 79.4

AECOM Calculated %R	94.8	OK	Reported %R	94.8

MS calculation

batch 819442 P. 635, 664

460-249274-4 MS (Total)

114-MW-61D-130.8-20211216

Background reading 0
 Total absorbance 0.039
 Total absorbance - background 0.039
 Instrument Concentration (ug/L) 43.039

Sample aliquot (L)	0.05		
Final volume (L)	0.05		
Dilution Factor	5		
AECOM Calculated MS Result (ug/L)	215	OK	Reported Result (ug/L) 215

%R = Found/True*100	batch 819442	P. 635, 664	460-249274-4 MS (Total)	114-MW-61D-130.8-20211216
True Value (ug/L)	133			
Native concentration (ug/L)	59			
AECOM Calculated MS Result %R	117.7	OK, rounding	Reported %R	118

Reporting Limit	460-249274-4	625, 664	114-MW-61D-130.8-20211216
Low Standard(ug/l)	10		
Initial volume (L)	0.05		
Final volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Reporting Limit	10.0	OK	Reported RL (ug/L) = 10.0

<u>Sample Calculations</u>	460-249274-3	P. 624, 666	114-MW-4D-112.3-20211216
Background reading	0		
Total absorbance	-0.001		
Total absorbance - background	-0.001		
Instrument Response (ug/L)	-1.431		
Sample volume (L)	0.05		
Final Volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Result (ug/L)	-1	OK, ≤MDL, report as ND	Reported Result (ug/L) 8.1U

Client Name: PPG Industries		Project Number: 60667926, Task GW.BR.DATA		
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ		Project Manager: Shannon Gleason		
Laboratory: Eurofins TestAmerica, Edison		Type of Validation: Limited		
Laboratory Job No: 460-249274 (J249274)		Date Checked: 01/07/2021		
Validator: Allison Wamness		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?		X		1.0° C, OK
Signed COCs included?	X			
Date of sample collection included?	X			12/16/2021
Date of sample digestion included?	X			12/22/2021
Date of analysis included?	X			12/23/2021
Holding time met Method QC criteria?	X			
Method reference included?	X			EPA SW-846 Method 6020B
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			Up to 20x. See table below.
Method Blank Included in Lab Package?	X			MB 460-820418/1-A
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples?	X			
3) MB results nondetect?	X			
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			460-249275-1
1) FB/EB result non-detect?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			460-249274-4 MS only
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met?	X			
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike		X		Not required
1) %R criteria met? (75-125%R) - %R>125			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			460-249274-4 DU
Aqueous - RPD is >20%?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?	X			114-MW-61D-130.8-20211216 (460-249274-4) and 114-MW-61D-130.8-20211216X (460-249274-5)
Aqueous - RPD is <30%?	X			RPD 27.0%

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PZ-66WR-82.2-20211216	460-249274-8	CHROMIUM	20

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock	
Laboratory:	Eurofins TestAmerica, Edison	
Laboratory Job No.:	460-249366-1 (J249366-1)	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926, Task GW.BR.DATA	
Prepared by:	Allison Warnness /AECOM	Completed on: 01/10/2022
Reviewed by:	Kristin Rutherford/AECOM	File Name: 4602493661_2022_01_10 DVReport-F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016).

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 an associated blank. The presence of the analyte in the sample is negated (UB) due to possible laboratory or field contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in an associated blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to possible laboratory or field contamination and may be biased high.
- 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 December 17, 2021 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PZ-52WR-74.0-20211217	460-249366-1	Groundwater	Hexavalent Chromium, Chromium
114-MW4D-118.8-20211217	460-249366-2	Groundwater	Hexavalent Chromium, Chromium
114-MW4D-122.3-20211217	460-249366-3 3460-247633-3	Groundwater	Hexavalent Chromium, Chromium
FB-20211217	460-249366-4 4460-247633-4	Aqueous	Hexavalent Chromium, Chromium
114-MW4D-123.8-20211217	460-249366-5	Groundwater	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC criteria were met. No qualifiers were applied.

Total Chromium

All QC criteria were met. No qualifiers were applied.

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

All analytes detected at concentrations less than the RL but greater than the MDL are approximate values that have been qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 17, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249366-1 (J249366-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211217

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-52WR-74.0-20211217	460-249366-1	Total	CHROMIUM (HEXAVALENT)	U	27100	27100	2500		

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 17, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249366-1 (J249366-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211217

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-52WR-74.0-20211217	460-249366-1	Total	CHROMIUM	U	30400	30400	20.0		
114-MW4D-118.8-20211217	460-249366-2	Total	CHROMIUM	U	2.6 J	2.6 J	4.0	Qualify	1
114-MW4D-122.3-20211217	460-249366-3	Total	CHROMIUM	U	3.0 J	3.0 J	4.0	Qualify	1
114-MW4D-123.8-20211217	460-249366-5	Total	CHROMIUM	U	2.9 J	2.9 J	4.0	Qualify	1

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

NJDEP Validation Footnote

- 1) The reported result was greater than the MDL but less than the RL and qualified (J) as estimated by the laboratory.

Attachment B

Data Validation Report Form

Client Name: PPG Industries			Project Number: 60667926, Task GW.BR.DATA	
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ			Project Manager: Shannon Gleason	
Laboratory: Eurofins TestAmerica, Edison			Type of Validation: Full	
Laboratory Job No: 460-249366-1 (J249366-1)			Date Checked: 01/07/2022	
Validator: Allison Wamness			Peer: Kristin Rutherford	
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.3° C
Signed COCs included?	X			
Date of sample collection included?	X			12/17/2021
Date of sample digestion included?			X	Aqueous samples
Holding time to digestion met criteria?			X	Aqueous samples
Date of analysis included?	X			12/17/2021
Holding time to analysis met criteria?	X			
Method reference included?	X			EPA SW-846 Method 7196A
Laboratory Case Narrative included?	X			
Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation :Corr Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of =0.995 (7196A) or =0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			MBs and FB non-detect.
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Batch QC not assessed.
1) Soluble Matrix %R criteria met? (85-115%R).			X	
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?			X	NA for aqueous samples
1) Insoluble Matrix %R criteria met? (85-115%R).			X	
2) Was the spike concentration around 400 to 800 mg/Kg?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Post Spike		X		None reported
1) Post Spike %R criteria met? (85-115%R).			X	
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Sample Duplicate Data Included in Lab Package?	X			Batch QC not assessed
1) RPD criteria met? ($RPD \leq 20\%$) if both results are $\geq 4 \times RL$ or absolute difference $\pm RL$ if either or both results are $< 4 \times RL$			X	
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		None with this SDG
1) Were Field duplicate RPD criteria met?			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids $> 50\%$?			X	NA aqueous samples
2) Were any samples analyzed or reported with dilutions?	X			Up to 250x (see table below)

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?			X	NA aqueous samples
2) For aqueous or soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?			X	NA aqueous samples
5) For 7199, was each sample injected twice and was the RPD <20?			X	
Total vs Dissolved and Cr vs Cr6 Fraction Agreement Reviewed	X			
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			X	No data for dissolved Cr6
Chromium result and corresponding hexavalent chromium result met QC criteria?	X			

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-PZ-52WR-74.0-20211217	460-249366-1	30400	20.0	27100	10.0	11	T Cr>T Cr6, Accept
114-MW4D-118.8-20211217	460-249366-2	2.3	4.0	ND	10.0	NC	T Cr>T Cr6, Accept
114-MW4D-122.3-20211217	460-249366-3	3.0	4.0	ND	10.0	NC	T Cr>T Cr6, Accept
FB-20211217	460-249366-4	ND	4.0	ND	10.0	NC	Both ND, Accept
114-MW4D-123.8-20211217	460-249366-5	2.9	4.0	ND	10.0	NC	T Cr>T Cr6, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PZ-52WR-74.0-20211217	460-249366-1	CHROMIUM (HEXAVALENT)	250

460-249366-1**Batch: 819517**

Cr+6 ICAL - 12/17/2021

Groundwater

(p 505 of data pkg)

x - concentration	y - response
0	0
10	0.008
50	0.042
75	0.068
100	0.087
200	0.175

(p 505 of data pkg)

AECOM Calculated Intercept	0.3937	OK	Reported intercept	0.3947
AECOM Slope	1138.5	OK	Reported Slope	1139
AECOM Calculated r	0.9998	OK, rounding	Reported r	1.000

LCS calculation**460-819517/11****P. 478, 499**

Background absorbance	0
Sample absorbance	0.071
Total absorbance - background	0.071
Instrument Concentration (ug/L)	81.263
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	81.26	OK	Reported Result (ug/L)	81.26

%R = Found/True*100**460-819517/11****P. 478, 499**

True Value (ug/L)	79.4

AECOM Calculated %R	102.3	OK	Reported %R	102.3

MS calculation**batch 819517****P. 476, 500****460-249367-1 MS (Total)**

Background reading	0
Total absorbance	0.029
Total absorbance - background	0.029
Instrument Concentration (ug/L)	33.411

Sample aliquot (L) 0.05
 Final volume (L) 0.05
 Dilution Factor 1

AECOM Calculated MS Result (ug/L)	33	OK	Reported Result (ug/L)	33

%R = Found/True*100 **batch 819517** **P. 476, 500** **460-249367-1 MS (Total)**

True Value (ug/L) 30
 Native concentration (ug/L) 0

AECOM Calculated MS Result %R	111.4	OK	Reported %R	111

Reporting Limit **460-249366-3** **P. 468, 499** **114-MW4D-122.3-20211217 (Total)**

Low Standard(ug/l) 10
 Initial volume (L) 0.05
 Final volume (L) 0.05
 Dilution Factor 1

AECOM Calculated Reporting Limit	10.0	OK	Reported RL (ug/L) =	10.0

Sample Calculations **460-249366-3** **P. 468, 499** **114-MW4D-122.3-20211217 (Total)**

Background reading 0
 Total absorbance -0.004
 Total absorbance - background -0.004
 Instrument Response (ug/L) -4.160

Sample volume (L) 0.05
 Final Volume (L) 0.05
 Dilution Factor 1

AECOM Calculated Result (ug/L)	-4	OK	Reported Result (ug/L)	-4

Client Name: PPG Industries		Project Number: 60667926, Task GW.BR.DATA		
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ		Project Manager: Shannon Gleason		
Laboratory: Eurofins TestAmerica, Edison		Type of Validation: Limited		
Laboratory Job No: 460-249366-1(J249366-1)		Date Checked: 01/07/2022		
Validator: Allison Wamness		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.3° C
Signed COCs included?	X			
Date of sample collection included?	X			12/17/2021
Date of sample digestion included?	X			12/24/2021
Date of analysis included?	X			12/26/2021
Holding time met Method QC criteria?	X			
Method reference included?	X			EPA SW-846 Method 6020B
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			Up to 5x. See table below.
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples?	X			
3) MB results nondetect?	X			
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			460-249366-2 (MS and sample dup, no MSD)
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met?	X			
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike		X		Not required
1) %R criteria met? (75-125%R) - %R>125			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			460-249366-2
Aqueous - RPD is >20%?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			

ITEM	YES	NO	N/A	COMMENTS
Field Duplicate Data included in Lab Package?		X		None with this SDG
Aqueous - RPD is <30%?			X	

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PZ-52WR-74.0-20211217	460-249366-1	CHROMIUM	5

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock		
Laboratory:	Eurofins TestAmerica, Edison		
Laboratory Job No.:	460-24960-1 (J249604-1)		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B		
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)		
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ		
AECOM Project No:	60667926, Task GW.BR.DATA		
Prepared by:	Allison Warnness/AECOM	Completed on:	1/11/2021
Reviewed by:	Kristin Rutherford/AECOM	File Name:	460249604_2022_01_11 DVReport-F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016).

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 an associated blank. The presence of the analyte in the sample is negated (UB) due to possible laboratory or field contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in an associated blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to possible laboratory or field contamination and may be biased high.
- 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 December 21, 2021 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-MW-71D-141.5-20211221	460-249604-1	Groundwater	Hexavalent Chromium, Chromium
114-MW-66D-140.0-20211221	460-249604-2	Groundwater	Hexavalent Chromium, Chromium
FB-20211221	460-249604-3	Aqueous	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC criteria were met. No qualifiers were applied.

Total Chromium

All QC criteria were met. No qualifiers were applied.

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 21, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249604-1 (J249604-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211221

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-66D-140.0-20211221	460-249604-2	Total	CHROMIUM (HEXAVALENT)	U	55000	55000	5000		

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date December 21, 2021
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-249604-1 (J249604-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20211221

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW-71D-141.5-20211221	460-249604-1	Total	CHROMIUM	U	29.0	29.0	4.0		
114-P1B-MW102S-9.0-20210930	460-244020-5	Total	CHROMIUM	U	57300	57300	12.0		

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

Attachment B

Data Validation Report Form

Client Name: PPG Industries			Project Number: 60667926, Task GW.BR.DATA	
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ			Project Manager: Shannon Gleason	
Laboratory: Eurofins TestAmerica, Edison			Type of Validation: Full	
Laboratory Job No: 460-249604-1 (J249604-1)			Date Checked: 01/10/2022	
Validator: Allison Wamness			Peer: Kristin Rutherford	
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.8 ° C
Signed COCs included?	X			
Date of sample collection included?	X			12/21/2021
Date of sample digestion included?			X	Aqueous samples
Holding time to digestion met criteria?			X	Aqueous samples
Date of analysis included?	X			12/22/2021
Holding time to analysis met criteria?	X			
Method reference included?	X			EPA SW-846 Method 7196A
Laboratory Case Narrative included?	X			
Definitions: MDL Method Detection Limit; %R Percent Recovery; RL Reporting Limit; RPD Relative Percent Difference; RSD Relative Standard Deviation; Corr Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Initial calibration documentation included in lab package?	X			
1) Blank plus 4 standards (7196A) or blank plus 3 standards (7199)	X			
2) Correlation coefficient of ≥ 0.995 (7196A) or ≥ 0.999 (7199)	X			
3) Calibrate daily or each time instrument is set up.	X			
Calibration Check Standard (CCS) for 7196A and Quality Control Sample (QCS) for 7199 Included in Lab Package?	X			
1) %R criteria met? (90 - 110%)	X			
2) Correct frequency of one per every 10 samples	X			
3) CCS and QCS from independent source and at mid-level of calibration curve	X			
Calibration Blanks	X			
1) Analyzed prior to initial calibration standards and after each CCS/QCS?	X			
2) Absolute value should not exceed MDL.	X			
Method Blank, Field Blanks and/or Equipment Blanks Included in Lab Package?	X			MBs and FB non-detect.
1) Method blank analyzed with each preparation batch?	X			
2) Absolute value should not exceed MDL.	X			
Eh and pH Data	X			
1) Eh and pH data was included and plotted for all samples?	X			
Soluble Matrix Spike Data Included in Lab Package?	X			Batch QC not assessed.
1) Soluble Matrix %R criteria met? (85-115%R).			X	
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	

ITEM	YES	NO	N/A	COMMENTS
Insoluble Matrix Spike Data Included in Lab Package?			X	NA for aqueous samples
1) Insoluble Matrix %R criteria met? (85-115%R).			X	
2) Was the spike concentration around 400 to 800 mg/Kg?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Post Spike		X		None reported
1) Post Spike %R criteria met? (85-115%R).			X	
2) Was the spike concentration 40 mg/Kg or twice the sample concentration?			X	
3) Was a sample spiked at the frequency of 1 per batch or 20 samples?			X	
Sample Duplicate Data Included in Lab Package?	X			Batch QC not assessed.
1) RPD criteria met? ($RPD \leq 20\%$) if both results are $\geq 4 \times RL$ or absolute difference $\pm RL$ if either or both results are $< 4 \times RL$			X	
2) Was a sample duplicate analyzed at the frequency of 1 per batch or 20 samples?			X	
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Were any Field Duplicate samples submitted with this SDG?		X		None with this SDG
1) Were Field duplicate RPD criteria met?			X	
Were all sample quantitation and reporting requirements met?	X			
1) Were all solid samples reported with percent solids $> 50\%$?			X	NA aqueous samples
2) Were any samples analyzed or reported with dilutions?	X			Up to 500x (see table below)

ITEM	YES	NO	N/A	COMMENTS
Miscellaneous Items	X			
1) For soils by 7196A, was the pH within a range of 7.0-8.0?			X	NA aqueous samples
2) For aqueous or soils by 7199, was the pH within a range of 9.0-9.5?			X	
3) For aqueous by 7196A, was the pH with a range of 1.5-2.5?	X			
4) For soils (3060A), was the digestion temperature 90-95C for at least 60 minutes?			X	NA aqueous samples
5) For 7199, was each sample injected twice and was the RPD <20?			X	
Total vs Dissolved and Cr vs Cr6 Fraction Agreement Reviewed	X			
Total hexavalent chromium result and corresponding dissolved hexavalent chromium result met QC criteria?			X	No data for dissolved Cr6
Chromium result and corresponding hexavalent chromium result met QC criteria?	X			

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW-71D-141.5-20211221	460-249604-1	29.0	4.0		10.0		T Cr>T Cr6, Accept
114-MW-66D-140.0-20211221	460-249604-2	57300	12.0	55000	5000		T Cr>T Cr6, Accept
FB-20211221	460-249604-3		4.0		10.0		Both ND, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW-66D-140.0-20211221	460-249604-2	CHROMIUM (HEXAVALENT)	500

460-249604-1**Batch: 820388**

Cr+6 ICAL - 12/22/2021

Groundwater

(p 534 of data pkg)

x - concentration	y - response
0	0
10	0.008
50	0.041
75	0.067
100	0.083
200	0.180

(p 534 of data pkg)

AECOM Calculated Intercept	2.3248	OK	Reported intercept	2.325
AECOM Slope	1111.0	OK	Reported Slope	1111
AECOM Calculated r	0.9991	OK	Reported r	0.999

LCS calculation**460-820388/11 P. 509,528**

Background absorbance

0

Sample absorbance

0.068

Total absorbance - background

0.068

Instrument Concentration (ug/L)

77.873

Sample aliquot (L)

0.05

Final volume (L)

0.05

Dilution Factor

1

AECOM Calculated LCS Result (ug/L)	77.87	OK	Reported Result (ug/L)	77.87

%R = Found/True*100**460-820388/11 P. 509, 528**

True Value (ug/L)

79.4

AECOM Calculated %R	98.1	OK	Reported %R	98.1

MS calculation**batch 820388****MS not performed on site sample**

Background reading

Total absorbance

Total absorbance - background

0

Instrument Concentration (ug/L)

2.325

Sample aliquot (L)

0.05

Final volume (L) 0.05

Dilution Factor

AECOM Calculated MS Result (ug/L)	0	NA	Reported Result (ug/L)	NA

%R = Found/True*100**batch 820388****MS not performed on site sample**

True Value (ug/L)

Native concentration (ug/L) 0

AECOM Calculated MS Result %R	0	NA	Reported %R	NA

Reporting Limit**460-249604-2****P. 9, 529****114-MW-66D-140.0-20211221
(Total)**

Low Standard(ug/l) 10

Initial volume (L) 0.05

Final volume (L) 0.05

Dilution Factor 500

AECOM Calculated Reporting Limit	5000	OK	Reported RL (ug/L) =	5000

Sample Calculations**460-249604-2****P. 9, 529****114-MW-66D-140.0-20211221
(Total)**

Background reading 0

Total absorbance 0.097

Total absorbance - background 0.097

Instrument Response (ug/L) 110.087

Sample volume (L) 0.05

Final Volume (L) 0.05

Dilution Factor 500

AECOM Calculated Result (ug/L)	55044	OK, rounding	Reported Result (ug/L)	55000

Client Name: PPG Industries		Project Number: 60667926, Task GW.BR.DATA		
Site Location: Garfield Avenue Group GW RI Bedrock, Jersey City, NJ		Project Manager: Shannon Gleason		
Laboratory: Eurofins TestAmerica, Edison		Type of Validation: Limited		
Laboratory Job No: 460-249604-1 (J249604-1)		Date Checked: 01/11/2022		
Validator: Allison Wamness		Peer: Kristin Rutherford		
ITEM	YES	NO	N/A	COMMENTS
Sample results included?	X			
Reporting Limits met project requirements?	X			
Field I.D. included?	X			
Laboratory I.D. included?	X			
Did data package sample IDs match sample IDs on COC?	X			
Did electronic data deliverable (EDD) sample IDs match COC sample IDs?	X			
Did data package sample IDs match electronic data deliverable (EDD) sample IDs?	X			
Sample matrix included?	X			
Sample receipt temperature 2-6°C?	X			2.8° C
Signed COCs included?	X			
Date of sample collection included?	X			12/21/2021
Date of sample digestion included?	X			12/26/2021
Date of analysis included?	X			12/28/2021
Holding time met Method QC criteria?	X			
Method reference included?	X			EPA SW-846 Method 6020B
Laboratory Case Narrative included?	X			
Definitions: MDL - Method Detection Limit; %R - Percent Recovery; RL - Reporting Limit; RPD - Relative Percent Difference; RSD - Relative Standard Deviation :Corr - Correlation Coefficient.				

ITEM	YES	NO	N/A	COMMENTS
Sample dilutions?	X			Up to 3x. See table below.
Method Blank Included in Lab Package?	X			
1) Method blank analyzed with each preparation batch or every SDG, or 1/20 samples?	X			
2) Method blank analyzed 1/20 samples?	X			
3) MB results nondetect?	X			
4) Negative MB result reported?		X		
Field Blanks/Equipment Blanks Included in Lab Package?	X			
1) FB/EB result non-detect?	X			
Matrix Spike/Matrix Spike Duplicate Data Included in Lab Package?	X			460-249604-1 (MS and sample dup, no MSD)
1) MS/MSD %R (75-125%R) and RPD (+20%) criteria met?	X			
2) Was a sample spiked at the frequency of 1/batch or 20 samples?	X			
3) Was the MS performed on a site sample?	X			
4) Was the MS performed on a FB/EB or TB?		X		
Post Digestion Spike		X		Not required
1) %R criteria met? (75-125%R) - %R>125			X	
2) Was the spike performed on a FB/EB or TB?			X	
3) Was a sample spiked at the frequency of 1/batch or 20 samples?			X	
Laboratory Duplicate Data Included in Lab Package?	X			460-249604-1
Aqueous - RPD is >20%?	X			
Was a Laboratory Control Sample (LCS) Included in Lab Package?	X			
1) LCS %R criteria met? (80-120%R).	X			
2) Was an LCS analyzed at the frequency of 1/batch or 20 samples?	X			
Field Duplicate Data included in Lab Package?		X		None with this SDG

ITEM	YES	NO	N/A	COMMENTS
Aqueous - RPD is <30%?			X	

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW66D-140.0-20211221	460-249604-2	CHROMIUM	3

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock	
Laboratory:	Eurofins TestAmerica, Edison	
Laboratory Job No.:	460-256705-1	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926 GW.BR.RI	
Prepared by:	Charlene Flint /AECOM	Completed on: 05/05/2022
Reviewed by:	Alison Wamness/AECOM	File Name: 460256705_2022_05_05 DVReport-F

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 April 21, 2022 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW52D-80-83-20220421	460-256705-1	Groundwater	Hexavalent Chromium, Chromium
114-MW52D-87-90-20220421	460-256705-2	Groundwater	Hexavalent Chromium, Chromium
114-MW52D-102-105-20220421	460-256705-3	Groundwater	Hexavalent Chromium, Chromium
114-MW61D-130.8-20220421	460-256705-4	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20220421	460-256705-5	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20220421-X (Field Duplicate of 114-MW66D-91-97-20220421)	460-256705-6	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-107-111-20220421	460-256705-7	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-118-123-20220421	460-256705-8	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-124-129-20220421	460-256705-9	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-137-140-20220421	460-256705-10	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-102-106-20220421	460-256705-11	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-110-114-20220421	460-256705-12	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-116-119-20220421	460-256705-13	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-123-126-20220421	460-256705-14	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20220421 (Field Blank)	460-247853-15	Aqueous	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous 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

Holding Time

Sample 114-MW72D-102-106-20220421 (460-256705-11) exceeded the 24hr aqueous hold time by less than 1hr. Results were qualified (J).

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Matrix Spike

Two samples were analyzed as matrix spikes (MS). Sample 114-MW52D-80-83-20220421 (460-256705-1) and sample 114-MW66D-91-97-20220421 (460-256705-5).

Sample 114-MW52D-80-83-20220421 MS (460-256705-1) met QC criteria. No qualification was required for this sample. Sample 114-MW66D-91-97-20220421 MS (460-256705-5) recovery exceeded upper acceptance limit. Estimate (J+) all positive groundwater (GW) samples.

Field Duplicate Results

The field duplicate pair in this SDG were 114-MW66D-91-97-20220421 (460-256705-5) and 114-MW66D-91-97-20220421 -X (460-256705-6). The relative percent difference (RPD) for hexavalent chromium did not meet QC criteria. All associated GW samples were estimated (J/UJ).

Total Chromium

Sample Results

Reported results (flagged J by the laboratory) that were less than the RL but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

Field Duplicate Results

The field duplicate pair in this SDG for chromium were 114-MW66D-91-97-20220421 (460-256705-5) and 114-MW66D-91-97-20220421 -X (460-256705-6). The RPD for chromium did not meet QC criteria. Chromium sample results for the field duplicate pair were estimated (J).

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

Results estimated due to holding time exceedance and or poor field duplicate precision, are useable with an unknown bias.

Results for hexavalent chromium that were estimated due to high MS recoveries are useable with a high bias.

Results estimated due to total chromium results less than total hexavalent chromium are useable with an unknown bias.

All analytes detected at concentrations less than the RL but greater than the MDL are approximate values that have been qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date April 21, 2022
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-256705-1 (J256705-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220421

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20220421	460-256705-1	Total	CHROMIUM (HEXAVALENT)	U	21.4	21.4	10.0	Qualify	1
114-MW66D-137-140-20220421	460-256705-10	Total	CHROMIUM (HEXAVALENT)	U	165	165	10.0	Qualify	1,2
114-MW72D-102-106-20220421	460-256705-11	Total	CHROMIUM (HEXAVALENT)	U	136	136	10.0	Qualify	1,2,3
114-MW72D-110-114-20220421	460-256705-12	Total	CHROMIUM (HEXAVALENT)	U	83.7	83.7	10.0	Qualify	1,2
114-MW72D-116-119-20220421	460-256705-13	Total	CHROMIUM (HEXAVALENT)	U	923	923	100	Qualify	1,2
114-MW72D-123-126-20220421	460-256705-14	Total	CHROMIUM (HEXAVALENT)	U	247	247	20.0	Qualify	1,2
114-MW52D-87-90-20220421	460-256705-2	Total	CHROMIUM (HEXAVALENT)	U	644	644	50.0	Qualify	1,2
114-MW52D-102-105-20220421	460-256705-3	Total	CHROMIUM (HEXAVALENT)	U	709	709	50.0	Qualify	1,2
114-MW61D-130.8-20220421	460-256705-4	Total	CHROMIUM (HEXAVALENT)	U	26.4	26.4	10.0	Qualify	1,2
114-MW66D-91-97-20220421	460-256705-5	Total	CHROMIUM (HEXAVALENT)	U	2410	2410	200	Qualify	1,2,4
114-MW66D-91-97-20220421-X	460-256705-6	Total	CHROMIUM (HEXAVALENT)	U	10U	10UJ	10.0	Qualify	1
114-MW66D-107-111-20220421	460-256705-7	Total	CHROMIUM (HEXAVALENT)	U	10U	10UJ	10.0	Qualify	1
114-MW66D-118-123-20220421	460-256705-8	Total	CHROMIUM (HEXAVALENT)	U	10U	10UJ	10.0	Qualify	1
114-MW66D-124-129-20220421	460-256705-9	Total	CHROMIUM (HEXAVALENT)	U	164	164	10.0	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 Validation Footnote

1. Field duplicate precision criteria were not met.
2. MS and/or MSD recovery exceeded upper acceptance limit.
3. Technical holding time was exceeded.
4. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date April 21, 2022
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-256705-1 (J256705-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220421

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20220421	460-256705-1	Total	CHROMIUM	U	79.7	79.7	4.0		
114-MW66D-137-140-20220421	460-256705-10	Total	CHROMIUM	U	181	181	4.0		
114-MW72D-102-106-20220421	460-256705-11	Total	CHROMIUM	U	130	130	4.0		
114-MW72D-110-114-20220421	460-256705-12	Total	CHROMIUM	U	143	143	4.0		
114-MW72D-116-119-20220421	460-256705-13	Total	CHROMIUM	U	1710	1710	4.0		
114-MW72D-123-126-20220421	460-256705-14	Total	CHROMIUM	U	994	994	4.0		
114-MW52D-87-90-20220421	460-256705-2	Total	CHROMIUM	U	748	748	4.0		
114-MW52D-102-105-20220421	460-256705-3	Total	CHROMIUM	U	878	878	4.0		
114-MW61D-130.8-20220421	460-256705-4	Total	CHROMIUM	U	28.3	28.3	4.0		
114-MW66D-91-97-20220421	460-256705-5	Total	CHROMIUM	U	805	805	4.0	Qualify	2,3
114-MW66D-91-97-20220421-X	460-256705-6	Total	CHROMIUM	U	3.1J	3.1J	4.0	Qualify	1,2
114-MW66D-107-111-20220421	460-256705-7	Total	CHROMIUM	U	2.8J	2.8J	4.0	Qualify	1
114-MW66D-124-129-20220421	460-256705-9	Total	CHROMIUM	U	189	189	4.0		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory..
2. Field duplicate precision criteria were not met.
3. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-256705-1		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 5/05/2022	
Number of Samples/Matrix: 14 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.5°C below 2-6°C criteria. No qualification since samples were received in good condition on ice.
Holding Time	No	Yes	Sample 114-MW72D-102-106-20220421 (460-256705-11) exceeded the 24hr aqueous hold time by less than 1hr. Results were qualified (J).
Quantitation Limits	Yes	No	70 ug/L
Dilutions	Yes	No	Up to 20x. See table below
Initial Calibration	Yes	No	4/21/2022
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	All ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20220421 ND
Eh/pH	Yes	No	
Matrix Spike	No	Yes	114-MW52D-80-83-20220421 MS (460-256705-1) met QC criteria; 114-MW66D-91-97-20220421 MS (460-256705-5) recovery exceeded upper acceptance limit. Estimate J+ all positive GW samples.
Laboratory Duplicate	Yes	No	114-MW52D-80-83-20220421 (460-256705-1) met QC criteria; 114-MW66D-91-97-20220421 (460-256705-5) met QC criteria
Laboratory Control Standards	Yes	No	460-840579/11, 460-840710/11, 460-840710/45 and 460-840710/45
Field Duplicate	No	Yes	114-MW66D-91-97-20220421 (460-256705-5) and 114-MW66D-91-97-20220421 -X (460-256705-6) (RPD 198.3%). see table below

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Method 7196 Sample Prep	Yes	No	
Total vs Dissolved Results	No	Yes	See table below
Calculation Spot Checks	Yes	No	See calculations below

Dilutions

Sample ID	Lab Sample ID	Analyte	Fraction	Dilution
114-MW72D-116-119-20220421	460-256705-13	CHROMIUM (HEXAVALENT)	Total	10
114-MW72D-123-126-20220421	460-256705-14	CHROMIUM (HEXAVALENT)	Total	2
114-MW52D-87-90-20220421	460-256705-2	CHROMIUM (HEXAVALENT)	Total	5
114-MW52D-102-105-20220421	460-256705-3	CHROMIUM (HEXAVALENT)	Total	5
114-MW66D-91-97-20220421	460-256705-5	CHROMIUM (HEXAVALENT)	Total	20

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW52D-80-83-20220421	460-256705-1	79.7	4.0	21.4	10.0	115	T Cr > T Cr6, Accept
114-MW66D-137-140-20220421	460-256705-10	181	4.0	165	10.0	9	T Cr > T Cr6, Accept
114-MW72D-102-106-20220421	460-256705-11	130	4.0	136	10.0	5	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-110-114-20220421	460-256705-12	143	4.0	83.7	10.0	52	T Cr > T Cr6, Accept
114-MW72D-116-119-20220421	460-256705-13	1710	4.0	923	100	60	T Cr > T Cr6, Accept
114-MW72D-123-126-20220421	460-256705-14	994	4.0	247	20.0	120	T Cr > T Cr6, Accept
GW-RI-FB-20220421	460-256705-15		4.0		10.0		Both ND, Accept
114-MW52D-87-90-20220421	460-256705-2	748	4.0	644	50.0	15	T Cr > T Cr6, Accept
114-MW52D-102-105-20220421	460-256705-3	878	4.0	709	50.0	21	T Cr > T Cr6, Accept
114-MW61D-130.8-20220421	460-256705-4	28.3	4.0	26.4	10.0	7	T Cr > T Cr6, Accept
114-MW66D-91-97-20220421	460-256705-5	805	4.0	2410	200	100	T Cr < T Cr6, SRs < 4x RL, ABS > RL, Qualify J
114-MW66D-91-97-20220421-X	460-256705-6	3.1	4.0		10.0	NC	T Cr > T Cr6, Accept

114-MW66D-107-111-20220421	460-256705-7	2.8	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-118-123-20220421	460-256705-8		4.0		10.0		Both ND, Accept
114-MW66D-124-129-20220421	460-256705-9	189	4.0	164	10.0	14	T Cr > T Cr6, Accept

SR – sample result

NC- not calculated

Matrix Spike

Sample ID	Lab Sample ID	Analyte	% Recovery	Lower Limit	Upper Limit	Action
114-MW52D-80-83-20220421	460-256705-1	CHROMIUM (HEXAVALENT)	87	85	115	OK, Accept
114-MW66D-91-97-20220421	460-256705-5	CHROMIUM (HEXAVALENT)	117	85	115	%R>upper limit, Estimate (J+) all positive hits

Field Duplicates

114-MW66D-91-97-20220421 (460-256705-5) and 114-MW66D-91-97-20220421-X (460-256705-6)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM (HEXAVALENT)	2410		10	U	200/10	ug/l	198.3	Estimate (J/UJ) all samples

460-256705-1**Batch: 840579-0**

Cr+6 ICAL - 4/21/2022

Groundwater

(p 949 of data pkg)

x - concentration	y - response
0	0
10	0.01
50	0.048
75	0.078
100	0.095
200	0.184

(p 949 of
data pkg)

AECOM Calculated Intercept	-2.4578	OK	Reported intercept	-2.458
AECOM Slope	1083.7	OK	Reported Slope	1084
AECOM Calculated r	0.9987	OK	Reported r	0.997

LCS calculation**460-840579/11****P. 901, 976**

Background absorbance	0
Sample absorbance	0.071
Total absorbance - background	0.071
Instrument Concentration (ug/L)	74.506
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	74.51	OK	Reported Result (ug/L)	74.51

%R = Found/True*100**460-840579/11****P. 901, 976**

True Value (ug/L)	79.4

AECOM Calculated %R	93.8	OK	Reported %R	93.8

MS calculation**460-256705-1 MS****P. 899, 939****114-MW52D-80-83-20220421
MS**

Background reading	0
Total absorbance	0.027
Total absorbance - background	0.027
Instrument Concentration (ug/L)	26.803
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	5

AECOM Calculated MS Result (ug/L)	134	OK	Reported Result (ug/L)	134.1

%R = Found/True*100**460-256705-1 MS****P. 899, 939****114-MW52D-80-83-20220421
MS**

True Value (ug/L)	130

Native concentration (ug/L)	21

AECOM Calculated MS Result %R	86.6	OK	Reported %R	87

Reporting Limit**460-256705-1****P. 878, 939****114-MW52D-80-83-20220421**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)=	10

<u>Sample Calculations</u>	460-256705-1	P. 878, 939	114-MW52D-80-83-20220421
Background reading	0		
Total absorbance	0.022		
Total absorbance - background	0.022		
Instrument Response (ug/L)	21.384		
Sample volume (L)	0.05		
Final Volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Result (ug/L)	21	OK	Reported Result (ug/L) 21

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-256705-1		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 5/05/2022	
Number of Samples/Matrix: 14 GW, 1 FB		Validator: Charlene Flint	
Analysis: Total Chromium 6020B		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.5°C below 2-6C criteria. No qualification since samples were received in good condition on ice.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	70 ug/L
Dilutions	Yes	No	No dilutions
Method Blanks	Yes	No	MB 460-841729/1-A ND
Field Blanks	Yes	No	GW-RI-FB-20220421 ND
Matrix Spike	Yes	No	114-MW66D-91-97-20220421 MS (460-256705-5)
Matrix Spike Duplicate	NA	NA	None with this SDG
Post Digestion Spike	Yes	No	114-MW66D-91-97-20220421 MS (460-256705-5)
Laboratory Duplicate	Yes	No	114-MW66D-91-97-20220421 MS (460-256705-5)
Laboratory Control Standards	Yes	No	460-841729/2-A
Field Duplicate	No	Yes	114-MW66D-91-97-20220421 and 114-MW66D-91-97-20220421-X (RPD 198.5%), criteria not met. See table below
Total Metals vs Dissolved Metals Results	NA	NA	Not analyzed for dissolved Cr
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	Total Cr vs Total Cr6 criteria was not met for 114-MW66D-91-97-20220421 (460-256705-5). See table in Hexavalent chromium section.

Field Duplicates

114-MW66D-91-97-20220421 (460-256705-5) and 114-MW66D-91-97-20220421-X (460-256705-6)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM	805		3.1	J	4.0	ug/l	198.5	Estimate (J)

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock	
Laboratory:	Eurofins TestAmerica, Edison	
Laboratory Job No.:	460-258087-1	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926 GW.BR.RI	
Prepared by:	Charlene Flint /AECOM	Completed on: 05/31/2022
Reviewed by:	Alison Wamness/AECOM	File Name: 460258087_2022_05_31 DVRReport-F

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 May 13, 2022 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW66D-91-97-20220513	460-258087-1	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20220513-X (Field Duplicate of 114-MW66D-91-97-20220513)	460-258087-2	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20220513 (Field Blank)	460-247853-3	Aqueous	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Field Duplicate Results

All quality control (QC) criteria were met. No qualifiers were applied.

Dilutions

The field blank, sample GW-RI-FB-20220513 (460-258087-3), was diluted 2x and the hexavalent chromium results were reported as non-detect. The laboratory reanalyzed the sample outside of holding time with no dilution and the results were also non-detect. As the associated samples reported hexavalent chromium with significantly higher concentrations, no qualifications were made. The original results were reported.

Total Chromium

Field Duplicate Results

All quality control (QC) criteria were met. No qualifiers were applied.

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date May 13, 2022
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-258087-1 (J258087-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220513

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20220513	460-258087-1	Total	CHROMIUM (HEXAVALENT)	U	161	161	10.0		
114-MW66D-91-97-20220513-X	460-258087-2	Total	CHROMIUM (HEXAVALENT)	U	164	164	10.0		

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

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date May 13, 2022
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-258087-1 (J258087-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220513

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20220513	460-258087-1	Total	CHROMIUM	U	2580	2580	4.0		
114-MW66D-91-97-20220513-X	460-258087-2	Total	CHROMIUM	U	2470	2470	4.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-258087-1		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 5/31/2022	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7°C.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	70 ug/L
Dilutions	Yes	No	2x. Reanalysis out of HT w no dil. ND. All associated SRs are significantly higher. No qualifications made. See table below
Initial Calibration	Yes	No	5/14/2022
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	All ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20220513 ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC, Not evaluated
Laboratory Duplicate	NA	NA	Batch QC, Not evaluated
Laboratory Control Standards	Yes	No	460-844585/11 and 460-844585/41
Field Duplicate	Yes	No	114-MW66D-91-97-20220513(460-258087-1) and 114-MW66D-91-97-20220513-X (460-258087-2) (RPD 1.8%). see table below
Method 7196 Sample Prep	Yes	No	
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Dilutions

Sample ID	Lab Sample ID	Analyte	Fraction	Dilution
GW-RI-FB-20220513	460-258087-3	CHROMIUM (HEXAVALENT)	Total	2

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW66D-91-97-20220513	460-258087-1	2580	4.0	161	10.0	176.5	T Cr > T Cr6, Accept
114-MW66D-91-97-20220513-X	460-258087-2	2470	4.0	164	10.0	175.1	T Cr > T Cr6, Accept
GW-RI-FB-20220513	460-258087-3	ND	4.0	ND	20.0		OK, Accept
GW-RI-FB-20220513	460-258087-3	ND	4.0	ND	10		OK, Accept

ND – non-detect**Field Duplicates**

114-MW66D-91-97-20220513 (460-258087-1) and 114-MW66D-91-97-20220513-X (460-258087-2)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM (HEXAVALENT)	161		164		10	ug/l	1.8	OK, Accept

460-258087-1**Batch: 844585-0**

Cr+6 ICAL - 5/14/2022

Groundwater

(p 1091 of data pkg)

x - concentration	y - response
0	0
10	0.011
50	0.043
75	0.065
100	0.082
200	0.175

(p 1091 of
data pkg)

AECOM Calculated Intercept	0.1308	OK	Reported intercept	0.131
AECOM Slope	1154.8	OK	Reported Slope	1155
AECOM Calculated r	0.9993	OK	Reported r	0.999

LCS calculation**460-844585/11****P. 513, 537**

Background absorbance

0

Sample absorbance

0.068

Total absorbance - background

0.068

Instrument Concentration (ug/L)

78.671

Sample aliquot (L)

0.05

Final volume (L)

0.05

Dilution Factor

1

AECOM Calculated LCS Result (ug/L)	78.67	OK	Reported Result (ug/L)	78.67

%R = Found/True*100**460-844585/11****P. 513, 537**

True Value (ug/L)

79.4

AECOM Calculated %R	99.1	OK	Reported %R	99.1

MS calculation**batch****P. 511, 536****460-258089-1**

Background reading

0

Total absorbance

0.051

Total absorbance - background

0.051

Instrument Concentration (ug/L)

59.027

Sample aliquot (L)

0.05

Final volume (L)

0.05

Dilution Factor

5

AECOM Calculated MS Result (ug/L)	295	OK	Reported Result (ug/L)	295.2

%R = Found/True*100**batch****P. 511, 536****460-258089-1**

True Value (ug/L)

150

Native concentration (ug/L)

139

AECOM Calculated MS Result %R	104.1	OK	Reported %R	104

Reporting Limit**460-258087-1****P. 502, 537****114-MW66D-91-97-20220513**

Low Standard(ug/l)

10

Initial volume (L)

0.05

Final volume (L)

0.05

Dilution Factor

1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)=	10

Sample Calculations**460-258087-1****P. 502, 537****114-MW66D-91-97-20220513**

Background reading	0		
Total absorbance	0.139		
Total absorbance - background	0.139		
Instrument Response (ug/L)	160.652		
Sample volume (L)	0.05		
Final Volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Result (ug/L)	161	OK	Reported Result (ug/L) 161

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-258087-1		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 5/31/2022	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Total Chromium 6020B		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7°C.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	70 ug/L
Dilutions	Yes	No	No dilutions
Method Blanks	Yes	No	MB 460-845637/1-A ND
Field Blanks	Yes	No	GW-RI-FB-20220513 ND
Matrix Spike	NA	NA	Batch QC, not evaluated
Matrix Spike Duplicate	NA	NA	None with this SDG
Post Digestion Spike	NA	NA	Batch QC, not evaluated
Laboratory Duplicate	NA	NA	Batch QC, not evaluated
Laboratory Control Standards	Yes	No	460-845637/2-A
Field Duplicate	Yes	No	114-MW66D-91-97-20220513 and 114-MW66D-91-97-20220513-X (RPD 4.4%),
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	T>D, see Hexavalent chromium section

Field Duplicates

114-MW66D-91-97-20220513 (460-258087-1) and 114-MW66D-91-97-20220513 -X (460-258087-2)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM	2580		2470		4.0	ug/l	4.4	OK, Accept

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock		
Laboratory:	Eurofins TestAmerica, Edison		
Laboratory Job No.:	460-259361-1		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B		
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)		
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ		
AECOM Project No:	60667926 GA.GW.RI		
Prepared by:	Charlene Flint /AECOM	Completed on:	06/20/2022
Reviewed by:	Allison Wamness /AECOM	File Name:	460259361-1_2022_06_20 DVReport-F

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 3, 2022 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW52D-80-83-20220603	460-259361-1	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-102-106-20220603	460-259361-10	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-110-114-20220603	460-259361-11	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-116-119-20220603	460-259361-12	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-123-126-20220603	460-259361-13	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20220603	460-259361-14	Aqueous	Hexavalent Chromium, Chromium
114-MW52D-87-90-20220603	460-259361-2	Groundwater	Hexavalent Chromium, Chromium
114-MW52D-102-105-20220603	460-259361-3	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20220603	460-259361-4	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20220603-X (Field duplicate of 114-MW66D-91-97-20220603)	460-259361-5	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-107-111-20220603	460-259361-6	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-118-123-20220603	460-259361-7	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-124-129-20220603	460-259361-8	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-137-140-20220603	460-259361-9	Groundwater	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Total Chromium

Field Duplicates

Samples 114-MW66D-91-97-20220603 (460-259361-4) and 114-MW66D-91-97-20220603-X (460-259361-5) were analyzed as the field duplicate pair in this SDG. Chromium did not meet QC criteria and was estimated (J) in the field duplicate pair

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

The results estimated due to poor field duplicate precision are useable with potential low bias.

Results estimated due to total chromium results reported less than total hexavalent results are useable with an unknown bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date June 3, 2022
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-259361-1 (J259361-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220603

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20220603	460-259361-10	Total	CHROMIUM (HEXAVALENT)	U	20.4	20.4	10.0		
114-MW72D-110-114-20220603	460-259361-11	Total	CHROMIUM (HEXAVALENT)	U	53.6	53.6	10.0		
114-MW72D-116-119-20220603	460-259361-12	Total	CHROMIUM (HEXAVALENT)	U	22.6	22.6	10.0		
114-MW72D-123-126-20220603	460-259361-13	Total	CHROMIUM (HEXAVALENT)	U	12.6	12.6	10.0		
114-MW52D-102-105-20220603	460-259361-3	Total	CHROMIUM (HEXAVALENT)	U	99.1	99.1	10.0	Qualify	1
114-MW66D-91-97-20220603	460-259361-4	Total	CHROMIUM (HEXAVALENT)	U	1050	1050	100	Qualify	1
114-MW66D-91-97-20220603-X	460-259361-5	Total	CHROMIUM (HEXAVALENT)	U	1090	1090	100	Qualify	1

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

NJDEP Laboratory Footnote

1. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date June 3, 2022
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-259361-1 (J259361-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220603

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20220603	460-259361-1	Total	CHROMIUM	U	66.6	66.6	4.0		
114-MW72D-102-106-20220603	460-259361-10	Total	CHROMIUM	U	29.0	29.0	4.0		
114-MW72D-110-114-20220603	460-259361-11	Total	CHROMIUM	U	63.6	63.6	4.0		
114-MW72D-116-119-20220603	460-259361-12	Total	CHROMIUM	U	25.3	25.3	4.0		
114-MW72D-123-126-20220603	460-259361-13	Total	CHROMIUM	U	18.0	18.0	4.0		
114-MW52D-87-90-20220603	460-259361-2	Total	CHROMIUM	U	10.4	10.4	4.0		
114-MW52D-102-105-20220603	460-259361-3	Total	CHROMIUM	U	U	UJ	4.0	Qualify	1
114-MW66D-91-97-20220603	460-259361-4	Total	CHROMIUM	U	1600	1600J	4.0	Qualify	1
114-MW66D-91-97-20220603-X	460-259361-5	Total	CHROMIUM	U	299	299J	4.0	Qualify	1
114-MW66D-107-111-20220603	460-259361-6	Total	CHROMIUM	U	4.1	4.1	4.0		
114-MW66D-118-123-20220603	460-259361-7	Total	CHROMIUM	U	3.4J	3.4J	4.0	Qualify	2

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

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

NJDEP Laboratory Footnote

1. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-259361-1		Project Number: 60667926.GW.GW.RI	
Validation Level: Full		Date: 1/12/2021	
Number of Samples/Matrix: 13 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.5°C and 2.7°C
Holding Time	Yes	No	
Quantitation Limits	Yes	No	
Dilutions	Yes	No	Up to 10x. See table below
Initial Calibration	Yes	No	6/4/2022
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-848146/10, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20220603 (460-259361-14), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW66D-91-97-20220603 (460-259361-4) {%R 97%} and 114-MW66D-118-123-20220603 (460-259361-7) {%R 94%}
Laboratory Duplicate	Yes	No	114-MW66D-91-97-20220603 (460-259361-4) {RPD 0} and 114-MW66D-118-123-20220603 (460-259361-7) {Both ND}
Laboratory Control Standards	Yes	No	460-848146/11
Field Duplicate	Yes	No	114-MW66D-91-97-20220603 and 114-MW66D-91-97-20220603-X (RPD 3.7%)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	No	Yes	See table below
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW52D-80-83-20220603	460-259361-1	66.6	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW52D-87-90-20220603	460-259361-2	10.4	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW52D-102-105-20220603	460-259361-3		4.0	99.1	10.0	NC	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL > RL, Qualify J/UJ
114-MW66D-91-97-20220603	460-259361-4	1600	4.0	1050	100	42	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL > RL, Qualify J
114-MW66D-91-97-20220603-X	460-259361-5	299	4.0	1090	100	114	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-MW66D-107-111-20220603	460-259361-6	4.1	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-118-123-20220603	460-259361-7	3.4	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-124-129-20220603	460-259361-8		4.0		10.0		Both ND, accept
114-MW66D-137-140-20220603	460-259361-9		4.0		10.0		Both ND, accept
114-MW72D-102-106-20220603	460-259361-10	29.0	4.0	20.4	10.0	35	T Cr > T Cr6, Accept
114-MW72D-110-114-20220603	460-259361-11	63.6	4.0	53.6	10.0	17	T Cr > T Cr6, Accept
114-MW72D-116-119-20220603	460-259361-12	25.3	4.0	22.6	10.0	11	T Cr > T Cr6, Accept
114-MW72D-123-126-20220603	460-259361-13	18.0	4.0	12.6	10.0	35	T Cr > T Cr6, Accept
GW-RI-FB-20220603	460-259361-14		4.0		10.0		Both ND, accept

SR – sample result

NC- not calculated

Dilutions

Sample ID	Lab Sample ID	Dilution
114-MW66D-91-97-20220603	460-259361-4	10
114-MW66D-91-97-20220603-X	460-259361-5	10

460-259361-1**Batch: 848146-0**

Cr+6 ICAL - 6/04/2022

Groundwater

(p 555 of data pkg)

x - concentration	y - response
0	0
10	0.011
50	0.047
75	0.068
100	0.088
200	0.182

(p 555
of data
pkg)

AECOM Calculated Intercept	-0.6947	OK	Reported intercept	-0.6947
AECOM Slope	1109.0	OK	Reported Slope	1109
AECOM Calculated r	0.9997	OK	Reported r	0.999

LCS calculation**460-848146/11****P. 524, 546**

Background absorbance	0
Sample absorbance	0.067
Total absorbance - background	0.067
Instrument Concentration (ug/L)	73.608
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	73.61	OK	Reported Result (ug/L)	73.61

%R = Found/True*100**460-848146/11****P. 524, 546**

True Value (ug/L)	79.4

AECOM Calculated %R	92.7	OK	Reported %R	92.7

MS calculation**460-259361-4****P. 521, 548****114-MW66D-91-97-20220603 MS
(Total)**

Background reading	0
Total absorbance	0.13
Total absorbance - background	0.13
Instrument Concentration (ug/L)	143.477
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	10

AECOM Calculated MS Result (ug/L)	1435	OK	Reported Result (ug/L)	1435

%R = Found/True*100**460-259361-4****P. 521, 548****114-MW66D-91-97-20220603 MS
(Total)**

True Value (ug/L)	400
Native concentration (ug/L)	1050

AECOM Calculated MS Result %R	96.2	OK, rounding	Reported %R	97

Reporting Limit**460-259361-1****P. 487, 546****114-MW52D-80-83-20220603 (Total)**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)=	10

<u>Sample Calculations</u>	460-259361-1	P. 487, 546	114-MW52D-80-83-20220603 (Total)
Background reading	0		
Total absorbance	-0.002		
Total absorbance - background	-0.002		
Instrument Response (ug/L)	-2.913		
Sample volume (L)	0.05		
Final Volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Result (ug/L)	-3	OK, <MDL, report as ND	Reported Result (ug/L) 8.1 U

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-259361-1		Project Number: 60667926.GA.GW.RI	
Validation Level: Limited		Date: 6/20/2022	
Number of Samples/Matrix: 13 GW, 1 FB		Validator: Charlene Flint	
Analysis: Total Chromium 6020B		Reviewer and Date: Allison Wamness	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.5° C and 2.7° C.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Method Blanks	Yes	No	MB 460-848200/1-A , MB 460-848199/1-A both ND
Field Blanks	Yes	No	GW-RI-FB-20220603 (460-259361-14)
Matrix Spike	Yes	No	114-MW66D-91-97-20220603 (460-259361-4) { %R 120% }
Matrix Spike Duplicate	NA	NA	MSD not performed on site sample
Post Digestion Spike	Yes	No	114-MW66D-91-97-20220603 (460-259361-4)
Laboratory Duplicate	Yes	No	114-MW66D-91-97-20220603 (460-259361-4), {RPD 4}
Laboratory Control Standards	Yes	No	460-848200/2-A, 460-848199/2-A
Field Duplicate	No	Yes	114-MW66D-91-97-20220603 and 114-MW66D-91-97-20220603-X (RPD 137%)
Total Metals vs Dissolved Metals Results	NA	NA	Not analyzed for dissolved Cr
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	see hexavalent chromium section for table

Field Duplicates

114-MW66D-91-97-20220603 and 114-MW66D-91-97-20220603-X

Analyte	Sample Result (ug/l)	FD Result (ug/l)	RL (ug/l)	RPD (%)	RPD Limit (%)	Action
CHROMIUM	1600	299	4.0	137	30	Estimate (J)

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock	
Laboratory:	Eurofins TestAmerica, Edison	
Laboratory Job No.:	460-261318-1	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926 GA.GW.RI	
Prepared by:	Charlene Flint /AECOM	Completed on: 07/21/2022
Reviewed by:	Allison Wamness /AECOM	File Name: 460261318-1_2022_07_21 DVReport-F

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 July 5, 2022 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW52D-80-83-20220705	460-261318-1	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-102-106-20220705	460-261318-10	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-110-114-20220705	460-261318-11	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-116-119-20220705	460-261318-12	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-123-126-20220705	460-261318-13	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20220705	460-261318-14	Aqueous	Hexavalent Chromium, Chromium
114-MW52-87-90-20220705	460-259361-2	Groundwater	Hexavalent Chromium, Chromium
114-MW52D-102-105-20220705	460-259361-3	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20220705	460-259361-4	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20220705-X	460-259361-5	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-107-111-20220705	460-259361-6	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-118-123-20220705	460-259361-7	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-124-129-20220705	460-259361-8	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-137-140-20220705	460-259361-9	Groundwater	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a

listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Total Chromium

Reported results (flagged B by the laboratory) that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values that have been qualified as estimated (J).

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

Reported results (flagged B by the laboratory) that were less than the RL, but greater than or equal to the MDL are approximate values that have been qualified as estimated (J).

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date July 5, 2022
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-261318-1 (J261318-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220705

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20220705	460-261318-10	Total	CHROMIUM (HEXAVALENT)	U	76.8	76.8	10.0		
114-MW72D-110-114-20220705	460-261318-11	Total	CHROMIUM (HEXAVALENT)	U	92.2	92.2	10.0		
114-MW72D-116-119-20220705	460-261318-12	Total	CHROMIUM (HEXAVALENT)	U	19.4	19.4	10.0		
114-MW52D-102-105-20220705	460-261318-3	Total	CHROMIUM (HEXAVALENT)	U	22.7	22.7	10.0		
114-MW66D-91-97-20220705	460-261318-4	Total	CHROMIUM (HEXAVALENT)	U	51.4	51.4	10.0		
114-MW66D-91-97-20220705-X	460-261318-5	Total	CHROMIUM (HEXAVALENT)	U	58.0	58.0	10.0		

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date July 5, 2022
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-261318-1 (J261318-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220705

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20220705	460-261318-1	Total	CHROMIUM	U	47.7	47.7	4.0		
114-MW72D-102-106-20220705	460-261318-10	Total	CHROMIUM	U	79.6	79.6	4.0		
114-MW72D-110-114-20220705	460-261318-11	Total	CHROMIUM	U	86.8	86.8	4.0		
114-MW72D-116-119-20220705	460-261318-12	Total	CHROMIUM	U	31.5	31.5	4.0		
114-MW72D-123-126-20220705	460-261318-13	Total	CHROMIUM	U	12.8	12.8	4.0		
114-MW52-87-90-20220705	460-261318-2	Total	CHROMIUM	U	9.4	9.4	4.0		
114-MW52D-102-105-20220705	460-261318-3	Total	CHROMIUM	U	57.1	57.1	4.0		
114-MW66D-91-97-20220705	460-261318-4	Total	CHROMIUM	U	427	427	4.0		
114-MW66D-91-97-20220705-X	460-261318-5	Total	CHROMIUM	U	385	385	4.0		
114-MW66D-107-111-20220705	460-261318-6	Total	CHROMIUM	U	4.1	4.1	4.0		
114-MW66D-118-123-20220705	460-261318-7	Total	CHROMIUM	U	2.5	2.5	4.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-261318-1		Project Number: 60667926.GW.GW.RI	
Validation Level: Full		Date: 7/21/2022	
Number of Samples/Matrix: 13 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.1°C and 3.5°C
Holding Time	Yes	No	
Quantitation Limits	Yes	No	
Dilutions	Yes	No	
Initial Calibration	Yes	No	7/6/2022
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-853822/10, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20220705 (460-261318-14), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW66D-91-97-20220705 (460-261318-4) {%R 111%}
Laboratory Duplicate	Yes	No	114-MW66D-91-97-20220705 (460-261318-4) {RPD 0}
Laboratory Control Standards	Yes	No	460-853822/11
Field Duplicate	Yes	No	114-MW66D-91-97-20220705 (460-261318-4) and 114-MW66D-91-97-20220705-X (RPD 12.1%)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	See table below
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW52D-80-83-20220705	460-261318-1	47.7	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW72D-102-106-20220705	460-261318-10	79.6	4.0	76.8	10.0	4	T Cr > T Cr6, Accept
114-MW72D-110-114-20220705	460-261318-11	86.8	4.0	92.2	10.0	6	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-116-119-20220705	460-261318-12	31.5	4.0	19.4	10.0	48	T Cr > T Cr6, Accept
114-MW72D-123-126-20220705	460-261318-13	12.8	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20220705	460-261318-14		4.0		10.0		Both ND, Accept
114-MW52-87-90-20220705	460-261318-2	9.4	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW52D-102-105-20220705	460-261318-3	57.1	4.0	22.7	10.0	86	T Cr > T Cr6, Accept
114-MW66D-91-97-20220705	460-261318-4	427	4.0	51.4	10.0	157	T Cr > T Cr6, Accept
114-MW66D-91-97-20220705-X	460-261318-5	385	4.0	58.0	10.0	148	T Cr > T Cr6, Accept
114-MW66D-107-111-20220705	460-261318-6	4.1	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-118-123-20220705	460-261318-7	2.5	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-124-129-20220705	460-261318-8		4.0		10.0		Both ND, Accept
114-MW66D-137-140-20220705	460-261318-9		4.0		10.0		Both ND, Accept

SR – sample result

NC- not calculated

Field Duplicates

114-MW66D-91-97-20220705 (460-261318-4) and 114-MW66D-91-97-20220705-X (460-261318-5)

Analyte	Sample Result (ug/l)	FD Result (ug/l)	RL (ug/l)	RPD (%)	RPD Limit (%)	Action
HEXAVALENT CHROMIUM	51.4	58	10	12.1	30	Ok, Accept

460-261318-1**Batch: 853822-0**

Cr+6 ICAL - 7/06/2022

Groundwater

(p 283 of data pkg)

x - concentration	y - response
0	0
10	0.009
50	0.045
75	0.068
100	0.087
200	0.182

(p 283 of
data pkg)

AECOM Calculated Intercept	0.6522	OK	Reported intercept	0.6522
AECOM Slope	1102.5	OK	Reported Slope	1103
AECOM Calculated r	0.9997	OK	Reported r	0.999

LCS calculation**460-853822/11****P. 247, 273**

Background absorbance	0
Sample absorbance	0.07
Total absorbance - background	0.07
Instrument Concentration (ug/L)	77.862
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	77.86	OK	Reported Result (ug/L)	77.86

%R = Found/True*100**460-853822/11****P. 247, 273**

True Value (ug/L)	79.4

AECOM Calculated %R	98.1	OK	Reported %R	98.1

MS calculation**460-261318-4****P. 244, 274****114-MW66D-91-97-20220705 MS
(Total)**

Background reading	0
Total absorbance	0.149
Total absorbance - background	0.149
Instrument Concentration (ug/L)	164.928
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated MS Result (ug/L)	165	OK	Reported Result (ug/L)	165

%R = Found/True*100**460-261318-4****P. 244, 274****114-MW66D-91-97-20220705 MS
(Total)**

True Value (ug/L)	103
Native concentration (ug/L)	51

AECOM Calculated MS Result %R	110.2	OK, rounding	Reported %R	111

Reporting Limit**460-261318-4****P. 207, 273****114-MW66D-91-97-20220705 (Total)**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)=	10

<u>Sample Calculations</u>	460-261318-4	P. 207, 273	114-MW66D-91-97-20220705 (Total)
Background reading	0		
Total absorbance	0.046		
Total absorbance - background	0.046		
Instrument Response (ug/L)	51.368		
Sample volume (L)	0.05		
Final Volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Result (ug/L)	51	OK	Reported Result (ug/L)
			51

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-261318-1		Project Number: 60667926.GA.GW.RI	
Validation Level: Limited		Date: 7/21/2022	
Number of Samples/Matrix: 13 GW, 1 FB		Validator: Charlene Flint	
Analysis: Total Chromium 6020B		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.1°C and 3.5°C
Holding Time	Yes	No	
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Method Blanks	Yes	No	MB 460-854443/1-A, ND
Field Blanks	Yes	No	GW-RI-FB-20220705 (460-261318-14)
Matrix Spike	Yes	No	114-MW66D-91-97-20220705 (460-261318-4) {%R 103%}
Matrix Spike Duplicate	NA	NA	MSD not performed on site sample
Post Digestion Spike	Yes	No	114-MW66D-91-97-20220705 (460-261318-4) {%R 103%}
Laboratory Duplicate	Yes	No	114-MW66D-91-97-20220705 (460-261318-4) {%RPD 1%}
Laboratory Control Standards	Yes	No	460-854443/2-A
Field Duplicate	Yes	No	114-MW66D-91-97-20220705 (460-261318-4) and 114-MW66D-91-97-20220705-X (RPD 10.3%)
Total Metals vs Dissolved Metals Results	NA	NA	Not analyzed for dissolved Cr
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Field Duplicates

114-MW66D-91-97-20220705 (460-261318-4) and 114-MW66D-91-97-20220705-X (460-261318-5)

Analyte	Sample Result (ug/l)	FD Result (ug/l)	RL (ug/l)	RPD (%)	RPD Limit (%)	Action
CHROMIUM	427	385	4.0	10.3	30	OK, Accept

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock		
Laboratory:	Eurofins TestAmerica, Edison		
Laboratory Job No.:	460-263254-1		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B		
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)		
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ		
AECOM Project No:	60667926		
Prepared by:	Charlene Flint /AECOM	Completed on: 08/22/2022	
Reviewed by:	Danielle Woitas /AECOM	File Name: 460263254_2022_08_22 DVRReport-F	

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 4, 2022 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW66D-91-97-20220804	460-263254-1	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20220804-X (Field duplicate of 114-MW66D-91-97-20220804)	460-263254-2	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-102-106-20220804	460-263254-3	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-110-114-20220804	460-263254-4	Groundwater	Hexavalent Chromium, Chromium
114-MW57D-87.25-20220804	460-263254-5	Groundwater	Hexavalent Chromium, Chromium
114-MW57D-90-20220804	460-263254-6	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20220804	460-263254-7	Aqueous	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

No qualifications were made.

Total Chromium

Matrix Spike/ Matrix Spike Duplicate (MS/MSD)

Sample 114-MW66D-91-97-20220804 (460-263254-1) was selected for the matrix spike/duplicate analysis. The MS/MSD %R of chromium did not meet QC criteria. Since the parent sample concentration was greater than four times the spiked amount, no qualifications were required.

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date August 4, 2022
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-263254-1 (J263254-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220804

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20220804	460-263254-1	Total	CHROMIUM (HEXAVALENT)	U	389	389	100		
114-MW66D-91-97-20220804-X	460-263254-2	Total	CHROMIUM (HEXAVALENT)	U	422	422	100		
114-MW72D-102-106-20220804	460-263254-3	Total	CHROMIUM (HEXAVALENT)	U	36.7	36.7	10.0		
114-MW72D-110-114-20220804	460-263254-4	Total	CHROMIUM (HEXAVALENT)	U	62.0	62.0	10.0		

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date August 4, 2022
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-263254-1 (J263254-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220804

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20220804	460-263254-1	Total	CHROMIUM	U	909	909	4.0		
114-MW66D-91-97-20220804-X	460-263254-2	Total	CHROMIUM	U	1110	1110	4.0		
114-MW72D-102-106-20220804	460-263254-3	Total	CHROMIUM	U	43.8	43.8	4.0		
114-MW72D-110-114-20220804	460-263254-4	Total	CHROMIUM	U	52.4	52.4	4.0		
114-MW57D-87.25-20220804	460-263254-5	Total	CHROMIUM	U	322	322	4.0		
114-MW57D-90-20220804	460-263254-6	Total	CHROMIUM	U	489	489	4.0		

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-263254-1		Project Number: 60667926.GW.BR.DATA	
Validation Level: Full		Date: 8/22/2022	
Number of Samples/Matrix: 6 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas, 8/23/2022	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	No	No	1.5°C below 2-6C criteria. No qualification since samples were received in good condition on ice.
Holding Time	Yes	No	
Quantitation Limits	No	No	70 ug/L, Samples 114-MW66D-91-97-20220804 and 114-MW66D-91-97-20220804-X diluted 10x. RL 100 ug/L
Dilutions	Yes	No	Up to 10x. See table below
Initial Calibration	Yes	No	8/05/2022
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	460-859496/10, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20220804, ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW66D-91-97-20220804 (460-263254-1), {104%R }
Laboratory Duplicate	Yes	No	114-MW66D-91-97-20220804 (460-263254-1), RPD 6
Laboratory Control Standards	Yes	No	460-859496/11 (96.2%)
Field Duplicate	Yes	No	114-MW66D-91-97-20220804 and 114-MW66D-91-97-20220804-X, RPD 8.1%, criteria met
Method 7196 Sample Prep	Yes	No	
Total vs Dissolved Results	Yes	No	Total Cr vs Total Cr6 criteria met
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW66D-91-97-20220804	460-263254-1	909	4.0	389	100	80	T Cr > T Cr6, Accept
114-MW66D-91-97-20220804-X	460-263254-2	1110	4.0	422	100	90	T Cr > T Cr6, Accept
114-MW72D-102-106-20220804	460-263254-3	43.8	4.0	36.7	10.0	18	T Cr > T Cr6, Accept
114-MW72D-110-114-20220804	460-263254-4	52.4	4.0	62.0	10.0	17	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW57D-87.25-20220804	460-263254-5	322	4.0		10.0	200	T Cr > T Cr6, Accept
114-MW57D-90-20220804	460-263254-6	489	4.0		10.0	200	T Cr > T Cr6, Accept
GW-RI-FB-20220804	460-263254-7		4.0		10.0		Both ND, Accept

Matrix Spike

Sample ID	Lab Sample ID	Analyte	% Recovery	Lower Limit	Upper Limit
114-MW66D-91-97-20220804	460-263254-1	CHROMIUM (HEXAVALENT)	104	85	115

Field Duplicates

114-MW66D-91-97-20220804 (460-263254-1) & 114-MW66D-91-97-20220804-X (460-263254-2)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM (HEXAVALENT)	389		422		100	ug/l	8.1	OK <30%, Accept

Lab Duplicates

114-MW66D-91-97-20220804 (460-263254-1)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM (HEXAVALENT)	389		367.2		100	ug/l	5.8	OK <20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW66D-91-97-20220804	460-263254-1	CHROMIUM (HEXAVALENT)	10
114-MW66D-91-97-20220804-X	460-263254-2	CHROMIUM (HEXAVALENT)	10

460-263254-1**Batch: 859496-0**

Cr+6 ICAL - 8/5/2022

Groundwater

(p 769 of data pkg)

x - concentration	y - response
0	0
10	0.008
50	0.045
75	0.068
100	0.091
200	0.181

(p 769
of data
pkg)

AECOM Calculated Intercept	0.3826	OK	Reported intercept	0.383
AECOM Slope	1101.0	OK	Reported Slope	1101
AECOM Calculated r	1.0000	OK	Reported r	1.000

LCS calculation**460-859496/11****P. 749, 764**

Background absorbance	0
Sample absorbance	0.069
Total absorbance - background	0.069
Instrument Concentration (ug/L)	76.352
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	76.35	OK	Reported Result (ug/L)	76.35

%R = Found/True*100**460-859496/11****P. 749, 764**

True Value (ug/L)	79.4

AECOM Calculated %R	96.2	OK	Reported %R	96.2

MS calculation**460-263254-1****P. 747, 764****114-MW66D-91-97-20220804 MS
(Total)**

Background reading	0
Total absorbance	0.109
Total absorbance - background	0.109
Instrument Concentration (ug/L)	120.395
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	10

AECOM Calculated MS Result (ug/L)	1204	OK	Reported Result (ug/L)	1204

%R = Found/True*100**460-263254-1****P. 747, 764****114-MW66D-91-97-20220804 MS
(Total)**

True Value (ug/L)	780
Native concentration (ug/L)	389

AECOM Calculated MS Result %R	104.5	OK	Reported %R	104

Reporting Limit**460-263254-1****P. 730, 764****114-MW66D-91-97-20220804**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05
Dilution Factor	10

AECOM Calculated Reporting Limit	100	OK	Reported RL (ug/L)=	100

Sample Calculations**460-263254-1****P. 730, 764****114-MW66D-91-97-20220804**

Background reading	0
Total absorbance	0.035
Total absorbance - background	0.035
Instrument Response (ug/L)	38.919
Sample volume (L)	0.05
Final Volume (L)	0.05
Dilution Factor	10

AECOM Calculated Result (ug/L)	389	OK	Reported Result (ug/L)	389

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-263254-1		Project Number: 60667926.GW.BR.DATA	
Validation Level: Limited		Date: 8/22/2022	
Number of Samples/Matrix: 6 GW, 1 FB		Validator: Charlene Flint	
Analysis: Total Chromium 6020B		Reviewer and Date: Dani Woitas, 8/23/2022	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	No	No	1.5°C below 2-6C criteria. No qualification since samples were received in good condition on ice.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Method Blanks	Yes	No	MB 460-860307/1-A and 460-860126/1-A, both ND
Field Blanks	Yes	No	GW-RI-FB-20220804, ND
Matrix Spike	No	No	114-MW66D-91-97-20220804 MS/MSD recovery did not meet QC criteria. No qualifications required since sample concentration is >4X spiked amount.
Matrix Spike Duplicate	No	No	See above
Post Digestion Spike	No	No	114-MW66D-91-97-20220804 (460-263254-1), see above
Laboratory Duplicate	Yes	No	114-MW66D-91-97-20220804 (460-263254-1), {RPD 8}
Laboratory Control Standards	Yes	No	460-860307/2-A [112%R]
Field Duplicate	Yes	No	114-MW66D-91-97-20220804 and 114-MW66D-91-97-20220804-X, RPD 19.9, criteria met
Total Metals vs Dissolved Metals Results	NA	NA	Not analyzed for dissolved Cr
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	Total Cr vs Total Cr6 criteria met

Matrix Spike

Sample ID	Lab id	Analyte	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	PDS % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
114-MW66D-91-97-20220804	460-263254-1	Chromium	50.0	909	830.6	992.8	-157	168	NC	125	75	18	20	SR > 4X Spike amount, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NC – Not calculated

NA – not applicable

Field Duplicates

114-MW66D-91-97-20220804 (460-263254-1) & 114-MW66D-91-97-20220804-X (460-263254-2)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM	909		1110		4.0	ug/l	19.9	OK <30%, Accept

Lab Duplicates

114-MW66D-91-97-20220804 (460-263254-1)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM	909		984.8		4.0	ug/l	8	OK <30%, Accept

Data Validation Report

Project:	Garfield Avenue Group GW RI Bedrock		
Laboratory:	Eurofins TestAmerica, Edison		
Laboratory Job No.:	460-263336-1		
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B		
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)		
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ		
AECOM Project No:	60667926		
Prepared by:	Charlene Flint /AECOM	Completed on: 08/22/2022	
Reviewed by:	Danielle Woitas /AECOM	File Name: 460263336_2022_08_22 DVRReport-F	

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods)
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016)

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 5, 2022 as part of the Groundwater Remedial Investigation for Bedrock at the Garfield Avenue (GA) Group Sites, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW57D-98-20220805	460-263336-1	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20220805	460-263336-2	Aqueous	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the 2021 Bedrock Remedial Investigation Scope of Work for the GA Group Sites, 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

There were no QC nonconformances noted during validation, thus the data were accepted as reported by the laboratory.

Total Chromium

There were no QC nonconformances noted during validation, thus the data were accepted as reported by the laboratory.

Data Quality and Usability

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date August 5, 2022
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-263336-1 (J263336-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220805

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported		Total	CHROMIUM (HEXAVALENT)	U					

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name Garfield Avenue Group GW RI Bedrock
Sampling Date August 5, 2022
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-263336-1 (J263336-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20220805

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-98-20220805	460-263336-1	Total	CHROMIUM	U	375	375	4.0		

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-263336-1		Project Number: 60667926.GW.BR.DATA	
Validation Level: Full		Date: 8/22/2022	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Danielle Woitas, 8/22/2022	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	No	No	1.4°C below 2-6°C criteria. No qualification since samples were received in good condition on ice.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	70 ug/L
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	8/05/2022
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	460-859666/10, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20220805, ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC, not evaluated
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	460-859666/11 (99.1%)
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	
Total vs Dissolved Results	Yes	No	Total Cr vs Total Cr6 criteria met
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	RP D (%)	Action
114-MW57D-98-20220805	460-263336-1	375	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20220805	460-263336-2		4.0		10.0		Both ND, Accept

460-263336-1**Batch: 859666-0**

Cr+6 ICAL - 8/5/2022

Groundwater

(p 738 of data pkg)

x - concentration	y - response
0	0
10	0.009
50	0.044
75	0.067
100	0.087
200	0.180

(p 738 of data
pkg)

AECOM Calculated Intercept	0.6726	OK	Reported intercept	0.673
AECOM Slope	1113.6	OK	Reported Slope	1114
AECOM Calculated r	0.9998	OK	Reported r	1.000

LCS calculation**460-859666/11****P. 721, 735**

Background absorbance

0

Sample absorbance

0.07

Total absorbance - background

0.07

Instrument Concentration (ug/L)

78.653

Sample aliquot (L)

0.05

Final volume (L)

0.05

Dilution Factor

1

AECOM Calculated LCS Result (ug/L)	78.65	OK	Reported Result (ug/L)	78.65

%R = Found/True*100**460-859666/11****P. 721, 735**

True Value (ug/L)

79.4

AECOM Calculated %R	99.1	OK	Reported %R	99.1

MS calculation**batch QC****P. 719, 735****460-263354-1 MS**

Background reading

0

Total absorbance

0.026

Total absorbance - background

0.026

Instrument Concentration (ug/L)

29.626

Sample aliquot (L)

0.05

Final volume (L)

0.05

Dilution Factor

1

AECOM Calculated MS Result (ug/L)	30	OK	Reported Result (ug/L)	30

%R = Found/True*100**batch QC****P. 719, 735****460-263354-1 MS**

True Value (ug/L)

30

Native concentration (ug/L)

0

AECOM Calculated MS Result %R	98.8	OK	Reported %R	99

Reporting Limit**460-263336-1****P. 711, 735****114-MW57D-98-20220805**

Low Standard(ug/l)

10

Initial volume (L)

0.05

Final volume (L)

0.05

Dilution Factor

1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)=	10

Sample Calculations

460-263336-1

P. 711, 735

114-MW57D-98-20220805

Background reading 0

Total absorbance 0

Total absorbance - background 0

Instrument Response (ug/L) 0.673

Sample volume (L) 0.05

Final Volume (L) 0.05

Dilution Factor 1

AECOM Calculated Result (ug/L)	1	OK, report ND	Reported Result (ug/L)	8.1 U

Laboratory: Eurofins TestAmerica, Edison		Client/Site Name: Garfield Avenue Group GW RI Bedrock	
Laboratory SDG/Job No: 460-263336-1		Project Number: 60667926.GW.BR.DATA	
Validation Level: Limited		Date: 8/22/2022	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Total Chromium 6020B		Reviewer and Date: Danielle Woitas, 8/22/2022	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	No	No	1.4°C below 2-6C criteria. No qualification since samples were received in good condition on ice.
Holding Time	Yes	No	
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Method Blanks	Yes	No	MB 460-860307/1-A, ND
Field Blanks	Yes	No	GW-RI-FB-20220805, ND
Matrix Spike	NA	NA	Batch QC, not evaluated
Matrix Spike Duplicate	NA	NA	None with this SDG
Post Digestion Spike	NA	NA	Batch QC, not evaluated
Laboratory Duplicate	NA	NA	Batch QC, not evaluated
Laboratory Control Standards	Yes	No	460-860307/2-A [112%R}
Field Duplicate	NA	NA	None with this SDG
Total Metals vs Dissolved Metals Results	NA	NA	Not analyzed for dissolved Cr
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	Total Cr vs Total Cr6 criteria met

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-283332-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926. GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/13/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602833321_2023_07_13 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 29, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-PZ-66WR-83-20230629	460-283332-1	Groundwater	Hexavalent Chromium, Chromium
114-PZ-66WR-83-20230629-X (Field Duplicate of 114-PZ-66WR-83-20230629)	460-283332-2	Groundwater	Hexavalent Chromium, Chromium
114-MW61C-67.5-20230629	460-283332-3	Groundwater	Hexavalent Chromium, Dissolved Hexavalent Chromium, Chromium, Dissolved Chromium
114-MW-55C-70.5-20230629	460-283332-4	Groundwater	Hexavalent Chromium, Chromium
114-MW52D-80-83-20230629	460-283332-5	Groundwater	Hexavalent Chromium, Chromium
114-MW52D-87-90-20230629	460-283332-6	Groundwater	Hexavalent Chromium, Chromium
114-MW52D-102-105-20230629	460-283332-7	Groundwater	Hexavalent Chromium, Chromium
114-MW61D-117-20230629	460-283332-8	Groundwater	Hexavalent Chromium, Dissolved Hexavalent Chromium, Chromium, Dissolved Chromium
114-MW58C-75.0-20230629	460-283332-9	Groundwater	Hexavalent Chromium, Chromium
114-MW62C-73-20230629	460-283332-10	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20230629	460-283332-11	Field Blank	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a

listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The original chain of custody (COC) included samples for analysis of ferrous iron, sulfate, and TOC. These samples were reported in SDG 460-283332-2.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Total chromium results vs total hexavalent chromium results for sample 114-PZ-66WR-83-20230629-X (460-283332-2) did not meet QC criteria. Results were estimated (J).

Matrix Spike (MS)

Sample 114-PZ-66WR-83-20230629 (460-283332-1) was analyzed as a MS for this data set. All QC acceptance criteria were met. No qualifications were required.

Laboratory Duplicate

Sample 114-PZ-66WR-83-20230629 (460-283332-1) was analyzed as the laboratory duplicate for hexavalent chromium. All QC acceptance criteria were met. No qualifications were required.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. No qualifications were required.

Field Duplicate

The field duplicate pair for this data set were samples 114-PZ-66WR-83-20230629 (460-283332-1) total and 114-PZ-66WR-83-20230629-X (460-283333-2) total. The RPD exceeded the QC limit. All sample results (total) were estimated (J/UJ).

Chromium

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample 114-PZ-66WR-83-20230629 (460-283332-1) was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met. No qualifications were required.

Laboratory Duplicate

Sample 114-PZ-66WR-83-20230629 (460-283332-1) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met. No qualifications were required.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. No qualifications were required.

Field Duplicate

The field duplicate pair submitted with this data set were samples 114-PZ-66WR-83-20230629 (460-283332-1) and 114-PZ-66WR-83-20230629-X (460-283333-2). All QC acceptance criteria were met. No qualifications were required.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. Sample 114-PZ-66WR-83-20230629-X (460-283332-2) did not meet QC criteria. Results were estimated (J).

The results for total metals and dissolved metals were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and dissolved results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Metals vs. Dissolved Metals Comparison	Action
Total Concentration Greater than Dissolved Concentration	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the value > the RL and the RL of the ND result is $\leq$ RL	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Both Sample Results Positive and < 5x RL; Absolute Difference $\leq$ RL	No Qualification
Both Sample Results Positive and < 5x RL; Absolute Difference > RL	Qualify J

Both Sample Results Positive and $\geq 5\times$ RL; RPD $\leq 30\%$	No Qualification
Both Sample Results Positive and $\geq 5\times$ RL; RPD $>30\%$	Qualify J
Total Concentration Equal to Dissolved Concentration	No Qualification

All QC acceptance criteria were met. No qualifications were required.

Reported results that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability Summary

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

Sample results reported between the MDL and RL content are usable as estimated values with an unknown directional bias.

Sample results estimated due to poor field duplicate precision are useable with an unknown bias.

Results estimated due to total chromium results less than the corresponding hexavalent chromium result, are useable with an unknown bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date June 29, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283332-1 (J283332-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230629

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66WR-83-20230629	460-283332-1	Total	CHROMIUM (HEXAVALENT)	U	124000	124000J	20000	Qualify	1
114-PZ-66WR-83-20230629-X	460-283332--2	Total	CHROMIUM (HEXAVALENT)	U	233000	233000J	20000	Qualify	1,2
114-MW61C-67.5-20230629	460-283332--3	Total	CHROMIUM (HEXAVALENT)	U	4650	4650J	400	Qualify	1
114-MW61C-67.5-20230629	460-283332--3	Dissolved	CHROMIUM (HEXAVALENT)	U	5480	5480	400		
114-MW-55C-70.5-20230629	460-283332--4	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	10.0	Qualify	1
114-MW52D-80-83-20230629	460-283332--5	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	10.0	Qualify	1
114-MW52D-87-90-20230629	460-283332--6	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	10.0	Qualify	1
114-MW52D-102-105-20230629	460-283332--7	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	10.0	Qualify	1
114-MW61D-117-20230629	460-283332--8	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	10.0	Qualify	1
114-MW58C-75.0-20230629	460-283332--9	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	10.0	Qualify	1
114-MW62C-73-20230629	460-283332-10	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	10.0	Qualify	1

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

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

NJDEP Laboratory Footnote

1. Field duplicate precision criteria were not met.
2. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date June 29, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283332-1 (J283332-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230629

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66WR-83-20230629	460-283332-1	Total	CHROMIUM	U	111000	111000	40.0		
114-PZ-66WR-83-20230629-X	460-283332-2	Total	CHROMIUM	U	109000	109000J	40.0	Qualify	2
114-MW61C-67.5-20230629	460-283332-3	Total	CHROMIUM	U	6250	6250	4.0		
114-MW61C-67.5-20230629	460-283332-3	Dissolved	CHROMIUM	U	5490	5490	4.0		
114-MW-55C-70.5-20230629	460-283332-4	Total	CHROMIUM	U	10.8	10.8	4.0		
114-MW52D-80-83-20230629	460-283332-5	Total	CHROMIUM	U	24.2	24.2	4.0		
114-MW52D-87-90-20230629	460-283332-6	Total	CHROMIUM	U	9.5	9.5	4.0		
114-MW52D-102-105-20230629	460-283332-7	Total	CHROMIUM	U	16.2	16.2	4.0		
114-MW61D-117-20230629	460-283332-8	Total	CHROMIUM	U	20.0	20.0	4.0		
114-MW58C-75.0-20230629	460-283332-9	Total	CHROMIUM	U	2.9J	2.9J	4.0	Qualify	1

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.
2. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283332-1 (J283332-1)		Project Number: 60667926. GW.BR.RI	
Validation Level: Full		Date: 7/13/2023	
Number of Samples/Matrix: 10 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 7/14/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.0 °C and 2.5 °C
Holding Time	Yes	No	Sampled 6/29/2023, analyzed 6/30/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	6/30/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-918661/10, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230629 (460-283332-11), ND
Eh/pH	No	No	No Eh plot for 114-MW58C-75.0-20230629 (460-283332-9), out of sample
Matrix Spike	Yes	No	114-PZ-66WR-83-20230629 (460-283332-1) {115%R}
Laboratory Duplicate	Yes	No	114-PZ-66WR-83-20230629 (460-283332-1) {RPD 4%}
Laboratory Control Standards	Yes	No	460-918661/11 {101.3%R}
Field Duplicate	No	Yes	114-PZ-66WR-83-20230629 (460-283332-1) and 114-PZ-66WR-83-20230629-X (460-283333-2)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	No	Yes	See table below
Calculation Spot Checks	Yes	No	See calculations below

Field Duplicate

114-PZ-66WR-83-20230629 (460-283332-1) and 114-PZ-66WR-83-20230629-X (460-283333-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	ABS DIFF	Action
HEXAVALENT CHROMIUM	Total	124000		233000		20000	ug/l	61.1	109000	RPD >20%, SR>5xRL, Estimate (J)

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PZ-66WR-83-20230629	460-283332-1	111000	40.0	124000	20000	11	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PZ-66WR-83-20230629-X	460-283332--2	109000	40.0	230000	20000	71	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-MW61C-67.5-20230629	460-283332--3	6250	4.0	4650	400	29	T Cr > T Cr6, Accept
114-MW-55C-70.5-20230629	460-283332--4	10.8	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW52D-80-83-20230629	460-283332--5	24.2	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW52D-87-90-20230629	460-283332--6	9.5	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW52D-102-105-20230629	460-283332--7	16.2	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW61D-117-20230629	460-283332--8	20.0	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW58C-75.0-20230629	460-283332--9	2.9	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW62C-73-20230629	460-283332-10		4.0		10.0		Both ND, Accept
GW-RI-FB-20230629	460-283332-11		4.0		10.0		Both ND, Accept

NC – not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61C-67.5-20230629	460-283332--3	5490	4.0	5480	400	0	D Cr > D Cr6, Accept
114-MW61D-117-20230629	460-283332--8		4.0		10		Both ND, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61C-67.5-20230629	460-283332--3	4650	400	5480	400	16	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW61D-117-20230629	460-283332--8		10.0		10		Both ND, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-66WR-83-20230629	460-283332-1	Hexavalent Chromium	Total	2000
114-PZ-66WR-83-20230629-X	460-283332-2	Hexavalent Chromium	Total	2000
114-MW61C-67.5-20230629	460-283332-3	Hexavalent Chromium	Total	40
114-MW61C-67.5-20230629	460-283332-3	Hexavalent Chromium	Dissolved	40

460-283332-1**Batch: 918661-0**

Cr+6 ICAL - 6/30/2023

Groundwater

(p 1550 of data pkg)

x - concentration	y - response
0	0
10	0.008
50	0.041
75	0.066
100	0.084
200	0.173

(p 1550 of
data pkg)

AECOM Calculated Intercept	0.9377	OK	Reported intercept	0.9377
AECOM Slope	1154.2	OK	Reported Slope	1154
AECOM Calculated r	0.9998	OK	Reported r	1.000

LCS calculation**460-918661/11****P. 1517, 1541**

Background absorbance	0
Sample absorbance	0.048
Total absorbance - background	0.048
Instrument Concentration (ug/L)	56.330
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	56.33	OK	Reported Result (ug/L)	56.33

%R = Found/True*100**460-918661/11****P. 1517, 1541**

True Value (ug/L)	55.6

AECOM Calculated %R	101.3	OK	Reported %R	101.3

MS calculation**460-283332-1****P. 1515, 1541****114-PZ-66WR-83-20230629**

Background reading	0
Total absorbance	0.07
Total absorbance - background	0.07
Instrument Concentration (ug/L)	81.734
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	5000

AECOM Calculated MS Result (ug/L)	408669.2	OK	Reported Result (ug/L)	408600.0

%R = Found/True*100**460-283332-1****P. 1515, 1541****114-PZ-66WR-83-20230629**

True Value (ug/L)	248000
Native concentration (ug/L)	124000

AECOM Calculated MS Result %R	114.8	OK	Reported %R	115

Reporting Limit**460-283332-1****p. 1481, 1541****114-PZ-66WR-83-20230629**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05

Dilution Factor	2000			
AECOM Calculated Reporting Limit	20000	OK	Reported RL (ug/L)	20000
<u>Sample Calculations</u>	460-283332-1	p. 1481, 1541	114-PZ-66WR-83-20230629	
Background reading	0			
Total absorbance	0.053			
Total absorbance - background	0.053			
Instrument Response (ug/L)	62.112			
Sample volume (L)	0.05			
Final Volume (L)	0.05			
Dilution Factor	2000			
AECOM Calculated Result (ug/L)	124223.9	OK	Reported Result (ug/L)	124000

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283332-1 (J283332-1)		Project Number: 60667926 GW.BR.RI	
Validation Level: Limited		Date: 7/13/2023	
Number of Samples/Matrix: 10 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Chromium/6020B		Reviewer and Date: Dani Woitas 7/14/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Samples for Ferrous iron, sulfate and TOC reported in 460-283332-2
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.0 °C and 2.5 °C
Holding Time	Yes	No	Sampled 6/29/2023, analyzed 7/5/2023 and 7/10/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-919265/1-A (total) ND, MB 460-920263/7-A dissolved Cr, ND
Field Blanks	Yes	No	GW-RI-FB-20230629 (460-283332-11) ND
Matrix Spike	Yes	No	114-PZ-66WR-83-20230629 (460-283332-1), see table below
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	Yes	No	114-PZ-66WR-83-20230629 (460-283332-1)
Laboratory Duplicate	Yes	No	114-PZ-66WR-83-20230629 (460-283332-1), {RPD 5%}
Laboratory Control Standards	Yes	No	460-919265/2-A (93%R) total, 460-920263/8-A dissolved chromium {104%R}
Field Duplicate	Yes	No	114-PZ-66WR-83-20230629 (460-283332-1) and 114-PZ-66WR-83-20230629-X (460-283333-2)
Total Metals vs Dissolved Metals Results	Yes	No	Dissolved 114-MW61C-67.5-20230629 (460-283332-3) and 114-MW61D-117-20230629 (460-283332-8)
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	See hexavalent chromium section for table

Matrix Spikes

114-PZ-66WR-83-20230629 (460-283332-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Chromium	Total	50.0	111000	112400	111100	3534	880	125	75	1	20	SR>4x spike amount, Accept

Laboratory Duplicate

114-PZ-66WR-83-20230629 (460-283332-1)

Analyte	Fraction	SR (ug/l)	RL	SDR (ug/l)	RL	RPD %	RPD Upper Limit	Action
Chromium	Total	111000	40.0	115900	40.0	4.3	20	OK, Accept

Field Duplicates

114-PZ-66WR-83-20230629 (460-283332-1) & 114-PZ-66WR-83-20230629-X (460-283332-2)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
Chromium	111000		109000		40.0	ug/l	1.8	OK, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RPD (%)	Action
114-MW61C-67.5-20230629	460-283332--3	6250	4.0	5490	4.0	13	T Cr > D Cr, Accept
114-MW61D-117-20230629	460-283332--8	20.0	4.0		4.0	200	T Cr > D Cr, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-66WR-83-20230629	460-283332-1	Chromium	Total	10
114-PZ-66WR-83-20230629-X	460-283332-2	Chromium	Total	10

Data Validation Report

Project:	PPG GW RI - Bedrock	
Laboratory:	Eurofins TestAmerica, Edison, NJ	
Laboratory Job No.:	460-283394-1	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926. GW.BR.RI	
Prepared by:	Dani Woitas/AECOM	Completed on: 7/14/2023
Reviewed by:	Allison Wamness/AECOM	File Name: 460283394_2023_07_14 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 30, 2023 as part of the PPG GW RI Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and

parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-PZ-52WR-74-20230630	460-283394-1	Groundwater	Hexavalent Chromium, Dissolved Hexavalent Chromium, Chromium, Dissolved Chromium
114-MW61D-121-20230630	460-283394-2	Groundwater	Hexavalent Chromium, Chromium
114-MW57C-71-20230630	460-283394-3	Groundwater	Hexavalent Chromium, Dissolved Hexavalent Chromium, Chromium, Dissolved Chromium
114-MW57C-71-20230630-X (Field Duplicate of 114-MW57C-71-20230630)	460-283394-4	Groundwater	Hexavalent Chromium, Dissolved Hexavalent Chromium, Chromium, Dissolved Chromium
114-MW61D-126-20230630	460-283394-5	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20230630	460-283394-6	Field Blank	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The original chain of custody (COC) included samples for analysis of ferrous iron, sulfate, and TOC. These samples were reported in SDG 460-283394-2.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Total/dissolved chromium results vs total/dissolved hexavalent chromium results for sample 114-MW57C-71-20230630 (460-283394-3) and 114-MW57C-71-20230630-X (460-283394-4) did not meet QC criteria. Results were estimated (J).

Sample 114-PZ-52WR-74-20230630 (460-283394-3) (total and dissolved) was diluted 1000x and 2000x resulting in elevated RLs for hexavalent chromium that exceeded the GWQS limits. Project limits may not be met.

Matrix Spike (MS)

Sample 114-MW57C-71-20230630 (460-283394-3) was analyzed as a MS for this data set. All QC acceptance criteria were met. No qualifications were required.

Laboratory Duplicate

Sample 114-MW57C-71-20230630 (460-283394-3) was analyzed as the laboratory duplicate for hexavalent chromium. All QC acceptance criteria were met. No qualifications were required.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. No qualifications were required.

Field Duplicate

The field duplicate pair submitted with this data set were samples 114-MW57C-71-20230630 (460-283394-3) and 114-MW57C-71-20230630-X (460-283394-4). All QC acceptance criteria were met. No qualifications were required.

Chromium

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Sample 114-PZ-66WR-83-20230629 (460-283394-3) was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met. No qualifications were required.

Laboratory Duplicate

Sample 114-PZ-66WR-83-20230629 (460-283394-3) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met. No qualifications were required.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. No qualifications were required.

Field Duplicate

The field duplicate pair submitted with this data set were samples 114-MW57C-71-20230630 (460-283394-3) and 114-MW57C-71-20230630-X (460-283394-4). All QC acceptance criteria were met. No qualifications were required.

Sample Results

The results for total metals and dissolved metals were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and dissolved results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Metals vs. Dissolved Metals Comparison	Action
Total Concentration Greater than Dissolved Concentration	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the value > the RL and the RL of the ND result is ≤RL	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Both Sample Results Positive and < 5x RL; Absolute Difference ≤ RL	No Qualification
Both Sample Results Positive and < 5x RL; Absolute Difference > RL	Qualify J
Both Sample Results Positive and ≥ 5x RL; RPD ≤30%	No Qualification
Both Sample Results Positive and ≥ 5x RL; RPD >30%	Qualify J
Total Concentration Equal to Dissolved Concentration	No Qualification

All QC acceptance criteria were met. No qualifications were required.

Data Quality and Usability Summary

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

Results estimated due to total chromium results less than the corresponding hexavalent chromium result, are useable with an unknown bias.

The nondetect total and dissolved hexavalent chromium results in 114-PZ-52WR-74-20230630 (460-280792-3), as presented in Attachments A and B, exceeded the Groundwater Action levels; therefore, the nondetect results may not meet project objectives.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date June 30, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283394-1 (J283394-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230630

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-71-20230630	460-283394-3	Dissolved	CHROMIUM (HEXAVALENT)	U	22400	22400J	5000	Qualify	2
114-MW57C-71-20230630	460-283394-3	Total	CHROMIUM (HEXAVALENT)	U	23000	23000J	5000	Qualify	1
114-MW57C-71-20230630-X	460-283394-4	Dissolved	CHROMIUM (HEXAVALENT)	U	20800	20800J	5000	Qualify	2
114-MW57C-71-20230630-X	460-283394-4	Total	CHROMIUM (HEXAVALENT)	U	23500	23500J	5000	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 total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.
2. The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date June 30, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283394-1 (J283394-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230630

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-52WR-74-20230630	460-283394-1	Dissolved	CHROMIUM	U	294	294	4.0		
114-PZ-52WR-74-20230630	460-283394-1	Total	CHROMIUM	U	5340	5340	4.0		
114-MW61D-121-20230630	460-283394-2	Total	CHROMIUM	U	13.6	13.6	4.0		
114-MW57C-71-20230630	460-283394-3	Dissolved	CHROMIUM	U	11100	11100J	20.0	Qualify	2
114-MW57C-71-20230630	460-283394-3	Total	CHROMIUM	U	13100	13100J	4.0	Qualify	1
114-MW57C-71-20230630-X	460-283394-4	Dissolved	CHROMIUM	U	11300	11300J	20.0	Qualify	2
114-MW57C-71-20230630-X	460-283394-4	Total	CHROMIUM	U	14000	14000J	4.0	Qualify	1
114-MW61D-126-20230630	460-283394-5	Total	CHROMIUM	U	10.0	10.0	4.0		

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

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

NJDEP Laboratory Footnote

1. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.
2. The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283394-1 (J283332-1)		Project Number: 60667926. GW.BR.RI	
Validation Level: Full		Date: 7/14/2023	
Number of Samples/Matrix: 5 GW, 3 GWF, 1 FB		Validator: Dani Woitas	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The case narrative noted that the container label did not match the COC for 460-283394-3 and 460-283394-4. An extra container was received for 460-283394-3 (dissolved Cr6) but logged in for 460-283394-4 since it was missing a container.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7 °C
Holding Time	Yes	No	Sampled 6/30/2023, analyzed 7/1/2023
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	7/1/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-918780/10, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230630 (460-283394-6), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW57C-71-20230630 (460-283394-3) {96%R}
Laboratory Duplicate	Yes	No	114-MW57C-71-20230630 (460-283394-3) {RPD 0%}
Laboratory Control Standards	Yes	No	460-918780/11 {104.2%R}
Field Duplicate	Yes	No	114-MW57C-71-20230630 (460-283394-3) and 114-MW57C-71-20230630-X (460-283394-4)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5

Total vs Dissolved Results	No	Yes	Dissolved for 114-PZ-52WR-74-20230630, 114-MW57C-71-20230630, 114-MW57C-71-20230630-X
Calculation Spot Checks	Yes	No	See calculations below

Field Duplicate

114-MW57C-71-20230630 (460-283394-3) and 114-MW57C-71-20230630-X (460-283394-4)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	ABS DIFF	Action
HEXAVALENT CHROMIUM	Total	23000		23500		5000	ug/l	2.15	500	RPD <20%, SR<5xRL, ABS Diff< QL, Accept
HEXAVALENT CHROMIUM	Dissolved	22400		20800		5000	ug/l	7.41	1600	RPD <20%, SR<5xRL, ABS Diff< QL, Accept

Reporting Limits Hexavalent Chromium

Sample ID	Lab ID	Analyte	Fraction	Result	Detect Flag	Units	GWQS Action Level
114-PZ-52WR-74-20230630	460-283394-1	CHROMIUM (HEXAVALENT)	Dissolved	814	N	ug/l	70
114-PZ-52WR-74-20230630	460-283394-1	CHROMIUM (HEXAVALENT)	Total	1630	N	ug/l	70

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PZ-52WR-74-20230630	460-283394-1	5340	4.0		2000	NC	T Cr > T Cr6, Accept
114-MW61D-121-20230630	460-283394-2	13.6	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW57C-71-20230630	460-283394-3	13100	4.0	23000	5000	55	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-MW57C-71-20230630-X	460-283394-4	14000	4.0	23500	5000	51	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-MW61D-126-20230630	460-283394-5	10.0	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230630	460-283394-6		4.0		10.0		T Cr > T Cr6, Accept

NC – not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PZ-52WR-74-20230630	460-283394-1	294	4.0		1000	NC	D Cr > D Cr6, Accept
114-MW57C-71-20230630	460-283394-3	11100	20.0	22400	5000	67	D Cr < D Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-MW57C-71-20230630-X	460-283394-4	11300	20.0	20800	5000	59	D Cr < D Cr6, SRs > 4x RL, %RPD > 30%, Qualify J

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PZ-52WR-74-20230630	460-283394-1		2000		1000		Both ND, Accept
114-MW57C-71-20230630	460-283394-3	23000	5000	22400	5000	3	T Cr6 > D Cr6, Accept
114-MW57C-71-20230630-X	460-283394-4	23500	5000	20800	5000	12	T Cr6 > D Cr6, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-52WR-74-20230630	460-283394-1	Hexavalent Chromium	Total	200
114-PZ-52WR-74-20230630	460-283394-1	Hexavalent Chromium	Dissolved	100
114-MW57C-71-20230630	460-283394-3	Hexavalent Chromium	Total	500
114-MW57C-71-20230630	460-283394-3	Hexavalent Chromium	Dissolved	500
114-MW57C-71-20230630-X	460-283394-4	Hexavalent Chromium	Total	500
114-MW57C-71-20230630-X	460-283394-4	Hexavalent Chromium	Dissolved	500

460-283394-1**Batch: 918780-0**

Cr+6 ICAL - 7/1/2023

Groundwater

(p 1392 of data pkg)

x - concentration	y - response
0	0
10	0.009
50	0.046
75	0.066
100	0.087
200	0.184

(p 1392 of data pkg)

AECOM Calculated Intercept	1.1710	OK	Reported intercept	1.171
AECOM Slope	1091.8	OK	Reported Slope	1092
AECOM Calculated r	0.9995	OK	Reported r	0.999

LCS calculation**460-918780/11****P. 1364, 1386**

Background absorbance	0
Sample absorbance	0.052
Total absorbance - background	0.052
Instrument Concentration (ug/L)	57.955
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	57.96	OK	Reported Result (ug/L)	57.96

%R = Found/True*100**460-918780/11****P. 1364, 1386**

True Value (ug/L)	55.6

AECOM Calculated %R	104.2	OK	Reported %R	104.2

MS calculation**460-283394-3****P. 1362, 1387****114-MW57C-71-20230630**

Background reading	0
Total absorbance	0.076
Total absorbance - background	0.076
Instrument Concentration (ug/L)	84.146
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	500

AECOM Calculated MS Result (ug/L)	42072.8	OK	Reported Result (ug/L)	42080.0

%R = Found/True*100**460-283394-3****P. 1362, 1387****114-MW57C-71-20230630**

True Value (ug/L)	20000

Native concentration (ug/L)	23000

AECOM Calculated MS Result %R	95.4	OK	Reported %R	96

Reporting Limit**460-283394-1****p. 1338, 1386****114-PZ-52WR-74-20230630**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05
Dilution Factor	200

AECOM Calculated Reporting Limit	2000	OK	Reported RL (ug/L)	2000

Sample Calculations**460-283394-1****p. 1338, 1386****114-PZ-52WR-74-20230630**

Background reading	0
Total absorbance	-0.004
Total absorbance - background	-0.004
Instrument Response (ug/L)	-3.196

Sample volume (L)	0.05
Final Volume (L)	0.05
Dilution Factor	200

AECOM Calculated Result (ug/L)	-639.2	OK	Reported Result (ug/L)	1630 U

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283394-1 (J283394-1)		Project Number: 60667926 GW.BR.RI	
Validation Level: Limited		Date: 7/14/2023	
Number of Samples/Matrix: 5 GW, 3 GWF, 1 FB		Validator: Dani Woitas	
Analysis: Chromium/6020B		Reviewer and Date: Allison Wamness	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Samples for Ferrous iron, sulfate and TOC reported in 460-283394-2
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7 °C
Holding Time	Yes	No	Sampled 6/30/2023, analyzed 7/7/2023 and 7/9/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-919528/1-A (total) ND, MB 460-919726/4-A (dissolved), ND
Field Blanks	Yes	No	GW-RI-FB-20230630 (460-283394-6) ND
Matrix Spike	Yes	No	114-MW57C-71-20230630 (460-283394-3) total, see table below. Batch QC-dissolved.
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	Yes	No	114-MW57C-71-20230630 (460-283394-3) total
Laboratory Duplicate	Yes	No	114-MW57C-71-20230630 (460-283394-3) total, {RPD 3%}
Laboratory Control Standards	Yes	No	460-919528/2-A (98%R) total, 460-919726/5-A dissolved {97%R}
Field Duplicate	Yes	No	114-MW57C-71-20230630 (460-283394-3) and 114-MW57C-71-20230630-X (460-283394-4)
Total Metals vs Dissolved Metals Results	Yes	No	Dissolved for 114-PZ-52WR-74-20230630, 114-MW57C-71-20230630, 114-MW57C-71-20230630-X
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	See hexavalent chromium section for table

Matrix Spikes

114-MW57C-71-20230630 (460-283394-3)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Chromium	Total	50.0	13100	13770	12970	1385	-206	125	75	6	20	SR>4x spike amount, Accept

Laboratory Duplicate

114-MW57C-71-20230630 (460-283394-3)

Analyte	Fraction	SR (ug/l)	RL	SDR (ug/l)	RL	RPD %	RPD Upper Limit	Action
Chromium	Total	13100	4.0	13420	4.0	3	20	OK, Accept

Field Duplicates

114-MW57C-71-20230630 (460-283394-3) and 114-MW57C-71-20230630-X (460-283394-4)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
Chromium	Total	13100		14000		4.0	ug/l	6.6	OK, Accept
Chromium	Dissolved	11100		11300		20.0	ug/l	1.8	OK, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RPD (%)	Action
114-PZ-52WR-74-20230630	460-283394-1	5340	4.0	294	4.0	179	T Cr > D Cr, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RPD (%)	Action
114-MW57C-71-20230630	460-283394-3	13100	4.0	11100	20.0	17	T Cr > D Cr, Accept
114-MW57C-71-20230630-X	460-283394-4	14000	4.0	11300	20.0	21	T Cr > D Cr, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW57C-71-20230630	460-283394-3	Chromium	Dissolved	5
114-MW57C-71-20230630-X	460-283394-4	Chromium	Dissolved	5

Data Validation Report

Project:	PPG GW RI - Bedrock	
Laboratory:	Eurofins TestAmerica, Edison, NJ	
Laboratory Job No.:	460-283547-1	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60667926. GW.BR.RI	
Prepared by:	Dani Woitas/AECOM	Completed on: 7/17/2023
Reviewed by:	Allison Wamness/AECOM	File Name: 460283547_2023_07_17 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 July 3, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW53C-47.5-20230703	460-283547-1	Groundwater	Hexavalent Chromium, Chromium
114-MW61D-131-20230703	460-283547-2	Groundwater	Hexavalent Chromium, Dissolved Hexavalent Chromium, Chromium, Dissolved Chromium
114-MW61D-136-20230703	460-283547-3	Groundwater	Hexavalent Chromium, Dissolved Hexavalent Chromium, Chromium, Dissolved Chromium
GW-RI-FB-20230703	460-283547-4	Field Blank	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The original chain of custody (COC) included samples for analysis of ferrous iron, sulfate, and TOC. These samples were reported in SDG 460-283547-2.

Hexavalent Chromium

Hold Time

All samples were analyzed more than 48 hours after collection. Validation guidance states to reject all sample results if the holding time exceeds 48 hours. Professional judgment has been used to qualify the detected results as estimated (J) and the non-detect results as rejected but usable for project objectives (RA). The eH/pH data for all samples indicate an oxidizing matrix capable of supporting hexavalent chromium so the concentration is unlikely to have decreased (reduced to trivalent chromium) during the extended holding period. However, these non-detect results are to be used with extreme caution.

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met. No qualifications were required.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. No qualifications were required.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Chromium

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. No qualifications were required.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total metals and dissolved metals were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and dissolved results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Metals vs. Dissolved Metals Comparison	Action
Total Concentration Greater than Dissolved Concentration	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the value > the RL and the RL of the ND result is ≤RL	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Both Sample Results Positive and < 5x RL; Absolute Difference ≤ RL	No Qualification
Both Sample Results Positive and < 5x RL; Absolute Difference > RL	Qualify J
Both Sample Results Positive and ≥ 5x RL; RPD ≤30%	No Qualification
Both Sample Results Positive and ≥ 5x RL; RPD >30%	Qualify J
Total Concentration Equal to Dissolved Concentration	No Qualification

All QC acceptance criteria were met. No qualifications were required.

Data Quality and Usability Summary

The chromium data appear to be valid and may be used for decision-making purposes. The non-detect hexavalent chromium results were rejected due to holding time exceedances; however, the results may be usable for project objectives as discussed above. When applicable, qualified results are discussed in attachments A and B below.

Hexavalent chromium results estimated (J) due to holding time exceedances are useable with an unknown bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date July 3, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283547-1 (J283547-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230703

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW53C-47.5-20230703	460-283547-1	Total	CHROMIUM (HEXAVALENT)	U	37900	37900J	2000	Qualify	2
114-MW61D-131-20230703	460-283547-2	Dissolved	CHROMIUM (HEXAVALENT)	U	U	RA	10	Reject	1
114-MW61D-131-20230703	460-283547-2	Total	CHROMIUM (HEXAVALENT)	U	U	RA	10	Reject	1
114-MW61D-136-20230703	460-283547-3	Dissolved	CHROMIUM (HEXAVALENT)	U	U	RA	10	Reject	1
114-MW61D-136-20230703	460-283547-3	Total	CHROMIUM (HEXAVALENT)	U	U	RA	10	Reject	1
GW-RI-FB-20230703	460-283547-4	Total	CHROMIUM (HEXAVALENT)	U	U	RA	10	Reject	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 rejected because the hold time exceeded 48 hrs.
2. The result was qualified because the hold time exceeded 48 hrs.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date July 3, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283547-1 (J283547-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230703

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW53C-47.5-20230703	460-283547-1	Total	CHROMIUM	U	39100	39100	20.0		
114-MW61D-131-20230703	460-283547-2	Total	CHROMIUM	U	17.1	17.1	4.0		
114-MW61D-136-20230703	460-283547-3	Total	CHROMIUM	U	157	157	4.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283547-1 (J283547-1)		Project Number: 60667926. GW.BR.RI	
Validation Level: Full		Date: 7/17/2023	
Number of Samples/Matrix: 3 GW, 2 GWF, 1 FB		Validator: Dani Woitas	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.5 °C
Holding Time	No	Yes	Sampled 7/3/2023, analyzed 7/7/2023. All samples analyzed >48 hours from collection. PJ used to qualify detected result (J) and all non-detected sample results rejected (RA) but still useable for project objectives. See table below.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	7/7/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-919782/10 and MB 460-919782/33, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230703 (460-283547-4), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	LCSSRM 460-919782/11 {93.4%R} and LCSSRM 460-919782/34 {91.4%R}
Field Duplicate	NA	NA	Field duplicate not submitted
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5

Total vs Dissolved Results	Yes	No	Dissolved for 114-MW61D-131-20230703 (460-283547-2) and 114-MW61D-136-20230703 (460-283547-3)
Calculation Spot Checks	Yes	No	See calculations below

Holding time

Sample ID	Lab ID	Analyte	Fraction	Sample Date/time	Analysis date/time	HT limit 24 hrs	Action
114-MW53C-47.5-20230703	460-283547-1	CHROMIUM (HEXAVALENT)	T	7/3/2023 10:15	7/7/2023 9:30	>48 hours	Detected, Qualify (J)
114-MW61D-131-20230703	460-283547-2	CHROMIUM (HEXAVALENT)	T	7/3/2023 11:20	7/7/2023 9:30	>48 hours	Non-detect, Reject (RA)
114-MW61D-136-20230703	460-283547-3	CHROMIUM (HEXAVALENT)	T	7/3/2023 14:00	7/7/2023 9:30	>48 hours	Non-detect, Reject (RA)
GW-RI-FB-20230703	460-283547-4	CHROMIUM (HEXAVALENT)	T	7/3/2023 11:30	7/7/2023 9:30	>48 hours	Non-detect, Reject (RA)
114-MW61D-131-20230703	460-283547-2	CHROMIUM (HEXAVALENT)	D	7/3/2023 11:20	7/7/2023 9:30	>48 hours	Non-detect, Reject (RA)
114-MW61D-136-20230703	460-283547-3	CHROMIUM (HEXAVALENT)	D	7/3/2023 14:00	7/7/2023 9:30	>48 hours	Non-detect, Reject (RA)

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW53C-47.5-20230703	460-283547-1	39100	20.0	37900	2000	3	T Cr > T Cr6, Accept
114-MW61D-131-20230703	460-283547-2	17.1	4.0		10	NC	T Cr > T Cr6, Accept
114-MW61D-136-20230703	460-283547-3	157	4.0		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230703	460-283547-4		4.0		10		Both ND, accept

NC – not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61D-131-20230703	460-283547-2		4.0		10		Both ND, accept
114-MW61D-136-20230703	460-283547-3		4.0		10		Both ND, accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61D-131-20230703	460-283547-2		10		10		Both ND, Accept
114-MW61D-136-20230703	460-283547-3		10		10		Both ND, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW53C-47.5-20230703	460-283547-1	Hexavalent Chromium	Total	200

460-283547-1**Batch: 919782-0**

Cr+6 ICAL - 7/7/2023

Groundwater

(p 1382 of data pkg)

x - concentration	y - response
0	0
10	0.01
50	0.044
75	0.069
100	0.089
200	0.182

(p 1382 of data pkg)

AECOM Calculated Intercept	0.1359	OK	Reported intercept	0.1359
AECOM Slope	1102.0	OK	Reported Slope	1102
AECOM Calculated r	0.9998	OK	Reported r	1.000

LCS calculation**460-919782/11****P. 1352, 1375**

Background absorbance	0
Sample absorbance	0.047
Total absorbance - background	0.047
Instrument Concentration (ug/L)	51.930
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	51.93	OK	Reported Result (ug/L)	51.93

%R = Found/True*100**460-919782/11****P. 1352, 1375**

True Value (ug/L)	55.6

AECOM Calculated %R	93.4	OK	Reported %R	93.4

MS calculation**460-282859-4****P. 1349, 1375****Batch QC**

Background reading	0
Total absorbance	0.029
Total absorbance - background	0.029
Instrument Concentration (ug/L)	32.094
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated MS Result (ug/L)	32.1	OK	Reported Result (ug/L)	32.1

%R = Found/True*100**460-282859-4****P. 1349, 1375****Batch QC**

True Value (ug/L)	30
Native concentration (ug/L)	0

AECOM Calculated MS Result %R	107.0	OK	Reported %R	107

Reporting Limit**460-283547-1****p. 1332, 1375****114-MW53C-47.5-20230703**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05
Dilution Factor	200

AECOM Calculated Reporting Limit	2000	OK	Reported RL (ug/L)	2000

Sample Calculations**460-283547-1****p. 1332, 1375****114-MW53C-47.5-20230703**

Background reading 0

Total absorbance 0.172

Total absorbance - background 0.172

Instrument Response (ug/L) 189.678

Sample volume (L) 0.05

Final Volume (L) 0.05

Dilution Factor 200

AECOM Calculated Result (ug/L)	37935.7	OK	Reported Result (ug/L)	37900

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283547-1 (J283547-1)		Project Number: 60667926 GW.BR.RI	
Validation Level: Limited		Date: 7/17/2023	
Number of Samples/Matrix: 3 GW, 2 GWF, 1 FB		Validator: Dani Woitas	
Analysis: Chromium/6020B		Reviewer and Date: Allison Wamness	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Samples for Ferrous iron, sulfate and TOC reported in 460-283547-2
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.5 °C
Holding Time	Yes	No	Sampled 7/3/2023, analyzed 7/7/2023 and 7/9/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-919528/1-A (total) ND, MB 460-919726/4-A (dissolved), ND
Field Blanks	Yes	No	GW-RI-FB-20230703 (460-283547-4) ND
Matrix Spike	NA	NA	Batch QC
Matrix Spike Duplicate	NA	NA	Batch QC
Post Digestion Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	460-919528/2-A (98%R) total, 460-919726/5-A dissolved (97%R)
Field Duplicate	NA	NA	Field duplicate not submitted
Total Metals vs Dissolved Metals Results	Yes	No	Dissolved for 114-MW61D-131-20230703 (460-283547-2) and 114-MW61D-136-20230703 (460-283547-3)
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	See hexavalent chromium section for table

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RPD (%)	Action
114-MW61D-131-20230703	460-283547-2	17.1	4.0		4.0	NC	T Cr > D Cr, Accept
114-MW61D-136-20230703	460-283547-3	157	4.0		4.0	NC	T Cr > D Cr, Accept

NC – not calculated**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW53C-47.5-20230703	460-283547-1	Chromium	Total	5

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-283193-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926. GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/11/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602831931_2023_07_04 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 27, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW72D-102-106-20230627	460-2831931-1	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-110-114-20230627	460-2831931-2	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-116-119-20230627	460-2831931-3	Groundwater	Hexavalent Chromium, Chromium
114-MW72D-123-126-20230627	460-2831931-4	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20230627	460-2831931-5	Field Blank	Hexavalent Chromium, Chromium
114-MW4D-90-94-20230627	460-2831931-6	Groundwater	Hexavalent Chromium, Chromium
114-MW4D-98-102-20230627	460-2831931-7	Groundwater	Hexavalent Chromium, Chromium
114-MW4D-111-115-20230627	460-2831931-8	Groundwater	Hexavalent Chromium, Chromium
114-MW4D-121-125-20230627	460-2831931-9	Groundwater	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium were compared to results from the total chromium concentration to ensure that the results from the chromium were greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

Sample 114-MW4D-121-125-20230627(460-283193-9) total was analyzed as the laboratory duplicate for hexavalent chromium. Both sample results were nondetect. No qualifications were made.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Chromium

Matrix Spike (MS)

Sample 114-MW72D-102-106-20230627 (460-283193-1) was analyzed as the MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW72D-102-106-20230627 (460-283193-1) was analyzed as the laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above for evaluation and action. No qualifications were required.

Reported results that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability Summary

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

Sample results reported between the MDL and RL content 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)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date June 27, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283193-1 (J283193-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230627

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20230627	460-2831931-1	Total	CHROMIUM (HEXAVALENT)	U	54.7	54.7	10.0		
114-MW72D-110-114-20230627	460-2831931-2	Total	CHROMIUM (HEXAVALENT)	U	61.3	61.3	10.0		
114-MW72D-116-119-20230627	460-2831931-3	Total	CHROMIUM (HEXAVALENT)	U	42.4	42.4	10.0		
114-MW72D-123-126-20230627	460-2831931-4	Total	CHROMIUM (HEXAVALENT)	U	22.4	22.4	10.0		

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

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date June 27, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283193-1 (J283193-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230627

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20230627	460-2831931-1	Total	CHROMIUM	U	98.2	98.2	4.0		
114-MW72D-110-114-20230627	460-2831931-2	Total	CHROMIUM	U	125	125	4.0		
114-MW72D-116-119-20230627	460-2831931-3	Total	CHROMIUM	U	62.8	62.8	4.0		
114-MW72D-123-126-20230627	460-2831931-4	Total	CHROMIUM	U	23.4	23.4	4.0		
114-MW4D-121-125-20230627	460-2831931-9	Total	CHROMIUM	U	3.8J	3.8J	4.0	Qualify	1

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283193-1 (J283193-1)		Project Number: 60667926. GW.BR.RI	
Validation Level: Full		Date: 7/04/2023	
Number of Samples/Matrix: 8 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 7/11/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7 °C
Holding Time	Yes	No	Sampled 6/27/2023, analyzed 6/28/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	6/28/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-918169/10, MB 460-918169/33, Both ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230627 (460-283193-5), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	None with this SDG
Laboratory Duplicate	Yes	No	114-MW4D-121-125-20230627 (460-283193-9), total, Both ND
Laboratory Control Standards	Yes	No	460-918169/11 { 96.3%R} total, 460-918169/34 {94.3%R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW72D-102-106-20230627	460-2831931-1	98.2	4.0	54.7	10.0	57	T Cr > T Cr6, Accept
114-MW72D-110-114-20230627	460-2831931-2	125	4.0	61.3	10.0	68	T Cr > T Cr6, Accept
114-MW72D-116-119-20230627	460-2831931-3	62.8	4.0	42.4	10.0	39	T Cr > T Cr6, Accept
114-MW72D-123-126-20230627	460-2831931-4	23.4	4.0	22.4	10.0	4	T Cr > T Cr6, Accept
GW-RI-FB-20230627	460-2831931-5		4.0		10.0		Both ND, Accept
114-MW4D-90-94-20230627	460-2831931-6		4.0		10.0		Both ND, Accept
114-MW4D-98-102-20230627	460-2831931-7		4.0		10.0		Both ND, Accept
114-MW4D-111-115-20230627	460-2831931-8		4.0		10.0		Both ND, Accept
114-MW4D-121-125-20230627	460-2831931-9	3.8	4.0		10.0	NC	T Cr > T Cr6, Accept

NC – not calculated

460-2831931-1**Batch: 918169-0**

Cr+6 ICAL - 6/28/2023

Groundwater

(p 483 of data pkg)

x - concentration	y - response
0	0
10	0.01
50	0.044
75	0.067
100	0.089
200	0.180

(p 483 of data
pkg)

AECOM Calculated Intercept	0.0795	OK	Reported intercept	0.07955
AECOM Slope	1114.2	OK	Reported Slope	1114
AECOM Calculated r	0.9999	OK	Reported r	1.000

LCS calculation**460-918169/11****P. 458, 474**

Background absorbance	0
Sample absorbance	0.048
Total absorbance - background	0.048
Instrument Concentration (ug/L)	53.552
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	53.55	OK	Reported Result (ug/L)	53.55

%R = Found/True*100**460-918169/11****P. 458, 474**

True Value (ug/L)	55.6

AECOM Calculated %R	96.3	OK	Reported %R	96.3

MS calculation**None****P.**

Background reading	0
Total absorbance	0
Total absorbance - background	0
Instrument Concentration (ug/L)	0.080
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated MS Result (ug/L)	0.1	NA	Reported Result (ug/L)	NA

%R = Found/True*100**None****P.**

True Value (ug/L)	30
Native concentration (ug/L)	0

AECOM Calculated MS Result %R	0.3	NA	Reported %R	NA

Reporting Limit**460-283193-1****P. 434, 474****114-MW72D-102-106-20230627**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05

Dilution Factor	1		
AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L) 10
<u>Sample Calculations</u>	460-283193-1	P. 434, 474	114-MW72D-102-106-20230627
Background reading	0		
Total absorbance	0.049		
Total absorbance - background	0.049		
Instrument Response (ug/L)	54.673		
Sample volume (L)	0.05		
Final Volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Result (ug/L)	54.7	OK	Reported Result (ug/L) 54.7

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283193-1 (J283193-1)		Project Number: 60667926 GW.BR.RI	
Validation Level: Limited		Date: 7/04/2023	
Number of Samples/Matrix: 8 GW, 1 FB		Validator: Charlene Flint	
Analysis: Chromium/6020B		Reviewer and Date: Dani Woitas 7/11/2023	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7 °C
Holding Time	Yes	No	Sampled 6/27/2023, analyzed 6/30/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilution
Method Blanks	Yes	No	MB 460-918523/1-A (total) ND
Field Blanks	Yes	No	GW-RI-FB-20230627 (460-283193-5) ND
Matrix Spike	Yes	No	114-MW72D-102-106-20230627 (460-283193-1) {101%R}
Matrix Spike Duplicate	NA	NA	None
Post Digestion Spike	Yes	No	114-MW72D-102-106-20230627 (460-283193-1), PDS {99%R}
Laboratory Duplicate	Yes	No	114-MW72D-102-106-20230627 (460-283193-1), {RPD 4}
Laboratory Control Standards	Yes	No	460-918523/2-A (102%R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	Total only, see hexavalent chromium section for table

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-283253-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Chromium SW-846 3010A/6020B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926. GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/13/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602832531_2023_07_13 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 28, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW57D-87.5-91.5-20230628	460-2832531-1	Groundwater	Hexavalent Chromium, Chromium
114-MW57D-96.5-110.5-20230628	460-2832531-2	Groundwater	Hexavalent Chromium, Chromium
114-MW57D-104-108-20230628	460-2832531-3	Groundwater	Hexavalent Chromium, Chromium
114-MW57D-109-113-20230628	460-2832531-4	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-91-97-20230628	460-2832531-5	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-107-111-20230628	460-2832531-6	Groundwater	Hexavalent Chromium, Chromium
114-MW60C-122-20230628	460-2832531-7	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-118-123-20230628	460-2832531-8	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-124-129-20230628	460-2832531-9	Groundwater	Hexavalent Chromium, Chromium
114-MW66D-137-140-20230628	460-2832531-10	Groundwater	Hexavalent Chromium, Chromium
114-MW64C-94.5-20230628	460-2832531-11	Groundwater	Hexavalent Chromium, Chromium
GW-RI-FB-20230628	460-2832531-12	Field Blank	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The original chain of custody (COC) included samples for analysis of ferrous iron, sulfate and TOC, which were reported in SDG 460-283253-2.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium were compared to results from the total chromium concentration to ensure that the results from the chromium were greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Two matrix spikes were analyzed with this data set. Samples 114-MW57D-87.5-91.5-20230628 (460-283253-1) and 114-MW57D-96.5-110.5-20230628 (460-283253-2). All QC acceptance criteria were met.

Laboratory Duplicate

Samples 114-MW57D-87.5-91.5-20230628 (460-283253-1) and 114-MW57D-96.5-110.5-20230628 (460-283253-2) were analyzed as the laboratory duplicates for hexavalent chromium. All sample results were nondetect. No qualifications were made.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Chromium**Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above for evaluation and action. No qualifications were required.

Reported results that were less than the reporting limit (RL), but greater than or equal to the method detection limit (MDL) are approximate values and have been qualified as estimated (J).

Data Quality and Usability Summary

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

Sample results reported between the MDL and RL content 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)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date June 28, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283253-1 (J283253-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230628

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20230628	460-2832531-5	Total	CHROMIUM (HEXAVALENT)	U	3870	3870	500		
114-MW66D-107-111-20230628	460-2832531-6	Total	CHROMIUM (HEXAVALENT)	U	51.6	51.6	10.0		

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

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date June 28, 2023
Lab Name/ID Eurofins TestAmerica, Edison, NJ
SDG No 460-283253-1 (J283253-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230628

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-87.5-91.5-20230628	460-2832531-1	Total	CHROMIUM	U	11.5	11.5	4.0		
114-MW57D-96.5-110.5-20230628	460-2832531-2	Total	CHROMIUM	U	3.3J	3.3J	4.0	Qualify	1
114-MW66D-91-97-20230628	460-2832531-5	Total	CHROMIUM	U	4110	4110	4.0		
114-MW66D-107-111-20230628	460-2832531-6	Total	CHROMIUM	U	82.2	82.2	4.0		
114-MW60C-122-20230628	460-2832531-7	Total	CHROMIUM	U	117	117	4.0		
114-MW66D-118-123-20230628	460-2832531-8	Total	CHROMIUM	U	4.2	4.2	4.0		
114-MW66D-124-129-20230628	460-2832531-9	Total	CHROMIUM	U	4.6	4.6	4.0		
114-MW66D-137-140-20230628	460-2832531-10	Total	CHROMIUM	U	3.5J	3.5J	4.0	Qualify	1
114-MW64C-94.5-20230628	460-2832531-11	Total	CHROMIUM	U	14.0	14.0	4.0		

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283253-1 (J283253-1)		Project Number: 60667926. GW.BR.RI	
Validation Level: Full		Date: 7/13/2023	
Number of Samples/Matrix: 11 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 7/14/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	4.1 °C and 4.5 °C
Holding Time	Yes	No	Sampled 6/28/2023, analyzed 6/29/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	6/28/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-918303/10, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230628 (460-283253-12), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW57D-87.5-91.5-20230628 (460-283253-1) {97%R} and 114-MW57D-96.5-110.5-20230628 (460-283253-2) {100%R}
Laboratory Duplicate	Yes	No	114-MW57D-87.5-91.5-20230628 (460-283253-1) and 114-MW57D-96.5-110.5-20230628 (460-283253-2), Both ND
Laboratory Control Standards	Yes	No	460-918303/11 {98.6%R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW57D-87.5-91.5-20230628	460-2832531-1	11.5	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW57D-96.5-110.5-20230628	460-2832531-2	3.3	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW57D-104-108-20230628	460-2832531-3		4.0		10.0		Both ND, Accept
114-MW57D-109-113-20230628	460-2832531-4		4.0		10.0		Both ND, Accept
114-MW66D-91-97-20230628	460-2832531-5	4110	4.0	3870	500	6	T Cr > T Cr6, Accept
114-MW66D-107-111-20230628	460-2832531-6	82.2	4.0	51.6	10.0	46	T Cr > T Cr6, Accept
114-MW60C-122-20230628	460-2832531-7	117	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-118-123-20230628	460-2832531-8	4.2	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-124-129-20230628	460-2832531-9	4.6	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-137-140-20230628	460-2832531-10	3.5	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW64C-94.5-20230628	460-2832531-11	14.0	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230628	460-2832531-12		4.0		10.0		Both ND, Accept

NC – not calculated**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW66D-91-97-20230628	460-2832531-5	Hexavalent Chromium	Total	50

460-2832531-1**Batch: 918303-0**

Cr+6 ICAL - 6/28/2023

Groundwater

(p 1133 of data pkg)

x - concentration	y - response
0	0
10	0.011
50	0.047
75	0.069
100	0.09
200	0.188

(p 1133
of data
pkg)

AECOM Calculated Intercept	0.1261	OK	Reported intercept	0.1261
AECOM Slope	1072.2	OK	Reported Slope	1072
AECOM Calculated r	0.9996	OK	Reported r	0.999

LCS calculation**460-918303/11****P. 1108, 1124**

Background absorbance	0
Sample absorbance	0.051
Total absorbance - background	0.051
Instrument Concentration (ug/L)	54.798
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	54.80	OK	Reported Result (ug/L)	54.80

%R = Found/True*100**460-918303/11****P. 1108, 1124**

True Value (ug/L)	55.6

AECOM Calculated %R	98.6	OK	Reported %R	98.6

MS calculation**460-283253-1****P. 1106, 1125****114-MW57D-87.5-91.5-20230628**

Background reading	0
Total absorbance	0.027
Total absorbance - background	0.027
Instrument Concentration (ug/L)	29.076
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated MS Result (ug/L)	29.1	NA	Reported Result (ug/L)	29.1

%R = Found/True*100**460-283253-1****P. 1106, 1125****114-MW57D-87.5-91.5-20230628**

True Value (ug/L)	30
Native concentration (ug/L)	0

AECOM Calculated MS Result %R	96.9	NA	Reported %R	97

Reporting Limit**460-283253-1****p. 1075, 1124****114-MW57D-87.5-91.5-20230628**

Low Standard(ug/l)	10
Initial volume (L)	0.05

Final volume (L) 0.05

Dilution Factor 1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)	10

Sample Calculations

460-283253-1

p. 1075, 1124

114-MW57D-87.5-91.5-20230628

Background reading 0

Total absorbance 0

Total absorbance - background 0

Instrument Response (ug/L) 0.126

Sample volume (L) 0.05

Final Volume (L) 0.05

Dilution Factor 1

AECOM Calculated Result (ug/L)	0.1	OK, <MDL, report as ND	Reported Result (ug/L)	8.1 U

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-283253-1 (J283253-1)		Project Number: 60667926 GW.BR.RI	
Validation Level: Limited		Date: 7/13/2023	
Number of Samples/Matrix: 11 GW, 1 FB		Validator: Charlene Flint	
Analysis: Chromium/6020B		Reviewer and Date: Dani Woitas 7/14/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Samples for Ferrous iron, sulfate and TOC reported in 460-283253-2
Data Completeness	Yes	No	
Sample Preservation	Yes	No	4.1 °C and 4.5 °C
Holding Time	Yes	No	Sampled 6/28/2023, analyzed 7/1/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilution
Method Blanks	Yes	No	MB 460-918639/1-A, ND
Field Blanks	Yes	No	GW-RI-FB-20230628 (460-283253-12) ND
Matrix Spike	NA	NA	Batch QC
Matrix Spike Duplicate	NA	NA	Batch QC
Post Digestion Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	460-918639/2-A (93%R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	Total only, see hexavalent chromium section for table

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-284965-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 8/16/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602849651_2023_08_16 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 July 26, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW60C-122-20230726	460-284965-1	Groundwater	Hexavalent Chromium, *Metals, Fe, **Wet Chemistry
114-MW60C-122-20230726-X	460-284965-2	Groundwater	Hexavalent Chromium, *Metals, Fe, **Wet Chemistry
114-MW72D-102-106-20230726	460-284965-3	Groundwater	Hexavalent Chromium, *Metals, Fe, **Wet Chemistry
114-MW72D-110-114-20230726	460-284965-4	Groundwater	Hexavalent Chromium, *Metals, Fe, **Wet Chemistry
114-MW72D-116-119-20230726	460-284965-5	Groundwater	Hexavalent Chromium, *Metals, Fe, **Wet Chemistry
114-MW72D-123-126-20230726	460-284965-6	Groundwater	Hexavalent Chromium, *Metals, Fe, **Wet Chemistry
GW-RI-FB-20230726	460-284965-7	Field Blank	Hexavalent Chromium, Chromium, Fe, **Wet Chemistry
*Metals – Chromium, dissolved Iron			
**Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – dissolved Iron, dissolved Ferrous Iron, dissolved Ferric Iron			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested dissolved ferrous iron. The laboratory analyzed and reported results for dissolved iron by method 6020B, dissolved ferrous iron by method SM3500 FE D and dissolved ferric iron by method SM 3500. All results have been reported.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and total hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW60C-122-20230726 (460-284965-1) was analyzed as the MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW60C-122-20230726 (460-284965-1) was analyzed as the lab duplicate for this SDG. All sample results were non-detect. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

The field duplicate pair for this data set were 114-MW60C-122-20230726 (460-284965-1) and 114-MW60C-122-20230726-X (460-284965-2). Both results were nondetect. No qualifications were made.

Metals**Sample Preservation**

It was noted in the narrative that ferrous iron samples were collected in improper containers and preserved with nitric acid (HNO₃) instead of hydrochloric acid (HCL). All ferrous and ferric iron results are estimated (J/UJ).

Holding Time

Dissolved ferrous iron analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The analysis for all of the samples in this data package were performed in the laboratory. All ferrous and ferric iron results are estimated (J/UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW60C-122-20230726 (460-284965-1) was analyzed as the MS/MSD for this data set. In addition, 114-MW60C-122-20230726-X (460-284965-2) was analyzed as an MS/MSD for ferrous iron. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW60C-122-20230726 (460-284965-1) was analyzed as the lab duplicate for total Cr and dissolved iron by 6020 in this SDG. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

The field duplicate pair for this data set were 114-MW60C-122-20230726 (460-284965-1) and 114-MW60C-122-20230726-X (460-284965-2). All QC acceptance criteria were met. No qualifications were made.

Wet Chemistry (Sulfate, TOC)**Matrix Spike (MS)/Matrix Spike Duplicate (MSD)**

Sample 114-MW60C-122-20230726 (460-284965-1) was analyzed as the MS/MSD for this data set. Sulfate met QC criteria. No qualifications were made for sulfate. TOC was below the QC limits for the MS and MSD. All TOC results were estimated (J-).

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

The field duplicate pair for this data set were 114-MW60C-122-20230726 (460-284965-1) and 114-MW60C-122-20230726-X (460-284965-2). TOC and sulfate did not meet QC criteria. TOC and sulfate results were estimated (J) in the field duplicate pair.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Results estimated due to poor field duplicate precision, holding time issues or preservative issues are useable with an unknown bias.

Results estimated due to low MS/MSD recoveries are useable with a low bias.

Sample results reported between the MDL and RL content 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)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date July 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-284965 (J284965-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GWW-RI-FB-20230726

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20230726	460-284965-3	Total	CHROMIUM (HEXAVALENT)	U	92.8	92.8	10.0		
114-MW72D-110-114-20230726	460-284965-4	Total	CHROMIUM (HEXAVALENT)	U	129	129	10.0		
114-MW72D-116-119-20230726	460-284965-5	Total	CHROMIUM (HEXAVALENT)	U	33.0	33.0	10.0		
114-MW72D-123-126-20230726	460-284965-6	Total	CHROMIUM (HEXAVALENT)	U	63.5	63.5	10.0		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date July 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-284965 (J284965-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GWW-RI-FB-20230726

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-122-20230726	460-284965-1	Total	CHROMIUM	U	8.4	8.4	16.0		
114-MW60C-122-20230726-X	460-284965-2	Total	CHROMIUM	U	6.0	6.0	40.0		
114-MW72D-102-106-20230726	460-284965-3	Total	CHROMIUM	U	104	104	8.0		
114-MW72D-110-114-20230726	460-284965-4	Total	CHROMIUM	U	136	136	20.0		
114-MW72D-116-119-20230726	460-284965-5	Total	CHROMIUM	U	23.5	23.5	400		
114-MW72D-123-126-20230726	460-284965-6	Total	CHROMIUM	U	69.1	69.1	1000		

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

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

Aqueous Target Analyte Summary Hit List (Ferrous iron dissolved and Ferric iron dissolved)

Site Name PPG GW RI - Bedrock
Sampling Date July 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-284965 (J284965-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GWW-RI-FB-20230726

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-122-20230726	460-284965-1	Dissolved	Iron (Ferrous)	U	0.099J	0.099J	0.10	Qualify	1,2,3
114-MW60C-122-20230726-X	460-284965-2	Dissolved	Iron (Ferrous)	U	0.15	0.15J	0.10	Qualify	1,2
114-MW72D-102-106-20230726	460-284965-3	Dissolved	Iron (Ferrous)	U	U	UJ	0.10	Qualify	1,2
114-MW72D-110-114-20230726	460-284965-4	Dissolved	Iron (Ferrous)	U	U	UJ	0.10	Qualify	1,2
114-MW72D-116-119-20230726	460-284965-5	Dissolved	Iron (Ferrous)	U	U	UJ	0.10	Qualify	1,2
114-MW72D-123-126-20230726	460-284965-6	Dissolved	Iron (Ferrous)	U	U	UJ	0.10	Qualify	1,2
GW-RI-FB-20230726	460-284965-7	Dissolved	Iron (Ferrous)	U	U	UJ	0.10	Qualify	1,2
114-MW60C-122-20230726	460-284965-1	Dissolved	Iron (Ferric)	U	U	UJ	0.10	Qualify	1,2
114-MW60C-122-20230726-X	460-284965-2	Dissolved	Iron (Ferric)	U	U	UJ	0.10	Qualify	1,2
114-MW72D-102-106-20230726	460-284965-3	Dissolved	Iron (Ferric)	U	U	UJ	0.10	Qualify	1,2
114-MW72D-110-114-20230726	460-284965-4	Dissolved	Iron (Ferric)	U	U	UJ	0.10	Qualify	1,2
114-MW72D-116-119-20230726	460-284965-5	Dissolved	Iron (Ferric)	U	U	UJ	0.10	Qualify	1,2
114-MW72D-123-126-20230726	460-284965-6	Dissolved	Iron (Ferric)	U	U	UJ	0.10	Qualify	1,2
GW-RI-FB-20230726	460-284965-7	Dissolved	Iron (Ferric)	U	U	UJ	0.10	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. Technical holding time was exceeded.
2. Chemical preservative issue.
3. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date July 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-284965 (J284965-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GWW-RI-FB-20230726

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-122-20230726	460-284965-1	SULFATE	U	67.9	67.9J	2.40	Qualify	1
114-MW60C-122-20230726-X	460-284965-2	SULFATE	U	104	104J	2.40	Qualify	1
114-MW72D-102-106-20230726	460-284965-3	SULFATE	U	3.16	3.16	0.48		
114-MW72D-110-114-20230726	460-284965-4	SULFATE	U	2.76	2.76	0.48		
114-MW72D-116-119-20230726	460-284965-5	SULFATE	U	3.24	3.24	0.48		

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

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

NJDEP Laboratory Footnote

1. Field duplicate precision criteria were not met.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date July 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-284965 (J284965-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GWW-RI-FB-20230726

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-122-20230726	460-284965-1	Total	Total Organic Carbon	U	38.4	38.4J	1.0	Qualify	1,2
114-MW60C-122-20230726-X	460-284965-2	Total	Total Organic Carbon	U	23.8	23.8J	1.0	Qualify	1,2
114-MW72D-102-106-20230726	460-284965-3	Total	Total Organic Carbon	U	9.7	9.7J-	1.0	Qualify	2
114-MW72D-110-114-20230726	460-284965-4	Total	Total Organic Carbon	U	10.9	10.9J-	1.0	Qualify	2
114-MW72D-116-119-20230726	460-284965-5	Total	Total Organic Carbon	U	20.9	20.9J-	1.0	Qualify	2
114-MW72D-123-126-20230726	460-284965-6	Total	Total Organic Carbon	U	14.6	14.6J-	1.0	Qualify	2

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

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

NJDEP Laboratory Footnote

1. Field duplicate precision criteria were not met.
2. MS and/or MSD recovery was below the lower acceptance limit.

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-284965-1 (J284965-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 8/16/2023	
Number of Samples/Matrix: 6GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 8/17/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	Yes	No	Sampled 7/26/2023, analyzed 7/27/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	7/27/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-923300/10 (total), ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230726 (460-284965-7), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW60C-122-20230726 (460-284965-1) (95%R)
Laboratory Duplicate	Yes	No	114-MW60C-122-20230726 (460-284965-1), both ND
Laboratory Control Standards	Yes	No	460-923300/11 {100.4 %R}
Field Duplicate	Yes	No	114-MW60C-122-20230726 (460-284965-1) and 114-MW60C-122-20230726-X (460-284965-2), All ND
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5, results p. 1024
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW60C-122-20230726	460-284965-1	8.4	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW60C-122-20230726-X	460-284965-2	6.0	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW72D-102-106-20230726	460-284965-3	104	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW72D-110-114-20230726	460-284965-4	136	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW72D-116-119-20230726	460-284965-5	23.5	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW72D-123-126-20230726	460-284965-6	69.1	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230726	460-284965-7		4.0		10.0		Both ND, Accept

NC- not calculated

460-284965-1**Batch: 923300-0**

Cr+6 ICAL - 7/27/2023

Groundwater

(p 984 of data pkg)

x - concentration	y - response
0	0
10	0.01
50	0.046
75	0.069
100	0.088
200	0.185

(p 984 of
data pkg)

AECOM Calculated Intercept	0.3568	OK	Reported intercept	0.3568
AECOM Slope	1087.6	OK	Reported Slope	1088
AECOM Calculated r	0.9996	OK	Reported r	0.999

LCS calculation**460-923300/11****P. 947, 978**

Background absorbance	0
Sample absorbance	0.051
Total absorbance - background	0.051
Instrument Concentration (ug/L)	55.845
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	55.84	OK	Reported Result (ug/L)	55.84

%R = Found/True*100**460-923300/11****P. 947, 978**

True Value (ug/L)	55.6

AECOM Calculated %R	100.4	OK	Reported %R	100.4

MS calculation**460-284965-1****P. 943, 979****114-MW60C-122-20230726**

Background reading	0
Total absorbance	0.026
Total absorbance - background	0.026
Instrument Concentration (ug/L)	28.634
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated MS Result (ug/L)	28.6	OK	Reported Result (ug/L)	28.6

%R = Found/True*100**460-284965-1****P. 943, 979****114-MW60C-122-20230726**

True Value (ug/L)	30
Native concentration (ug/L)	0

AECOM Calculated MS Result %R	95.4	OK	Reported %R	95

Reporting Limit**460-284965-1****p. 913, 978****114-MW60C-122-
20230726**

Low Standard(ug/l)	10
Initial volume (L)	0.05
Final volume (L)	0.05

Dilution Factor	1		
AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L) 10
<u>Sample Calculations</u>	460-284965-1	p. 913, 978	114-MW60C-122-20230726
Background reading	0		
Total absorbance	0		
Total absorbance - background	0		
Instrument Response (ug/L)	0.357		
Sample volume (L)	0.05		
Final Volume (L)	0.05		
Dilution Factor	1		
AECOM Calculated Result (ug/L)	0.4	OK, <MDL, report as ND	Reported Result (ug/L) 8.1 U

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-284965-1 (J284965-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 8/16/2023	
Number of Samples/Matrix: 6 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Dani Woitas 8/17/2023	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Ferrous iron was requested on the COC. Laboratory analyzed for dissolved iron by 6020, dissolved ferrous iron, and dissolved ferric iron. Results are reported.
Data Completeness	Yes	No	
Sample Preservation	No	Yes	1.4 °C, Noted in the narrative that dissolved ferrous iron samples were collected in improper contains and preserved with nitric acid.
Holding Time	No	Yes	Sampled 7/26/2023, analyzed 7/28 - 8/02/2023, Ferrous iron (dissolved) normally performed in the field (15 min HT). Performed in the lab.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-924135/1-B (dissolved) Fe ND, MB 460-923362/1-A, (total) metals ND, MB 460-924537/7, MB 460-924537/23, and MB 460-924537/39 ND TOC, MB 460-923611/5 ND sulfate, MB 460-924775/4, MB 460-925036/4 ND Ferrous Fe
Field Blanks	Yes	No	GW-RI-FB-20230726 (460-284965-7) ND
Matrix Spike	No	Yes	114-MW60C-122-20230726 (460-284965-1), Cr (total), Fe (dissolved), ferrous iron, TOC, and sulfate. 114-MW60C-122-20230726-X (460-284965-2) ferrous iron. see tables below
Matrix Spike Duplicate	No	Yes	Same as above
Post Digestion Spike	Yes	No	114-MW60C-122-20230726 (460-284965-1), Cr only
Laboratory Duplicate	Yes	No	114-MW60C-122-20230726 (460-284965-1) Cr (total) and Fe (dissolved) , none for all others, see table below
Laboratory Control Standards	Yes	No	460-923362/2-A Cr (total), 460-924137/2-A Fe (dissolved), 460-924537/24 and 460-924537/42 TOC, 460-923611/7 and 460-923611/8 sulfate, LCS 460-924775/5 and LCS 460-925036/5 ferrous iron.
Field Duplicate	No	Yes	114-MW60C-122-20230726 (460-284965-1) and 114-MW60C-122-20230726-X (460-284965-2), see table below

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total Metals vs Dissolved Metals Results	NA	NA	Cr total only, Fe dissolved only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table, total only

Matrix Spikes/Matrix Spike Duplicates

114-MW60C-122-20230726 (460-284965-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	38.4	75.91	76.4	75	76	115	85	1	10	Estimate (J-)
SULFATE	Total	4.80	67.9	69.65	70.26	37	50	110	90	1	15	SR>4x amt spiked, Accept
Ferrous Iron	Dissolved	2.00	0.099	2.29	2.21	110	109	115	85	0	10	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

Matrix Spikes/Matrix Spike Duplicates

114-MW60C-122-20230726-X (460-284965-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Ferrous Iron	Dissolved	2.00	0.15	2.14	2.21	99	103	115	85	3	10	OK, Accept

114-MW60C-122-20230726 (460-284965-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
IRON	Dissolved	2500	58.2	2307	2243	92	90	125	75	3	20	OK, Accept
CHROMIUM	Total	50.0	8.4	54.33	53.47	92	90	125	75	2	20	OK, Accept

Laboratory Duplicates

114-MW60C-122-20230726 (460-284965-1)

Analyte	Fraction	SR (ug/l)	Qual	RL	SDR (ug/l)	Qual	RL	RPD %	RPD Upper Limit	Action
IRON	Dissolved	58.2	U	120	58.2	U	120	NC	20	Both ND, OK Accept
CHROMIUM	Total	8.4		4.0	8.48		4.0	0.6	20	OK, Accept

Field Duplicates

114-MW60C-122-20230726 (460-284965-1) and 114-MW60C-122-20230726-X (460-284965-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	120	U	120	U	120	ug/l		Both ND
TOTAL ORGANIC CARBON	Total	38.4		23.8		1	mg/l	46.9	RPD > 20%, Estimate (J)
CHROMIUM	Total	8.4		6		4	ug/l	33.3	Both SR<5x RL, ABS diff < RL, no qualification
SULFATE	Total	67.9		104		2.4	mg/l	42	RPD > 20%, Estimate (J)
FERROUS IRON	Dissolved	0.099	J	0.15		0.10	mg/l	41	Both SR<5x RL, ABS diff < RL, no qualification
FERRIC IRON	Dissolved	0.10	U	0.10	U	0.10	mg/l		Both ND

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW60C-122-20230726	460-284965-1	SULFATE	Total	5
114-MW60C-122-20230726-X	460-284965-2	SULFATE	Total	5

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-286753-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 9/19/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602867531_2023_09_19 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 23, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW60C-122-20230823	460-286753-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW60C-122-20230823-X (Field Duplicate of 114-MW60C-122-20230823)	460-286753-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20230823	460-286753-3	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested dissolved ferrous iron by method 6020B. Filtered unpreserved samples for ferrous iron were not received by the laboratory and insufficient sample volume was provided for the lab to filter and analyze. No dissolved ferrous iron is reported.

Hexavalent Chromium**Sample Results**

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and total hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW60C-122-20230823 (460-286753-1) was analyzed as the MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW60C-122-20230823 (460-286753-1) was analyzed as the lab duplicate for this SDG. All sample results were non-detect. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

The field duplicate pair submitted with this data set was 114-MW60C-122-20230823 (460-286753-1) and 114-MW60C-122-20230823-X (460-286753-2). Both results were nondetect. No qualifications were made.

Metals**Matrix Spike (MS)/Matrix Spike Duplicate (MSD)**

Sample 114-MW60C-122-20230823 (460-286753-1) was analyzed as the MS/MSD for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW60C-122-20230823 (460-286753-1) was analyzed as the lab duplicate for total chromium in this SDG. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

The field duplicate pair submitted with this data set was 114-MW60C-122-20230823 (460-286753-1) and 114-MW60C-122-20230823-X (460-286753-2). All QC acceptance criteria were met. No qualifications were made.

Wet Chemistry (Sulfate, TOC)**Field Blank (FB)**

The FB, GW-RI-FB-20230823 (460-286634-3) total, reported Total Organic Carbon (TOC) at a concentration less than the reporting limit (RL) but greater than the method detection limit (MDL). All sample results for TOC were greater than ten times the amount in the FB. No qualifications were made.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW60C-122-20230823 (460-286753-1) was analyzed as the MS/MSD for this data set. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

The field duplicate pair submitted with this data set was 114-MW60C-122-20230823 (460-286753-1) and 114-MW60C-122-20230823-X (460-286753-2). All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Sample results reported between the MDL and RL content 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)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date August 23, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-286753 (J286753-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230823

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date August 23, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-286753 (J286753-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230823

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-122-20230823	460-286753-1	Total	CHROMIUM	U	4.2	4.2	4.0		
114-MW60C-122-20230823-X	460-286753-2	Total	CHROMIUM	U	5.7	5.7	4.0		

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

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date August 23, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-286753 (J286753-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230823

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-122-20230823	460-286753-1	SULFATE	U	60.4	60.4	2.40		
114-MW60C-122-20230823-X	460-286753-2	SULFATE	U	54.2	54.2	2.40		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date August 23, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-286753 (J286753-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230823

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-122-20230823	460-286753-1	Total	Total Organic Carbon	U	42.6	42.6	2.0		
114-MW60C-122-20230823-X	460-286753-2	Total	Total Organic Carbon	U	37.3	37.3	2.0		
GW-RI-FB-20230823	460-286753-3	Total	Total Organic Carbon	U	0.79J	0.79J	1.0	Qualify	1

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-286753-1 (J286753-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 9/19/2023	
Number of Samples/Matrix: 2GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 10/9/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.5 °C
Holding Time	Yes	No	Sampled 8/23/2023, analyzed 8/24/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	8/24/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-928343/10 (total), ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230823 (460-286753-3), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW60C-122-20230823 (460-286753-1) (100%R)
Laboratory Duplicate	Yes	No	114-MW60C-122-20230823 (460-286753-1), both ND
Laboratory Control Standards	Yes	No	460-928343/11 {98.1 %R}
Field Duplicate	Yes	No	114-MW60C-122-20230823 (460-286753-1) and 114-MW60C-122-20230823-X (460-286753-2), All ND
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	Total only. See below
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW60C-122-20230823	460-286753-1	4.2	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW60C-122-20230823-X	460-286753-2	5.7	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230823	460-286753-3		4.0		10.0		Both ND, Accept

NC- not calculated

460-286753-1**Batch: 928343-0**

Cr+6 ICAL - 8/24/2023

Groundwater

(p 652 of data pkg)

x - concentration	y - response
0	0
10	0.008
50	0.041
75	0.064
100	0.082
200	0.163

(p 652 of
data pkg)

AECOM Calculated Intercept	-0.6006	OK	Reported intercept	-0.6006
AECOM Slope	1225.2	OK	Reported Slope	1226
AECOM Calculated r	0.9998	OK	Reported r	1.000

LCS calculation**460-928343/11****P. 623, 646**

Background absorbance
Sample absorbance
Total absorbance - background
Instrument Concentration (ug/L)
Sample aliquot (L)
Final volume (L)
Dilution Factor

0
0.045
0.045
54.569
0.05
0.05
1

AECOM Calculated LCS Result (ug/L)	54.57	OK	Reported Result (ug/L)	54.52

%R = Found/True*100**460-928343/11****P. 623, 646**

True Value (ug/L)

55.6

AECOM Calculated %R	98.1	OK	Reported %R	98.1

MS calculation**460-286753-1 MS****P. 620, 647****114-MW60C-122-20230823**

Background reading
Total absorbance
Total absorbance - background
Instrument Concentration (ug/L)
Sample aliquot (L)
Final volume (L)
Dilution Factor

0
0.025
0.025
30.028
0.05
0.05
2

AECOM Calculated MS Result (ug/L)	60.1	OK	Reported Result (ug/L)	60.1

%R = Found/True*100**460-286753-1 MS****P. 620, 647****114-MW60C-122-20230823**

True Value (ug/L)

60

Native concentration (ug/L)

0

AECOM Calculated MS Result %R	100.1	OK	Reported %R	100

Reporting Limit**460-286753-1****p. 607, 646****114-MW60C-122-
20230823**

Low Standard(ug/l)

10

Initial volume (L)

0.05

Final volume (L) 0.05

Dilution Factor 1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)	10

Sample Calculations**460-286753-1****p. 607, 646****114-MW60C-122-20230823**

Background reading 0

Total absorbance 0.001

Total absorbance - background 0.001

Instrument Response (ug/L) 0.625

Sample volume (L) 0.05

Final Volume (L) 0.05

Dilution Factor 1

AECOM Calculated Result (ug/L)	0.6	OK, <MDL, report as ND	Reported Result (ug/L)	8.1 U

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-286753-1 (J286753-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 9/19/2023	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Dani Woitas 10/9/2023	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Ferrous iron was requested on the COC. Lab did not receive samples and insufficient sample volume was provided for the lab to filter and analyze for Fe. No dissolved ferrous iron is reported.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.5 °C
Holding Time	Yes	No	Sampled 8/23/2023, analyzed 8/24 - 9/01/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-928710/1-A, and MB 460-928924/1-A Cr (total) ND, MB 460-930606/23, MB 460-930606/7 ND TOC, MB 460-928357/3 ND sulfate
Field Blanks	No	No	GW-RI-FB-20230823 (460-286753-3), see table below
Matrix Spike	Yes	No	114-MW60C-122-20230823 (460-286753-1) Cr (total), TOC, and sulfate. see tables below
Matrix Spike Duplicate	Yes	No	Same as above
Post Digestion Spike	Yes	No	114-MW60C-122-20230823 (460-286753-1), Cr
Laboratory Duplicate	Yes	No	114-MW60C-122-20230823 (460-286753-1) Cr (total), none for all others, see table below
Laboratory Control Standards	Yes	No	460-928710/2-A and 460-928924/2-A Cr (total), 460-930606/24 TOC, 460-928357/5 and 460-928357/6 sulfate
Field Duplicate	Yes	No	114-MW60C-122-20230823 (460-286753-1) and 114-MW60C-122-20230823-X (460-286753-2), see table below
Total Metals vs Dissolved Metals Results	NA	NA	Cr total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table, total only

Field Blank

GW-RI-FB-20230823 (460-286753-3)

Analyte	Fraction	SR (ug/l)	Qual	RL	Action
TOC	Total	0.79	J	1.0	SR >10x FB, Accept

Matrix Spikes/Matrix Spike Duplicates

114-MW60C-122-20230823 (460-286753-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	100	42.6	139.9	137.9	97	95	115	85	1	10	OK, Accept
SULFATE	Total	4.80	60.4	58.91	57.11	-30	-68	110	90	3	15	SR>4x amt spiked, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW60C-122-20230823 (460-286753-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	50.0	4.2	54.93	54.83	101	101	125	75	0	20	OK, Accept

Laboratory Duplicates

114-MW60C-122-20230823 (460-286753-1)

Analyte	Fraction	SR (ug/l)	Qual	RL	SDR (ug/l)	Qual	RL	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	4.2		4.0	3.96	J	4.0	7	20	OK, Accept

Field Duplicates

114-MW60C-122-20230823 (460-286753-1) and 114-MW60C-122-20230823 -X (460-286753-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
TOTAL ORGANIC CARBON	Total	42.6		37.3		2.0	mg/l	13.3	OK, Accept
CHROMIUM	Total	4.2		5.7		4.0	ug/l	30.3	Both SR<5x RL, ABS diff < RL, no qualification
SULFATE	Total	60.4		54.2		2.4	mg/l	10.8	OK, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW60C-122-20230823	460-286753-1	SULFATE	Total	5
114-MW60C-122-20230823	460-286753-1	TOC	Total	2
114-MW60C-122-20230823-X	460-286753-2	SULFATE	Total	5
114-MW60C-122-20230823-X	460-286753-2	TOC	Total	2

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-288731-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 10/05/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602887311_2023_10_05 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 21, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW61D-117-20230921	460-288731-1	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
GW-RI-FB-20230921	460-288731-2	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – dissolved Iron, dissolved Ferrous Iron, dissolved Ferric Iron			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested dissolved ferrous iron by method 6020B. The laboratory analyzed and reported results for dissolved iron by method 6020B, dissolved ferrous iron by method SM3500 FE D and dissolved ferric iron by method SM 3500. All results have been reported.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals

Holding Time

Dissolved ferrous iron analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The analysis for the sample in this data package was performed in the laboratory. All ferrous and ferric iron results are estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry (Sulfate, TOC)**Matrix Spike (MS)/Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Results estimated due to holding time issues are useable with an unknown bias.

Sample results reported between the MDL and RL content 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)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date September 21, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288731 (J288731-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230921

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date September 21, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288731 (J288731-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230921

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-117-20230921	460-288731-1	Total	CHROMIUM	U	3.3J	3.3J	4.0	Qualify	1

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Aqueous Target Analyte Summary Hit List (Ferrous iron dissolved and Ferric iron dissolved by method SM3500 FE D)

Site Name PPG GW RI - Bedrock
Sampling Date September 21, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288731 (J288731-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230921

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-117-20230921	460-288731-1	Dissolved	Iron (Ferrous)	U	U	UJ	0.10	Qualify	1
114-MW61D-117-20230921	460-288731-1	Dissolved	Iron (Ferric)	U	U	UJ	0.10	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. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date September 21, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288731 (J288731-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230921

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-117-20230921	460-288731-1	SULFATE	U	28.5	28.5	2.40		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date September 21, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288731 (J288731-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230921

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-117-20230921	460-288731-1	Total	Total Organic Carbon	U	2.5	2.5	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-288731-1 (J288731-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 10/05/2023	
Number of Samples/Matrix: 1GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 10/9/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.1 °C
Holding Time	Yes	No	Sampled 9/21/2023, analyzed 9/22/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	9/22/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-933728/10 (total), ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230921 (460-288731-2), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	460-933728/11 {96.3 %R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	Total only. See table below
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW61D-117-20230921	460-288731-1	3.3	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230921	460-288731-2		4.0		10.0		Both ND, Accept

NC- not calculated

460-288731-1**Batch: 933728-0**

Cr+6 ICAL - 9/22/2023

Groundwater

(p 1304 of data pkg)

x - concentration	y - response
0	0
10	0.009
50	0.045
75	0.069
100	0.087
200	0.180

(p 1304 of
data pkg)

AECOM Calculated Intercept	0.0761	OK	Reported intercept	0.0761
AECOM Slope	1114.2	OK	Reported Slope	1114
AECOM Calculated r	0.9998	OK	Reported r	1.000

LCS calculation**460-933728/11****P. 1267, 1299**

Background absorbance	0
Sample absorbance	0.048
Total absorbance - background	0.048
Instrument Concentration (ug/L)	53.548
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	53.55	OK	Reported Result (ug/L)	53.55

%R = Found/True*100**460-933728/11****P. 1267, 1299**

True Value (ug/L)	55.6

AECOM Calculated %R	96.3	OK	Reported %R	96.3

MS calculation**460-288732-3****P. 1263, 1299****Batch QC**

Background reading	0
Total absorbance	0.028
Total absorbance - background	0.028
Instrument Concentration (ug/L)	31.274
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated MS Result (ug/L)	31.3	OK	Reported Result (ug/L)	31

%R = Found/True*100**460-288732-3****P. 1263, 1299****Batch QC**

True Value (ug/L)	30
Native concentration (ug/L)	0

AECOM Calculated MS Result %R	104.2	OK	Reported %R	104

Reporting Limit**460-288731-1****p. 1251, 1299****114-MW61D-117-
20230921**

Low Standard(ug/l)	10
Initial volume (L)	0.05

Final volume (L) 0.05

Dilution Factor 1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)	10

Sample Calculations

460-288731-1

p. 1251, 1299

114-MW61D-117-20230921

Background reading 0

Total absorbance 0.001

Total absorbance - background 0.001

Instrument Response (ug/L) 1.190

Sample volume (L) 0.05

Final Volume (L) 0.05

Dilution Factor 1

AECOM Calculated Result (ug/L)	1.2	OK, <MDL report as ND	Reported Result (ug/L)	8.1 U

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-288731-1 (J288731-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 10/05/2023	
Number of Samples/Matrix: 1GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Dani Woitas 10/9/2023	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Ferrous iron by 6020B was requested on the COC. Laboratory analyzed for dissolved iron by 6020, dissolved ferrous iron by SM 3500 FE D, and dissolved ferric iron by SM 3500. Results are reported.
Data Completeness	Yes	No	
Sample Preservation	No	Yes	1.1 °C
Holding Time	No	Yes	Sampled 9/21/2023, analyzed 9/23 - 10/02/2023, Dissolved iron by method 6020 met QC HT. Dissolved ferrous iron by method SM3500 is normally performed in the field with a method-defined holding time of 15 minutes. Results are estimated (UJ) as the analysis was performed in the lab outside the 15- minute HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-933700/1-A, (total) Cr ND, 460-935493/1-A (dissolved) Fe, MB 460-934774/6 and MB 460-934774/22 ND TOC, MB 460-934085/3 ND sulfate, MB 460-935066/4 ND Ferrous Fe
Field Blanks	Yes	No	GW-RI-FB-20230921 (460-288731-2) Cr, TOC, sulfate ND, no FB for iron
Matrix Spike	NA	NA	Batch QC Cr, iron, TOC, ferrous iron, none for sulfate
Matrix Spike Duplicate	NA	NA	Batch QC
Post Digestion Spike	NA	NA	Batch QC Cr only
Laboratory Duplicate	NA	NA	Batch QC Cr, iron only, none for all others
Laboratory Control Standards	Yes	No	460-933700/2-A Cr (total), 460-935493/2-A Fe (dissolved), 460-934774/23 TOC, 460-934085/5 and 460-934085/6 sulfate, LCS 460-935066/5 ferrous iron.
Field Duplicate	NA	NA	None with this SDG

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total Metals vs Dissolved Metals Results	NA	NA	Cr total only, Fe dissolved only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table, total only

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW61D-117-20230921	460-288731-1	SULFATE	Total	5

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-288809-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 10/04/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602888091_2023_10_04 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 22, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-PZ-66WR-83.0-20230922	460-288809-1	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-PZ-66WR-83.0-20230922-X (Field Duplicate of 114-PZ-66WR-83.0-20230922)	460-288809-2	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW61D-121-20230922	460-288809-3	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
114-MW61C-67.5-20230922	460-288809-4	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
114-MW53C-47.5-20230922	460-288809-5	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-PZ-52WR-74.0-20230922	460-288809-6	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
GW-RI-FB-20230922	460-288809-7	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – dissolved Iron, dissolved Ferrous Iron, dissolved Ferric Iron			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey and the Field Sampling Plan/Quality

General Comments

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

The chain of custody (COC) requested dissolved ferrous iron by method 6020B. The laboratory analyzed and reported results for dissolved iron by method 6020B, dissolved ferrous iron by method SM3500 FE D and dissolved ferric iron by method SM 3500. All results have been reported.

Hexavalent Chromium

Sample Results

The results for total/dissolved chromium and total/dissolved hexavalent chromium were compared to ensure that the total/dissolved chromium concentration was greater than the total/dissolved hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Hexavalent chromium (see table below) was diluted up to 50x in two samples, resulting in elevated RLs that exceeded the GWQS limits. Project limits may not be met.

Matrix Spike (MS)

Samples 114-PZ-66WR-83.0-20230922 (460-288809-1) and 114-MW61D-121-20230922 (460-288809-3) were analyzed as the matrix spikes for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Samples 114-PZ-66WR-83.0-20230922 (460-288809-1) and 114-MW61D-121-20230922 (460-288809-3) were analyzed as lab duplicates for this SDG. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

The field duplicate pair submitted with this data set was 114-PZ-66WR-83.0-20230922(460-288809-1) and 114-PZ-66WR-83.0-20230922-X (460-288809-2). All QC acceptance criteria were met. No qualifications were made.

Metals

Holding Time

Dissolved ferrous iron analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The analysis for all of the samples in this data package reported by method SM3500-FE D were performed in the laboratory. All ferrous and ferric iron results are estimated (J/UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-PZ-66WR-83.0-20230922 (460-288809-1) was analyzed as the MS/MSD for this data set. All QC acceptance criteria were met for chromium (total) and iron (dissolved) by method SW6020B. Ferrous iron (dissolved) which was analyzed by method SM3500 FE D, did not meet the percent recovery criteria and was less than ten percent. The results for ferrous iron (dissolved) and ferric iron (dissolved) in sample 114-PZ-66WR-83.0-20230922 (460-288809-1) were rejected (R).

Laboratory Duplicate

Sample 114-PZ-66WR-83.0-20230922 (460-288809-1) was analyzed as the lab duplicate for total/dissolved Cr and dissolved iron in this SDG. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

The field duplicate pair submitted with this data set was 114-PZ-66WR-83.0-20230922(460-288809-1) and 114-PZ-66WR-83.0-20230922-X (460-288809-2). All QC acceptance criteria were met. No qualifications were made.

Wet Chemistry (Sulfate, TOC)**Field Blank (FB)**

The FB, GW-RI-FB-20230922 (460-288809-7), reported TOC at a concentration less than the reporting limit (RL) but greater than the method detection limit (MDL). Sample result for 114-PZ-52WR-74.0-20230922 (460-288809-7) was greater than ten times the amount in the FB; therefore, no qualifications were required. All other samples were greater than three times but less than ten times the amount in the FB. All of these sample results were estimated (JB).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-PZ-66WR-83.0-20230922 (460-288809-1) was analyzed as the MS/MSD for this data set. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

The field duplicate pair submitted with this data set was 114-PZ-66WR-83.0-20230922(460-288809-1) and 114-PZ-66WR-83.0-20230922-X (460-288809-2). All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes with the exception of ferrous iron (dissolved) and ferric iron (dissolved) for sample 114-PZ-66WR-83.0-20230922 (460-288809-1). When applicable, qualified results are discussed in attachments A and B below.

The nondetect results for hexavalent chromium in two samples, as presented in Attachment B, exceeded the Groundwater Action levels; therefore, the nondetect results may not meet project objectives.

Results estimated due to holding time issues are useable with an unknown bias.

Results estimated due to field blank contamination are useable with a high bias.

Results rejected due to low MS/MSD recoveries are not useable.

Sample results reported between the MDL and RL content are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date September 22, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288809 (J288809-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230922

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66WR-83.0-20230922	460-288809-1	Total	CHROMIUM (HEXAVALENT)	U	112000	112000	10000		
114-PZ-66WR-83.0-20230922-X	460-288809-2	Total	CHROMIUM (HEXAVALENT)	U	111000	111000	10000		
114-MW61C-67.5-20230922	460-288809-4	Total	CHROMIUM (HEXAVALENT)	U	3600	3600	500		
114-MW61C-67.5-20230922	460-288809-4	Dissolved	CHROMIUM (HEXAVALENT)	U	3650	3650	500		
114-MW53C-47.5-20230922	460-288809-5	Total	CHROMIUM (HEXAVALENT)	U	29200	29200	5000		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date September 22, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288809 (J288809-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230922

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66WR-83.0-20230922	460-288809-1	Total	CHROMIUM	U	120000	120000	40.0		
114-PZ-66WR-83.0-20230922-X	460-288809-2	Total	CHROMIUM	U	119000	119000	40.0		
114-MW61D-121-20230922	460-288809-3	Dissolved	CHROMIUM	U	4.2	4.2	4.0		
114-MW61D-121-20230922	460-288809-3	Total	CHROMIUM	U	6.4	6.4	4.0		
114-MW61C-67.5-20230922	460-288809-4	Dissolved	CHROMIUM	U	3880	3880	4.0		
114-MW61C-67.5-20230922	460-288809-4	Total	CHROMIUM	U	3860	3860	4.0		
114-MW53C-47.5-20230922	460-288809-5	Total	CHROMIUM	U	28400	28400	20.0		
114-PZ-52WR-74.0-20230922	460-288809-6	Dissolved	CHROMIUM	U	1260	1260	40.0		
114-PZ-52WR-74.0-20230922	460-288809-6	Total	CHROMIUM	U	3170	3170	40.0		
114-PZ-52WR-74.0-20230922	460-288809-6	Dissolved	IRON	U	55400	55400	1200		

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

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

Aqueous Target Analyte Summary Hit List (Ferrous iron dissolved and Ferric iron dissolved by method SM3500 FE D)

Site Name PPG GW RI - Bedrock
Sampling Date September 22, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288809 (J288809-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230922

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66WR-83.0-20230922	460-288809-1	Dissolved	Iron (Ferrous)	U	U	R	0.10	Reject	1,2
114-PZ-66WR-83.0-20230922-X	460-288809-2	Dissolved	Iron (Ferrous)	U	J	UJ	0.10	Qualify	1
114-MW61D-121-20230922	460-288809-3	Dissolved	Iron (Ferrous)	U	J	UJ	0.10	Qualify	1
114-MW61C-67.5-20230922	460-288809-4	Dissolved	Iron (Ferrous)	U	J	UJ	0.10	Qualify	1
114-MW53C-47.5-20230922	460-288809-5	Dissolved	Iron (Ferrous)	U	J	UJ	0.10	Qualify	1
114-PZ-52WR-74.0-20230922	460-288809-6	Dissolved	Iron (Ferrous)	U	57.4	57.4J	0.10	Qualify	1
114-PZ-66WR-83.0-20230922	460-288809-1	Dissolved	Iron (Ferric)	U	U	R	0.10	Reject	1,2
114-PZ-66WR-83.0-20230922-X	460-288809-2	Dissolved	Iron (Ferric)	U	J	UJ	0.10	Qualify	1
114-MW61D-121-20230922	460-288809-3	Dissolved	Iron (Ferric)	U	J	UJ	0.10	Qualify	1
114-MW61C-67.5-20230922	460-288809-4	Dissolved	Iron (Ferric)	U	J	UJ	0.10	Qualify	1
114-MW53C-47.5-20230922	460-288809-5	Dissolved	Iron (Ferric)	U	J	UJ	0.10	Qualify	1
114-PZ-52WR-74.0-20230922	460-288809-6	Dissolved	Iron (Ferric)	U	J	UJ	0.10	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. Technical holding time was exceeded.
2. MS and/or MSD recovery was below the lower acceptance limit.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date September 22, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288809 (J288809-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230922

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66WR-83.0-20230922	460-288809-1	SULFATE	U	296	296	9.60		
114-PZ-66WR-83.0-20230922-X	460-288809-2	SULFATE	U	296	296	9.60		
114-MW61D-121-20230922	460-288809-3	SULFATE	U	28.9	28.9	2.40		
114-MW61C-67.5-20230922	460-288809-4	SULFATE	U	94.7	94.7	4.80		
114-MW53C-47.5-20230922	460-288809-5	SULFATE	U	297	297	9.60		
114-PZ-52WR-74.0-20230922	460-288809-6	SULFATE	U	243	243	24.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date September 22, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288809 (J288809-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230922

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66WR-83.0-20230922	460-288809-1	Total	Total Organic Carbon	U	3.5	3.5JB	1.0	Qualify	1
114-PZ-66WR-83.0-20230922-X	460-288809-2	Total	Total Organic Carbon	U	3.4	3.4JB	1.0	Qualify	1
114-MW61D-121-20230922	460-288809-3	Total	Total Organic Carbon	U	3.3	3.3JB	1.0	Qualify	1
114-MW61C-67.5-20230922	460-288809-4	Total	Total Organic Carbon	U	1.7	1.7JB	1.0	Qualify	1
114-MW53C-47.5-20230922	460-288809-5	Total	Total Organic Carbon	U	4.6	4.6JB	1.0	Qualify	1
114-PZ-52WR-74.0-20230922	460-288809-6	Total	Total Organic Carbon	U	3390	3390	100		
GW-RI-FB-20230922	460-288809-7	Total	Total Organic Carbon	U	0.50J	0.50J	1.0	Qualify	2

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

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

NJDEP Laboratory Footnote

1. Sample result was $\geq 3x$ and $<10X$ the associated blank result.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-288809-1 (J288809-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 10/04/2023	
Number of Samples/Matrix: 6GW, 3 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 10/10/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	Yes	No	Sampled 9/22/2023, analyzed 9/23/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	9/23/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-933905/10 (total), ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230922 (460-288809-7), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-PZ-66WR-83.0-20230922 (460-288809-1) (112 %R) and 114-MW61D-121-20230922 (460-288809-3) {98 %R}
Laboratory Duplicate	Yes	No	114-PZ-66WR-83.0-20230922 (460-288809-1) and 114-MW61D-121-20230922 (460-288809-3)
Laboratory Control Standards	Yes	No	460-933905/11 {101.1 %R}
Field Duplicate	Yes	No	114-PZ-66WR-83.0-20230922(460-288809-1) and 114-PZ-66WR-83.0-20230922-X (460-288809-2), {RPD 0.9}
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-PZ-66WR-83.0-20230922 (460-288809-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	40000	112000	157000	NA	112	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW61D-121-20230922 (460-288809-3)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Dissolved	30.0	0	29.35	NA	98	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PZ-66WR-83.0-20230922	460-288890-1	HEXAVALENT CHROMIUM (total)	112000		111100		10000	ug/l	1	OK, Accept
114-MW61D-121-20230922	460-288890-3	HEXAVALENT CHROMIUM (dissolved)	8.1	U	8.1	U	10	ug/l	NC	Both ND, Accept

NC – Not calculated

Field Duplicates

114-PZ-66WR-83.0-20230922(460-288809-1) and 114-PZ-66WR-83.0-20230922-X (460-288809-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	112000		111000			ug/l	0.9	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PZ-66WR-83.0-20230922	460-288809-1	120000	40.0	112000	10000	7	T Cr > T Cr6, Accept
114-PZ-66WR-83.0-20230922-X	460-288809-2	119000	40.0	111000	10000	7	T Cr > T Cr6, Accept
114-MW61D-121-20230922	460-288809-3	6.4	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW61C-67.5-20230922	460-288809-4	3860	4.0	3650	500	6	T Cr > T Cr6, Accept
114-MW53C-47.5-20230922	460-288809-5	28400	20.0	29200	5000	3	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PZ-52WR-74.0-20230922	460-288809-6	3170	40.0		500	154	T Cr > T Cr6, Accept
GW-RI-FB-20230922	460-288809-7		4.0		10.0		Both ND, Accept

NC- not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61D-121-20230922	460-288809-3	4.2	4.0		10.0	NC	D Cr > D Cr6, Accept

114-MW61C-67.5-20230922	460-288809-4	3880	4.0	3600	500	7	D Cr > D Cr6, Accept
114-PZ-52WR-74.0-20230922	460-288809-6	1260	40.0		200	NC	D Cr > D Cr6, Accept

NC- not calculated

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW61D-121-20230922	460-288809-3		10.0		40		Both ND, Accept
114-MW61C-67.5-20230922	460-288809-4	3650	500	3600	2000	1	T Cr6 > D Cr6, Accept
114-PZ-52WR-74.0-20230922	460-288809-6		500		800		Both ND, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Fraction	Result	Detect Flag	Units	GWQS Action Level
114-PZ-52WR-74.0-20230922	460-288809-6	CHROMIUM (HEXAVALENT)	Dissolved	200	N	ug/l	70
114-PZ-52WR-74.0-20230922	460-288809-6	CHROMIUM (HEXAVALENT)	Total	500	N	ug/l	70

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-66WR-83.0-20230922	460-288809-1	HEXAVALENT CHROMIUM	Total	1000
114-PZ-66WR-83.0-20230922-X	460-288809-2	HEXAVALENT CHROMIUM	Total	1000
114-MW61C-67.5-20230922	460-288809-4	HEXAVALENT CHROMIUM	Dissolved	50
114-MW61C-67.5-20230922	460-288809-4	HEXAVALENT CHROMIUM	Total	50
114-MW53C-47.5-20230922	460-288809-5	HEXAVALENT CHROMIUM	Total	500
114-PZ-52WR-74.0-20230922	460-288809-6	HEXAVALENT CHROMIUM	Dissolved	20
114-PZ-52WR-74.0-20230922	460-288809-6	HEXAVALENT CHROMIUM	Total	50

460-288809-1**Batch: 933905-0**

Cr+6 ICAL - 9/23/2023

Groundwater

(p 1965 of data pkg)

x - concentration	y - response
0	0
10	0.01
50	0.046
75	0.066
100	0.085
200	0.180

(p 1965 of
data pkg)

AECOM Calculated Intercept	0.2335	OK	Reported intercept	0.2335
AECOM Slope	1120.4	OK	Reported Slope	1120
AECOM Calculated r	0.9994	OK	Reported r	0.999

LCS calculation**460-933905/11****P. 1918, 1957**

Background absorbance
Sample absorbance
Total absorbance - background
Instrument Concentration (ug/L)
Sample aliquot (L)
Final volume (L)
Dilution Factor

0
0.05
0.05
56.234
0.05
0.05
1

AECOM Calculated LCS Result (ug/L)	56.23	OK	Reported Result (ug/L)	56.23

%R = Found/True*100**460-933905/11****P. 1918, 1957**

True Value (ug/L)

55.6

AECOM Calculated %R	101.1	OK	Reported %R	101.1

MS calculation**460-288809-1****P. 1914, 1958****114-PZ-66WR-83.0-20230922**

Background reading
Total absorbance
Total absorbance - background
Instrument Concentration (ug/L)
Sample aliquot (L)
Final volume (L)
Dilution Factor

0
0.14
0.14
157.091
0.05
0.05
1000

AECOM Calculated MS Result (ug/L)	157091.1	OK	Reported Result (ug/L)	157000

%R = Found/True*100**460-288809-1****P. 1914, 1958****114-PZ-66WR-83.0-20230922**

True Value (ug/L)

40000

Native concentration (ug/L)

112000

AECOM Calculated MS Result %R	112.7	OK	Reported %R	112

Reporting Limit**460-288809-1****p. 1881, 1957****114-PZ-66WR-83.0-20230922**

Low Standard(ug/l)

10

Initial volume (L)

0.05

Final volume (L) 0.05
Dilution Factor 1000

AECOM Calculated Reporting Limit	10000	OK	Reported RL (ug/L)	10000

Sample Calculations**460-288809-1****p. 1881, 1957****114-PZ-66WR-83.0-20230922**

Background reading 0
Total absorbance 0.1
Total absorbance - background 0.1
Instrument Response (ug/L) 112.275

Sample volume (L) 0.05
Final Volume (L) 0.05
Dilution Factor 1000

AECOM Calculated Result (ug/L)	112274.6	OK	Reported Result (ug/L)	112000

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-288809-1 (J288809-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 10/04/2023	
Number of Samples/Matrix: 6 GW, 3 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Dani Woitas 10/10/2023	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Ferrous iron by 6020B was requested on the COC. Laboratory analyzed for dissolved iron by 6020, dissolved ferrous iron by SM 3500 FE D, and dissolved ferric iron by SM 3500. Results are reported.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	No	Yes	Sampled 9/22/2023, analyzed 9/24 - 10/02/2023, Dissolved iron by method 6020 met QC HT. Dissolved ferrous iron by method SM3500 is normally performed in the field with a method-defined holding time of 15 minutes. Results are estimated (J/UJ) as the analysis was performed in the lab outside the 15- minute HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-934147/1-A, (total) Cr ND, 460-935493/1-A (dissolved) Fe, (dissolved) Cr ND, MB 460-935040/6 and MB 460-935040/38 ND TOC, MB 460-934085/3 ND sulfate, MB 460-935066/4 ND Ferrous Fe
Field Blanks	No	Yes	GW-RI-FB-20230922 (460-288809-7) TOC {0.5J}, see table below
Matrix Spike	No	Yes	114-PZ-66WR-83.0-20230922 (460-288809-1), Cr (total), Fe (dissolved), ferrous iron, TOC, and sulfate. see tables below
Matrix Spike Duplicate	No	Yes	Same as above
Post Digestion Spike	Yes	No	114-PZ-66WR-83.0-20230922 (460-288809-1), Cr only
Laboratory Duplicate	Yes	No	114-PZ-66WR-83.0-20230922 (460-288809-1), (460-288809-1) Cr (total/dissolved) and Fe (dissolved) , none for all others, see table below
Laboratory Control Standards	Yes	No	460-934147/2-A Cr (total), 460-935493/2-A Fe (dissolved) and (dissolved) Cr, 460-935040/41 TOC, 460-934085/5 and 460-934085/6 sulfate, LCS 460-935066/5 ferrous iron.

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Field Duplicate	Yes	No	114-PZ-66WR-83.0-20230922(460-288809-1) and 114-PZ-66WR-83.0-20230922-X (460-288809-2), see table below
Total Metals vs Dissolved Metals Results	Yes	No	Cr total/dissolved only, Fe dissolved only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table, total only

Field Blank

GW-RI-FB-2023922 (460-288809-7)

Analyte	Fraction	SR (ug/l)	Qual	RL	Action
TOC	Total	0.50	J	1.0	Sample results for 114-PZ-52WR-74.0-20230922 (460-288809-7) >10x FB, Accept. All other samples were >3x but <10x FB, estimate (JB).

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates**

114-PZ-66WR-83.0-20230922 (460-288809-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	3.5	48.02	47.93	89	89	115	85	0	10	OK, Accept
SULFATE	Total	4.80	296	298.1	298.2	38	39	110	90	0	15	SR>4x amt spiked, Accept
Ferrous Iron	Dissolved	2.00	0.081 U	0.118	0.230	6	12	115	85	NC	10	Reject (R)

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-PZ-66WR-83.0-20230922 (460-288809-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
IRON	Dissolved	2500	58.2 U	2529	2514	101	101	125	75	1	20	OK, Accept
CHROMIUM	Total	50.0	114800	120000	116000	-9618	-7270	125	75	1	20	SR>4x amt spiked, Accept

Laboratory Duplicates

114-PZ-66WR-83.0-20230922 (460-288809-1)

Analyte	Fraction	SR (ug/l)	Qual	RL	SDR (ug/l)	Qual	RL	RPD %	RPD Upper Limit	Action
IRON	Dissolved	58.2	U	120	58.2	U	120	NC	20	Both ND, OK Accept
CHROMIUM	Dissolved	110000		80	110000		80	0.3	20	OK, Accept
CHROMIUM	Total	120000		40	120300		40	0.6	20	OK, Accept

Field Duplicates

114-PZ-66WR-83.0-20230922 (460-288809-1) and 114-PZ-66WR-83.0-20230922-X (460-288809-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	58.2	U	58.2	U	120	ug/l		Both ND, Accept
TOTAL ORGANIC CARBON	Total	3.5		3.4		1.0	mg/l	2.9	OK, Accept
CHROMIUM	Total	120000		119000		40	ug/l	0.8	OK, Accept
SULFATE	Total	296		296		9.6	mg/l	0	OK, Accept
FERROUS IRON	Dissolved	0.081	U	0.081	U	0.10	mg/l		Both ND, Accept
FERRIC IRON	Dissolved	0.10	U	0.10	U	0.10	mg/l		Both ND, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-MW61D-121-20230922	460-288809-3	6.4	4.0	4.2	4.0	20	2	42	T Cr > D Cr, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-MW61C-67.5-20230922	460-288809-4	3860	4.0	3880	4.0	20	20	1	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PZ-52WR-74.0-20230922	460-288809-6	3170	40.0	1260	40.0	200	1910	86	T Cr > D Cr, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-66WR-83.0-20230922	460-288809-1	CHROMIUM	Total	10
114-PZ-66WR-83.0-20230922	460-288809-1	SULFATE	Total	20
114-PZ-66WR-83.0-20230922-X	460-288809-2	CHROMIUM	Total	10
114-PZ-66WR-83.0-20230922-X	460-288809-2	SULFATE	Total	20
114-MW61D-121-20230922	460-288809-3	SULFATE	Total	5
114-MW61C-67.5-20230922	460-288809-4	SULFATE	Total	10
114-MW53C-47.5-20230922	460-288809-5	CHROMIUM	Total	5
114-MW53C-47.5-20230922	460-288809-5	SULFATE	Total	20
114-PZ-52WR-74.0-20230922	460-288809-6	IRON	Dissolved	10
114-PZ-52WR-74.0-20230922	460-288809-6	CHROMIUM	Dissolved	10
114-PZ-52WR-74.0-20230922	460-288809-6	CHROMIUM	Total	10
114-PZ-52WR-74.0-20230922	460-288809-6	TOC	Total	100
114-PZ-52WR-74.0-20230922	460-288809-6	SULFATE	Total	50
114-PZ-52WR-74.0-20230922	460-288809-6	IRON (FERROUS)	Dissolved	50

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-288953-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 10/09/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602889531_2023_10_09 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW57C-71.0-20230925	460-288953-1	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW57C-71.0-20230925-X	460-288953-2	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW62C-73.0-20230925	460-288953-3	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
GW-RI-FB-20230925	460-288953-4	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – dissolved Iron, dissolved Ferrous Iron, dissolved Ferric Iron			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested dissolved ferrous iron for all samples by method 6020B. Dissolved ferrous iron for sample GW-RI-FB-20230925 (460-288953-4) was cancelled. The laboratory analyzed and reported results for dissolved iron by method 6020B, dissolved ferrous iron by method SM3500 FE D, and dissolved ferric iron by method SM 3500. All results have been reported.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Hold Time

Sample 114-MW57C-71.0-20230925 (460-288953-1) was reanalyzed more than 48 hours after collection. Validation guidance states to reject all sample results if the holding time exceeds 48 hours. Professional judgement was used as the concentration was high and results agreed with the field duplicate; which was analyzed within holding time. Results were estimated (J).

Matrix Spike (MS)

Sample 114-MW57C-71.0-20230925 (460-288953-1) was analyzed as the matrix spike for this data set. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

Sample 114-MW57C-71.0-20230925 (460-288953-1) was analyzed as the laboratory duplicate for this data set. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. No qualifications were made.

Field Duplicate

The field duplicate pair submitted with this data set was 114-MW57C-71.0-20230925 (460-288953-1) and 114-MW57C-71.0-20230925-X (460-288953-2). All QC acceptance criteria were met. No qualifications were made.

Metals

Holding Time

Dissolved ferrous iron analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The analysis for all of the samples in this data package reported by method SM3500-FE D were performed in the laboratory. All ferrous iron and ferric iron results reported by method SM3500-FE D were estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW57C-71.0-20230925 (460-288953-1) was analyzed as the MS/MSD for this data set. All QC acceptance criteria were met for chromium (total) and iron (dissolved) by method SW6020B. Ferrous iron (dissolved) which was analyzed by method SM3500 FE D, did not meet the percent recovery criteria and was less than ten percent. All ferrous iron and ferric iron results reported by method SM3500-FE D were rejected (R).

Laboratory Duplicate

Sample 114-MW57C-71.0-20230925 (460-288953-1) was analyzed as the lab duplicate for total Cr and dissolved iron in this SDG. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met. No qualifications were made.

Field Duplicate

The field duplicate pair submitted with this data set was 114-MW57C-71.0-20230925 (460-288953-1) and 114-MW57C-71.0-20230925 -X (460-288953-2). All QC acceptance criteria were met. No qualifications were made.

Sample Results

Iron (see table below) was diluted up to 5x in two samples, resulting in elevated RLs that exceeded the GWQS limits. Project limits may not be met.

Wet Chemistry (Sulfate, TOC)

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW57C-71.0-20230925 (460-288953-1) was analyzed as the MS/MSD for this data set. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

The field duplicate pair submitted with this data set was 114-MW57C-71.0-20230925 (460-288953-1) and 114-MW57C-71.0-20230925 -X (460-288953-2). All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

The data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The nondetect results for iron in two samples, as presented in Attachments A and B, exceeded the Groundwater Action levels; therefore, the nondetect results may not meet project objectives.

Results estimated due to holding time issues are useable with an unknown bias.

Results rejected due to poor matrix spike recoveries are not useable.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date September 25, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288953 (J288953-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230925

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-71.0-20230925	460-288953-1	Total	CHROMIUM (HEXAVALENT)	U	10700	10700J	1000	Qualify	1
114-MW57C-71.0-20230925-X	460-288953-2	Total	CHROMIUM (HEXAVALENT)	U	11400	11400	1000		

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. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date September 25, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288953 (J288953-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230925

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-71.0-20230925	460-288953-1	Total	CHROMIUM	U	11600	11600	4.0		
114-MW57C-71.0-20230925-X	460-288953-2	Total	CHROMIUM	U	11300	11300	4.0		
114-MW62C-73.0-20230925	460-288953-3	Total	CHROMIUM	U	7.3	7.3	4.0		

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

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

Aqueous Target Analyte Summary Hit List (Ferrous iron dissolved and Ferric iron dissolved by method SM3500 FE D)

Site Name PPG GW RI - Bedrock
Sampling Date September 25, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288953 (J288953-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230925

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-71.0-20230925	460-288953-1	Dissolved	IRON (FERROUS)	U	U	R	0.10	Qualify	1,2
114-MW57C-71.0-20230925-X	460-288953-2	Dissolved	IRON (FERROUS)	U	U	R	0.10	Qualify	1,2
114-MW62C-73.0-20230925	460-288953-3	Dissolved	IRON (FERROUS)	U	U	R	0.10	Qualify	1,2
114-MW57C-71.0-20230925	460-288953-1	Dissolved	IRON (FERRIC)	U	U	R	0.10	Qualify	1,2
114-MW57C-71.0-20230925-X	460-288953-2	Dissolved	IRON (FERRIC)	U	U	R	0.10	Qualify	1,2
114-MW62C-73.0-20230925	460-288953-3	Dissolved	IRON (FERRIC)	U	U	R	0.10	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. Technical holding time was exceeded.
2. MS and/or MSD recovery was below the lower acceptance limit.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date September 25, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288953 (J288953-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230925

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-71.0-20230925	460-288953-1	SULFATE	U	300	300	9.60		
114-MW57C-71.0-20230925-X	460-288953-2	SULFATE	U	285	285	9.60		
114-MW62C-73.0-20230925	460-288953-3	SULFATE	U	48.4	48.4	2.40		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date September 25, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-288953 (J288953-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230925

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-71.0-20230925	460-288953-1	Total	Total Organic Carbon	U	3.0	3.0	1.0		
114-MW57C-71.0-20230925-X	460-288953-2	Total	Total Organic Carbon	U	2.9	2.9	1.0		
114-MW62C-73.0-20230925	460-288953-3	Total	Total Organic Carbon	U	1.8	1.8	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-288953-1 (J288953-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 10/09/2023	
Number of Samples/Matrix: 3GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 10/17/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	No	Yes	Sampled 9/25/2023, analyzed 9/26/2023 and 10/10/2023. Sample 114-MW57C-71.0-20230925 (460-288953-1) was reanalyzed out of HT to verify original results which did not agree with FD. Reanalysis results are reported. Results are estimated.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	9/26/2023, 10/09/2023, 10/10/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-934472/10 (total), MB 460-937144/10 (total), and MB 460-037326/10 (total), all ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230925 (460-288953-4), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW57C-71.0-20230925 (460-288953-1) (114 %R)
Laboratory Duplicate	Yes	No	114-MW57C-71.0-20230925 (460-288953-1), (RPD 1%)
Laboratory Control Standards	Yes	No	460-934472/11 {105.3 %R}, 460-937144/11 {100.6}, 460-937326/11 {96.2 %R}
Field Duplicate	Yes	No	114-MW57C-71.0-20230925 (460-288953-1) and 114-MW57C-71.0-20230925-X (460-288953-2), see table below

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	Total only
Calculation Spot Checks	Yes	No	See calculations below

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW57C-71.0-20230925	460-288953-1	HEXAVALENT CHROMIUM	9/25/2023 12:05	10/10/2023 10:45	HT >48hr., PJ estimate (J)
114-MW57C-71.0-20230925-X	460-288953-2	HEXAVALENT CHROMIUM	9/25/2023 12:20	9/26/2023 9:55	OK, Accept
114-MW62C-73.0-20230925	460-288953-3	HEXAVALENT CHROMIUM	9/25/2023 11:35	9/26/2023 9:20	OK, Accept
GW-RI-FB-20230925	460-288953-4	HEXAVALENT CHROMIUM	9/25/2023 14:00	9/26/2023 9:55	OK, Accept

Matrix Spikes

114-MW57C-71.0-20230925 (460-288953-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	21300	10700	34840	NA	114	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW57C-71.0-20230925	460-288953-1	HEXAVALENT CHROMIUM	10700		10770		10.0	ug/l	1	OK, Accept

NC – Not calculated

Field Duplicates

114-MW57C-71.0-20230925 (460-288953-1) and 114-MW57C-71.0-20230925-X (460-288953-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	10700		11400		1000	ug/l	6.3	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW57C-71.0-20230925	460-288953-1	11600	4.0	10700	1000	8	T Cr > T Cr6, Accept
114-MW57C-71.0-20230925-X	460-288953-2	11300	4.0	11400	1000	1	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW62C-73.0-20230925	460-288953-3	7.3	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230925	460-288953-4		4.0		10.0		Both ND, Accept

NC- not calculated

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW57C-71.0-20230925	460-288953-1	HEXAVALENT CHROMIUM	Total	100
114-MW57C-71.0-20230925-X	460-288953-2	HEXAVALENT CHROMIUM	Total	100

460-288953-1**Batch: 937326-0**

Cr+6 ICAL - 10/10/2023

Groundwater

(p 1705 of data pkg)

x - concentration	y - response
0	0
10	0.009
50	0.045
75	0.069
100	0.089
200	0.177

(p 1705 of data pkg)

AECOM Calculated Intercept	-0.7588	OK	Reported intercept	-0.7588
AECOM Slope	1130.0	OK	Reported Slope	1130
AECOM Calculated r	0.9999	OK	Reported r	1.000

LCS calculation**460-937326/11****P. 1651, 1694**

Background absorbance

0

Sample absorbance

0.048

Total absorbance - background

0.048

Instrument Concentration (ug/L)

53.481

Sample aliquot (L)

0.05

Final volume (L)

0.05

Dilution Factor

1

AECOM Calculated LCS Result (ug/L)	53.48	OK	Reported Result (ug/L)	53.48

%R = Found/True*100**460-937326/11****P. 1651, 1694**

True Value (ug/L)

55.6

AECOM Calculated %R	96.2	OK	Reported %R	96.2

MS calculation**460-288953-1****P. 1647, 1761****114-MW57C-71.0-20230925**

Background reading

0

Total absorbance

0.124

Total absorbance - background

0.124

Instrument Concentration (ug/L)

139.356

Sample aliquot (L)

0.05

Final volume (L)

0.05

Dilution Factor

250

AECOM Calculated MS Result (ug/L)	34838.9	OK	Reported Result (ug/L)	34840

%R = Found/True*100**460-288953-1****P. 1647, 1761****114-MW57C-71.0-20230925**

True Value (ug/L)

21300

Native concentration (ug/L)

10700

AECOM Calculated MS Result %R	113.3	OK	Reported %R	114

Reporting Limit**460-288953-1****p. 1625, 1681****114-MW57C-71.0-20230925**

Low Standard(ug/l)

10

Initial volume (L)

0.05

Final volume (L) 0.05
Dilution Factor 100

AECOM Calculated Reporting Limit	1000	OK	Reported RL (ug/L)	1000

Sample Calculations**460-288953-1****p. 1625, 1681****114-MW57C-71.0-20230925**

Background reading 0
Total absorbance 0.095
Total absorbance - background 0.095
Instrument Response (ug/L) 106.587

Sample volume (L) 0.05
Final Volume (L) 0.05
Dilution Factor 100

AECOM Calculated Result (ug/L)	10658.7	OK	Reported Result (ug/L)	10700

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-288953-1 (J288953-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 10/09/2023	
Number of Samples/Matrix: 3 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Dani Woitas 10/17/2023	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Ferrous iron by 6020B was requested on the COC. Dissolved ferrous iron for sample GW-RI-FB-20230925 (460-288953-4) was cancelled. Laboratory analyzed for dissolved iron by SW 6020B, dissolved ferrous iron by SM3500 FE D, and dissolved ferric iron by SM3500 FE. All Results are reported.
Data Completeness	Yes	No	
Sample Preservation	No	Yes	1.4 °C
Holding Time	No	Yes	Sampled 9/25/2023, analyzed 9/27 - 10/02/2023, Dissolved iron by method 6020 met QC HT. Dissolved ferrous iron by method SM3500 is normally performed in the field with a method-defined holding time of 15 minutes. Results are estimated (UJ) as the analysis was performed in the lab outside the 15- minute HT.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-934441/1-A, (total) Cr ND, 460-935430/1-A (dissolved) Fe ND, MB 460-935282/6 ND TOC, MB 460-934708/3 ND sulfate, MB 460-935066/4 and MB 460-935066/133 ND Ferrous Fe
Field Blanks	Yes	No	GW-RI-FB-20230925 (460-288953-4) ND, no iron
Matrix Spike	No	Yes	114-MW57C-71.0-20230925 (460-288953-1), Cr (total), Fe (dissolved), Ferrous iron (dissolved), TOC, and sulfate. see tables below
Matrix Spike Duplicate	Yes	No	Same as above
Post Digestion Spike	Yes	No	114-MW57C-71.0-20230925 (460-288953-1), Cr only
Laboratory Duplicate	Yes	No	114-MW57C-71.0-20230925(460-288953-1) Cr (total) and Fe (dissolved) , none for all others, see table below
Laboratory Control Standards	Yes	No	460-934441/2-A Cr (total), 460-935430/2-A Fe (dissolved), 460-935282/7 TOC, 460-934708/5 and 460-934708/6 sulfate, LCS 460-935066/5 and 460-935066/134 Ferrous iron.

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Field Duplicate	Yes	No	114-MW57C-71.0-20230925 (460-288953-1) and 114-MW57C-71.0-20230925 -X (460-288953-2), see table below
Total Metals vs Dissolved Metals Results	NA	NA	Cr total only, Fe dissolved only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table, total only

Matrix Spikes/Matrix Spike Duplicates

114-MW57C-71.0-20230925 (460-288953-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	3.0	55.33	55.71	105	105	115	85	1	10	OK, Accept
SULFATE	Total	4.80	300	290.1	293.0	-208	-146	110	90	1	15	SR>4x amt spiked, Accept
Ferrous Iron	Dissolved	2.00	0.081 U	0.081 U	0.081 U	0	0	115	85	NC	10	Reject (R)

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NC – not calculable

114-MW57C-71.0-20230925 (460-288953-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
IRON	Dissolved	12500	92.0 U	12900	12180	103	97	125	75	6	20	OK, Accept
CHROMIUM	Total	50.0	11600	11190	11990	-759	831	125	75	7	20	SR>4x amt spiked, Accept

Laboratory Duplicates

114-MW57C-71.0-20230925 (460-288953-1)

Analyte	Fraction	SR (ug/l)	Qual	RL	SDR (ug/l)	Qual	RL	RPD %	RPD Upper Limit	Action
IRON	Dissolved	92.0	U	600	92.0	U	600	NC	20	Both ND, OK Accept

Analyte	Fraction	SR (ug/l)	Qual	RL	SDR (ug/l)	Qual	RL	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	11600		4.0	11330		4.0	2	20	OK, Accept

NC – not calculable

Field Duplicates

114-MW57C-71.0-20230925 (460-288953-1) and 114-MW57C-71.0-20230925 -X (460-288953-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	92.0	U	92.0	U	600	ug/l		Both ND, Accept
TOTAL ORGANIC CARBON	Total	3.0		2.9		1.0	mg/l	3.4	OK, Accept
CHROMIUM	Total	11600		11300		4.0	ug/l	2.6	OK, Accept
SULFATE	Total	300		285		9.6	mg/l	5.1	OK, Accept
FERROUS IRON	Dissolved	0.081	U	0.081	U	0.10	mg/l		Both ND, Accept
FERRIC IRON	Dissolved	0.10	U	0.10	U	0.10	mg/l		Both ND, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Fraction	Result	Detect Flag	Units	GWQS Action Level
114-MW57C-71.0-20230925	460-288953-1	IRON	Dissolved	600	N	ug/l	300
114-MW57C-71.0-20230925-X	460-288953-2	IRON	Dissolved	600	N	ug/l	300

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW57C-71.0-20230925	460-288953-1	SULFATE	Total	20
114-MW57C-71.0-20230925	460-288953-1	IRON	Dissolved	5
114-MW57C-71.0-20230925-X	460-288953-2	SULFATE	Total	20
114-MW57C-71.0-20230925-X	460-288953-2	IRON	Dissolved	5
114-MW62C-73.0-20230925	460-288953-3	SULFATE	Total	5

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-289002-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 10/09/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602890021_2023_10_09 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 26, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW4D-90.0-94.0-20230926	460-289002-1	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW4D-98.0-102.0-20230926	460-289002-2	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW4D-111.0-115.0-20230926	460-289002-3	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW4D-121.0-125.0-20230926	460-289002-4	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW57D-87.5-91.5-20230926	460-289002-5	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW57D-96.5-100.5-20230926	460-289002-6	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW57D-104.0-108.0-20230926	460-289002-7	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW57D-109.0-113.0-20230926	460-289002-8	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
GW-RI-FB-20230926	460-289002-9	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-126.0-20230926	460-289002-10	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW61D-131.0-20230926	460-289002-11	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – dissolved Iron, dissolved Ferrous Iron, dissolved Ferric Iron			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested dissolved ferrous iron for all samples by method 6020B. The laboratory analyzed and reported results for dissolved iron by method 6020B, dissolved ferrous iron by method SM3500 FE D and dissolved ferric iron by method SM 3500. All results have been reported.

Sample 114-MW61D-131.0-20230926 (460-289002-11) was received at the laboratory without a sample collection time documented on the COC. The collection time was taken from the sample container.

Hexavalent Chromium

Sample Results

The results for total/dissolved chromium and total/dissolved hexavalent chromium were compared to ensure that the total/dissolved chromium concentration was greater than the total/dissolved hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $\leq 30\%$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $> 30\%$	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

Sample 114-MW57D-109.0-113.0-20230926 (460-289002-8) was analyzed as lab duplicate for this SDG. Both sample results were nondetect. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals

Holding Time

Dissolved ferrous iron analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The analysis for the sample in this data package was performed in the laboratory. All ferrous and ferric iron results are estimated (J-/UJ).

Matrix Spike (MS)

Sample 114-MW57D-87.5-91.5-20230926 (460-289002-5) was analyzed as the MS for chromium in this data set. All QC acceptance criteria were met for chromium (total).

Laboratory Duplicate

Sample 114-MW57D-87.5-91.5-20230926 (460-289002-5) was analyzed as the lab duplicate for total Cr in this SDG. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry (Sulfate, TOC)

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Samples 114-MW4D-98.0-102.0-20230926 (460-289002-2) and 114-MW61D-131.0-20230926 (460-289002-11) were analyzed as the MS/MSD for TOC in this data set. All QC acceptance criteria were met. No qualifications were made.

A MS/MSD was not performed on a site sample in this data set for sulfate. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Results estimated due to holding time issues are useable with an unknown bias.

Sample results reported between the MDL and RL content 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)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date September 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289002 (J289002-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230926

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-90.0-94.0-20230926	460-289002-1	Total	CHROMIUM (HEXAVALENT)	U	9.7J	9.7J	10.0	Qualify	1

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date September 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289002 (J289002-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230926

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-90.0-94.0-20230926	460-289002-1	Dissolved	IRON	U	127	127	120		
114-MW4D-90.0-94.0-20230926	460-289002-1	Total	CHROMIUM	U	11.9	11.9	4.0		
114-MW61D-126.0-20230926	460-289002-10	Dissolved	IRON	U	102J	102J	120	Qualify	1
114-MW61D-126.0-20230926	460-289002-10	Total	CHROMIUM	U	21.0	21.0	4.0		
114-MW61D-131.0-20230926	460-289002-11	Dissolved	IRON	U	37.0J	37.0J	120	Qualify	1
114-MW61D-131.0-20230926	460-289002-11	Total	CHROMIUM	U	4.4	4.4	4.0		
114-MW4D-111.0-115.0-20230926	460-289002-3	Dissolved	IRON	U	333	333	120		
114-MW4D-111.0-115.0-20230926	460-289002-3	Total	CHROMIUM	U	8.4	8.4	4.0		
114-MW4D-121.0-125.0-20230926	460-289002-4	Dissolved	IRON	U	619	619	120		
114-MW4D-121.0-125.0-20230926	460-289002-4	Total	CHROMIUM	U	4.0	4.0	4.0		
114-MW57D-87.5-91.5-20230926	460-289002-5	Total	CHROMIUM	U	5.1	5.1	4.0		
114-MW57D-96.5-100.5-20230926	460-289002-6	Dissolved	IRON	U	38.9J	38.9J	120	Qualify	1
114-MW57D-96.5-100.5-20230926	460-289002-6	Total	CHROMIUM	U	40.5	40.5	4.0		
114-MW57D-104.0-108.0-20230926	460-289002-7	Dissolved	IRON	U	44.5J	44.5J	120	Qualify	1
114-MW57D-104.0-108.0-20230926	460-289002-7	Total	CHROMIUM	U	174	174	4.0		
114-MW57D-109.0-113.0-20230926	460-289002-8	Dissolved	IRON	U	24.9J	24.9J	120	Qualify	1

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-109.0-113.0-20230926	460-289002-8	Total	CHROMIUM	U	3.2J	3.2J	4.0	Qualify	1

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Aqueous Target Analyte Summary Hit List (Ferrous iron dissolved and Ferric iron dissolved by method SM3500 FE D)

Site Name PPG GW RI - Bedrock
Sampling Date September 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289002 (J289002-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230926

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-90.0-94.0-20230926	460-289002-1	Dissolved	IRON (FERROUS)	U	0.13	0.13J	0.10	Qualify	1
114-MW4D-90.0-94.0-20230926	460-289002-1	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW61D-126.0-20230926	460-289002-10	Dissolved	IRON (FERROUS)	U	0.93	0.93J	0.10	Qualify	1
114-MW61D-126.0-20230926	460-289002-10	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW61D-131.0-20230926	460-289002-11	Dissolved	IRON (FERROUS)	U	0.20	0.20J	0.10	Qualify	1
114-MW61D-131.0-20230926	460-289002-11	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW4D-98.0-102.0-20230926	460-289002-2	Dissolved	IRON (FERROUS)	U	0.087J	0.087J	0.10	Qualify	1,2
114-MW4D-98.0-102.0-20230926	460-289002-2	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-111.0-115.0-20230926	460-289002-3	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW4D-111.0-115.0-20230926	460-289002-3	Dissolved	IRON (FERRIC)	U	0.33	0.33J	0.10	Qualify	1
114-MW4D-121.0-125.0-20230926	460-289002-4	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW4D-121.0-125.0-20230926	460-289002-4	IRON (FERROUS)	IRON (FERRIC)	U	0.62	0.62J	0.10	Qualify	1
114-MW57D-87.5-91.5-20230926	460-289002-5	IRON (FERRIC)	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW57D-87.5-91.5-20230926	460-289002-5	IRON (FERROUS)	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW57D-96.5-100.5-20230926	460-289002-6	IRON (FERRIC)	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW57D-96.5-100.5-20230926	460-289002-6	IRON (FERROUS)	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW57D-104.0-108.0-20230926	460-289002-7	IRON (FERRIC)	IRON (FERROUS)	U	0.30	0.30J	0.10	Qualify	1
114-MW57D-104.0-108.0-20230926	460-289002-7	IRON (FERROUS)	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW57D-109.0-113.0-20230926	460-289002-8	IRON (FERRIC)	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW57D-109.0-113.0-20230926	460-289002-8	IRON (FERROUS)	IRON (FERRIC)	U	U	UJ	0.10	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. Technical holding time was exceeded.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date September 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289002 (J289002-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230926

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-90.0-94.0-20230926	460-289002-1	SULFATE	U	39.3	39.3	2.40		
114-MW61D-126.0-20230926	460-289002-10	SULFATE	U	24.1	24.1	2.40		
114-MW61D-131.0-20230926	460-289002-11	SULFATE	U	23.8	23.8	2.40		
114-MW4D-98.0-102.0-20230926	460-289002-2	SULFATE	U	21.4	21.4	2.40		
114-MW4D-111.0-115.0-20230926	460-289002-3	SULFATE	U	215	215	2.40		
114-MW4D-121.0-125.0-20230926	460-289002-4	SULFATE	U	70.2	70.2	2.40		
114-MW57D-87.5-91.5-20230926	460-289002-5	SULFATE	U	74.9	74.9	2.40		
114-MW57D-96.5-100.5-20230926	460-289002-6	SULFATE	U	50.6	50.6	2.40		
114-MW57D-104.0-108.0-20230926	460-289002-7	SULFATE	U	106	106	2.40		
114-MW57D-109.0-113.0-20230926	460-289002-8	SULFATE	U	87.0	87.0	2.40		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date September 26, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289002 (J289002-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230926

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-90.0-94.0-20230926	460-289002-1	Total	Total Organic Carbon	U	36.9	36.9	1.0		
114-MW61D-126.0-20230926	460-289002-10	Total	Total Organic Carbon	U	4.8	4.8	1.0		
114-MW61D-131.0-20230926	460-289002-11	Total	Total Organic Carbon	U	4.0	4.0	1.0		
114-MW4D-98.0-102.0-20230926	460-289002-2	Total	Total Organic Carbon	U	81.1	81.1	1.0		
114-MW4D-111.0-115.0-20230926	460-289002-3	Total	Total Organic Carbon	U	96.1	96.1	1.0		
114-MW4D-121.0-125.0-20230926	460-289002-4	Total	Total Organic Carbon	U	112	112	5.0		
114-MW57D-87.5-91.5-20230926	460-289002-5	Total	Total Organic Carbon	U	26.2	26.2	1.0		
114-MW57D-96.5-100.5-20230926	460-289002-6	Total	Total Organic Carbon	U	51.0	51.0	1.0		
114-MW57D-104.0-108.0-20230926	460-289002-7	Total	Total Organic Carbon	U	16.6	16.6	1.0		
114-MW57D-109.0-113.0-20230926	460-289002-8	Total	Total Organic Carbon	U	20.6	20.6	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-289002-1 (J289002-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 10/09/2023	
Number of Samples/Matrix: 10 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 10/10/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Sample 114-MW61D-131.0-20230926 (460-289002-11) was received at the laboratory without a sample collection time documented on the COC. The collection time was taken from the sample container.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.3 °C, 1.4 °C
Holding Time	Yes	No	Sampled 9/26/2023, analyzed 9/27/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	9/27/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-934698/10 (total), ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230926 (460-289002-9), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	Yes	No	114-MW57D-109.0-113.0-20230926 (460-289002-8), Both ND
Laboratory Control Standards	Yes	No	460-934698/11 {95 %R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	Dissolved 460-289002-10 and -11 only
Calculation Spot Checks	Yes	No	See calculations below

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW57D-109.0-113.0-20230926	460-289002-8	HEXAVALENT CHROMIUM	8.1	U	8.1	U	10.0	ug/l	NC	Both ND, Accept

NC – Not calculated**Total Chromium vs Total Hexavalent Chromium**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW4D-90.0-94.0-20230926	460-289002-1	11.9	4.0	9.7	10.0	20	T Cr > T Cr6, Accept
114-MW61D-126.0-20230926	460-289002-10	21.0	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW61D-131.0-20230926	460-289002-11	4.4	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW4D-98.0-102.0-20230926	460-289002-2		4.0		10.0		Both ND, Accept
114-MW4D-111.0-115.0-20230926	460-289002-3	8.4	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW4D-121.0-125.0-20230926	460-289002-4	4.0	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW57D-87.5-91.5-20230926	460-289002-5	5.1	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW57D-96.5-100.5-20230926	460-289002-6	40.5	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW57D-104.0-108.0-20230926	460-289002-7	174	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW57D-109.0-113.0-20230926	460-289002-8	3.2	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230926	460-289002-9		4.0		10.0		Both ND, Accept

NC- not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61D-126.0-20230926	460-289002-10		4.0		10.0		Both ND, Accept
114-MW61D-131.0-20230926	460-289002-11		4.0		10.0		Both ND, Accept

NC- not calculated**Total Hexavalent Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61D-126.0-20230926	460-289002-10		10.0		10.0		Both ND, Accept
114-MW61D-131.0-20230926	460-289002-11		10.0		10.0		Both ND, Accept

NC- not calculated

460-289002-1**Batch: 934698-0**

Cr+6 ICAL - 9/27/2023

Groundwater

(p 2268 of data pkg)

x - concentration	y - response
0	0
10	0.009
50	0.045
75	0.069
100	0.09
200	0.180

(p 2268 of
data pkg)

AECOM Calculated Intercept	-0.2601	OK	Reported intercept	-0.2601
AECOM Slope	1110.8	OK	Reported Slope	1111
AECOM Calculated r	1.0000	OK	Reported r	1.000

LCS calculation**460-934698/11****P. 2211, 2257**

Background absorbance
Sample absorbance
Total absorbance - background
Instrument Concentration (ug/L)
Sample aliquot (L)
Final volume (L)
Dilution Factor

0
0.048
0.048
53.068
0.05
0.05
1

AECOM Calculated LCS Result (ug/L)	53.07	OK	Reported Result (ug/L)	53.07

%R = Found/True*100**460-934698/11****P. 2211, 2257**

True Value (ug/L)

55.6

AECOM Calculated %R	95.4	OK	Reported %R	95.0

MS calculation**460-289008-1****P. 2207, 2257****Batch QC**

Background reading
Total absorbance
Total absorbance - background
Instrument Concentration (ug/L)
Sample aliquot (L)
Final volume (L)
Dilution Factor

0
0.029
0.029
31.954
0.05
0.05
1

AECOM Calculated MS Result (ug/L)	32.0	OK	Reported Result (ug/L)	32.0

%R = Found/True*100**460-289008-1****P. 2207, 2257****Batch QC**

True Value (ug/L)

30

Native concentration (ug/L)

0

AECOM Calculated MS Result %R	106.5	OK	Reported %R	107

Reporting Limit**460-289002-1****p. 2161, 2257****114-MW4D-90.0-94.0-
20230926**

Low Standard(ug/l)

10

Initial volume (L)

0.05

Final volume (L) 0.05
Dilution Factor 1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)	10

Sample Calculations **460-289002-1** **p. 2161, 2257** **114-MW4D-90.0-94.0-20230926**

Background reading 0
Total absorbance 0.009
Total absorbance - background 0.009
Instrument Response (ug/L) 9.737

Sample volume (L) 0.05
Final Volume (L) 0.05
Dilution Factor 1

AECOM Calculated Result (ug/L)	9.7	OK	Reported Result (ug/L)	9.7 J

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-289002-1 (J289002-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 10/09/2023	
Number of Samples/Matrix: 10 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Dani Woitas 10/10/2023	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Ferrous iron by 6020B was requested on the COC. Laboratory analyzed for dissolved iron by SW 6020B, dissolved ferrous iron by SM3500 FE D, and dissolved ferric iron by method SM3500. All Results are reported. Sample 114-MW61D-131.0-20230926 (460-289002-11) was received at the laboratory without a sample collection time documented on the COC. The collection time was taken from the sample container.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.3 °C, 1.4 °C
Holding Time	No	Yes	Sampled 9/26/2023, analyzed 9/28 - 10/02/2023, Dissolved iron by method 6020 met QC HT. Dissolved ferrous iron by method SM3500- FE D is normally performed in the field with a method-defined holding time of 15 minutes. Results are estimated (J/UJ) as the analysis was performed in the lab outside the 15- minute HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-935123/1-A, (total) Cr ND, 460-935430/1-A (total) Fe, Cr ND, MB 460-935427/1-C (dissolved) Fe, MB 460-935199/1-A Cr (total), MB 460-935671/6 , MB 460-935671/22 and MB 460-935939/6 ND TOC, MB 460-935002/3 ND sulfate, MB 460-935066/4 ND Ferrous Fe
Field Blanks	Yes	No	GW-RI-FB-20230926 (460-289002-9), no iron
Matrix Spike	Yes	No	114-MW57D-87.5-91.5-20230926 (460-289002-5), Cr (total) and batch QC Cr (total/dissolved), Fe (dissolved), 114-MW4D-98.0-102.0-20230926 (460-289002-2) and 114-MW61D-131.0-20230926 (460-289002-11) TOC, and none for sulfate. Batch QC ferrous iron, see tables below
Matrix Spike Duplicate	Yes	No	Batch QC Cr (total/dissolved), Fe (dissolved), 114-MW4D-98.0-102.0-20230926 (460-289002-2) and 114-MW61D-131.0-20230926 (460-289002-11) TOC, batch QC ferrous iron

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Post Digestion Spike	Yes	No	114-MW57D-87.5-91.5-20230926 (460-289002-5), Cr only (94%R)
Laboratory Duplicate	Yes	No	114-MW57D-87.5-91.5-20230926 (460-289002-5) Cr (total), batch QC Cr (total/dissolved) and Fe (dissolved) , none for all others, see table below
Laboratory Control Standards	Yes	No	460-935123/2-A Cr (total), 460-935429/3-A Fe (dissolved), 460-935430/2-A Cr (total) and Fe (dissolved), 460-935199/2-A Cr (total), 460-935671/7, 460-935671/23 and 460-935939/7 TOC, 460-935002/5 and 460-935002/6 sulfate, LCS 460-935066/5 Ferrous iron.
Field Duplicate	NA	NA	None with this SDG
Total Metals vs Dissolved Metals Results	Yes	No	460-289002-10, -11 only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table,

Matrix Spikes/Matrix Spike Duplicates

114-MW4D-98.0-102.0-20230926 (460-289002-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	250	81.1	319.4	315.8	95	94	115	85	1	10	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

114-MW61D-131.0-20230926 (460-289002-11)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	3.0	52.22	52.34	96	97	115	85	0	10	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

114-MW57D-87.5-91.5-20230926 (460-289002-5)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	50.0	5.1	52.67	NA	95	NA	125	75	NA	20	OK, Accept

Laboratory Duplicates

114-MW57D-87.5-91.5-20230926 (460-289002-5)

Analyte	Fraction	SR (ug/l)	Qual	RL	SDR (ug/l)	Qual	RL	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	5.1		4.0	5.25		4.0	2	20	OK, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-MW61D-126.0-20230926	460-289002-10	21.0	4.0		4.0	20	21	NC	OK, Accept
114-MW61D-131.0-20230926	460-289002-11	4.4	4.0		4.0	20	4	NC	OK, Accept

NC- not calculated

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW4D-90.0-94.0-20230926	460-289002-1	SULFATE	Total	5
114-MW61D-126.0-20230926	460-289002-10	SULFATE	Total	5
114-MW61D-131.0-20230926	460-289002-11	SULFATE	Total	5
114-MW4D-98.0-102.0-20230926	460-289002-2	SULFATE	Total	5
114-MW4D-111.0-115.0-20230926	460-289002-3	SULFATE	Total	5
114-MW4D-121.0-125.0-20230926	460-289002-4	SULFATE	Total	5
114-MW4D-121.0-125.0-20230926	460-289002-4	TOC	Total	5
114-MW57D-87.5-91.5-20230926	460-289002-5	SULFATE	Total	5
114-MW57D-96.5-100.5-20230926	460-289002-6	SULFATE	Total	5
114-MW57D-104.0-108.0-20230926	460-289002-7	SULFATE	Total	5
114-MW57D-109.0-113.0-20230926	460-289002-8	SULFATE	Total	5

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	Eurofins TestAmerica, Edison, NJ
Laboratory Job No.:	460-289062-1
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 10/10/2023
Reviewed by:	Dani Woitas/AECOM File Name: 4602890621_2023_10_10 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 27, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW72D-102.0-106.0-20230927	460-289062-1	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
114-MW72D-110.0-114.0-20230927	460-289062-2	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
114-MW72D-116.0-119.0-20230927	460-289062-3	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
114-MW72D-123.0-126.0-20230927	460-289062-4	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
114-MW66D-91.0-97.0-20230927	460-289062-5	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW66D-91.0-97.0-20230927X (Field duplicate of 114-MW66D-91.0-97.0-20230927)	460-289062-6	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW66D-107.0-111.0-20230927	460-289062-7	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW66D-118.0-123.0-20230927	460-289062-8	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW66D-124.0-129.0-20230927	460-289062-9	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW66D-137.0-140.0-20230927	460-289062-10	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW52D-80.0-83.0-20230927	460-289062-11	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW52D-87.0-90.0-20230927	460-289062-12	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW52D-102.0-105.0-20230927	460-289062-13	Groundwater	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
114-MW61D-136.0-20230927	460-289062-14	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, *Wet Chemistry
GW-RI-FB-20230927	460-289062-15	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – dissolved Iron, dissolved Ferrous Iron, dissolved Ferric Iron			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested dissolved ferrous iron for all samples by method 6020B. The laboratory analyzed and reported results for dissolved iron by method 6020B, dissolved ferrous iron by method SM3500 FE D and dissolved ferric iron by method SM 3500. All results have been reported.

Hexavalent Chromium

Sample Results

The results for total/dissolved chromium and total/dissolved hexavalent chromium were compared to ensure that the total/dissolved chromium concentration was greater than the total/dissolved hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Total and dissolved chromium results were less than the total and dissolved hexavalent chromium results in sample 114-MW72D-123.0-126.0-20230927 (460-289062-4). Results were estimated (J).

Sample Prep

The final pH for sample 114-MW52D-102.0-105.0-20230927 (460-289062-13) exceeded the QC pH limits of 1.5-2.5. Professional judgement was used to qualify the non-detect result as estimated (UJ).

Matrix Spike (MS)

Samples 114-MW66D-107.0-111.0-20230927 (460-289062-7) and 114-MW66D-118.0-123.0-20230927 (460-289062-8) were analyzed as matrix spikes for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Samples 114-MW66D-107.0-111.0-20230927 (460-289062-7) and 114-MW66D-118.0-123.0-20230927 (460-289062-8) were analyzed as lab duplicates for this SDG. All results were nondetect. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-MW66D-91.0-97.0-20230927 (460-289062-5) and 114-MW66D-91.0-97.0-20230927X (460-289062-6) were submitted as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals

Holding Time

Dissolved ferrous iron analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The analysis for the sample in this data package was performed in the laboratory. All ferrous and ferric iron results are estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW66D-107.0-111.0-20230927 (460-289062-7) was analyzed as the MS/MSD for chromium (total) and iron (dissolved) in this data set. All QC acceptance criteria were met for chromium (total).

Laboratory Duplicate

Sample 114-MW66D-107.0-111.0-20230927 (460-289062-7) was analyzed as the lab duplicate for dissolved chromium and dissolved iron in this SDG. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-MW66D-91.0-97.0-20230927 (460-289062-5) and 114-MW66D-91.0-97.0-20230927X (460-289062-6) were submitted as the field duplicate pair for chromium and iron. All QC acceptance criteria were met. No qualifications were made.

Wet Chemistry (Sulfate, TOC)

Field Blank (FB)

The FB, GW-RI-FB-20230927 (460-289062-15), reported TOC at a concentration less than the reporting limit (RL) but greater than the method detection limit (MDL). Sample results for 114-MW61D-136.0-20230927 (460-289062-14) and 114-MW66D-107.0-111.0-20230927 (460-289062-7) were greater than three times but less than ten times the amount in the FB and were qualified as estimated (JB). All other sample results were greater than ten times in the FB; therefore, no qualifications were required.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW66D-107.0-111.0-20230927 (460-289062-7) was analyzed as a MS/MSD for TOC, sulfate, and ferrous iron in this data set. Sample 114-MW61D-136.0-20230927 (460-289062-14) was also analyzed as a MS/MSD for TOC. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

Samples 114-MW66D-91.0-97.0-20230927 (460-289062-5) and 114-MW66D-91.0-97.0-20230927X (460-289062-6) were submitted as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Results estimated due to holding time issues are useable with an unknown bias.

Sample results reported between the MDL and RL content are usable as estimated values with an unknown directional bias.

Results estimated due to total/dissolved chromium results lower than total/dissolved hexavalent chromium results are useable with an unknown bias.

Results estimated due to pH exceeding QC limits are useable with an unknown bias.

Results estimated due to field blank contamination are useable with a high bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date September 27, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289062 (J289062-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230927

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102.0-106.0-20230927	460-289062-1	Dissolved	CHROMIUM (HEXAVALENT)	U	99.5	99.5	10.0		
114-MW72D-102.0-106.0-20230927	460-289062-1	Total	CHROMIUM (HEXAVALENT)	U	108	108	10.0		
114-MW52D-102.0-105.0-20230927	460-289062-13	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	10.0	Qualify	1
114-MW72D-110.0-114.0-20230927	460-289062-2	Dissolved	CHROMIUM (HEXAVALENT)	U	78.6	78.6	10.0		
114-MW72D-110.0-114.0-20230927	460-289062-2	Total	CHROMIUM (HEXAVALENT)	U	80.8	80.8	10.0		
114-MW72D-116.0-119.0-20230927	460-289062-3	Dissolved	CHROMIUM (HEXAVALENT)	U	56.5	56.5	10.0		
114-MW72D-116.0-119.0-20230927	460-289062-3	Total	CHROMIUM (HEXAVALENT)	U	60.9	60.9	10.0		
114-MW72D-123.0-126.0-20230927	460-289062-4	Dissolved	CHROMIUM (HEXAVALENT)	U	42.1	42.1J	10.0	Qualify	3
114-MW72D-123.0-126.0-20230927	460-289062-4	Total	CHROMIUM (HEXAVALENT)	U	35.5	35.5J	10.0	Qualify	2
114-MW66D-91.0-97.0-20230927	460-289062-5	Total	CHROMIUM (HEXAVALENT)	U	2720	2720	200		

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91.0-97.0-20230927X	460-289062-6	Total	CHROMIUM (HEXAVALENT)	U	2570	2570	200		

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 pH exceeded established criteria.
2. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.
3. The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date September 27, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289062 (J289062-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230927

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102.0-106.0-20230927	460-289062-1	Dissolved	CHROMIUM	U	117	117	4.0		
114-MW72D-102.0-106.0-20230927	460-289062-1	Total	CHROMIUM	U	124	124	4.0		
114-MW66D-137.0-140.0-20230927	460-289062-10	Total	CHROMIUM	U	3.2J	3.2J	4.0	Qualify	1
114-MW52D-80.0-83.0-20230927	460-289062-11	Dissolved	IRON	U	83.3J	83.3J	120	Qualify	1
114-MW52D-80.0-83.0-20230927	460-289062-11	Total	CHROMIUM	U	17.6	17.6	4.0		
114-MW52D-87.0-90.0-20230927	460-289062-12	Dissolved	IRON	U	57.6J	57.6J	120	Qualify	1
114-MW52D-87.0-90.0-20230927	460-289062-12	Total	CHROMIUM	U	41.4	41.4	4.0		
114-MW52D-102.0-105.0-20230927	460-289062-13	Dissolved	IRON	U	25.2J	25.2J	120	Qualify	1
114-MW52D-102.0-105.0-20230927	460-289062-13	Total	CHROMIUM	U	7.4	7.4	4.0		
114-MW61D-136.0-20230927	460-289062-14	Total	CHROMIUM	U	10.7	10.7	4.0		
114-MW72D-110.0-114.0-20230927	460-289062-2	Dissolved	CHROMIUM	U	82.7	82.7	4.0		
114-MW72D-110.0-114.0-20230927	460-289062-2	Total	CHROMIUM	U	90.6	90.6	4.0		
114-MW72D-116.0-119.0-20230927	460-289062-3	Dissolved	CHROMIUM	U	57.8	57.8	4.0		
114-MW72D-116.0-119.0-20230927	460-289062-3	Total	CHROMIUM	U	59.0	59.0	4.0		
114-MW72D-123.0-126.0-20230927	460-289062-4	Dissolved	CHROMIUM	U	21.3	21.3J	4.0	Qualify	3
114-MW72D-123.0-126.0-20230927	460-289062-4	Total	CHROMIUM	U	23.2	23.2J	4.0	Qualify	2

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91.0-97.0-20230927	460-289062-5	Total	CHROMIUM	U	3120	3120	4.0		
114-MW66D-91.0-97.0-20230927X	460-289062-6	Total	CHROMIUM	U	2810	2810	4.0		
114-MW66D-107.0-111.0-20230927	460-289062-7	Total	CHROMIUM	U	110	110	4.0		
114-MW66D-118.0-123.0-20230927	460-289062-8	Total	CHROMIUM	U	8.2	8.2	4.0		
114-MW66D-124.0-129.0-20230927	460-289062-9	Total	CHROMIUM	U	3.8J	3.8J	4.0	Qualify	1

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.
2. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.
3. The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Ferrous iron dissolved and Ferric iron dissolved by method SM3500 FE D)

Site Name PPG GW RI - Bedrock
Sampling Date September 27, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289062 (J289062-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230927

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102.0-106.0-20230927	460-289062-1	Dissolved	IRON (FERROUS)	U	0.095J	0.095J	0.10	Qualify	1,2
114-MW72D-102.0-106.0-20230927	460-289062-1	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW66D-137.0-140.0-20230927	460-289062-10	Dissolved	IRON (FERROUS)	U	0.099J	0.099J	0.10	Qualify	1,2
114-MW66D-137.0-140.0-20230927	460-289062-10	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW52D-80.0-83.0-20230927	460-289062-11	Dissolved	IRON (FERROUS)	U	0.15	0.15J	0.10	Qualify	1
114-MW52D-80.0-83.0-20230927	460-289062-11	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW52D-87.0-90.0-20230927	460-289062-12	Dissolved	IRON (FERROUS)	U	0.094J	0.094J	0.10	Qualify	1,2
114-MW52D-87.0-90.0-20230927	460-289062-12	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-102.0-105.0-20230927	460-289062-13	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW52D-102.0-105.0-20230927	460-289062-13	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW61D-136.0-20230927	460-289062-14	Dissolved	IRON (FERROUS)	U	0.17	0.17J	0.10	Qualify	1
114-MW61D-136.0-20230927	460-289062-14	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW72D-110.0-114.0-20230927	460-289062-2	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW72D-110.0-114.0-20230927	460-289062-2	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW72D-116.0-119.0-20230927	460-289062-3	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW72D-116.0-119.0-20230927	460-289062-3	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW72D-123.0-126.0-20230927	460-289062-4	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW72D-123.0-126.0-20230927	460-289062-4	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW66D-91.0-97.0-20230927	460-289062-5	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW66D-91.0-97.0-20230927	460-289062-5	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW66D-91.0-97.0-20230927X	460-289062-6	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW66D-91.0-97.0-20230927X	460-289062-6	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-107.0-111.0-20230927	460-289062-7	Dissolved	IRON (FERROUS)	U	0.16J	0.16J	0.10	Qualify	1
114-MW66D-107.0-111.0-20230927	460-289062-7	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW66D-118.0-123.0-20230927	460-289062-8	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW66D-118.0-123.0-20230927	460-289062-8	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	Qualify	1
114-MW66D-124.0-129.0-20230927	460-289062-9	Dissolved	IRON (FERROUS)	U	U	UJ	0.10	Qualify	1
114-MW66D-124.0-129.0-20230927	460-289062-9	Dissolved	IRON (FERRIC)	U	U	UJ	0.10	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. Technical holding time was exceeded.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date September 27, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289062 (J289062-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230927

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102.0-106.0-20230927	460-289062-1	SULFATE	U	1.95	1.95	0.48		
114-MW66D-137.0-140.0-20230927	460-289062-10	SULFATE	U	84.3	84.3	2.40		
114-MW52D-80.0-83.0-20230927	460-289062-11	SULFATE	U	29.1	29.1	2.40		
114-MW52D-87.0-90.0-20230927	460-289062-12	SULFATE	U	85.7	85.7	2.40		
114-MW52D-102.0-105.0-20230927	460-289062-13	SULFATE	U	111	111	2.40		
114-MW61D-136.0-20230927	460-289062-14	SULFATE	U	39.6	39.6	2.40		
114-MW72D-110.0-114.0-20230927	460-289062-2	SULFATE	U	2.42	2.42	2.40		
114-MW72D-116.0-119.0-20230927	460-289062-3	SULFATE	U	1.91J	1.91J	2.40	Qualify	1
114-MW72D-123.0-126.0-20230927	460-289062-4	SULFATE	U	2.05J	2.05J	2.40	Qualify	1
114-MW66D-91.0-97.0-20230927	460-289062-5	SULFATE	U	91.5	91.5	2.40		
114-MW66D-91.0-97.0-20230927X	460-289062-6	SULFATE	U	91.5	91.5	2.40		
114-MW66D-107.0-111.0-20230927	460-289062-7	SULFATE	U	112	112	2.40		
114-MW66D-118.0-123.0-20230927	460-289062-8	SULFATE	U	111	111	2.40		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-124.0-129.0-20230927	460-289062-9	SULFATE	U	97.8	97.8	2.40		

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date September 27, 2023
Lab Name/ID Eurofins TestAmerica, Edison
SDG No 460-289062 (J289062-1)
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20230927

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102.0-106.0-20230927	460-289062-1	Total	Total Organic Carbon	U	27.0	27.0	2.0		
114-MW66D-137.0-140.0-20230927	460-289062-10	Total	Total Organic Carbon	U	22.5	22.5	1.0		
114-MW52D-80.0-83.0-20230927	460-289062-11	Total	Total Organic Carbon	U	161	161	5.0		
114-MW52D-87.0-90.0-20230927	460-289062-12	Total	Total Organic Carbon	U	110	110	5.0		
114-MW52D-102.0-105.0-20230927	460-289062-13	Total	Total Organic Carbon	U	56.6	56.6	2.0		
114-MW61D-136.0-20230927	460-289062-14	Total	Total Organic Carbon	U	2.4	2.4JB	1.0	Qualify	2
GW-RI-FB-20230927	460-289062-15	Total	Total Organic Carbon	U	0.50J	0.50J	1.0	Qualify	1
114-MW72D-110.0-114.0-20230927	460-289062-2	Total	Total Organic Carbon	U	19.3	19.3	1.0		
114-MW72D-116.0-119.0-20230927	460-289062-3	Total	Total Organic Carbon	U	45.9	45.9	2.0		
114-MW72D-123.0-126.0-20230927	460-289062-4	Total	Total Organic Carbon	U	50.8	50.8	2.0		
114-MW66D-91.0-97.0-20230927	460-289062-5	Total	Total Organic Carbon	U	6.6	6.6	1.0		
114-MW66D-91.0-97.0-20230927X	460-289062-6	Total	Total Organic Carbon	U	6.5	6.5	1.0		
114-MW66D-107.0-111.0-20230927	460-289062-7	Total	Total Organic Carbon	U	2.6	2.6JB	1.0	Qualify	2
114-MW66D-118.0-123.0-20230927	460-289062-8	Total	Total Organic Carbon	U	5.5	5.5	1.0		

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-124.0-129.0-20230927	460-289062-9	Total	Total Organic Carbon	U	9.4	9.4	1.0		

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.
2. Sample result was $\geq 3x$ and $<10X$ the associated blank result.

Attachment B

Data Validation Report Form

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-289062-1 (J289062-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 10/10/2023	
Number of Samples/Matrix: 14 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Dani Woitas 10/11/2023	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C, 2.3 °C, 2.6°C
Holding Time	Yes	No	Sampled 9/27/2023, analyzed 9/28/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	9/28/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB 460-934862/10 (total), ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20230927 (460-289062-15), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW66D-107.0-111.0-20230927 (460-289062-7) and 114-MW66D-118.0-123.0-20230927 (460-289062-8)
Laboratory Duplicate	Yes	No	114-MW66D-107.0-111.0-20230927(460-289062-7), and 114-MW66D-118.0-123.0-20230927 (460-289062-8) Both ND
Laboratory Control Standards	Yes	No	460-934862/11 {101.5 %R}
Field Duplicate	Yes	No	114-MW66D-91.0-97.0-20230927 (460-289062-5) and 114-MW66D-91.0-97.0-20230927X (460-289062-6)
Method 7196 Sample Prep	No	Yes	pH 1.5-2.5, 114-MW52D-102.0-105.0-20230927 (460-289062-13) final pH 2.90, Estimate (UJ)
Total vs Dissolved Results	No	Yes	Dissolved 460-289062-1, -14, -2, -3, and -4 only. See tables below

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW66D-107.0-111.0-20230927 (460-289062-7)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	30.0	0	28.83	NA	96	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW66D-118.0-123.0-20230927 (460-289062-8)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	30.0	29.93	100	NA	0	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW66D-107.0-111.0-20230927	460-289062-7	HEXAVALENT CHROMIUM	8.1	U	8.1	U	10.0	ug/l	NC	Both ND, Accept
114-MW66D-118.0-123.0-20230927	460-289062-8	HEXAVALENT CHROMIUM	8.1	U	8.1	U	10.0	ug/l	NC	Both ND, Accept

NC – Not calculated

Field Duplicates

114-MW66D-91.0-97.0-20230927 (460-289062-5) and 114-MW66D-91.0-97.0-20230927X (460-289062-6)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	2720		2570		200	ug/l	5.7	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW72D-102.0-106.0-20230927	460-289062-1	124	4.0	108	10.0	14	T Cr > T Cr6, Accept
114-MW66D-137.0-140.0-20230927	460-289062-10	3.2	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW52D-80.0-83.0-20230927	460-289062-11	17.6	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW52D-87.0-90.0-20230927	460-289062-12	41.4	4.0		20.0	NC	T Cr > T Cr6, Accept
114-MW52D-102.0-105.0-20230927	460-289062-13	7.4	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW61D-136.0-20230927	460-289062-14	10.7	4.0		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20230927	460-289062-15		4.0		10.0		Both ND, Accept
114-MW72D-110.0-114.0-20230927	460-289062-2	90.6	4.0	80.8	10.0	11	T Cr > T Cr6, Accept
114-MW72D-116.0-119.0-20230927	460-289062-3	59.0	4.0	60.9	10.0	3	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-123.0-126.0-20230927	460-289062-4	23.2	4.0	35.5	10.0	42	T Cr < T Cr6, SRs < 4x RL, ABS > RL, Qualify J
114-MW66D-91.0-97.0-20230927	460-289062-5	3120	4.0	2720	200	14	T Cr > T Cr6, Accept
114-MW66D-91.0-97.0-20230927X	460-289062-6	2810	4.0	2570	200	9	T Cr > T Cr6, Accept
114-MW66D-107.0-111.0-20230927	460-289062-7	110	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-118.0-123.0-20230927	460-289062-8	8.2	4.0		10.0	NC	T Cr > T Cr6, Accept
114-MW66D-124.0-129.0-20230927	460-289062-9	3.8	4.0		10.0	NC	T Cr > T Cr6, Accept

NC- not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW72D-102.0-106.0-20230927	460-289062-1	117	4.0	99.5	10.0	16	D Cr > D Cr6, Accept
114-MW61D-136.0-20230927	460-289062-14		4.0		10.0		Both ND, Accept
114-MW72D-110.0-114.0-20230927	460-289062-2	82.7	4.0	78.6	10.0	5	D Cr > D Cr6, Accept
114-MW72D-116.0-119.0-20230927	460-289062-3	57.8	4.0	56.5	10.0	2	D Cr > D Cr6, Accept
114-MW72D-123.0-126.0-20230927	460-289062-4	21.3	4.0	42.1	10.0	66	D Cr < D Cr6, SRs > 4x RL, %RPD > 30%, Qualify J

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW72D-102.0-106.0-20230927	460-289062-1	108	10.0	99.5	10.0	8	T Cr6 > D Cr6, Accept
114-MW61D-136.0-20230927	460-289062-14		10.0		10.0		Both ND, Accept
114-MW72D-110.0-114.0-20230927	460-289062-2	80.8	10.0	78.6	10.0	3	T Cr6 > D Cr6, Accept
114-MW72D-116.0-119.0-20230927	460-289062-3	60.9	10.0	56.5	10.0	7	T Cr6 > D Cr6, Accept
114-MW72D-123.0-126.0-20230927	460-289062-4	35.5	10.0	42.1	10.0	17	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW52D-87.0.0-90.0-20230927	460-289062-12	CHROMIUM (HEXAVALENT)	Total	2
114-MW66D-91.0-97.0-20230927	460-289062-5	CHROMIUM (HEXAVALENT)	Total	20
114-MW66D-91.0-97.0-20230927X	460-289062-6	CHROMIUM (HEXAVALENT)	Total	20

460-289062-1**Batch: 934862-0**

Cr+6 ICAL - 9/28/2023

Groundwater

(p 2754 of data pkg)

x - concentration	y - response
0	0
10	0.01
50	0.046
75	0.067
100	0.088
200	0.182

(p 2754
of data
pkg)

AECOM Calculated Intercept	0.0964	OK	Reported intercept	0.09642
AECOM Slope	1105.4	OK	Reported Slope	1105
AECOM Calculated r	0.9998	OK	Reported r	1.000

LCS calculation**460-934862/11****P. 2693,2740**

Background absorbance	0
Sample absorbance	0.051
Total absorbance - background	0.051
Instrument Concentration (ug/L)	56.451
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated LCS Result (ug/L)	56.45	OK	Reported Result (ug/L)	56.45

%R = Found/True*100**460-934862/11****P. 2693,2740**

True Value (ug/L)	55.6

AECOM Calculated %R	101.5	OK	Reported %R	101.5

MS calculation**460-289062-7****P. 2689, 2742****114-MW66D-107.0-111.0-20230927**

Background reading	0
Total absorbance	0.026
Total absorbance - background	0.026
Instrument Concentration (ug/L)	28.837
Sample aliquot (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated MS Result (ug/L)	28.8	OK	Reported Result (ug/L)	28.8

%R = Found/True*100**460-289062-7****P. 2689, 2742****114-MW66D-107.0-111.0-20230927**

True Value (ug/L)	30
Native concentration (ug/L)	0

AECOM Calculated MS Result %R	96.1	OK	Reported %R	96

Reporting Limit**460-289062-1****p. 2627, 2740****114-MW72D-102.0-106.0-20230927**

Low Standard(ug/l)	10

Initial volume (L)	0.05
Final volume (L)	0.05
Dilution Factor	1

AECOM Calculated Reporting Limit	10	OK	Reported RL (ug/L)	10

Sample Calculations**460-289062-1****p. 2627, 2740****114-MW72D-102.0-106.0-20230927**

Background reading	0
Total absorbance	0.098
Total absorbance - background	0.098
Instrument Response (ug/L)	108.425

Sample volume (L)	0.05
Final Volume (L)	0.05
Dilution Factor	1

AECOM Calculated Result (ug/L)	108.4	OK	Reported Result (ug/L)	108

Laboratory: Eurofins TestAmerica, Edison, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: 460-289062-1 (J289062-1)		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 10/10/2023	
Number of Samples/Matrix: 14 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Dani Woitas 10/11/2023	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Ferrous iron by 6020B was requested on the COC. Laboratory analyzed for dissolved iron by SW 6020B, dissolved ferrous iron by SM 3500 FE D, and dissolved ferric iron by method SM3500. All Results are reported
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C, 2.3 °C, 2.6°C
Holding Time	No	Yes	Sampled 9/27/2023, analyzed 9/28 - 10/06/2023, Dissolved iron by method 6020 met QC HT. Dissolved ferrous iron by method SM3500- FE D is normally performed in the field with a method-defined holding time of 15 minutes. Results are estimated (J/UJ) as the analysis was performed in the lab outside the 15- minute HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MB 460-935499/1-A, (total) Cr ND, 460-935362/1-A (total) Cr ND, MB 460-936267/1-A (dissolved) Fe, and Cr ND, MB 460-935939/6 , MB 460-935939/22 , MB 460-935939/38, and MB 460-936161/6 ND TOC, MB 460-935308/3 and MB 460-935414/6 ND sulfate, MB 460-935066/4 and MB 460-935066/133 ND Ferrous Fe
Field Blanks	No	Yes	GW-RI-FB-20230927 (460-289062-15), no iron, TOC {0.5 mg/l}, see table below
Matrix Spike	Yes	No	114-MW66D-107.0-111.0-20230927 (460-289062-7), Cr (total), Fe (dissolved), TOC, sulfate, and ferrous iron. Batch QC Cr and TOC, 114-MW61D-136.0-20230927 (460-289062-14) TOC, see tables below
Matrix Spike Duplicate	Yes	No	Same as above
Post Digestion Spike	Yes	No	Batch QC Cr
Laboratory Duplicate	Yes	No	114-MW66D-107.0-111.0-20230927 (460-289062-7), Cr (dissolved), Fe (dissolved), batch QC Cr (total/dissolved) none for all others, see table below

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Laboratory Control Standards	Yes	No	460-935499/2-A Cr (total), 460-935362/2-A Cr (total), 460-936267/2-A Cr (total), and Iron (dissolved), 460-935939/23, 460-935939/41, and 460-936161/7 TOC, 460-935308/5, 460-935414/8, 460-935308/6, and 460-935414/9 sulfate, 460-935066/5 and 460-935066/134 Ferrous iron.
Field Duplicate	Yes	No	114-MW66D-91.0-97.0-20230927 (460-289062-5) and 114-MW66D-91.0-97.0-20230927X (460-289062-6)
Total Metals vs Dissolved Metals Results	No	Yes	460-289062-1,-14, -2,-3, -4 only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table,

Field Blank

GW-RI-FB-20230927 (460-289062-15)

Analyte	Fraction	SR (ug/l)	Qual	RL	Action
TOC	Total	0.50	J	1.0	114-MW61D-136.0-20230927 (460-289062-14) and 114-MW66D-107.0-111.0-20230927 (460-289062-7) SR >3x but <10x FB, Estimate (JB), All other SR >10x FB, Accept

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates**

114-MW66D-107.0-111.0-20230927 (460-289062-7)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50.0	2.6	50.17	50.43	95	96	115	85	1	10	OK, Accept
Ferrous Iron	Dissolved	2.00	0.16	1.90	1.89	87	87	115	85	0	10	OK, Accept
SULFATE	Total	4.80	112	115	114.8	67	63	110	90	0	15	SR >4x spike amt, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW61D-136.0-20230927 (460-289062-14)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	2.4	48.68	49.02	93	93	115	85	1	10	OK, Accept

SR – sample result**SSR – Spiked sample result**

SDR – Sample duplicate result

NA – not applicable

114-MW66D-107.0-111.0-20230927 (460-289062-7)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	50.0	110	161.2	160.8	103	103	125	75	0	20	OK, Accept
IRON	Dissolved	2500	18.4 U	2442	2410	98	96	125	75	1	20	OK, Accept

Laboratory Duplicates

114-MW66D-107.0-111.0-20230927 (460-289062-7)

Analyte	Fraction	SR (ug/l)	Qual	RL	SDR (ug/l)	Qual	RL	RPD %	RPD Upper Limit	Action
CHROMIUM	Dissolved	7.6		4.0	7.78		4.0	2	20	OK, Accept
IRON	Dissolved	18.4	U	120	18.4	U	120		20	Both ND, Accept

Field Duplicates

114-MW66D-91.0-97.0-20230927 (460-289062-5) and 114-MW66D-91.0-97.0-20230927X (460-289062-6)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
SULFATE	Total	91.5		91.5		2.40	ug/l	0	RPD < 20%, Accept
IRON (FERROUS)	Dissolved	0.10	U	0.10	U	0.10	ug/l		RPD < 20%, Accept
IRON (FERRIC)	Dissolved	0.10	U	0.10	U	0.10	ug/l		RPD < 20%, Accept
IRON	Dissolved	120	U	120	U	120	ug/l		RPD < 20%, Accept
CHROMIUM	Total	3120		2810		4.0	mg/l	10.5	RPD < 20%, Accept
TOTAL ORGANIC CARBON	Total	6.6		6.5		1.0	mg/l	1.5	RPD < 20%, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-MW72D-102.0-106.0-20230927	460-289062-1	124	4.0	117	4.0	20	7	6	T Cr > D Cr, Accept
114-MW61D-136.0-20230927	460-289062-14	10.7	4.0		4.0	20	11	NC	T Cr > D Cr, Accept
114-MW72D-110.0-114.0-20230927	460-289062-2	90.6	4.0	82.7	4.0	20	8	9	T Cr > D Cr, Accept
114-MW72D-116.0-119.0-20230927	460-289062-3	59.0	4.0	57.8	4.0	20	1	2	T Cr > D Cr, Accept
114-MW72D-123.0-126.0-20230927	460-289062-4	23.2	4.0	21.3	4.0	20	2	9	T Cr > D Cr, Accept

NC- not calculated

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW72D-102.0-106.0-20230927	460-289062-1	TOC	Total	2
114-MW66D-137.0-140.0-20230927	460-289062-10	SULFATE	Total	5
114-MW52D-80.0-83.0-20230927	460-289062-11	SULFATE	Total	5
114-MW52D-80.0-83.0-20230927	460-289062-11	TOC	Total	5
114-MW52D-87.0-90.0-20230927	460-289062-12	SULFATE	Total	5
114-MW52D-87.0-90.0-20230927	460-289062-12	TOC	Total	5
114-MW52D-102.0-105.0-20230927	460-289062-13	SULFATE	Total	5
114-MW52D-102.0-105.0-20230927	460-289062-13	TOC	Total	2
114-MW61D-136.0-20230927	460-289062-14	SULFATE	Total	5
114-MW72D-110.0-114.0-20230927	460-289062-2	SULFATE	Total	5
114-MW72D-116.0-119.0-20230927	460-289062-3	SULFATE	Total	5
114-MW72D-116.0-119.0-20230927	460-289062-3	TOC	Total	2
114-MW72D-123.0-126.0-20230927	460-289062-4	SULFATE	Total	5
114-MW72D-123.0-126.0-20230927	460-289062-4	TOC	Total	2
114-MW66D-91.0-97.0-20230927	460-289062-5	SULFATE	Total	5
114-MW66D-91.0-97.0-20230927X	460-289062-6	SULFATE	Total	5
114-MW66D-107.0-111.0-20230927	460-289062-7	SULFATE	Total	5
114-MW66D-118.0-123.0-20230927	460-289062-8	SULFATE	Total	5
114-MW66D-124.0-129.0-20230927	460-289062-9	SULFATE	Total	5

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	SGS, Dayton, NJ
Laboratory Job No.:	JD78984
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/09/2024
Reviewed by:	Waverly Braunstein/AECOM File Name: JD78984_2024_1_09 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 December 15, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW66D-91-97-20231215	JD78984-1	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD78984-1F	Groundwater (D)	Iron, Manganese
114-MW66D-137-140-20231215	JD78984-2	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD78984-2F	Groundwater (D)	Iron, Manganese
114-MW66D-107-111-20231215	JD78984-3	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD78984-3F	Groundwater (D)	Iron, Manganese
114-MW66D-118-123-20231215	JD78984-4	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD78984-4F	Groundwater (D)	Iron, Manganese
114-MW66D-124-129-20231215	JD78984-5	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD78984-5F	Groundwater (D)	Iron, Manganese
GW-RI-FB-20231215	JD78984-6	Field Blank (T)	Chromium, *Wet Chemistry
	JD78984-6F	Field Blank (D)	Iron, Manganese

Field ID	Laboratory ID	Matrix	Parameter
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
D – Dissolved (Field filtered)			
T – Total			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested hexavalent chromium for sample GW-RI-FB-20231215 (JD78984-6). The sample for hexavalent chromium was not received at the laboratory. All other sample fractions for this sample were received and reported.

The sampled date on the COC for sample GW-RI-FB-20231215 (JD78984-6) was listed as 12/25/2023. The correct sampled date is 12/15/2023.

Hexavalent Chromium

Holding Time

All hexavalent chromium samples were analyzed outside of the aqueous 24-hour holding time. Results were rejected (R), and are not useable for decision making purposes.

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $\leq 30\%$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $> 30\%$	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

The total chromium result was less than the total hexavalent chromium result in sample 114-MW66D-91-97-20231215 (JD78984-1). Results were estimated (J). Note that the hexavalent chromium result was previously rejected due to exceeded holding time. No additional qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW66D-118-123-20231215 (JD78984-4) was used for matrix spike analysis for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW66D-118-123-20231215 (JD78984-4) was analyzed as lab duplicate for this SDG. All results were nondetect. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%Rs) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Metals

MS/Matrix Spike Duplicate (MSD)

Samples 114-MW66D-91-97-20231215 (JD78984-1) and 114-MW66D-118-123-20231215 (JD78984-4) were selected for MS/MSD analyses for chromium (total), iron (dissolved) and manganese (dissolved) in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Wet Chemistry (Sulfate, TOC)

Field Blank (FB)

The FB, GW-RI-FB-20231215 (JD78984-6), reported sulfate at a concentration less than the reporting limit (RL) but greater than the method detection limit (MDL). All sulfate sample results were greater than ten times the amount in the FB; therefore, no qualifications were required.

MS/ MSD

Sample 114-MW66D-91-97-20231215 (JD78984-1) was analyzed as a MS/MSD for TOC in this data set. Sample 114-MW66D-137-140-20231215 (JD78984-2) was also analyzed as a MS for sulfate. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

Sample 114-MW66D-137-140-20231215 (JD78984-2) was analyzed as a laboratory duplicate for sulfate in this data set. All QC acceptance criteria were met.

A laboratory duplicate for TOC was not performed on a site sample in this data set. No validation actions were taken on this basis.

LCS/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the metals and wet chemistry data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below. Data for hexavalent chromium is not useable due to holding time exceedance.

Results rejected due to holding time issues are not useable.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

The chromium result estimated due to the result being lower than the corresponding total hexavalent chromium result is useable with an unknown bias. The corresponding hexavalent chromium result was previously rejected as noted above.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit Lists

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date December 15, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD78984
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231215

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20231215	JD78984-1	Total	CHROMIUM (HEXAVALENT)	U	4.1	4.1R	0.050	Reject	1,2
114-MW66D-137-140-20231215	JD78984-2	Total	CHROMIUM (HEXAVALENT)	U	U	R	0.010	Reject	2
114-MW66D-107-111-20231215	JD78984-3	Total	CHROMIUM (HEXAVALENT)	U	0.017	0.017R	0.010	Reject	2
114-MW66D-118-123-20231215	JD78984-4	Total	CHROMIUM (HEXAVALENT)	U	U	R	0.010	Reject	2
114-MW66D-124-129-20231215	JD78984-5	Total	CHROMIUM (HEXAVALENT)	U	U	R	0.010	Reject	2

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

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

NJDEP Validation Footnote

1. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.
2. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date December 15, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD78984
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231215

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20231215	JD78984-1	Total	CHROMIUM	U	2820	2820	50	Qualify	2
114-MW66D-137-140-20231215	JD78984-2F	Dissolved	MANGANESE	U	5.7B	5.7J	10	Qualify	1
114-MW66D-107-111-20231215	JD78984-3	Total	CHROMIUM	U	102	102	10		
114-MW66D-107-111-20231215	JD78984-3F	Dissolved	MANGANESE	U	11.8	11.8	10		
114-MW66D-118-123-20231215	JD78984-4	Total	CHROMIUM	U	15.7	15.7	10		
114-MW66D-118-123-20231215	JD78984-4F	Dissolved	MANGANESE	U	5.5B	5.5J	10	Qualify	1
114-MW66D-124-129-20231215	JD78984-5	Total	CHROMIUM	U	3.9B	3.9J	10	Qualify	1
114-MW66D-124-129-20231215	JD78984-5F	Dissolved	MANGANESE	U	5.9B	5.9J	10	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 Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date December 15, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD78984
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231215

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20231215	JD78984-1	SULFATE	U	98.8	98.8	2.0		
114-MW66D-137-140-20231215	JD78984-2	SULFATE	U	103	103	2.0		
114-MW66D-107-111-20231215	JD78984-3	SULFATE	U	123	123	2.0		
114-MW66D-118-123-20231215	JD78984-4	SULFATE	U	127	127	2.0		
114-MW66D-124-129-20231215	JD78984-5	SULFATE	U	113	113	2.0		
GW-RI-FB-20231215	JD78984-6	SULFATE	U	1.4B	1.4J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date December 15, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD78984
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231215

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20231215	JD78984-1	Total	Total Organic Carbon	U	5.5	5.5	1.0		
114-MW66D-137-140-20231215	JD78984-2	Total	Total Organic Carbon	U	16.7	16.7	1.0		
114-MW66D-107-111-20231215	JD78984-3	Total	Total Organic Carbon	U	1.9	1.9	1.0		
114-MW66D-118-123-20231215	JD78984-4	Total	Total Organic Carbon	U	4.2	4.2	1.0		
114-MW66D-124-129-20231215	JD78984-5	Total	Total Organic Carbon	U	6.8	6.8	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD78984		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 1/09/2024	
Number of Samples/Matrix: 5 GW		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Waverly Braunstein 1/15/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	Sample GW-RI-FB-20231215 (JD78984-6) not received by lab for Cr6 analysis.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.0 °C
Holding Time	No	Yes	Sampled 12/15/2023, analyzed 12/18/2023, Aq samples 24 hr HT, beyond 48 hrs. Reject (R)
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	12/18/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN49419-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	NA	NA	None received with this data package.
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW66D-118-123-20231215 (JD78984-4)
Laboratory Duplicate	Yes	No	114-MW66D-118-123-20231215 (JD78984-4), Both ND
Laboratory Control Standards	Yes	No	GN49419-B1 {100.0 %R}
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5,
Total Chromium vs Hexavalent Chromium Results	No	Yes	1 sample qualified J, see table below.
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Holding Time

Sample ID	Lab ID	Analyte	Date Sampled	Date analyzed	Sampled to analysis	Action
114-MW66D-91-97-20231215	JD78984-1	HEXAVALENT CHROMIUM	12/15/2023 9:40	12/18/2023 14:41	3 days	Reject
114-MW66D-137-140-20231215	JD78984-2	HEXAVALENT CHROMIUM	12/15/2023 10:15	12/18/2023 14:41	3 days	Reject
114-MW66D-107-111-20231215	JD78984-3	HEXAVALENT CHROMIUM	12/15/2023 9:50	12/18/2023 14:41	3 days	Reject
114-MW66D-118-123-20231215	JD78984-4	HEXAVALENT CHROMIUM	12/15/2023 10:00	12/18/2023 14:41	3 days	Reject
114-MW66D-124-129-20231215	JD78984-5	HEXAVALENT CHROMIUM	12/15/2023 10:10	12/18/2023 14:41	3 days	Reject

Matrix Spikes

114-MW66D-118-123-20231215 (JD78984-4)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.14	NA	93.3	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW66D-118-123-20231215	JD78984-4	HEXAVALENT CHROMIUM	0	U	0	U	0.010	mg/l	0	Both ND, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW66D-91-97-20231215	JD78984-1	2820	50	4100	50	37	T Cr < T Cr6, SRs > 4x RL, RPD > 30%, Qualify J
114-MW66D-137-140-20231215	JD78984-2		10		10	0	Both ND, Accept
114-MW66D-107-111-20231215	JD78984-3	102	10	17	10	143	T Cr > T Cr6, Accept
114-MW66D-118-123-20231215	JD78984-4	15.7	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-124-129-20231215	JD78984-5	3.9	10		10	NC	T Cr > T Cr6, Accept

NC- not calculated**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW66D-91-97-20231215	JD78984-1	CHROMIUM (HEXAVALENT)	Total	5

SDG#: JD78984/ Method 7196**GN49419**

Cr+6 ICAL 12/18/23

GW

(p. 1672 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.089
0.3	0.261
0.5	0.44
0.8	0.685
1	0.855

(p. 1672 of
data pkg)

AECOM Calculated Intercept	0.00309	OK	Reported intercept	0.0031
AECOM Slope	0.8552	OK	Reported Slope	0.8552
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation**GN49419-B1****P. 1655, 1672**

Background absorbance 0

Sample absorbance 0.131

LCS Soluble Instrument Response 0.131

Instrument Concentration (mg/L) 0.150

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN49419-B1****P. 1655, 1672**

True Value (mg/L) 0.15

AECOM Calculated %R	99.7	OK	Reported %R	100.0

MS calculation**GN49541-S1****P. 1657, 1673****114-MW66D-118-123-20231215****UNFILTERED**

Background reading 0

Total absorbance 0.127

Total absorbance - background 0.127

Instrument Concentration (mg/L) 0.1449

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 1

AECOM Calculated MS Result (mg/L)	0.14	OK	Reported Result (mg/L)	0.14

%R = Found/True*100**GN49541-S1****P. 1657, 1673****114-MW66D-118-123-20231215**

True Value (mg/L) 0.150

Native concentration (mg/L) 0

AECOM Calculated MS Result %R	96.6	OK, rounding	Reported %R	93.3

UNFILTERED

Reporting Limit	JD78984-4	P. 21, 1672	114-MW66D-118-123-20231215

Low Standard	0.01

NA: standards
and samples
treated the same

Initial volume (L)	0.5

Final volume (L)	0.5

Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED

<u>Sample Calculations</u>	JD78984-4	P. 21, 1672	114-MW66D-118-123-20231215

Background reading	0

Total absorbance	0.001

Total absorbance - background	0.001

Instrument Response (mg/L)	-0.002

NA: standards
and samples
treated the same

Sample volume (L)	0.5

Final Volume (L)	0.5

Dilution Factor	1

AECOM Calculated Result (mg/L)	-0.0024	OK, <MDL report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD78984		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 1/09/2024	
Number of Samples/Matrix: 5 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Waverly Braunstein 1/15/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	JD78984-1 through -5 lab received 1x500ml FF NP volumes labeled as Fe2 analysis. COC requested FF Fe. Lab was directed to preserve with HNO3 and analyze as FF Fe. Sample -6 Received FF CR6 and Metals volumes. COC requests Unfiltered CR6 and Metal analyses. Received 1x500ml NP volume labeled as Fe2 analysis - COC asks for FF Fe analysis. Lab was directed to preserve with HNO3 and analyze as FF Fe. Cr6 not received.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.0 °C, see COC
Holding Time	Yes	No	Sampled 12/15/2023, analyzed 12/19 - 12/28/2023, and 1/3/2024,
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP43842 Cr, Fe, Mn all ND, MP43970 Cr, Fe, Mn all ND, and MP44021 Cr, Fe, Mn all ND, GP51163/GN49479 sulfate ND, GP51138/GN49527 and GP 51168/GN49644 TOC, Both ND
Field Blanks	No	No	GW-RI-FB-20231215(JD78984-6, -6F), Cr, Fe, Mn, TOC All ND, sulfate (1.4 mg/l), see table below
Matrix Spike	Yes	No	114-MW66D-91-97-20231215 (JD78984-2), sulfate, Mn, 114-MW66D-137-140-20231215 (JD78984-1), TOC, Cr, Fe, Mn, and 114-MW66D-118-123-20231215 (JD78984-4) Cr, Fe, Mn, see tables below
Matrix Spike Duplicate	Yes	No	Same as above but no sulfate
Post Digestion Spike	NA	NA	
Laboratory Duplicate	Yes	No	114-MW66D-91-97-20231215 (JD78984-2), sulfate, none for all others, see table below
Laboratory Control Standards	Yes	No	MP43842 Cr (97.0%R), Fe (98.3 %R), and Mn (97.0 %R), MP43970 Cr (97.4 %R), Fe 106.0 %R), Mn (97.9 %R),

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
			MP44021 Cr (92.1 %R), Fe (105.0 %R), Mn (91.1 %R), GP51163/GN49479 sulfate (102.3 %R), GP51138/GN49527 TOC (94.4 %R) and GP51168/GN49644 TOC (103.0 %R)
Field Duplicate	NA	NA	None with this SDG
Total Metals vs Dissolved Metals Results	NA	NA	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	see hexavalent chromium section for table,

Field Blank

GW-RI-FB-20231215 (JD78984-6)

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
SULFATE	Total	1.4	J	2.0	Associated SR >10x FB, Accept

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates**

114-MW66D-137-140-20231215 (JD78984-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
SULFATE	Total	80	103	179	NA	95.0	NA	120	80	NA	15	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW66D-91-97-20231215 (JD78984-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	5.5	15.1	14.7	96.0	92.0	132	71	2.7	10	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result**

114-MW66D-91-97-20231215 (JD78984-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	2820	3340	3260	650	550	125	75	2.4	20	SR >4x spike amt, Accept
IRON	Dissolved	4000	21.5	3750	3630	93.4	90.4	125	75	3.3	20	OK, Accept
MANGANESE	Dissolved	80	0.95	76.5	73.4	95.6	91.8	125	75	4.1	20	OK, Accept

114-MW66D-118-123-20231215 (JD78984-4)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	15.7	86.3	80.5	88.3	81.0	125	75	7.0	20	OK, Accept
IRON	Dissolved	4000	0	4130	3920	103.3	98.0	125	75	5.2	20	OK, Accept
MANGANESE	Dissolved	80	6.5	79.5	73.1	91.3	83.3	125	75	8.4	20	OK, Accept

Laboratory Duplicates

114-MW66D-137-140-20231215 (JD78984-2)

Analyte	Fraction	SR (mg/l)	Qual	RL	SDR (mg/l)	Qual	RL	RPD %	RPD Upper Limit	Action
SULFATE	Total	103	2.0		103		2.0	0	20	OK, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW66D-91-97-20231215	JD78984-1	CHROMIUM	Total	50
114-MW66D-91-97-20231215	JD78984-1F	IRON	Dissolved	10
114-MW66D-91-97-20231215	JD78984-1F	MANGANESE	Dissolved	10
114-MW66D-137-140-20231215	JD78984-2	CHROMIUM	Total	10
114-MW66D-137-140-20231215	JD78984-2F	IRON	Dissolved	10
114-MW66D-137-140-20231215	JD78984-2F	MANGANESE	Dissolved	10
114-MW66D-107-111-20231215	JD78984-3	CHROMIUM	Total	10
114-MW66D-107-111-20231215	JD78984-3F	IRON	Dissolved	10
114-MW66D-107-111-20231215	JD78984-3F	MANGANESE	Dissolved	10
114-MW66D-118-123-20231215	JD78984-4	CHROMIUM	Total	10
114-MW66D-118-123-20231215	JD78984-4F	IRON	Dissolved	10
114-MW66D-118-123-20231215	JD78984-4F	MANGANESE	Dissolved	10
114-MW66D-124-129-20231215	JD78984-5	CHROMIUM	Total	10
114-MW66D-124-129-20231215	JD78984-5F	IRON	Dissolved	10
114-MW66D-124-129-20231215	JD78984-5F	MANGANESE	Dissolved	10
GW-RI-FB-20231215	JD78984-6	CHROMIUM	Total	2
GW-RI-FB-20231215	JD78984-6F	IRON	Dissolved	2
GW-RI-FB-20231215	JD78984-6F	MANGANESE	Dissolved	2

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	SGS, Dayton, NJ
Laboratory Job No.:	JD79185
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/09/2024
Reviewed by:	Waverly Braunstein/AECOM File Name: JD79185_2024_1_09 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 December 19, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW4D-90-94-20231219	JD79185-1	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-1F	Groundwater (D)	Iron, Manganese
114-MW4D-98-102-20231219	JD79185-2	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-2F	Groundwater (D)	Iron, Manganese
114-MW4D-111-115-20231219	JD79185-3	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-3F	Groundwater (D)	Iron, Manganese
114-MW4D-121-125-20231219	JD79185-4	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-4F	Groundwater (D)	Iron, Manganese
114-MW57D-87.5-91.5-20231219	JD79185-5	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-5F	Groundwater (D)	Iron, Manganese
114-MW57D-96.5-100.5-20231219	JD79185-6	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-6F	Groundwater (D)	Iron, Manganese
114-MW57D-104-108-20231219	JD79185-7	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-7F	Groundwater (D)	Iron, Manganese

Field ID	Laboratory ID	Matrix	Parameter
114-MW57D-109-113-20231219	JD79185-8	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-8F	Groundwater (D)	Iron, Manganese
114-MW57C-71.0-20231219	JD79185-9	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-9F	Groundwater (D)	Iron, Manganese
114-MW57C-71.0-20231219-X (Field Duplicate of 114-MW57C-71.0-20231219)	JD79185-10	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-10F	Groundwater (D)	Iron, Manganese
114-MW53C-47.5-20231219	JD79185-11	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-11F	Groundwater (D)	Iron, Manganese
114-PZ-52WR-74.0-20231219	JD79185-12	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-12F	Groundwater (D)	Hexavalent Chromium, Chromium, Iron, Manganese
114-MW61D-131.0-20231219	JD79185-13	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-13F	Groundwater (D)	Hexavalent Chromium, Chromium, Iron, Manganese
114-MW61D-136.0-20231219	JD79185-14	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-14F	Groundwater (D)	Hexavalent Chromium, Chromium, Iron, Manganese
GW-RI-FB-20231219	JD79185-15	Field Blank (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79185-15F	Field Blank (D)	Iron, Manganese
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
D – Dissolved (Field filtered)			
T – Total			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

The total chromium results were less than the total hexavalent chromium results in samples 114-MW53C-47.5-20231219 (JD79185-11) and 114-MW4D-121-125-20231219 (JD79185-4). Results were estimated (J/UJ).

Matrix Spike (MS)

Sample 114-MW57C-71.0-20231219 (JD79185-9) was analyzed as a matrix spike for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW57C-71.0-20231219 (JD79185-9) was analyzed as a lab duplicate for this SDG. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-MW57C-71.0-20231219 (JD79185-9) and 114-MW57C-71.0-20231219-X (JD79185-10) were analyzed as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW57C-71.0-20231219 (JD79185-9) was analyzed as the MS/MSD for chromium (total), iron (dissolved) and manganese (dissolved) in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-MW57C-71.0-20231219 (JD79185-9) and 114-MW57C-71.0-20231219-X (JD79185-10) were analyzed as the field duplicate pair for chromium. All QC acceptance criteria were met. No qualifications were made.

Wet Chemistry (Sulfate, TOC)

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW57C-71.0-20231219 (JD79185-9) was analyzed as a MS/MSD for TOC and sulfate in this data set. Sample 114-MW4D-98-102-20231219 (JD79185-2) was also analyzed as a MS for TOC. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

Sample 114-MW57C-71.0-20231219 (JD79185-9) was analyzed as a laboratory duplicate for sulfate in this data set. All QC acceptance criteria were met.

A laboratory duplicate for TOC was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

Samples 114-MW57C-71.0-20231219 (JD79185-9) and 114-MW57C-71.0-20231219-X (JD79185-10) were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Results estimated due to total chromium results lower than total hexavalent chromium results are useable with an unknown bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date December 19, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79185
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231219

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-90-94-20231219	JD79185-1	Total	CHROMIUM (HEXAVALENT)	U	0.0095B	0.0095J	0.010	Qualify	2
114-MW57C-71.0-20231219-X	JD79185-10	Total	CHROMIUM (HEXAVALENT)	U	14.7	14.7	0.50		
114-MW53C-47.5-20231219	JD79185-11	Total	CHROMIUM (HEXAVALENT)	U	20.3	20.3J	0.50	Qualify	1
114-PZ-52WR-74.0-20231219	JD79185-12	Total	CHROMIUM (HEXAVALENT)	U	0.048	0.048	0.010		
114-PZ-52WR-74.0-20231219	JD79185-12F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.047	0.047	0.010		
114-MW4D-121-125-20231219	JD79185-4	Total	CHROMIUM (HEXAVALENT)	U	0.028	0.028J	0.010	Qualify	1
114-MW57C-71.0-20231219	JD79185-9	Total	CHROMIUM (HEXAVALENT)	U	15.4	15.4	0.50		

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

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

NJDEP Validation Footnote

1. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date December 19, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79185
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231219

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-71.0-20231219-X	JD79185-10	Total	CHROMIUM	U	15400	15400	200		
114-MW57C-71.0-20231219-X	JD79185-10F	Dissolved	MANGANESE	U	87.2	87.2	10		
114-MW53C-47.5-20231219	JD79185-11	Total	CHROMIUM	U	14900	14900J	200	Qualify	2
114-MW53C-47.5-20231219	JD79185-11F	Dissolved	MANGANESE	U	286	286	10		
114-PZ-52WR-74.0-20231219	JD79185-12	Total	CHROMIUM	U	862	862	10		
114-PZ-52WR-74.0-20231219	JD79185-12F	Dissolved	IRON	U	68200	68200	250		
114-PZ-52WR-74.0-20231219	JD79185-12F	Dissolved	MANGANESE	U	3330	3330	50		
114-PZ-52WR-74.0-20231219	JD79185-12F	Dissolved	CHROMIUM	U	734	734	10		
114-MW61D-136.0-20231219	JD79185-14	Total	CHROMIUM	U	6.2B	6.2J	10	Qualify	1
114-MW4D-90-94-20231219	JD79185-1F	Dissolved	IRON	U	116B	116J	250	Qualify	1
114-MW4D-111-115-20231219	JD79185-3F	Dissolved	IRON	U	190B	190J	250	Qualify	1
114-MW4D-121-125-20231219	JD79185-4	Total	CHROMIUM	U	U	UJ	10	Qualify	2
114-MW4D-121-125-20231219	JD79185-4F	Dissolved	IRON	U	636	636	250		
114-MW57D-87.5-91.5-20231219	JD79185-5	Total	CHROMIUM	U	6.8B	6.8J	10	Qualify	1
114-MW57D-87.5-91.5-20231219	JD79185-5F	Dissolved	MANGANESE	U	17.5	17.5	10		
114-MW57D-96.5-100.5-20231219	JD79185-6	Total	CHROMIUM	U	35.2	35.2	10		

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-96.5-100.5-20231219	JD79185-6F	Dissolved	MANGANESE	U	13.2	13.2	10		
114-MW57D-104-108-20231219	JD79185-7	Total	CHROMIUM	U	11.3	11.3	10		
114-MW57D-104-108-20231219	JD79185-7F	Dissolved	MANGANESE	U	23.7	23.7	10		
114-MW57D-109-113-20231219	JD79185-8	Total	CHROMIUM	U	6.8B	6.8J	10	Qualify	1
114-MW57D-109-113-20231219	JD79185-8F	Dissolved	MANGANESE	U	24.0	24.0	10		
114-MW57C-71.0-20231219	JD79185-9	Total	CHROMIUM	U	15600	15600	200		
114-MW57C-71.0-20231219	JD79185-9F	Dissolved	MANGANESE	U	82.5	82.5	10		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date December 19, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79185
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231219

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-90-94-20231219	JD79185-1	SULFATE	U	50.2	50.2	2.0		
114-MW57C-71.0-20231219-X	JD79185-10	SULFATE	U	502	502	4.0		
114-MW53C-47.5-20231219	JD79185-11	SULFATE	U	371	371	2.0		
114-PZ-52WR-74.0-20231219	JD79185-12	SULFATE	U	158	158	100		
114-MW61D-131.0-20231219	JD79185-13	SULFATE	U	42.5	42.5	2.0		
114-MW61D-136.0-20231219	JD79185-14	SULFATE	U	40.1	40.1	2.0		
114-MW4D-98-102-20231219	JD79185-2	SULFATE	U	40.2	40.2	2.0		
114-MW4D-111-115-20231219	JD79185-3	SULFATE	U	203	203	2.0		
114-MW4D-121-125-20231219	JD79185-4	SULFATE	U	71.1	71.1	2.0		
114-MW57D-87.5-91.5-20231219	JD79185-5	SULFATE	U	97.2	97.2	2.0		
114-MW57D-96.5-100.5-20231219	JD79185-6	SULFATE	U	94.5	94.5	2.0		
114-MW57D-104-108-20231219	JD79185-7	SULFATE	U	124	124	2.0		
114-MW57D-109-113-20231219	JD79185-8	SULFATE	U	111	111	2.0		
114-MW57C-71.0-20231219	JD79185-9	SULFATE	U	501	501	6.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date December 19, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79185
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231219

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-90-94-20231219	JD79185-1	Total	Total Organic Carbon	U	26.1	26.1	1.0		
114-PZ-52WR-74.0-20231219	JD79185-12	Total	Total Organic Carbon	U	1530	1530	100		
114-MW61D-131.0-20231219	JD79185-13	Total	Total Organic Carbon	U	0.81B	0.81J	1.0	Qualify	1
114-MW61D-136.0-20231219	JD79185-14	Total	Total Organic Carbon	U	1.7	1.7	1.0		
114-MW4D-98-102-20231219	JD79185-2	Total	Total Organic Carbon	U	82.2	82.2	5.0		
114-MW4D-111-115-20231219	JD79185-3	Total	Total Organic Carbon	U	56.3	56.3	5.0		
114-MW4D-121-125-20231219	JD79185-4	Total	Total Organic Carbon	U	129	129	10		
114-MW57D-87.5-91.5-20231219	JD79185-5	Total	Total Organic Carbon	U	22.5	22.5	1.0		
114-MW57D-96.5-100.5-20231219	JD79185-6	Total	Total Organic Carbon	U	27.2	27.2	1.0		
114-MW57D-104-108-20231219	JD79185-7	Total	Total Organic Carbon	U	15.1	15.1	1.0		
114-MW57D-109-113-20231219	JD79185-8	Total	Total Organic Carbon	U	17.5	17.5	1.0		
114-MW57C-71.0-20231219	JD79185-9	Total	Total Organic Carbon	U	2.4	2.4	1.0		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD79185		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 1/09/2024	
Number of Samples/Matrix: 14 GW, 3 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Waverly Braunstein 1/15/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C
Holding Time	Yes	No	Sampled 12/19/2023, analyzed 12/20/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	12/20/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN49486-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20231219, ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW57C-71.0-20231219 (JD79185-9)
Laboratory Duplicate	Yes	No	114-MW57C-71.0-20231219 (JD79185-9)
Laboratory Control Standards	Yes	No	GN49486-B1 {100.0 %R}
Field Duplicate	Yes	No	114-MW57C-71.0-20231219 (JD79185-9) total & 114-MW57C-71.0-20231219-X (JD79185-10) total
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5,
Total Chromium vs Hexavalent Chromium Results	No	Yes	See table. Cr & Cr6 qualified J/UJ in samples 114-MW53C-47.5-20231219 and 114-MW4D-121-125-20231219.
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW57C-71.0-20231219 (JD79185-9)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	30.72	15.4	44.8	NA	95.7	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD (%)	Action
114-MW57C-71.0-20231219	JD79185-9	HEXAVALENT CHROMIUM	15.4		15.5		0.50	mg/l	0.6	OK, Accept

Field Duplicates

114-MW57C-71.0-20231219 (JD79185-9) & 114-MW57C-71.0-20231219-X (JD79185-10)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD (%)	Action
HEXAVALENT CHROMIUM	Total	15.4		14.7		0.50	mg/l	4.7	RPD<30, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW4D-90-94-20231219	JD79185-1		10	9.5	10	NC	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL ≤ RL, Accept
114-MW57C-71.0-20231219-X	JD79185-10	15400	200	14700	500	5	T Cr > T Cr6, Accept
114-MW53C-47.5-20231219	JD79185-11	14900	200	20300	500	31	T Cr < T Cr6, SRs > 4x RL, RPD > 30%, Qualify J
114-PZ-52WR-74.0-20231219	JD79185-12	862	10	48	10	179	T Cr > T Cr6, Accept
114-MW61D-131.0-20231219	JD79185-13		10		10	0	Both ND, Accept
114-MW61D-136.0-20231219	JD79185-14	6.2	10		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20231219	JD79185-15		2.0		10	0	Both ND, Accept
114-MW4D-98-102-20231219	JD79185-2		10		10	0	Both ND, Accept
114-MW4D-111-115-20231219	JD79185-3		10		10	0	Both ND, Accept
114-MW4D-121-125-20231219	JD79185-4		10	28	10	NC	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL > RL, Qualify J/UJ
114-MW57D-87.5-91.5-20231219	JD79185-5	6.8	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-96.5-100.5-20231219	JD79185-6	35.2	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-104-108-20231219	JD79185-7	11.3	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-109-113-20231219	JD79185-8	6.8	10		10	NC	T Cr > T Cr6, Accept
114-MW57C-71.0-20231219	JD79185-9	15600	200	15400	500	1	T Cr > T Cr6, Accept

NC- not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PZ-52WR-74.0-20231219	JD79185-12F	734	10	47	10	176	D Cr > D Cr6, Accept

114-MW61D-131.0-20231219	JD79185-13F		10		10	0	Both ND, Accept
114-MW61D-136.0-20231219	JD79185-14F		10		10	0	Both ND, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PZ-52WR-74.0-20231219	JD79185-12F	48	10	47	10	2	T Cr6 > D Cr6, Accept
114-MW61D-131.0-20231219	JD79185-13F		10		10	0	Both ND, Accept
114-MW61D-136.0-20231219	JD79185-14F		10		10	0	Both ND, Accept

NC- not calculated

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW57C-71.0-20231219-X	JD79185-10	CHROMIUM (HEXAVALENT)	Total	50
114-MW53C-47.5-20231219	JD79185-11	CHROMIUM (HEXAVALENT)	Total	50
114-MW57C-71.0-20231219	JD79185-9	CHROMIUM (HEXAVALENT)	Total	50

SDG#: JD79185/ Method 7196**GN49486**

Cr+6 ICAL 12/20/23

GW

(p. 1979 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.089
0.3	0.266
0.5	0.44
0.8	0.688
1	0.856

(p. 1979 of
data pkg)

AECOM Calculated Intercept	0.00384	OK	Reported intercept	0.0038
AECOM Slope	0.8566	OK	Reported Slope	0.8566
AECOM Calculated r	0.99991	OK	Reported r	0.99991

LCS calculation**GN49486-B1****P. 1967, 1979**

Background absorbance 0

Sample absorbance 0.132

LCS Soluble Instrument Response 0.132

Instrument Concentration (mg/L) 0.150

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN49486-B1****P. 1967, 1979**

True Value (mg/L) 0.15

AECOM Calculated %R	99.7	OK	Reported %R	100.0

MS calculation**GN49486-S1****P. 1969, 1979****114-MW57C-71.0-20231219****UNFILTERED**

Background reading 0

Total absorbance 0.388

Total absorbance - background 0.388

Instrument Concentration (mg/L) 0.4485

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 100

AECOM Calculated MS Result (mg/L)	44.85	OK	Reported Result (mg/L)	44.8

%R = Found/True*100**GN49486-S1****P. 1969, 1979****114-MW57C-71.0-20231219**

True Value (mg/L) 30.720

Native concentration (mg/L) 15

AECOM Calculated MS Result %R	95.9	OK, rounding	Reported %R	95.7

UNFILTERED

Reporting Limit	JD79185-9	P. 42, 1979	114-MW57C-71.0-20231219

Low Standard	0.01

NA: standards
and samples
treated the same

Initial volume (L)	0.5

Final volume (L)	0.5

Dilution Factor	50

AECOM Calculated Reporting Limit	0.500	OK	Reported RL (mg/L)=	0.50

UNFILTERED

<u>Sample Calculations</u>	JD79185-9	P. 42, 1979	114-MW57C-71.0-20231219

Background reading	0

Total absorbance	0.267

Total absorbance - background	0.267

Instrument Response (mg/L)	0.307

NA: standards
and samples
treated the same

Sample volume (L)	0.5

Final Volume (L)	0.5

Dilution Factor	50

AECOM Calculated Result (mg/L)	15.4	OK	Reported Result (mg/L)	15.4

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD79185		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 1/09/2024	
Number of Samples/Matrix: 14 GW, 3 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Waverly Braunstein 1/15/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C
Holding Time	Yes	No	Sampled 12/19/2023, analyzed 12/22 - 12/28/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP43842 Cr, Fe, Mn all ND, MP43866 Cr, Fe, Mn all ND, MP43969 Fe, Mn all ND, and MP43867 Cr, Fe, Mn all ND, GP51203/GN49629 sulfate ND, GP51199/GN49786, GP 51200/GN49786, and GP51201/GN49786 TOC, All ND
Field Blanks	Yes	No	GW-RI-FB-20231219 (JD79185-15, -15F), Cr, Fe, Mn, TOC, and sulfate, All ND
Matrix Spike	Yes	No	114-MW57C-71.0-20231219 (JD79185-9) Cr, Fe, Mn, sulfate, TOC, 114-MW4D-98-102-20231219 (JD79185-2) TOC, see tables below
Matrix Spike Duplicate	Yes	No	Same as above but no sulfate
Post Digestion Spike	NA	NA	
Laboratory Duplicate	Yes	No	114-MW57C-71.0-20231219 (JD79185-9) sulfate, none for all others, see table below
Laboratory Control Standards	Yes	No	MP43842 Cr (97.0%R), Fe (98.3 %R), Mn (97.0 %R), MP43866 Cr (97.6 %R), Fe (96.5 %R), Mn (101.8 %R), MP43867 Cr (97.5 %R), Fe (98.5 %R), Mn (98.5 %R), MP43969 Fe (102.5 %R), Mn (93.3 %R), GP51203/GN49629 sulfate (98.4 %R), GP51119/GN49786 TOC (94.1 %R), GP51200/GN49786 TOC (99.8 %R), and GP51201/GN49786 TOC (102.0 %R)
Field Duplicate	Yes	No	114-MW57C-71.0-20231219 (JD79185-9) total & 114-MW57C-71.0-20231219-X (JD79185-10) total Cr, TOC, sulfate
Total Metals vs Dissolved Metals Results	Yes	No	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	see hexavalent chromium section for table,

Matrix Spikes/Matrix Spike Duplicates

114-MW57C-71.0-20231219 (JD79185-9)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
SULFATE	Total	80	501	533	NA	30.0	NA	120	80	NA	15	SR >4x spike amt, Accept
TOC	Total	10	2.4	13.4	13.2	110	108	132	71	1.5	10	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW4D-98-102-20231219 (JD79185-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	82.2	137	135	109.6	103.4	132	71	1.5	10	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result**

114-MW57C-71.0-20231219 (JD79185-9)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	16600	13600	16000	-2500	500	125	75	16.2	20	SR >4x spike amt, Accept
IRON	Dissolved	4000	66.1	3840	4000	94.3	94.1	125	75	0.3	20	OK, Accept
MANGANESE	Dissolved	80	94.2	171	172	96.0	97.3	125	75	0.6	20	OK, Accept

Laboratory Duplicates

114-MW57C-71.0-20231219 (JD79185-9)

Analyte	Fraction	SR (mg/l)	Qual	RL	SDR (mg/l)	Qual	RL	RPD %	RPD Upper Limit	Action
SULFATE	Total	501	6.0		490		6.0	3.8	20	OK, Accept

Field Duplicates

114-MW57C-71.0-20231219 (JD79185-9) & 114-MW57C-71.0-20231219-X (JD79185-10)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM	Total	156000		154000		200	ug/l	1.3	Both ND, Accept
SULFATE	Total	501		502		6.0/4.0	mg/l	0.2	OK, Accept
TOC	Total	2.4		5.0	U	1.0/5.0	mg/l	70.3	SR<5xRL or ND, ABS Diff <RL, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RL X5	Absolute Difference	RPD (%)	Action
114-PZ-52WR-74.0-20231219	JD79185-12	862	10	734	10	50	128	16	T Cr > D Cr, Accept
114-MW61D-131.0-20231219	JD79185-13		10		10	50	0	0	Both ND, Accept
114-MW61D-136.0-20231219	JD79185-14	6.2	10		10	50	6	NC	T Cr > D Cr, Accept

NC- Not calculated**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW4D-90-94-20231219	JD79185-1	CHROMIUM	Total	10
114-MW57C-71.0-20231219-X	JD79185-10	SULFATE	Total	2
114-MW57C-71.0-20231219-X	JD79185-10	CHROMIUM	Total	200
114-MW57C-71.0-20231219-X	JD79185-10	TOC	Total	5
114-MW57C-71.0-20231219-X	JD79185-10F	IRON	Dissolved	10
114-MW57C-71.0-20231219-X	JD79185-10F	MANGANESE	Dissolved	10
114-MW53C-47.5-20231219	JD79185-11	CHROMIUM	Total	200
114-MW53C-47.5-20231219	JD79185-11	TOC	Total	5
114-MW53C-47.5-20231219	JD79185-11F	IRON	Dissolved	10
114-MW53C-47.5-20231219	JD79185-11F	MANGANESE	Dissolved	10
114-PZ-52WR-74.0-20231219	JD79185-12	SULFATE	Total	50
114-PZ-52WR-74.0-20231219	JD79185-12	CHROMIUM	Total	10
114-PZ-52WR-74.0-20231219	JD79185-12	TOC	Total	100
114-PZ-52WR-74.0-20231219	JD79185-12F	IRON	Dissolved	10
114-PZ-52WR-74.0-20231219	JD79185-12F	MANGANESE	Dissolved	50
114-PZ-52WR-74.0-20231219	JD79185-12F	CHROMIUM	Dissolved	10
114-MW61D-131.0-20231219	JD79185-13	CHROMIUM	Total	10
114-MW61D-131.0-20231219	JD79185-13F	IRON	Dissolved	10
114-MW61D-131.0-20231219	JD79185-13F	MANGANESE	Dissolved	10
114-MW61D-131.0-20231219	JD79185-13F	CHROMIUM	Dissolved	10
114-MW61D-136.0-20231219	JD79185-14	CHROMIUM	Total	10
114-MW61D-136.0-20231219	JD79185-14F	IRON	Dissolved	10
114-MW61D-136.0-20231219	JD79185-14F	MANGANESE	Dissolved	10
114-MW61D-136.0-20231219	JD79185-14F	CHROMIUM	Dissolved	10
GW-RI-FB-20231219	JD79185-15	CHROMIUM	Total	2
GW-RI-FB-20231219	JD79185-15F	IRON	Dissolved	2
GW-RI-FB-20231219	JD79185-15F	MANGANESE	Dissolved	2
114-MW4D-90-94-20231219	JD79185-1F	IRON	Dissolved	10
114-MW4D-90-94-20231219	JD79185-1F	MANGANESE	Dissolved	10
114-MW4D-98-102-20231219	JD79185-2	CHROMIUM	Total	10
114-MW4D-98-102-20231219	JD79185-2	TOC	Total	5
114-MW4D-98-102-20231219	JD79185-2F	IRON	Dissolved	10
114-MW4D-98-102-20231219	JD79185-2F	MANGANESE	Dissolved	10
114-MW4D-111-115-20231219	JD79185-3	CHROMIUM	Total	10
114-MW4D-111-115-20231219	JD79185-3	TOC	Total	5
114-MW4D-111-115-20231219	JD79185-3F	IRON	Dissolved	10

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW4D-111-115-20231219	JD79185-3F	MANGANESE	Dissolved	10
114-MW4D-121-125-20231219	JD79185-4	CHROMIUM	Total	10
114-MW4D-121-125-20231219	JD79185-4	TOC	Total	10
114-MW4D-121-125-20231219	JD79185-4F	IRON	Dissolved	10
114-MW4D-121-125-20231219	JD79185-4F	MANGANESE	Dissolved	10
114-MW57D-87.5-91.5-20231219	JD79185-5	CHROMIUM	Total	10
114-MW57D-87.5-91.5-20231219	JD79185-5F	IRON	Dissolved	10
114-MW57D-87.5-91.5-20231219	JD79185-5F	MANGANESE	Dissolved	10
114-MW57D-96.5-100.5-20231219	JD79185-6	CHROMIUM	Total	10
114-MW57D-96.5-100.5-20231219	JD79185-6F	IRON	Dissolved	10
114-MW57D-96.5-100.5-20231219	JD79185-6F	MANGANESE	Dissolved	10
114-MW57D-104-108-20231219	JD79185-7	CHROMIUM	Total	10
114-MW57D-104-108-20231219	JD79185-7F	IRON	Dissolved	10
114-MW57D-104-108-20231219	JD79185-7F	MANGANESE	Dissolved	10
114-MW57D-109-113-20231219	JD79185-8	CHROMIUM	Total	10
114-MW57D-109-113-20231219	JD79185-8F	IRON	Dissolved	10
114-MW57D-109-113-20231219	JD79185-8F	MANGANESE	Dissolved	10
114-MW57C-71.0-20231219	JD79185-9	SULFATE	Total	3
114-MW57C-71.0-20231219	JD79185-9	CHROMIUM	Total	200
114-MW57C-71.0-20231219	JD79185-9F	IRON	Dissolved	10
114-MW57C-71.0-20231219	JD79185-9F	MANGANESE	Dissolved	10

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	SGS, Dayton, NJ
Laboratory Job No.:	JD79285
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B/SM3500FE B-11 TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/04/2024
Reviewed by:	Waverly Braunstein/AECOM File Name: JD79285_2024_1_4 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 December 20, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW72D-102-106-20231220	JD79285-1	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, Mn, *Wet Chemistry
114-MW72D-110-114-20231220	JD79285-2	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, Mn, *Wet Chemistry
114-MW72D-116-119-20231220	JD79285-3	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, Mn, *Wet Chemistry
114-MW72D-123-126-20231220	JD79285-4	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, Mn, *Wet Chemistry
114-MW61D-126.0-20231220	JD79285-5	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, Mn, *Wet Chemistry
114-MW61D-121.0-20231220	JD79285-6	Groundwater	Hexavalent Chromium (total/dissolved), Chromium (total/dissolved), Fe, Mn, *Wet Chemistry
114-PZ-66WR-83.0-20231220	JD79285-7	Groundwater	Hexavalent Chromium, Chromium, Fe, Mn, *Wet Chemistry
114-PZ-66WR-83.0-20231220-X (Field duplicate of 114-PZ-66WR-83.0-20231220)	JD79285-8	Groundwater	Hexavalent Chromium, Chromium, Fe, Mn, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
GW-RI-FB-20231220	JD79285-9	Field Blank	Hexavalent Chromium, Chromium, Fe, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – dissolved Iron, dissolved Ferrous Iron,			
Mn – dissolved Manganese			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested dissolved ferrous iron for all samples by method 6020B. The laboratory analyzed and reported results for dissolved iron by method 6020B and dissolved ferrous iron by method SM3500 FE B-11. All results have been reported.

Hexavalent Chromium

Sample Results

The results for total/dissolved chromium and total/dissolved hexavalent chromium were compared to ensure that the total/dissolved chromium concentration was greater than the total/dissolved hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

The dissolved chromium results were less than the dissolved hexavalent chromium results in sample 114-MW72D-123-126-20231220 (JD79285-4F). Results were estimated (J).

The total hexavalent chromium results were less than the dissolved hexavalent chromium results in sample 114-MW72D-123-126-20231220 (JD79285-4F). Results were estimated (J).

Matrix Spike (MS) Results

Sample 114-PZ-66WR-83.0-20231220 (JD79285-7) was analyzed as matrix spikes for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-PZ-66WR-83.0-20231220 (JD79285-7) was analyzed as lab duplicate for this SDG. All results were nondetect. All QC acceptance criteria were met. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-PZ-66WR-83.0-20231220 (JD79285-7) and 114-PZ-66WR-83.0-20231220-X (JD79285-8) were submitted as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals

Holding Time

Dissolved ferrous iron analysis is normally performed in the field and has a method-defined holding time of 15 minutes. The analysis for the sample in this data package was performed in the laboratory. All ferrous iron results are estimated (J-/UJ).

MS/Matrix Spike Duplicate (MSD) Results

Sample 114-PZ-66WR-83.0-20231220 (JD79285-7, -7F) was analyzed as the MS/MSD for chromium (total/dissolved), iron (dissolved), ferrous iron (dissolved), and manganese (dissolved) in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-PZ-66WR-83.0-20231220 (JD79285-7) and 114-PZ-66WR-83.0-20231220-X (JD79285-8) were submitted as the field duplicate pair for chromium and iron. All QC acceptance criteria were met. No qualifications were made.

Wet Chemistry (Sulfate, TOC)

Field Blank (FB)

The FB, GW-RI-FB-20231220 (JD79285-9), reported sulfate at a concentration less than the reporting limit (RL) but greater than the method detection limit (MDL). Sample results for 114-MW72D-102-106-20231220 (JD79285-1) were greater than three times but less than ten times the amount in the FB. Estimate (JB). Sample results for 114-MW72D-110-114-20231220 (JD79285-2), 114-MW72D-116-119-20231220 (JD79285-3) and 114-MW72D-123-126-20231220 (JD79285-4) were less than three times the amount in the FB. Results were negated (UB) at the sample concentration. All other sample results were greater than ten times the amount in the FB; therefore, no qualifications were required.

MS/MSD Results

Sample 114-MW66D-107.0-111.0-20230927 (460-289062-7) was analyzed as a MS for sulfate, in this data set. Sample 114-MW61D-126.0-20231220 (JD79285-5) was also analyzed as a MS/MSD for TOC. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

Sample 114-MW66D-107.0-111.0-20230927 (460-289062-7) was analyzed as a laboratory duplicate for sulfate in this data set. All QC acceptance criteria were met. No qualifications were made.

LCS/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

Samples 114-PZ-66WR-83.0-20231220 (JD79285-7) and 114-PZ-66WR-83.0-20231220-X (JD79285-8) were submitted as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The nondetect result for iron in sample 114-PZ-66WR-83.0-20231220, as presented in Attachments A and B, exceeded the Groundwater Action levels; therefore, the nondetect results may not meet project objectives.

Results estimated due to holding time issues are useable with an unknown bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Results estimated due to total/dissolved chromium results lower than the corresponding total/dissolved hexavalent chromium results are useable with an unknown bias.

Results estimated due to field blank contamination are useable with a potential high bias.

Results negated due to field blank contamination are useable as non-detects at the reported concentration.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date December 20, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79285
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231220

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20231220	JD79285-1	Total	CHROMIUM (HEXAVALENT)	U	0.12	0.12	0.010		
114-MW72D-102-106-20231220	JD79285-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.12	0.12	0.010		
114-MW72D-110-114-20231220	JD79285-2	Total	CHROMIUM (HEXAVALENT)	U	0.10	0.10	0.010		
114-MW72D-110-114-20231220	JD79285-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.11	0.11	0.010		
114-MW72D-116-119-20231220	JD79285-3	Total	CHROMIUM (HEXAVALENT)	U	0.076	0.076	0.010		
114-MW72D-116-119-20231220	JD79285-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.078	0.078	0.010		
114-MW72D-123-126-20231220	JD79285-4	Total	CHROMIUM (HEXAVALENT)	U	0.036	0.036J	0.010	Qualify	1
114-MW72D-123-126-20231220	JD79285-4F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.055	0.055J	0.010	Qualify	1,2
114-PZ-66WR-83.0-20231220	JD79285-7	Total	CHROMIUM (HEXAVALENT)	U	157	157	5.0		
114-PZ-66WR-83.0-20231220-X	JD79285-8	Total	CHROMIUM (HEXAVALENT)	U	164	164	5.0		

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

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

NJDEP Validation Footnote

1. The total hexavalent chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

2. The dissolved total chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

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Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date December 20, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79285
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231220

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20231220	JD79285-1	Total	CHROMIUM	U	134	134	10		
114-MW72D-102-106-20231220	JD79285-1F	Dissolved	CHROMIUM	U	132	132	10		
114-MW72D-110-114-20231220	JD79285-2	Total	CHROMIUM	U	131	131	10		
114-MW72D-110-114-20231220	JD79285-2F	Dissolved	CHROMIUM	U	138	138	10		
114-MW72D-116-119-20231220	JD79285-3	Total	CHROMIUM	U	75.1	75.1	10		
114-MW72D-116-119-20231220	JD79285-3F	Dissolved	CHROMIUM	U	72.1	72.1	10		
114-MW72D-123-126-20231220	JD79285-4	Total	CHROMIUM	U	36.3	36.3	10		
114-MW72D-123-126-20231220	JD79285-4F	Dissolved	CHROMIUM	U	33.7	33.7J	10	Qualify	2
114-MW61D-126.0-20231220	JD79285-5	Total	CHROMIUM	U	5.0B	5.0J	10	Qualify	1
114-PZ-66WR-83.0-20231220	JD79285-7	Total	CHROMIUM	U	159000	159000	5000		
114-PZ-66WR-83.0-20231220	JD79285-7F	Dissolved	MANGANESE	U	146	146	100		
114-PZ-66WR-83.0-20231220-X	JD79285-8	Total	CHROMIUM	U	155000	155000	5000		
114-PZ-66WR-83.0-20231220-X	JD79285-8F	Dissolved	MANGANESE	U	155	155	10		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. The dissolved total chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Ferrous iron dissolved method SM3500 FE B)

Site Name PPG GW RI - Bedrock
Sampling Date December 20, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79285
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231220

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20231220	JD79285-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-110-114-20231220	JD79285-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-116-119-20231220	JD79285-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-123-126-20231220	JD79285-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-126.0-20231220	JD79285-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-121.0-20231220	JD79285-6F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-PZ-66WR-83.0-20231220	JD79285-7F	Dissolved	IRON (FERROUS)	U	0.48	0.48J	0.20	Qualify	1
114-PZ-66WR-83.0-20231220-X	JD79285-8F	Dissolved	IRON (FERROUS)	U	0.53	0.53J	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date December 20, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79285
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231220

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20231220	JD79285-1	SULFATE	U	3.5	3.5JB	2.0	Qualify	3
114-MW72D-110-114-20231220	JD79285-2	SULFATE	U	2.3	UB	2.3	Negate	2
114-MW72D-116-119-20231220	JD79285-3	SULFATE	U	2.4	UB	2.4	Negate	2
114-MW72D-123-126-20231220	JD79285-4	SULFATE	U	2.5	UB	2.5	Negate	2
114-MW61D-126.0-20231220	JD79285-5	SULFATE	U	46.1	46.1	2.0		
114-MW61D-121.0-20231220	JD79285-6	SULFATE	U	48.7	48.7	2.0		
114-PZ-66WR-83.0-20231220	JD79285-7	SULFATE	U	374	374	20		
114-PZ-66WR-83.0-20231220-X	JD79285-8	SULFATE	U	375	375	20		
GW-RI-FB-20231220	JD79285-9	SULFATE	U	1.0B	1.0J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. Sample result was >RL and <3X the associated blank result. Sample result was negated at the reported concentration.
3. Sample result was $\geq 3x$ and <10X the associated blank result.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date December 20, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79285
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231220

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20231220	JD79285-1	Total	Total Organic Carbon	U	20.5	20.5	1.0		
114-MW72D-110-114-20231220	JD79285-2	Total	Total Organic Carbon	U	32.6	32.6	1.0		
114-MW72D-116-119-20231220	JD79285-3	Total	Total Organic Carbon	U	43.4	43.4	1.0		
114-MW72D-123-126-20231220	JD79285-4	Total	Total Organic Carbon	U	37.1	37.1	1.0		
114-MW61D-126.0-20231220	JD79285-5	Total	Total Organic Carbon	U	0.71B	0.71J	1.0	Qualify	1
114-MW61D-121.0-20231220	JD79285-6	Total	Total Organic Carbon	U	0.69B	0.69J	1.0	Qualify	1
114-PZ-66WR-83.0-20231220	JD79285-7	Total	Total Organic Carbon	U	1.8B	1.8J	5.0	Qualify	1
114-PZ-66WR-83.0-20231220-X	JD79285-8	Total	Total Organic Carbon	U	2.4	2.4	1.0		

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

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

NJDEP Validation Footnote

- The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD79285		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 1/04/2024	
Number of Samples/Matrix: 8 GW, 6 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Waverly Braunstein 1/17/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.7°C
Holding Time	Yes	No	Sampled 12/20/2023, analyzed 12/21/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	12/21/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN49541-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-202320231220 (JD79285-9) total, ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-PZ-66WR-83.0-20231220 (JD79285-7)
Laboratory Duplicate	Yes	No	114-PZ-66WR-83.0-20231220 (JD79285-7)
Laboratory Control Standards	Yes	No	GN49541-B1 {95.3 %R}
Field Duplicate	Yes	No	114-PZ-66WR-83.0-20231220 (JD79285-7) and 114-PZ-66WR-83.0-20231220-X(JD79285-8)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5,
Total Chromium vs Hexavalent Chromium Results	No	Yes	See table. Dissolved Cr & dissolved Cr6 qualified J in sample 114-MW72D-123-126-20231220.
Total vs Dissolved Results	No	Yes	Dissolved JD79285, 1-6 only. See tables below. Dissolved and total Cr6 qualified J in sample 114-MW72D-123-126-20231220.
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-PZ-66WR-83.0-20231220 (JD79285-7)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	75	157	222	NA	86.7	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PZ-66WR-83.0-20231220	JD79285-7	HEXAVALENT CHROMIUM	157		151		5.0	mg/l	3.9	Both ND, Accept

Field Duplicates

114-PZ-66WR-83.0-20231220 (JD79285-7) and 114-PZ-66WR-83.0-20231220-X (JD79285-8)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	157		164		5.0	mg/l	4.4	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW72D-102-106-20231220	JD79285-1	134	10	120	10	11	T Cr > T Cr6, Accept
114-MW72D-110-114-20231220	JD79285-2	131	10	100	10	27	T Cr > T Cr6, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW72D-116-119-20231220	JD79285-3	75.1	10	76	10	1	T Cr < T Cr6, SRs > 4x RL, RPD ≤ 30%, Accept
114-MW72D-123-126-20231220	JD79285-4	36.3	10	36	10	1	T Cr > T Cr6, Accept
114-MW61D-126.0-20231220	JD79285-5	5.0	10		10	NC	T Cr > T Cr6, Accept
114-MW61D-121.0-20231220	JD79285-6		10		10	0	Both ND, Accept
114-PZ-66WR-83.0-20231220	JD79285-7	159000	5000	157000	5000	1	T Cr > T Cr6, Accept
114-PZ-66WR-83.0-20231220-X	JD79285-8	155000	5000	164000	5000	5.6	
GW-RI-FB-20231220	JD79285-9		2.0		10	0	Both ND, Accept

NC- not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW72D-102-106-20231220	JD79285-1F	132	10	120	10	10	D Cr > D Cr6, Accept
114-MW72D-110-114-20231220	JD79285-2F	138	10	110	10	23	D Cr > D Cr6, Accept
114-MW72D-116-119-20231220	JD79285-3F	72.1	10	78	10	8	D Cr < D Cr6, SRs > 4x RL, RPD ≤ 30%, Accept
114-MW72D-123-126-20231220	JD79285-4F	33.7	10	55	10	48	D Cr < D Cr6, SRs > 4x RL, RPD > 30%, Qualify J
114-MW61D-126.0-20231220	JD79285-5F		10		10	0	Both ND, Accept
114-MW61D-121.0-20231220	JD79285-6F		10		10	0	Both ND, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW72D-102-106-20231220	JD79285-1, -1F	120	10	120	10	0	T Cr6 = D Cr6, Accept
114-MW72D-110-114-20231220	JD79285-2, -2F	100	10	110	10	10	T Cr6 < D Cr6, SRs > 4x RL, RPD ≤ 30%, Accept
114-MW72D-116-119-20231220	JD79285-3, -3F	76	10	78	10	3	T Cr6 < D Cr6, SRs > 4x RL, RPD ≤ 30%, Accept
114-MW72D-123-126-20231220	JD79285-4, -4F	36	10	55	10	42	T Cr6 < D Cr6, SRs > 4x RL, RPD > 30%, Qualify J
114-MW61D-126.0-20231220	JD79285-5, -5F		10		10	0	Both ND, Accept
114-MW61D-121.0-20231220	JD79285-6, -6F		10		10	0	Both ND, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-66WR-83.0-20231220	JD79285-7	CHROMIUM (HEXAVALENT)	Total	500
114-PZ-66WR-83.0-20231220-X	JD79285-8	CHROMIUM (HEXAVALENT)	Total	500

SDG#: JD79285/ Method 7196**GN49541**

Cr+6 ICAL 12/21/23

GW

(p. 1376 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.089
0.3	0.266
0.5	0.44
0.8	0.688
1	0.856

(p. 1376 of
data pkg)

AECOM Calculated Intercept	0.00384	OK	Reported intercept	0.0038
AECOM Slope	0.8566	OK	Reported Slope	0.8566
AECOM Calculated r	0.99991	OK	Reported r	0.99991

LCS calculation**GN49541-B1****P. 1359, 1376**

Background absorbance 0

Sample absorbance 0.126

LCS Soluble Instrument Response 0.126

Instrument Concentration (mg/L) 0.143

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.143	OK	Reported Result (mg/L)	0.143

%R = Found/True*100**GN49541-B1****P. 1359, 1376**

True Value (mg/L) 0.15

AECOM Calculated %R	95.1	OK	Reported %R	95.3

MS calculation**GN49541-S2****P. 1361, 1376****114-PZ-66WR-83.0-20231220****UNFILTERED**

Background reading 0

Total absorbance 0.385

Total absorbance - background 0.385

Instrument Concentration (mg/L) 0.4450

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 500

AECOM Calculated MS Result (mg/L)	222.5	OK	Reported Result (mg/L)	222.5

%R = Found/True*100**GN49541-S2****P. 1361, 1376****114-PZ-66WR-83.0-20231220**

True Value (mg/L) 75.0

Native concentration (mg/L) 157

AECOM Calculated MS Result %R	88.0	OK	Reported %R	88.0

UNFILTERED

Reporting Limit	JD79285-7	P. 40, 1376	114-PZ-66WR-83.0-20231220

Low Standard	0.01

NA: standards
and samples
treated the same

Initial volume (L)	0.5

Final volume (L)	0.5

Dilution Factor	500

AECOM Calculated Reporting Limit	5.000	OK	Reported RL (mg/L)=	5.0

UNFILTERED

<u>Sample Calculations</u>	JD79285-7	P. 40, 1376	114-PZ-66WR-83.0-20231220

Background reading	0

Total absorbance	0.272

Total absorbance - background	0.272

Instrument Response (mg/L)	0.313

NA: standards
and samples
treated the same

Sample volume (L)	0.5

Final Volume (L)	0.5

Dilution Factor	500

AECOM Calculated Result (mg/L)	156.5	OK	Reported Result (mg/L)	157

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD79285		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 1/04/2024	
Number of Samples/Matrix: 8 GW, 6 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Waverly Braunstein 01/17/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Ferrous iron by 6020B was requested on the COC. Laboratory analyzed for dissolved iron by SW 6020B, and dissolved ferrous iron by SM 3500 FE B-11. All Results are reported
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.7 °C
Holding Time	No	Yes	Sampled 12/20/2023, analyzed 12/21 - 12/29/2023, Dissolved iron by method 6020 met QC HT. Dissolved ferrous iron by method SM3500- FE B is normally performed in the field with a method-defined holding time of 15 minutes. Results are estimated (J/UJ) as the analysis was performed in the lab outside the 15- minute HT.
Quantitation Limits	No	No	see table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP43946 Cr, Fe, Mn all ND
Field Blanks	No	Yes	GW-RI-FB-20231220 (JD79285-9, -9F), Cr, Fe, Mn , ferrous iron, All ND, sulfate (1.0 mg/l), see table below
Matrix Spike	No	Yes	114-PZ-66WR-83.0-20231220 (JD79285-7, -7F), Cr, Fe, Mn, ferrous iron, and sulfate, 114-MW61D-126.0-20231220 (JD79285-5) TOC, see tables below
Matrix Spike Duplicate	No	Yes	Same as above but no sulfate
Post Digestion Spike	NA	NA	
Laboratory Duplicate	Yes	No	114-PZ-66WR-83.0-20231220 (JD79285-7) sulfate, none for all others, see table below
Laboratory Control Standards	Yes	No	MP43946 Cr (94.4%R), Fe (102.0 %R), and Mn (93.5 %R), GN49584 ferrous iron (93.3 %R), GP51233/GN49600 sulfate (103.3 %R), GP51235/GN49786 TOC (104.0 %R) and GP51236/GN49776 TOC (100.0 %R)

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Field Duplicate	Yes	No	114-PZ-66WR-83.0-20231220 (JD79285-7) and 114-PZ-66WR-83.0-20231220-X (JD79285-8), see table below
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	see hexavalent chromium section for table,

Field Blank

GW-RI-FB-20231220 (JD79285-9)

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
SULFATE	Total	1.0	J	2.0	114-MW72D-102-106-20231220 (JD792855-1) SR >3x but less than 10x FB, Estimate (J+), Samples 114-MW72D-110-114-20231220 (JD79285-2), 114-MW72D-116-119-20231220 (JD79285-3) and 114-MW72D-123-126-20231220 (JD79285-4) SR <3x FB, Negate at concentration. All other SR >10x FB,

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates**

114-PZ-66WR-83.0-20231220 (JD79285-7, -7F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Ferrous Iron	Dissolved	3.0	0.48	3.3	3.3	94.0	94.0	113	92	0	20	OK, Accept
SULFATE	Total	80	374	429	NA	68.8	NA	120	80	NA	15	SR >4x spike amt, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW61D-126.0-20231220 (JD79285-5)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	0.71	47.1	47.0	92.8	92.3	132	71	0.2	10	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result**

114-PZ-66WR-83.0-20231220 (JD79285-7)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	159000	156000	131000	-3750	-35000	125	75	17.4	20	OK, Accept
IRON	Dissolved	4000	65.8	4280	4170	105.4	102.6	125	75	2.6	20	OK, Accept
MANGANESE	Dissolved	80	161.7	242	237	100	93.8	125	75	2.1	20	OK, Accept

114-PZ-66WR-83.0-20231220 (JD79285-7F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	155000	166000	144000	8750	-18750	125	75	14.2	20	OK, Accept
IRON	Dissolved	4000	83.4	4070	4110	99.7	100.7	125	75	1.0	20	OK, Accept
MANGANESE	Dissolved	80	146	215	220	86.3	92.5	125	75	2.3	20	OK, Accept

Laboratory Duplicates

114-PZ-66WR-83.0-20231220 (JD79285-7)

Analyte	Fraction	SR (mg/l)	Qual	RL	SDR (mg/l)	Qual	RL	RPD %	RPD Upper Limit	Action
SULFATE	Total	374		20	378		20	1.1	20	OK, Accept

Field Duplicates

114-PZ-66WR-83.0-20231220 (JD79285-7) and 114-PZ-66WR-83.0-20231220-X (JD79285-8)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
SULFATE	Total	374		375		20	mg/l	0.3	RPD < 20%, Accept
IRON (FERROUS)	Dissolved	0.48		0.53		0.20	mg/l	9.9	RPD < 20%, Accept
IRON	Dissolved	2500	U	250	U	2500/250	ug/l	0	Both ND
MANGANESE	Dissolved	146		155		100/10	ug/l	6.0	RPD < 20%, Accept
CHROMIUM	Total	159000		155000		5000	ug/l	2.5	RPD < 20%, Accept
TOTAL ORGANIC CARBON	Total	1.8	J	2.4		5.0/1.0	mg/l	28.6	1 SR<RL, ABS Diff <RL, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-MW72D-102-106-20231220	JD79285-1	134	10	132	10	50	2	2	T Cr > D Cr, Accept
114-MW72D-110-114-20231220	JD79285-2	131	10	138	10	50	7	5	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-MW72D-116-119-20231220	JD79285-3	75.1	10	72.1	10	50	3	4	T Cr > D Cr, Accept
114-MW72D-123-126-20231220	JD79285-4	36.3	10	33.7	10	50	3	7	T Cr > D Cr, Accept
114-MW61D-126.0-20231220	JD79285-5	5.0	10		10	50	5	NC	T Cr > D Cr, Accept
114-MW61D-121.0-20231220	JD79285-6		10		10	50	0	0	Both ND, Accept

NC- not calculated**Reporting Limits GW Metals**

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PZ-66WR-83.0-20231220	JD79285-7F	IRON	2500	N	ug/l	300

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW72D-102-106-20231220	JD79285-1	CHROMIUM	Total	10
114-MW72D-102-106-20231220	JD79285-1F	IRON	Dissolved	10
114-MW72D-102-106-20231220	JD79285-1F	MANGANESE	Dissolved	10
114-MW72D-102-106-20231220	JD79285-1F	CHROMIUM	Dissolved	10
114-MW72D-110-114-20231220	JD79285-2	CHROMIUM	Total	10
114-MW72D-110-114-20231220	JD79285-2F	IRON	Dissolved	10
114-MW72D-110-114-20231220	JD79285-2F	MANGANESE	Dissolved	10
114-MW72D-110-114-20231220	JD79285-2F	CHROMIUM	Dissolved	10
114-MW72D-116-119-20231220	JD79285-3	CHROMIUM	Total	10
114-MW72D-116-119-20231220	JD79285-3F	IRON	Dissolved	10
114-MW72D-116-119-20231220	JD79285-3F	MANGANESE	Dissolved	10
114-MW72D-116-119-20231220	JD79285-3F	CHROMIUM	Dissolved	10
114-MW72D-123-126-20231220	JD79285-4	CHROMIUM	Total	10
114-MW72D-123-126-20231220	JD79285-4F	IRON	Dissolved	10
114-MW72D-123-126-20231220	JD79285-4F	MANGANESE	Dissolved	10
114-MW72D-123-126-20231220	JD79285-4F	CHROMIUM	Dissolved	10
114-MW61D-126.0-20231220	JD79285-5	CHROMIUM	Total	10
114-MW61D-126.0-20231220	JD79285-5F	IRON	Dissolved	10
114-MW61D-126.0-20231220	JD79285-5F	MANGANESE	Dissolved	10
114-MW61D-126.0-20231220	JD79285-5F	CHROMIUM	Dissolved	10
114-MW61D-121.0-20231220	JD79285-6	CHROMIUM	Total	10
114-MW61D-121.0-20231220	JD79285-6F	IRON	Dissolved	10
114-MW61D-121.0-20231220	JD79285-6F	MANGANESE	Dissolved	10
114-MW61D-121.0-20231220	JD79285-6F	CHROMIUM	Dissolved	10
114-PZ-66WR-83.0-20231220	JD79285-7	SULFATE	Total	10
114-PZ-66WR-83.0-20231220	JD79285-7	CHROMIUM	Total	5000
114-PZ-66WR-83.0-20231220	JD79285-7	TOC	Total	5
114-PZ-66WR-83.0-20231220	JD79285-7F	IRON	Dissolved	100
114-PZ-66WR-83.0-20231220	JD79285-7F	MANGANESE	Dissolved	100
114-PZ-66WR-83.0-20231220-X	JD79285-8	SULFATE	Total	10
114-PZ-66WR-83.0-20231220-X	JD79285-8	CHROMIUM	Total	500
114-PZ-66WR-83.0-20231220-X	JD79285-8	CHROMIUM	Total	5000
114-PZ-66WR-83.0-20231220-X	JD79285-8F	IRON	Dissolved	10

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-66WR-83.0-20231220-X	JD79285-8F	IRON	Dissolved	10
114-PZ-66WR-83.0-20231220-X	JD79285-8F	MANGANESE	Dissolved	10
114-PZ-66WR-83.0-20231220-X	JD79285-8F	MANGANESE	Dissolved	10
GW-RI-FB-20231220	JD79285-9	CHROMIUM	Total	2
GW-RI-FB-20231220	JD79285-9F	IRON	Dissolved	2
GW-RI-FB-20231220	JD79285-9F	MANGANESE	Dissolved	2

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	SGS, Dayton, NJ
Laboratory Job No.:	JD79443
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/09/2024
Reviewed by:	Waverly Braunstein/AECOM File Name: JD79443_2024_1_09 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 December 22, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW62C-73.0-20231222	JD79443-1	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79443-1F	Groundwater (D)	Iron
114-MW61D-117.0-20231222	JD79443-2	Groundwater (T)	Hexavalent Chromium, Chromium, *Wet Chemistry
	JD79443-2F	Groundwater (D)	Hexavalent Chromium, Chromium, Iron, Manganese
GW-RI-FB-20231222	JD79443-3	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
D – Dissolved (Field filtered)			
T – Total			

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a

listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) requested field filtered metals for all samples. The laboratory did not receive sample volume for the field filtered metals for samples 114-MW62C-73.0-20231222 (JD79443-1) and GW-RI-FB-20231222 (JD79443-3). The laboratory was directed by AECOM to filter, preserve and analyze for dissolved iron for sample 114-MW62C-73.0-20231222 (JD79443-1).

The laboratory also received field filtered samples for hexavalent chromium for sample 114-MW61D-117.0-20231222 (JD79443-2) which was not on the COC. AECOM requested analysis be performed for hexavalent chromium, chromium, iron, and manganese for this field filtered sample.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

No qualifications were made.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals

MS/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry (Sulfate, TOC)

MS/ MSD

Sample 114-MW62C-73.0-20231222 (JD79443-1) was analyzed as a MS/MSD for sulfate in this data set. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

Sample 114-MW62C-73.0-20231222 (JD79443-1) was analyzed as a laboratory duplicate for sulfate in this data set. All QC acceptance criteria were met.

A laboratory duplicate for TOC was not performed on a site sample in this data set. No validation actions were taken on this basis.

LCS/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date December 22, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79443
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231222

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW62C-73.0-20231222	JD79443-1	Total	CHROMIUM (HEXAVALENT)	U	0.0052B	0.0052J	0.010	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GW RI - Bedrock
Sampling Date December 22, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79443
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231222

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW62C-73.0-20231222	JD79443-1	Total	CHROMIUM	U	9.5B	9.5J	10	Qualify	1
114-MW61D-117.0-20231222	JD79443-2	Total	CHROMIUM	U	7.8B	7.8J	10	Qualify	1
114-MW61D-117.0-20231222	JD79443-2F	Dissolved	IRON	U	25.7B	25.7J	50	Qualify	1
114-MW61D-117.0-20231222	JD79443-2F	Dissolved	MANGANESE	U	0.68B	0.68J	2.0	Qualify	1
114-MW61D-117.0-20231222	JD79443-2F	Dissolved	CHROMIUM	U	0.64B	0.64J	2.0	Qualify	1
GW-RI-FB-20231222	JD79443-3	Total	CHROMIUM	U	0.63B	0.63J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GW RI - Bedrock
Sampling Date December 22, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79443
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231222

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW62C-73.0-20231222	JD79443-1	SULFATE	U	57.6	57.6	2.0		
114-MW61D-117.0-20231222	JD79443-2	SULFATE	U	56.8	56.8	2.0		
GW-RI-FB-20231222	JD79443-3	SULFATE	U	1.4B	1.4J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date December 22, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79443
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231222

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW62C-73.0-20231222	JD79443-1	Total	Total Organic Carbon	U	1.0	1.0	1.0		
114-MW61D-117.0-20231222	JD79443-2	Total	Total Organic Carbon	U	1.0	1.0	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD79443		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 1/10/2024	
Number of Samples/Matrix: 2 GW, 1 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Waverly Braunstein 1/17/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The laboratory also received field filtered samples for hexavalent chromium for sample 114-MW61D-117.0-20231222 (JD79443-2) which was not on the COC. AECOM requested analysis be performed for hexavalent chromium (dissolved), chromium (dissolved), iron and dissolved manganese for this sample.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C
Holding Time	Yes	No	Sampled 12/22/2023, analyzed 12/22/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	12/22/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN49653-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20231222, ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN49653-B1 {100.0 %R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5,

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total Chromium vs Hexavalent Chromium Results	Yes	No	
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW62C-73.0-20231222	JD79443-1	9.5	10	5.2	10.0	59	T Cr > T Cr6, Accept
114-MW61D-117.0-20231222	JD79443-2	7.8	10		10.0	NC	T Cr > T Cr6, Accept
GW-RI-FB-20231222	JD79443-3	0.63	2.0		10.0	NC	T Cr > T Cr6, Accept

NC- not calculated**Dissolved Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61D-117.0-20231222	JD79443-2F	0.64	2.0		10	NC	D Cr > D Cr6, Accept

NC- not calculated**Total Hexavalent Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW61D-117.0-20231222	JD79443-2F		10		10	0	Both ND, Accept

NC- not calculated

SDG#: JD79443/ Method 7196**GN49653**

Cr+6 ICAL 12/22/23

GW

(p. 1180 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.425
0.8	0.672
1	0.850

(p. 1180 of
data pkg)

AECOM Calculated Intercept	-0.00041	OK	Reported intercept	-0.0004
AECOM Slope	0.8468	OK	Reported Slope	0.8468
AECOM Calculated r	0.99997	OK	Reported r	0.99997

LCS calculation**GN49653-B1****P. 1167, 1180**

Background absorbance 0

Sample absorbance 0.127

LCS Soluble Instrument Response 0.127

Instrument Concentration (mg/L) 0.150

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN49653-B1****P. 1167, 1180**

True Value (mg/L) 0.15

AECOM Calculated %R	100.3	OK	Reported %R	100.0

MS calculation**GN49653-S1****P. 1169, 1180****Batch QC (JD79442-5)****UNFILTERED**

Background reading 0

Total absorbance 0.128

Total absorbance - background 0.128

Instrument Concentration (mg/L) 0.1516

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 1

AECOM Calculated MS Result (mg/L)	0.152	OK	Reported Result (mg/L)	0.15

%R = Found/True*100**GN49653-S1****P. 1169, 1180****Batch QC - (JD79442-5)**

True Value (mg/L) 0.150

Native concentration (mg/L) 0

AECOM Calculated MS Result %R	101.1	OK, rounding	Reported %R	100.0

UNFILTERED

Reporting Limit	JD79443-1	P. 9, 1180	114-MW62C-73.0-20231222

Low Standard	0.01

NA: standards
and samples
treated the same

Initial volume (L)	0.5

Final volume (L)	0.5

Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.01

UNFILTERED

<u>Sample Calculations</u>	JD79443-1	P. 9, 1180	114-MW62C-73.0-20231222

Background reading	0

Total absorbance	0.004

Total absorbance - background	0.004

Instrument Response (mg/L)	0.005

NA: standards
and samples
treated the same

Sample volume (L)	0.5

Final Volume (L)	0.5

Dilution Factor	1

AECOM Calculated Result (mg/L)	0.0052	OK	Reported Result (mg/L)	0.0052 J

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD79443		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 1/09/2024	
Number of Samples/Matrix: 3 GW, 1 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Waverly Braunstein 1/17/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The chain of custody (COC) requested field filtered metals for all samples. The laboratory did not receive sample volume for the field filtered metals for samples 114-MW62C-73.0-20231222 (JD79443-1) and GW-RI-FB-20231222 (JD79443-3). The laboratory was directed by AECOM to filter, preserve and analyze for dissolved iron for sample 114-MW62C-73.0-20231222 (JD79443-1). The laboratory also received field filtered samples for hexavalent chromium for sample 114-MW61D-117.0-20231222 (JD79443-2) which was not on the COC. AECOM requested analysis be performed for hexavalent chromium (dissolved), chromium (dissolved), iron and dissolved manganese for this sample.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C
Holding Time	Yes	No	Sampled 12/22/2023, analyzed 12/27/23 - 1/3/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP43974 Cr, Fe, Mn all ND, MP44021 Fe ND, GP51273/GN49708 sulfate ND, GP51199317/GN49880, TOC ND
Field Blanks	Yes	No	GW-RI-FB-20231222 (JD79443-3), Cr, TOC, and sulfate, All ND
Matrix Spike	Yes	No	114-MW62C-73.0-20231222 (JD79443-1) sulfate, Batch QC Cr, Fe, Mn
Matrix Spike Duplicate	NA	NA	
Post Digestion Spike	NA	NA	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Laboratory Duplicate	Yes	No	114-MW62C-73.0-20231222 (JD79443-1) sulfate , none for all others, see table below
Laboratory Control Standards	Yes	No	MP43974 Cr (99.4%R), Fe (107.0 %R), Mn (99.4 %R), MP44021 Fe (105.0 %R), GP51273/GN49708 sulfate (107.4 %R), GP51317/GN49880 TOC (94.2 %R)
Field Duplicate	NA	NA	None with this SDG
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table,

Matrix Spikes/Matrix Spike Duplicates

114-MW62C-73.0-20231222 (JD79443-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
SULFATE	Total	80	57.6	140	NA	103.0	NA	120	80	NA	15	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Laboratory Duplicates**

114-MW62C-73.0-20231222 (JD79443-1)

Analyte	Fraction	SR (mg/l)	Qual	RL	SDR (mg/l)	Qual	RL	RPD %	RPD Upper Limit	Action
SULFATE	Total	57.6		2.0	58.8		2.0	2.1	20	OK, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RL X5	Absolute Difference	RPD (%)	Action
114-MW61D-117.0-20231222	JD79443-2	7.8	10	0.64	2.0	50	7	170	T Cr > D Cr, Accept

NC- Not calculated**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW62C-73.0-20231222	JD79443-1	CHROMIUM	Total	10
114-MW62C-73.0-20231222	JD79443-1F	IRON	Dissolved	10
114-MW61D-117.0-20231222	JD79443-2	CHROMIUM	Total	10
114-MW61D-117.0-20231222	JD79443-2F	IRON	Dissolved	2
114-MW61D-117.0-20231222	JD79443-2F	MANGANESE	Dissolved	2
114-MW61D-117.0-20231222	JD79443-2F	CHROMIUM	Dissolved	2
GW-RI-FB-20231222	JD79443-3	CHROMIUM	Total	2

Data Validation Report

Project:	PPG GW RI - Bedrock
Laboratory:	SGS, Dayton, NJ
Laboratory Job No.:	JD79684
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60667926.GW.BR.RI
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/09/2024
Reviewed by:	Waverly Braunstein/AECOM File Name: JD79684_2024_1_09 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 December 27, 2023 as part of the PPG GW RI - Bedrock at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW52D-80-83-20231227	JD79684-1	Groundwater	Hexavalent Chromium, Chromium, TOC
114-MW52D-87-90-20231227	JD79684-2	Groundwater	Hexavalent Chromium, Chromium, TOC
114-MW52D-102-105-20231227	JD79684-3	Groundwater	Hexavalent Chromium, Chromium, TOC
GW-RI-FB-20231227	JD79684-4	Field Blank	Hexavalent Chromium, Chromium, TOC

The samples were collected following the procedures detailed in the Work Order for PPG GW RI - Bedrock 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each

sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total/dissolved chromium and total/dissolved hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

No results were qualified.

Matrix Spike (MS)

Sample 114-MW52D-102-105-20231227 (JD79684-3) was analyzed as a matrix spike for this data set. The percent recoveries (%Rs) did not meet QC criteria. Results were qualified as estimated with potential low bias (J-/UJ).

Laboratory Duplicate

Sample 114-MW52D-102-105-20231227 (JD79684-3) was analyzed as a laboratory duplicate for this data package. Both samples were nondetect. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals**(MS)/Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry (TOC)**MS/(MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

LCS/Laboratory Control Sample Duplicate (LCSD) Results

The LCS/LCSD %Rs and relative percent difference (RPD) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Samples qualified due to low matrix spike recoveries are useable with a low bias.

Sample results reported between the MDL and RL content 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)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date December 27, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79684
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231227

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20231227	JD79684-1	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	0.010	Qualify	1
114-MW52D-87-90-20231227	JD79684-2	Total	CHROMIUM (HEXAVALENT)	U	0.0049B	0.0049J-	0.010	Qualify	1,2
114-MW52D-102-105-20231227	JD79684-3	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	0.010	Qualify	1

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

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

NJDEP Validation Footnote

1. MS and/or MSD recovery was below the lower acceptance limit.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG GW RI - Bedrock
Sampling Date December 27, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79684
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231227

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20231227	JD79684-1	Total	CHROMIUM	U	5.0B	5.0J	10	Qualify	1
114-MW52D-87-90-20231227	JD79684-2	Total	CHROMIUM	U	11.1	11.1	10		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GW RI - Bedrock
Sampling Date December 27, 2023
Lab Name/ID SGS, Dayton, NJ
SDG No JD79684
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20231227

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20231227	JD79684-1	Total	Total Organic Carbon	U	146	146	10		
114-MW52D-87-90-20231227	JD79684-2	Total	Total Organic Carbon	U	42.1	42.1	1.0		
114-MW52D-102-105-20231227	JD79684-3	Total	Total Organic Carbon	U	45.3	45.3	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD79684		Project Number: 60667926.GW.BR.RI	
Validation Level: Full		Date: 1/10/2024	
Number of Samples/Matrix: 3 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Waverly Braunstein 1/17/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.6 °C
Holding Time	Yes	No	Sampled 12/27/2023, analyzed 12/27/2023
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	12/27/2023
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN49745-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20231227 (JD79684-4), ND
Eh/pH	Yes	No	
Matrix Spike	No	Yes	114-MW52D-102-105-20231227 (JD79684-3), see table
Laboratory Duplicate	Yes	No	114-MW52D-102-105-20231227 (JD79684-3), Both ND
Laboratory Control Standards	Yes	No	GN49745-B1 {102.0 %R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5,
Total vs Dissolved Results	Yes	No	Total only
Total Chromium vs Hexavalent Chromium Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW52D-102-105-20231227 (JD79684-3)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.117	NA	78	NA	115	85	NA	20	Estimate (J-/UJ) all samples

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW52D-102-105-20231227	JD79684-3	HEXAVALENT CHROMIUM	0.010	U	0.010	U	0.010	mg/l	0	Both ND, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW52D-80-83-20231227	JD79684-1	5.0	10		NC	0	T Cr > T Cr6, Accept
114-MW52D-87-90-20231227	JD79684-2	11.1	10	4.9	10	78	T Cr > T Cr6, Accept
114-MW52D-102-105-20231227	JD79684-3		10		10	0	Both ND, Accept
GW-RI-FB-20231227	JD79684-4		2.0		10	0	Both ND, Accept

SDG#: JD79684/ Method 7196**GN49745**

Cr+6 ICAL 12/27/23

GW

(p. 501 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.089
0.3	0.261
0.5	0.433
0.8	0.680
1	0.854

(p. 501 of
data pkg)

AECOM Calculated Intercept	0.00280	OK	Reported intercept	0.0028
AECOM Slope	0.8513	OK	Reported Slope	0.8513
AECOM Calculated r	0.99996	OK	Reported r	0.99996

LCS calculation**GN49745-B1****P. 492, 501**

Background absorbance 0

Sample absorbance 0.133

LCS Soluble Instrument Response 0.133

Instrument Concentration (mg/L) 0.153

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.153	OK	Reported Result (mg/L)	0.153

%R = Found/True*100**GN49745-B1****P. 492, 501**

True Value (mg/L) 0.15

AECOM Calculated %R	102.0	OK	Reported %R	102.0

MS calculation**GN49745-S1****P. 494, 501****114-MW52D-102-105-20231227****UNFILTERED**

Background reading 0.004

Total absorbance 0.106

Total absorbance - background 0.102

Instrument Concentration (mg/L) 0.1165

NA: standards
and samples
treated the same

Sample aliquot 0.05

Final volume 0.05

Dilution Factor 1

AECOM Calculated MS Result (mg/L)	0.12	OK	Reported Result (mg/L)	0.12

%R = Found/True*100**GN49745-S1****P. 494, 501****114-MW52D-102-105-20231227**

True Value (mg/L) 0.150

Native concentration (mg/L) 0

AECOM Calculated MS Result %R	77.7	OK, rounding	Reported %R	80.0

UNFILTERED

UNFILTERED			
<u>Sample Calculations</u>	JD79684-3	P. 13, 501	114-MW52D-102-105-20231227
Background reading	0.003		
Total absorbance	0.002		
Total absorbance - background	-0.001		
Instrument Response (mg/L)	-0.004		
		NA: standards and samples treated the same	
Sample volume (L)	0.5		
Final Volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Result (mg/L)	0.0	OK, report as ND	Reported Result (mg/L) 0.0026 U

Laboratory: SGS, Dayton, NJ		Client/Site Name: PPG GW RI - Bedrock	
Laboratory SDG/Job No: JD79684		Project Number: 60667926.GW.BR.RI	
Validation Level: Limited		Date: 1/10/2024	
Number of Samples/Matrix: 3 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B and Wet Chemistry		Reviewer and Date: Waverly Braunstein 1/17/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.6 °C
Holding Time	Yes	No	Sampled 12/27/2023, analyzed 12/31/2023, 1/3/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP43996 Cr ND, MP44021 Cr ND, GP51338/GN49902 TOC, All ND
Field Blanks	Yes	No	GW-RI-FB-20231227 (JD79684-4), Cr, TOC, All ND
Matrix Spike	NA	NA	Batch QC
Matrix Spike Duplicate	NA	NA	Same as above
Post Digestion Spike	NA	NA	
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP43996 Cr (94.4 %R), MP44021 Cr (92.1 %R), GP51338/GN49902 TOC (96.5 %R)
Field Duplicate	NA	NA	None with this SDG
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table,

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW52D-80-83-20231227	JD79684-1	CHROMIUM	Total	10
114-MW52D-80-83-20231227	JD79684-1	TOC	Total	10
114-MW52D-87-90-20231227	JD79684-2	CHROMIUM	Total	10
114-MW52D-102-105-20231227	JD79684-3	CHROMIUM	Total	10
GW-RI-FB-20231227	JD79684-4	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2023 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD80633
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0 Ferrous Iron SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60704509 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/30/2024
Reviewed by:	Waverly Braunstein/AECOM File Name: JD80633_2024_1_30 DVReport_ID.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 January 16, 2024 as part of the PPG 2023 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW75WR-118.5-20240116	JD80633-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW75WR-118.5-20240116	JD80633-1F	Groundwater	dissolved hexavalent chromium, dissolved Chromium, Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2023 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All sample results were nondetect. No qualifications were made.

Field Blank (FB)

A FB was not submitted with this data set. No validation actions were taken on this basis.

Matrix Spike (MS)

Sample 114-MW75WR-118.5-20240116 (JD80633-1F) dissolved, was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW75WR-118.5-20240116 (JD80633-1F) dissolved, was analyzed as a laboratory duplicate for this data set. All samples were nondetect. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)

Field Blank

A FB was not submitted with this data set. No validation actions were taken on this basis.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW75WR-118.5-20240116 (JD80633-1F), was analyzed as a MS/MSD for ferrous iron in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total metals and dissolved metals were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and dissolved results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Metals vs. Dissolved Metals Comparison	Action
Total Concentration Greater than Dissolved Concentration	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the value > the RL and the RL of the ND result is $\leq$ RL	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Both Sample Results Positive and < 5x RL; Absolute Difference $\leq$ RL	No Qualification
Both Sample Results Positive and < 5x RL; Absolute Difference > RL	Qualify J
Both Sample Results Positive and $\geq$ 5x RL; RPD $\leq$ 30%	No Qualification
Both Sample Results Positive and $\geq$ 5x RL; RPD >30%	Qualify J
Total Concentration Equal to Dissolved Concentration	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Wet Chemistry (Sulfate, TOC)

Field Blank

A FB was not submitted with this data set. No validation actions were taken on this basis.

Matrix Spike Matrix Spike Duplicate

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date January 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD80633
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs NA

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
All sample results were non-detect.			CHROMIUM (HEXAVALENT)	U					

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date January 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD80633
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs NA

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
All sample results were non-detect.			CHROMIUM	U					

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date January 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD80633
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs NA

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW75WR-118.5-20240116	JD80633-1	SULFATE	U	60.5	60.5	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date January 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD80633
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs NA

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW75WR-118.5-20240116	JD80633-1	Total	Total Organic Carbon	U	5.9	5.9	1.0		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD80633		Project Number: 60704509 GWM.2023	
Validation Level: Full		Date: 1/30/2024	
Number of Samples/Matrix: 1 GW, 1 GWF		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Waverly Braunstein 2/25/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.7 °C
Holding Time	Yes	No	Sampled 1/16/2024, analyzed 1/17/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	1/17/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN50297-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	NA	NA	None with this SDG
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW75WR-118.5-20240116 (JD80633-1F), dissolved (100 %R)
Laboratory Duplicate	Yes	No	114-MW75WR-118.5-20240116 (JD80633-1F), dissolved, Both ND
Laboratory Control Standards	Yes	No	GN50297-B1 (101.3 %R)
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW75WR-118.5-20240116 (JD80633-1F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.154	NA	102.7	NA	115	85	NA	20	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW75WR-118.5-20240116	JD80633-1		10		10	0	Both ND, Accept

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW75WR-118.5-20240116	JD80633-1F		10		10	0	Both ND, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW75WR-118.5-20240116	JD80633-1, -1F		10		10	0	Both ND, Accept

SDG#: JD80633/ Method 7196**GN50297**

Cr+6 ICAL 1/17/24

GW

(p. 557 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.088
0.3	0.262
0.5	0.435
0.8	0.672
1	0.841

(p. 557 of
data pkg)

AECOM Calculated Intercept	0.00428	OK	Reported intercept	0.0043
AECOM Slope	0.8401	OK	Reported Slope	0.8401
AECOM Calculated r	0.99986	OK	Reported r	0.99986

LCS calculation**GN50297-B1****P. 547, 557**

Background absorbance	0	
Sample absorbance	0.132	
LCS Soluble Instrument Response	0.132	
Instrument Concentration (mg/L)	0.152	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.152	OK	Reported Result (mg/L)	0.152

%R = Found/True*100**GN50297-B1****P. 547, 557**

True Value (mg/L) 0.15

AECOM Calculated %R	101.3	OK	Reported %R	101.3

MS calculation**GN50297-S1****P. 549, 558****114-MW75WR-118.5-20240116****FILTERED**

Background reading	0.002	
Total absorbance	0.136	
Total absorbance - background	0.134	
Instrument Concentration (mg/L)	0.1544	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated MS Result (mg/L)	0.15	OK	Reported Result (mg/L)	0.15

%R = Found/True*100**GN50297-S1****P. 549, 558****114-MW75WR-118.5-20240116**

True Value (mg/L) 0.150

Native concentration (mg/L) 0

AECOM Calculated MS Result %R	102.9	OK	Reported %R	100

UNFILTERED

Reporting Limit	JD80633-1	P.8, 557	114-MW75WR-118.5-20240116

Low Standard	0.01

NA: standards
and samples
treated the same

Initial volume (L)	0.5

Final volume (L)	0.5

Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED

<u>Sample Calculations</u>	JD80633-1	P.8, 557	114-MW75WR-118.5-20240116

Background reading	0.058

Total absorbance	0.058

Total absorbance - background	0

Instrument Response (mg/L)	-0.005

NA: standards
and samples
treated the same

Sample volume (L)	0.5

Final Volume (L)	0.5

Dilution Factor	1

AECOM Calculated Result (mg/L)	-0.0051	OK, <MDL report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD80633		Project Number: 60704509 GWM.2023	
Validation Level: Limited		Date: 1/30/2024	
Number of Samples/Matrix: 1 GW, 1 GWF		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Waverly Braunstein 2/25/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.7 °C
Holding Time	Yes	No	Sampled 1/16/2024, analyzed 1/17 - 1/24/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP44312 (total/dissolved) ND Cr, GP51613/GN50320 ND sulfate, GP51587/GN50345 ND TOC, GN50374 ND dissolved Fe
Field Blanks	NA	NA	None with this SDG
Matrix Spike	Yes	No	114-MW75WR-118.5-20240116 (JD80633-1F), dissolved Fe (93.3 %R), Batch QC Cr, sulfate, TOC
Matrix Spike Duplicate	Yes	No	114-MW75WR-118.5-20240116 (JD80633-1F), dissolved Fe (93.3 %R, %RPD 0), Batch QC TOC and Cr, none for sulfate
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	Batch QC Sulfate only
Laboratory Control Standards	Yes	No	MP44312 Cr (91.8 %R), GP51613/GN50320 sulfate (101.0 %R), GP51587/GN50345 TOC (100.0 %R), GN50374 dissolved Fe (93.3 %R)
Field Duplicate	NA	NA	None with this SDG
Total Metals vs Dissolved Metals Results	Yes	No	See tables below
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RPD	Action
114-MW75WR-118.5-20240116	JD80633-1		10		10	0	Both ND, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW75WR-118.5-20240116	JD80633-1F	CHROMIUM	Dissolved	10
114-MW75WR-118.5-20240116	JD80633-1	CHROMIUM	Total	10

Data Validation Report

Project:	PPG 2023 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD82442
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60704509 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 2/26/2024
Reviewed by:	Linda Waters/AECOM File Name: JD82442_2024_2_26 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on February 14, 2024 as part of the PPG 2023 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW60C-R-117.5-20240214	JD82442-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry,
114-MW60C-R-117.5-20240214	JD82442-1F	Groundwater	Fe
114-MW58C-R-84.5-20240214	JD82442-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry, Fe
114-MW58C-R-84.5-20240214	JD82442-2F	Groundwater	Fe
114-MW58C-R-84.5-20240214-X (Field Duplicate of 114-MW58C-R-84.5-20240214)	JD82442-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry, Fe
114-MW58C-R-84.5-20240214-X (Field Duplicate of 114-MW58C-R-84.5-20240214)	JD82442-3F	Groundwater	Fe
GW-RI-FB-20240214	JD82442-4	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry, Fe
GW-RI-FB-20240214	JD82442-4F	Field Blank	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2023 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW60C-R-117.5-20240214 (JD82442-1), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW60C-R-117.5-20240214 (JD82442-1), was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-MW58C-R-84.5-20240214 (JD82442-2) and 114-MW58C-R-84.5-20240214-X (JD82442-3), were analyzed as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)**Hold Time**

Ferrous iron sample 114-MW60C-R-117.5-20240214 (JD82442-1) was received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW60C-R-117.5-20240214 (JD82442-1), was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-MW58C-R-84.5-20240214 (JD82442-2) and 114-MW58C-R-84.5-20240214-X (JD82442-3), were analyzed as the field duplicate pair for chromium(total) and ferrous iron (dissolved). All QC acceptance criteria were met. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW60C-R-117.5-20240214 (JD82442-1), was analyzed as a MS and/or MSD for this data set. All QC acceptance criteria were met.

Sample 114-MW60C-R-117.5-20240214 (JD82442-1), was analyzed as a laboratory duplicate for sulfate in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

Samples 114-MW58C-R-84.5-20240214 (JD82442-2) and 114-MW58C-R-84.5-20240214-X (JD82442-3), were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date February 14, 2024
Lab Name/ID SGS, Dayton
SDG No JD82442
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-R-117.5-20240214	JD82442-1	Total	CHROMIUM (HEXAVALENT)	U	0.033	0.033	0.010		
114-MW58C-R-84.5-20240214	JD82442-2	Total	CHROMIUM (HEXAVALENT)	U	0.056	0.056	0.010		
114-MW58C-R-84.5-20240214-X	JD82442-3	Total	CHROMIUM (HEXAVALENT)	U	0.050	0.050	0.010		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date February 14, 2024
Lab Name/ID SGS, Dayton
SDG No JD82442
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-R-117.5-20240214	JD82442-1	Total	CHROMIUM	U	29.1	29.1	10		
114-MW60C-R-117.5-20240214	JD82442-1F	Dissolved	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW58C-R-84.5-20240214	JD82442-2	Total	CHROMIUM	U	47.1	47.1	10		
114-MW58C-R-84.5-20240214	JD82442-2F	Dissolved	IRON (FERROUS)	U	U	UJ	200		
114-MW58C-R-84.5-20240214-X	JD82442-3	Total	CHROMIUM	U	46.4	46.4	10		
114-MW58C-R-84.5-20240214-X	JD82442-3F	Dissolved	IRON (FERROUS)	U	U	UJ	200		
GW-RI-FB-20240214	JD82442-4F	Dissolved	IRON (FERROUS)	U	U	UJ	200		

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 Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date February 14, 2024
Lab Name/ID SGS, Dayton
SDG No JD82442
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240214

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-R-117.5-20240214	JD82442-1	SULFATE	U	2.2	2.2	2.0		
114-MW58C-R-84.5-20240214	JD82442-2	SULFATE	U	22.6	22.6	2.0		
114-MW58C-R-84.5-20240214-X	JD82442-3	SULFATE	U	25.7	25.7	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date February 14, 2024
Lab Name/ID SGS, Dayton
SDG No JD82442
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-R-117.5-20240214	JD82442-1	Total	Total Organic Carbon	U	13.2	13.2	1.0		
114-MW58C-R-84.5-20240214	JD82442-2	Total	Total Organic Carbon	U	8.2	8.2	1.0		
114-MW58C-R-84.5-20240214-X	JD82442-3	Total	Total Organic Carbon	U	7.6	7.6	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD82442		Project Number: 60704509 GWM.2023	
Validation Level: Full		Date: 2/26/2024	
Number of Samples/Matrix: 3 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 4/2/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.3 °C
Holding Time	Yes	No	Sampled 2/14/2024, analyzed 2/15/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	2/15/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN51258-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240214-PT, ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW60C-R-117.5-20240214 (JD82442-1), 91.3 %R
Laboratory Duplicate	Yes	No	114-MW60C-R-117.5-20240214 (JD82442-1), RPD 9.5
Laboratory Control Standards	Yes	No	GN51258-B1 (100.0 %R)
Field Duplicate	Yes	No	114-MW58C-R-84.5-20240214 (JD82442-2) & 114-MW58C-R-84.5-20240214-X (JD82442-3), RPD 11.3
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW60C-R-117.5-20240214 (JD82442-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0.033	0.17	NA	91.3	NA	115	85	NA	20	OK, Accept

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW60C-R-117.5-20240214	JD82442-1	CHROMIUM	0.033		0.030		0.010	mg/l	9.5	OK, Accept

Field Duplicates

114-MW58C-R-84.5-20240214 (JD82442-2) & 114-MW58C-R-84.5-20240214-X (JD82442-3)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.056	U	0.050	U	0.010	mg/l	11.3	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW60C-R-117.5-20240214	JD82442-1	29.1	10	33	10	13	T Cr < T Cr6, SRs < 4x RL, ABS ≤ RL, Accept
114-MW58C-R-84.5-20240214	JD82442-2	47.1	10	56	10	17	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW58C-R-84.5-20240214-X	JD82442-3	46.4	10	50	10	7	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
GW-RI-FB-20240214	JD82442-4		2.0		10	0	Both ND, Accept

SDG#: JD82442/ Method 7196

GN51258

Cr+6 ICAL 2/15/24

GW

(p. 407 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.089
0.3	0.255
0.5	0.435
0.8	0.679
1	0.851

(p. 407 of
data pkg)

AECOM Calculated Intercept	0.00263	OK	Reported intercept	0.0026
AECOM Slope	0.8493	OK	Reported Slope	0.8493
AECOM Calculated r	0.99994	OK	Reported r	0.99994

LCS calculation

GN51258-B1

P. 395, 407

Background absorbance	0	
Sample absorbance	0.13	
LCS Soluble Instrument Response	0.13	
Instrument Concentration (mg/L)	0.150	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN51258-B1

P. 395, 407

True Value (mg/L)	0.15			
AECOM Calculated %R	100.0	OK	Reported %R	100.0

MS calculation

GN51258-S2

P. 397, 407

114-MW60C-R-117.5-20240214

Unfiltered

Background reading	0.002	
Total absorbance	0.146	
Total absorbance - background	0.144	
Instrument Concentration (mg/L)	0.1665	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated MS Result (mg/L)	0.166	OK	Reported Result (mg/L)	0.17

%R = Found/True*100

GN51258-S2

P. 397, 407

114-MW60C-R-117.5-20240214

True Value (mg/L)	0.150			
Native concentration (mg/L)	0.033			
AECOM Calculated MS Result %R	89.0	OK, rounding	Reported %R	91.3

UNFILTERED

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD82442		Project Number: 60704509 GWM.2023	
Validation Level: Limited		Date: 2/26/2024	
Number of Samples/Matrix: 3 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 2/4/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.3 °C
Holding Time	No	Yes	Sampled 2/14/2024, analyzed 2/15-2/21/2024, Ferrous iron analyzed out of 24 hr. HT for sample 114-MW60C-R-117.5-20240214 (JD82442-1).
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP44878 (total) ND Cr, GP52118/GN51295 ND sulfate, GP52101/GN51335 ND TOC, GN51267(dissolved) ND Fe
Field Blanks	Yes	No	GW-RI-FB-20240214, All ND
Matrix Spike	Yes	No	114-MW60C-R-117.5-20240214 (JD82442-1) total Cr, TOC, sulfate, 114-MW60C-R-117.5-20240214 (JD82442-1F) dissolved Fe
Matrix Spike Duplicate	Yes	No	114-MW60C-R-117.5-20240214 (JD82442-1), Cr, TOC, Fe, none for sulfate
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	Yes	No	114-MW60C-R-117.5-20240214 (JD82442-1) sulfate only (RPD 4.4), none for TOC, Cr
Laboratory Control Standards	Yes	No	MP44878 Cr (83.0 %R), GP52118/GN51295 sulfate (93.1 %R), GP52101/GN51335 TOC (102.0 %R), GN51267 Fe (93.3 %R)
Field Duplicate	Yes	No	114-MW58C-R-84.5-20240214 (JD82442-2) & 114-MW58C-R-84.5-20240214-X (JD82442-3), see table below
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW60C-R-117.5-20240214	JD82442-1F	IRON (FERROUS)	2/14/2024 10:05	2/15/2024 11:54	Estimate (UJ)
114-MW58C-R-84.5-20240214	JD82442-2F	IRON (FERROUS)	2/14/2024 13:55	2/15/2024 11:54	OK, Accept
114-MW58C-R-84.5-20240214-X	JD82442-3F	IRON (FERROUS)	2/14/2024 14:00	2/15/2024 11:54	OK, Accept
GW-RI-FB-20240214	JD82442-4F	IRON (FERROUS)	2/14/2024 15:15	2/15/2024 11:54	OK, Accept

Matrix Spikes/Matrix Spike Duplicates

114-MW60C-R-117.5-20240214 (JD82442-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	13.2	23.2	23.5	100	103	132	71	1.3	10	OK, Accept
SULFATE	Total	80	2.2	80.1	NA	97.4	NA	120	80	NA	15	OK, Accept
Iron, ferrous	Dissolved	3.0	0.029U	2.8	2.8	93.3	93.3	115	85	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW60C-R-117.5-20240214 (JD82442-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	29.1	99.8	94.5	88.4	81.8	125	75	5.5	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW60C-R-117.5-20240214	JD82442-1	SULFATE	2.2		2.3		2.0	mg/l	4.4	OK RPD <20%, Accept

Field Duplicates

114-MW58C-R-84.5-20240214 (JD82442-2) & 114-MW58C-R-84.5-20240214-X (JD82442-3)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	0.029	U	0.029	U	0.20	mg/l	0	Both ND, Accept
CHROMIUM	Total	47.1		46.4		10	ug/l	1.5	RPD < 30%, Accept
SULFATE	Total	22.6		25.7		2.0	mg/l	12.8	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	8.2		7.6		1.0	mg/l	7.6	RPD < 30%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW60C-R-117.5-20240214	JD82442-1	CHROMIUM	Total	10
114-MW58C-R-84.5-20240214	JD82442-2	CHROMIUM	Total	10
114-MW58C-R-84.5-20240214-X	JD82442-3	CHROMIUM	Total	10
GW-RI-FB-20240214	JD82442-4	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2023 GAG GW Remedial Activities	
Laboratory:	SGS, Dayton	
Laboratory Job No.:	JD84684	
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500	
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)	
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ	
AECOM Project No:	60704509 GWM.2023	
Prepared by:	Charlene Livingston Flint/AECOM	Completed on: 4/02/2024
Reviewed by:	Allison Wamness/AECOM	File Name: JD84684_2024_4_02 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 March 18, 2024 as part of the PPG 2023 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW61D-117.0-20240318	JD84684-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-117.0-20240318	JD84684-1F	Groundwater	Fe
114-MW61D-121.0-20240318	JD84684-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-121.0-20240318	JD84684-2F	Groundwater	Fe
114-MW61D-126.0-20240318	JD84684-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-126.0-20240318	JD84684-3F	Groundwater	Fe
GW-RI-FB-20240318	JD84684-4	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20240318	JD84684-4F	Field Blank	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2023 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample for chromium in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Samples 114-MW61D-117.0-20240318 (JD84684-1) and 114-MW61D-126.0-20240318 (JD84684-3), were analyzed as MSs for sulfate in this data set. All QC acceptance criteria were met.

A MS/MSD was not performed on a site sample for TOC in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

Samples 114-MW61D-117.0-20240318 (JD84684-1) and 114-MW61D-126.0-20240318 (JD84684-3), were analyzed as laboratory duplicates for sulfate in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD84684
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240318

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
All sample results were non-detect.									
CHROMIUM (HEXAVALENT)									

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD84684
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240318

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-117.0-20240318	JD84684-1F	Dissolved	CHROMIUM	U	U	UJ	200	Qualify	2
114-MW61D-121.0-20240318	JD84684-2	Total	CHROMIUM	U	3.3B	3.3J	10	Qualify	1
114-MW61D-121.0-20240318	JD84684-2F	Dissolved	CHROMIUM	U	U	UJ	200	Qualify	2
114-MW61D-126.0-20240318	JD84684-3	Total	CHROMIUM	U	3.1B	3.1J	10	Qualify	1
114-MW61D-126.0-20240318	JD84684-3F	Dissolved	CHROMIUM	U	U	UJ	200	Qualify	2
GW-RI-FB-20240318	JD84684-4F	Dissolved	CHROMIUM	U	U	UJ	200	Qualify	2

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.
2. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD84684
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240318

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-117.0-20240318	JD84684-1	SULFATE	U	46.9	46.9	2.0		
114-MW61D-121.0-20240318	JD84684-2	SULFATE	U	45.7	45.7	2.0		
114-MW61D-126.0-20240318	JD84684-3	SULFATE	U	43.7	43.7	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD84684
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240318

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-117.0-20240318	JD84684-1	Total	Total Organic Carbon	U	1.1	1.1	1.0		
114-MW61D-121.0-20240318	JD84684-2	Total	Total Organic Carbon	U	1.1	1.1	1.0		
114-MW61D-126.0-20240318	JD84684-3	Total	Total Organic Carbon	U	0.97B	0.97J	1.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD84684		Project Number: 60704509 GWM.2023	
Validation Level: Full		Date: 4/02/2024	
Number of Samples/Matrix: 3 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness 4/11/24	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.1 °C
Holding Time	Yes	No	Sampled 3/18/2024, analyzed 3/18/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	3/18/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN52482-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240318, ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN52482-B1 (98.7 %R)
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW61D-117.0-20240318	JD84684-1		10		10	0	Both ND, Accept
114-MW61D-121.0-20240318	JD84684-2	3.3	10		10	NC	T Cr > T Cr6, Accept
114-MW61D-126.0-20240318	JD84684-3	3.1	10		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20240318	JD84684-4		2.0		10	0	Both ND, Accept

SDG#: JD84684/ Method 7196

GN52482

Cr+6 ICAL 3/18/24

GW

(p. 667 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.424
0.8	0.672
1	0.848

(p. 667 of
data pkg)

AECOM Calculated Intercept	-0.00030	OK	Reported intercept	-0.0003
AECOM Slope	0.8454	OK	Reported Slope	0.8454
AECOM Calculated r	0.99998	OK	Reported r	0.99998

LCS calculation

GN52482-B1

P. 654, 667

Background absorbance	0	
Sample absorbance	0.125	
LCS Soluble Instrument Response	0.125	
Instrument Concentration (mg/L)	0.148	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.148	OK	Reported Result (mg/L)	0.148

%R = Found/True*100

GN52482-B1

P. 654, 667

True Value (mg/L)	0.15			
AECOM Calculated %R	98.8	OK	Reported %R	98.7

MS calculation

GN52482-S1

656, 667

Batch QC JD84687-2

Unfiltered

Background reading	0	
Total absorbance	0.126	
Total absorbance - background	0.126	
Instrument Concentration (mg/L)	0.1494	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated MS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.15

%R = Found/True*100

GN52482-S1

656, 667

Batch QC JD84687-2

True Value (mg/L)	0.150			
Native concentration (mg/L)	0.000			
AECOM Calculated MS Result %R	99.4	OK, rounding	Reported %R	100.0

UNFILTERED

Reporting Limit	JD84684-1	P. 10, 667	114-MW61D-117.0-20240318
Low Standard	0.01		
Initial volume (L)	0.5	NA: standards and samples treated the same	
Final volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)= 0.010

UNFILTERED

<u>Sample Calculations</u>	JD84684-1	P. 10, 667	114-MW61D-117.0-20240318	
Background reading	0.006			
Total absorbance	0.006			
Total absorbance - background	0			
Instrument Response (mg/L)	0.000			
		NA: standards and samples treated the same		
Sample volume (L)	0.5			
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	0.000	OK, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD84684		Project Number: 60704509 GWM.2023	
Validation Level: Limited		Date: 4/02/2024	
Number of Samples/Matrix: 3 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Allison Wamness 4/11/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.1 °C
Holding Time	No	Yes	Sampled 3/18/2024, analyzed 3/20/24 and 3/25-3/27/2024. Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP45436 (total) ND Cr, GP52764/GN52535, GP52765/GN52535 ND sulfate, GP52739/GN52596, GP52757/GN52596 ND TOC, GN52759(dissolved) ND Fe
Field Blanks	Yes	No	GW-RI-FB-20240318, All ND
Matrix Spike	Yes	No	114-MW61D-117.0-20240318 (JD84684-1) and 114-MW61D-126.0-20240318 (JD84684-3) sulfate, Batch QC total Cr, TOC, dissolved Fe
Matrix Spike Duplicate	NA	NA	Batch QC total Cr, TOC, Fe, none for sulfate
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	Yes	No	114-MW61D-117.0-20240318 (JD84684-1) and 114-MW61D-126.0-20240318 (JD84684-3) sulfate, none for TOC, Cr
Laboratory Control Standards	Yes	No	MP45436 Cr (87.3 %R), GP52764/GN52535 sulfate (104.9 %R), GP52765/GN52535 sulfate (108.3 %R), GP52739/GN52596 TOC (98.4 %R), GP52757/GN52596 TOC (97.3 %R), GN52759(dissolved) Fe (93.3 %R and 96.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW61D-117.0-20240318	JD84684-1F	IRON (FERROUS)	3/18/2024 10:00	3/25/2024 17:50	Estimate (UJ)
114-MW61D-121.0-20240318	JD84684-2F	IRON (FERROUS)	3/18/2024 11:25	3/25/2024 17:50	Estimate (UJ)
114-MW61D-126.0-20240318	JD84684-3F	IRON (FERROUS)	3/18/2024 13:00	3/25/2024 17:50	Estimate (UJ)
GW-RI-FB-20240318	JD84684-4F	IRON (FERROUS)	3/18/2024 15:05	3/25/2024 17:50	Estimate (UJ)

Matrix Spikes/Matrix Spike Duplicates

114-MW61D-117.0-20240318 (JD84684-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
SULFATE	Total	80	46.9	124	NA	96.4	NA	120	80	NA	15	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

114-MW61D-126.0-20240318 (JD84684-3)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
SULFATE	Total	80	43.7	132	NA	110.4	NA	120	80	NA	15	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW61D-117.0-20240318	JD84684-1	SULFATE	46.9		41.7		2.0	mg/l	11.7	OK RPD <20%, Accept
114-MW61D-126.0-20240318	JD84684-3	SULFATE	43.7		42.0		2.0	mg/l	4.0	OK RPD <20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW61D-117.0-20240318	JD84684-1	CHROMIUM	Total	10
114-MW61D-121.0-20240318	JD84684-2	CHROMIUM	Total	10
114-MW61D-126.0-20240318	JD84684-3	CHROMIUM	Total	10
GW-RI-FB-20240318	JD84684-4	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2023 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD84758
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60704509 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 4/09/2024
Reviewed by:	Allison Wamness/AECOM File Name: JD84758_2024_4_09 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 March 19, 2024 as part of the PPG 2023 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW72D-102-106-20240319	JD84758-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-102-106-20240319	JD84758-1F	Groundwater	Fe
114-MW72D-110-114-20240319	JD84758-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-110-114-20240319	JD84758-2F	Groundwater	Fe
114-MW72D-116-119-20240319	JD84758-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-116-119-20240319	JD84758-3F	Groundwater	Fe
114-MW72D-123-126-20240319	JD84758-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-123-126-20240319	JD84758-4F	Groundwater	Fe
114-MW4D-90-94-20240319	JD84758-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-90-94-20240319	JD84758-5F	Groundwater	Fe
114-MW4D-98-102-20240319	JD84758-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-98-102-20240319	JD84758-6F	Groundwater	Fe
114-MW4D-111-115-20240319	JD84758-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW4D-111-115-20240319	JD84758-7F	Groundwater	Fe
114-MW4D-121-125-20240319	JD84758-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-121-125-20240319	JD84758-8F	Groundwater	Fe
114-MW66D-91-97-20240319	JD84758-9	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-91-97-20240319	JD84758-9F	Groundwater	Fe
114-MW66D-107-111-20240319	JD84758-10	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-107-111-20240319	JD84758-10F	Groundwater	Fe
114-MW66D-118-123-20240319	JD84758-11	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-118-123-20240319	JD84758-11F	Groundwater	Fe
114-MW66D-124-129-20240319	JD84758-12	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-124-129-20240319	JD84758-12F	Groundwater	Fe
114-MW66D-137-140-20240319	JD84758-13	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-137-140-20240319	JD84758-13F	Groundwater	Fe
114-MW61D-131.0-20240319	JD84758-14	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-131.0-20240319	JD84758-14F	Groundwater	Fe
114-MW61D-136.0-20240319	JD84758-15	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-136.0-20240319	JD84758-15F	Groundwater	Fe
114-MW62C-73.0-20240319	JD84758-16	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW62C-73.0-20240319	JD84758-16F	Groundwater	Fe
114-MW53C-47.5-20240319	JD84758-17	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW53C-47.5-20240319	JD84758-17F	Groundwater	Fe
114-MW57C-71.0-20240319	JD84758-18	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57C-71.0-20240319	JD84758-18F	Groundwater	Fe
114-MW57C-71.0-20240319-X (Field Duplicate of 114-MW57C-71.0-20240319)	JD84758-19	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57C-71.0-20240319-X (Field Duplicate of 114-MW57C-71.0-20240319)	JD84758-19F	Groundwater	Fe
GW-RI-FB-20240319	JD84758-20	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20240319	JD84758-20F	Field Blank	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2023 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

The total chromium results for samples 114-MW22BR-27.8-20240122 (JD81017-2), 114-MW72D-110-114-20240319 (JD84758-3), and 114-MW72D-123-126-20240319 (JD84758-4), were less than the total hexavalent chromium result. The sample results were estimated (J).

Matrix Spike (MS)

Sample 114-MW72D-110-114-20240319 (JD84758-18), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW57C-71.0-20240319 (JD84758-18), was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-MW57C-71.0-20240319 (JD84758-18) and 114-MW57C-71.0-20240319-X (JD84758-19), were analyzed as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)

Hold Time

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were estimated (J/UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW57C-71.0-20240319 (JD84758-18, -18F), was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-MW57C-71.0-20240319 (JD84758-18) and 114-MW57C-71.0-20240319-X (JD84758-19), were analyzed as the field duplicate pair for chromium (total) and ferrous iron (dissolved). All QC acceptance criteria were met. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above for evaluation and action.

Wet Chemistry (Sulfate, TOC)

Matrix Spike/ Matrix Spike Duplicate

Sample 114-MW72D-102-106-20240319 (JD84758-1), was analyzed as a MS/MSD for TOC in this data set. All QC acceptance criteria were met.

Sample 114-MW57C-71.0-20240319 (JD84758-18, -18F), was analyzed as a MS and/or MSD for TOC and sulfate. in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW57C-71.0-20240319 (JD84758-18), was analyzed as a laboratory duplicate for sulfate in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

Samples 114-MW57C-71.0-20240319 (JD84758-18) and 114-MW57C-71.0-20240319-X (JD84758-19), were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Results estimated due to total chromium results lower than total hexavalent chromium results are usable with an unknown bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD84758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240319

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20240319	JD84758-1	Total	CHROMIUM (HEXAVALENT)	U	0.11	0.11	0.010		
114-MW53C-47.5-20240319	JD84758-17	Total	CHROMIUM (HEXAVALENT)	U	15.5	15.5	0.50		
114-MW57C-71.0-20240319	JD84758-18	Total	CHROMIUM (HEXAVALENT)	U	13.5	13.5	0.50		
114-MW57C-71.0-20240319-X	JD84758-19	Total	CHROMIUM (HEXAVALENT)	U	13.8	13.8	0.50		
114-MW72D-110-114-20240319	JD84758-2	Total	CHROMIUM (HEXAVALENT)	U	0.18	0.18J	0.010	Qualify	1
114-MW72D-116-119-20240319	JD84758-3	Total	CHROMIUM (HEXAVALENT)	U	0.13	0.13J	0.010	Qualify	1
114-MW72D-123-126-20240319	JD84758-4	Total	CHROMIUM (HEXAVALENT)	U	0.12	0.12J	0.010	Qualify	1
114-MW66D-91-97-20240319	JD84758-9	Total	CHROMIUM (HEXAVALENT)	U	0.33	0.33	0.010		

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

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

NJDEP Validation Footnote

1. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD84758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240319

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20240319	JD84758-1	Total	CHROMIUM	U	105	105	10		
114-MW66D-107-111-20240319	JD84758-10	Total	CHROMIUM	U	48.5	48.5	10		
114-MW66D-107-111-20240319	JD84758-10F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-118-123-20240319	JD84758-11F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-124-129-20240319	JD84758-12F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-137-140-20240319	JD84758-13	Total	CHROMIUM	U	3.3B	3.3J	10	Qualify	2
114-MW66D-137-140-20240319	JD84758-13F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-131.0-20240319	JD84758-14F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-136.0-20240319	JD84758-15F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW62C-73.0-20240319	JD84758-16F	Dissolved	IRON (FERROUS)	U	0.042B	0.042J	0.20	Qualify	1,2
114-MW53C-47.5-20240319	JD84758-17	Total	CHROMIUM	U	14100	14100	200		

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW53C-47.5-20240319	JD84758-17F	Dissolved	IRON (FERROUS)	U	0.067B	0.067J	0.20	Qualify	1,2
114-MW57C-71.0-20240319	JD84758-18	Total	CHROMIUM	U	12000	12000	200		
114-MW57C-71.0-20240319	JD84758-18F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57C-71.0-20240319-X	JD84758-19	Total	CHROMIUM	U	11900	11900	200		
114-MW57C-71.0-20240319-X	JD84758-19F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-102-106-20240319	JD84758-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-110-114-20240319	JD84758-2	Total	CHROMIUM	U	128	128J	10	Qualify	3
GW-RI-FB-20240319	JD84758-20F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-110-114-20240319	JD84758-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-116-119-20240319	JD84758-3	Total	CHROMIUM	U	78.0	78.0J	10	Qualify	3
114-MW72D-116-119-20240319	JD84758-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-123-126-20240319	JD84758-4	Total	CHROMIUM	U	44.0	44.0J	10	Qualify	3
114-MW72D-123-126-20240319	JD84758-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW4D-90-94-20240319	JD84758-5	Total	CHROMIUM	U	4.0B	4.0J	10	Qualify	2
114-MW4D-90-94-20240319	JD84758-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW4D-98-102-20240319	JD84758-6F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-111-115-20240319	JD84758-7F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW4D-121-125-20240319	JD84758-8F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-91-97-20240319	JD84758-9	Total	CHROMIUM	U	1310	1310	20		
114-MW66D-91-97-20240319	JD84758-9F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
3. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD84758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240319

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20240319	JD84758-1	SULFATE	U	3.3	3.3	2.0		
114-MW66D-107-111-20240319	JD84758-10	SULFATE	U	134	134	2.0		
114-MW66D-118-123-20240319	JD84758-11	SULFATE	U	133	133	2.0		
114-MW66D-124-129-20240319	JD84758-12	SULFATE	U	97.9	97.9	2.0		
114-MW66D-137-140-20240319	JD84758-13	SULFATE	U	99.8	99.8	2.0		
114-MW61D-131.0-20240319	JD84758-14	SULFATE	U	41.6	41.6	2.0		
114-MW61D-136.0-20240319	JD84758-15	SULFATE	U	42.6	42.6	2.0		
114-MW62C-73.0-20240319	JD84758-16	SULFATE	U	55.5	55.5	2.0		
114-MW53C-47.5-20240319	JD84758-17	SULFATE	U	384	384	4.0		
114-MW57C-71.0-20240319	JD84758-18	SULFATE	U	522	522	6.0		
114-MW57C-71.0-20240319-X	JD84758-19	SULFATE	U	529	529	6.0		
114-MW72D-110-114-20240319	JD84758-2	SULFATE	U	2.3	2.3	2.0		
114-MW72D-116-119-20240319	JD84758-3	SULFATE	U	2.1	2.1	2.0		
114-MW72D-123-126-20240319	JD84758-4	SULFATE	U	2.3	2.3	2.0		
114-MW4D-90-94-20240319	JD84758-5	SULFATE	U	47.8	47.8	2.0		

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW4D-98-102-20240319	JD84758-6	SULFATE	U	48.2	48.2	2.0		
114-MW4D-111-115-20240319	JD84758-7	SULFATE	U	90.1	90.1	2.0		
114-MW4D-121-125-20240319	JD84758-8	SULFATE	U	55.7	55.7	2.0		
114-MW66D-91-97-20240319	JD84758-9	SULFATE	U	96.2	96.2	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD84758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240319

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20240319	JD84758-1	Total	Total Organic Carbon	U	26.1	26.1	1.0		
114-MW66D-107-111-20240319	JD84758-10	Total	Total Organic Carbon	U	1.6	1.6	1.0		
114-MW66D-118-123-20240319	JD84758-11	Total	Total Organic Carbon	U	3.9	3.9	1.0		
114-MW66D-124-129-20240319	JD84758-12	Total	Total Organic Carbon	U	6.4	6.4	1.0		
114-MW66D-137-140-20240319	JD84758-13	Total	Total Organic Carbon	U	16.2	16.2	1.0		
114-MW61D-131.0-20240319	JD84758-14	Total	Total Organic Carbon	U	1.5	1.5	1.0		
114-MW61D-136.0-20240319	JD84758-15	Total	Total Organic Carbon	U	2.0	2.0	1.0		
114-MW62C-73.0-20240319	JD84758-16	Total	Total Organic Carbon	U	0.99B	0.99J	1.0	Qualify	1
114-MW53C-47.5-20240319	JD84758-17	Total	Total Organic Carbon	U	3.2	3.2	1.0		
114-MW57C-71.0-20240319	JD84758-18	Total	Total Organic Carbon	U	2.8	2.8	1.0		
114-MW57C-71.0-20240319-X	JD84758-19	Total	Total Organic Carbon	U	2.8	2.8	1.0		
114-MW72D-110-114-20240319	JD84758-2	Total	Total Organic Carbon	U	36.5	36.5	1.0		
114-MW72D-116-119-20240319	JD84758-3	Total	Total Organic Carbon	U	46.5	46.5	1.0		
114-MW72D-123-126-20240319	JD84758-4	Total	Total Organic Carbon	U	57.1	57.1	5.0		
114-MW4D-90-94-20240319	JD84758-5	Total	Total Organic Carbon	U	34.6	34.6	1.0		
114-MW4D-98-102-20240319	JD84758-6	Total	Total Organic Carbon	U	58.0	58.0	5.0		

114-MW4D-111-115-20240319	JD84758-7	Total	Total Organic Carbon	U	50.6	50.6	5.0		
114-MW4D-121-125-20240319	JD84758-8	Total	Total Organic Carbon	U	119	119	10		
114-MW66D-91-97-20240319	JD84758-9	Total	Total Organic Carbon	U	7.3	7.3	1.0		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD84758		Project Number: 60704509 GWM.2023	
Validation Level: Full		Date: 4/10/24	
Number of Samples/Matrix: 19 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness 4/10/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C, 1.3 °C, 1.2 °C
Holding Time	Yes	No	Sampled 3/19/2024, analyzed 3/20/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	3/20/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN52539-MB1, GN52539-MB2, and GN52539-MB3, all ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240319 (JD84758-20), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW57C-71.0-20240319 (JD84758-18), {97.1 %R}
Laboratory Duplicate	Yes	No	114-MW57C-71.0-20240319 (JD84758-18), {RPD 0}
Laboratory Control Standards	Yes	No	GN52539-B1 (102.7 %R), GN52539-B2 (102.7 %R), GN52539-B3 (101.3 %R),
Field Duplicate	Yes	No	114-MW57C-71.0-20240319 (JD84758-18) & 114-MW57C-71.0-20240319-X (JD84758-19), {RPD 2.2}
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	No	Yes	See table below

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW57C-71.0-20240319 (JD84758-18)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	27.08	13.5	39.8	NA	97.1	NA	115	85	NA	20	OK, Accept

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW57C-71.0-20240319	JD84758-18	CHROMIUM (Hexavalent)	13.5		13.5		0.050	mg/l	0	OK, Accept

Field Duplicates

114-MW57C-71.0-20240319 (JD84758-18) & 114-MW57C-71.0-20240319-X (JD84758-19)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	13.5	U	13.8	U	0.050	mg/l	2.2	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW72D-102-106-20240319	JD84758-1	105	10	110	10	5	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-110-114-20240319	JD84758-2	128	10	180	10	34	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-MW72D-116-119-20240319	JD84758-3	78.0	10	130	10	50	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW72D-123-126-20240319	JD84758-4	44.0	10	120	10	93	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-MW4D-90-94-20240319	JD82442-5	4.0	10		10	NC	T Cr > T Cr6, Accept
114-MW4D-98-102-20240319	JD84758-6		10		10	0	Both ND, Accept
114-MW4D-111-115-20240319	JD84758-7		10		10	0	Both ND, Accept
114-MW4D-121-125-20240319	JD84758-8		10		10	0	Both ND, Accept
114-MW66D-91-97-20240319	JD84758-9	1310	20	330	10	120	T Cr > T Cr6, Accept
114-MW66D-107-111-20240319	JD84758-10	48.5	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-118-123-20240319	JD84758-11		10		10	0	Both ND, Accept
114-MW66D-124-129-20240319	JD82442-12		10		10	0	Both ND, Accept
114-MW66D-137-140-20240319	JD84758-13	3.3	10		10	NC	T Cr > T Cr6, Accept
114-MW61D-131.0-20240319	JD84758-14		10		10	0	Both ND, Accept
114-MW61D-136.0-20240319	JD84758-15		10		10	0	Both ND, Accept
114-MW62C-73.0-20240319	JD84758-16		10		10	0	Both ND, Accept
114-MW53C-47.5-20240319	JD84758-17	14100	200	15500	500	9.4	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW57C-71.0-20240319	JD84758-18	12000	200	13500	500	11.8	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW57C-71.0-20240319-X	JD84758-19	11900	200	13800	500	14.8	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
GW-RI-FB-20240319	JD84758-20		2		10	0	Both ND, Accept

NC- not calculated

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW53C-47.5-20240319	JD84758-17	CHROMIUM (HEXAVALENT)	Total	50
114-MW57C-71.0-20240319	JD84758-18	CHROMIUM (HEXAVALENT)	Total	50
114-MW57C-71.0-20240319-X	JD84758-19	CHROMIUM (HEXAVALENT)	Total	50

SDG#: JD84758/ Method 7196

GN52539

Cr+6 ICAL 3/20/24

GW

(p. 1293 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.418
0.8	0.672
1	0.835

(p. 1293
of data
pkg)

AECOM Calculated Intercept	0.00046	OK	Reported intercept	0.0005
AECOM Slope	0.8364	OK	Reported Slope	0.8364
AECOM Calculated r	0.99999	OK	Reported r	0.99999

LCS calculation

GN52539-B1

P. 1272, 1293

Background absorbance	0	
Sample absorbance	0.129	
LCS Soluble Instrument Response	0.129	
Instrument Concentration (mg/L)	0.154	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.154	OK	Reported Result (mg/L)	0.154

%R = Found/True*100

GN52539-B1

P. 1272, 1293

True Value (mg/L) 0.15

AECOM Calculated %R	102.5	OK	Reported %R	102.7

MS calculation

GN52759-S2

P. 1274, 1293

114-MW57C-71.0-20240319

Unfiltered

Background reading	0	
Total absorbance	0.333	
Total absorbance - background	0.333	
Instrument Concentration (mg/L)	0.3976	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	100	

AECOM Calculated MS Result (mg/L)	39.76	OK	Reported Result (mg/L)	39.761

%R = Found/True*100

GN52759-S2

P. 1274, 1293

114-MW57C-71.0-20240319

True Value (mg/L) 27.08

Native concentration (mg/L) 13.50

AECOM Calculated MS Result %R	97.0	OK	Reported %R	97.1

UNFILTERED

Reporting Limit

JD84758-18

P. 72, 1293

114-MW57C-71.0-20240319

Low Standard

0.01

NA: standards
and samples
treated the same

Initial volume (L)

0.5

Final volume (L)

0.5

Dilution Factor

50

AECOM Calculated Reporting Limit

0.500

OK

Reported RL (mg/L)=

0.500

UNFILTERED

Sample Calculations

JD84758-18

P. 72, 1293

114-MW57C-71.0-20240319

Background reading

0

Total absorbance

0.227

Total absorbance - background

0.227

Instrument Response (mg/L)

0.271

NA: standards
and samples
treated the same

Sample volume (L)

0.5

Final Volume (L)

0.5

Dilution Factor

50

AECOM Calculated Result (mg/L)

13.5

OK

Reported Result (mg/L)

13.5

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD84758		Project Number: 60704509 GWM.2023	
Validation Level: Limited		Date: 4/09/2024	
Number of Samples/Matrix: 19 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Allison Wamness 4/10/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C, 1.3 °C, 1.2 °C
Holding Time	No	Yes	Sampled 3/19/2024, analyzed 3/20-4/5/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP45519 (total) ND Cr, GP52797/GN52578 ND sulfate, GP52757/GN52596 ND TOC, GP52772/GN52654 ND TOC, GP52773/GN52654 ND TOC, GN52759 (dissolved) ND Fe
Field Blanks	Yes	No	GW-RI-FB-20240319 (JD84758-20), All ND
Matrix Spike	Yes	No	114-MW57C-71.0-20240319 (JD84758-18, -18F), total Cr, TOC, sulfate, dissolved Fe, and 114-MW72D-102-106-20240319 (JD84758-1) TOC
Matrix Spike Duplicate	Yes	No	114-MW57C-71.0-20240319 (JD84758-18, -18F), Cr, TOC, Fe, 114-MW72D-102-106-20240319 (JD84758-1) TOC, none for sulfate
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	Yes	No	114-MW57C-71.0-20240319 (JD84758-18), sulfate only (RPD 2.3), none for TOC, Cr, Fe
Laboratory Control Standards	Yes	No	MP45519 Cr (85.1 %R), GP52797/GN52578 sulfate (107.6 %R), GP52757/GN52596 TOC (97.3 %R), GP52772/GN52654 TOC (94.1 %R), GP52773/GN52654 TOC (99.6 %R), GN52759 (dissolved) Fe (93.3 %R and 96.7 %R)
Field Duplicate	Yes	No	114-MW57C-71.0-20240319 (JD84758-18, -18F) & 114-MW57C-71.0-20240319-X (JD84758-19, -19F), see table below
Total Metals vs Dissolved Metals Results	NA	NA	Total only

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW66D-107-111-20240319	JD84758-10F	IRON (FERROUS)	3/19/2024 9:50	3/25/2024 17:50	Estimate (UJ)
114-MW66D-118-123-20240319	JD84758-11F	IRON (FERROUS)	3/19/2024 10:10	3/25/2024 17:50	Estimate (UJ)
114-MW66D-124-129-20240319	JD84758-12F	IRON (FERROUS)	3/19/2024 10:25	3/25/2024 17:50	Estimate (UJ)
114-MW66D-137-140-20240319	JD84758-13F	IRON (FERROUS)	3/19/2024 10:40	3/25/2024 17:50	Estimate (UJ)
114-MW61D-131.0-20240319	JD84758-14F	IRON (FERROUS)	3/19/2024 9:15	3/25/2024 17:50	Estimate (UJ)
114-MW61D-136.0-20240319	JD84758-15F	IRON (FERROUS)	3/19/2024 10:20	3/25/2024 17:50	Estimate (UJ)
114-MW62C-73.0-20240319	JD84758-16F	IRON (FERROUS)	3/19/2024 13:05	3/25/2024 17:50	Estimate (J)
114-MW53C-47.5-20240319	JD84758-17F	IRON (FERROUS)	3/19/2024 15:05	3/25/2024 17:50	Estimate (J)
114-MW57C-71.0-20240319	JD84758-18F	IRON (FERROUS)	3/19/2024 11:20	3/25/2024 17:50	Estimate (UJ)
114-MW57C-71.0-20240319-X	JD84758-19F	IRON (FERROUS)	3/19/2024 11:30	3/25/2024 17:50	Estimate (UJ)
114-MW72D-102-106-20240319	JD84758-1F	IRON (FERROUS)	3/19/2024 14:05	3/25/2024 17:50	Estimate (UJ)
GW-RI-FB-20240319	JD84758-20F	IRON (FERROUS)	3/19/2024 15:10	3/25/2024 17:50	Estimate (UJ)
114-MW72D-110-114-20240319	JD84758-2F	IRON (FERROUS)	3/19/2024 14:10	3/25/2024 17:50	Estimate (UJ)
114-MW72D-116-119-20240319	JD84758-3F	IRON (FERROUS)	3/19/2024 14:15	3/25/2024 17:50	Estimate (UJ)
114-MW72D-123-126-20240319	JD84758-4F	IRON (FERROUS)	3/19/2024 14:20	3/25/2024 17:50	Estimate (UJ)
114-MW4D-90-94-20240319	JD84758-5F	IRON (FERROUS)	3/19/2024 11:50	3/25/2024 17:50	Estimate (UJ)
114-MW4D-98-102-20240319	JD84758-6F	IRON (FERROUS)	3/19/2024 12:10	3/25/2024 17:50	Estimate (UJ)
114-MW4D-111-115-20240319	JD84758-7F	IRON (FERROUS)	3/19/2024 12:30	3/25/2024 17:50	Estimate (UJ)
114-MW4D-121-125-20240319	JD84758-8F	IRON (FERROUS)	3/19/2024 12:45	3/25/2024 17:50	Estimate (UJ)
114-MW66D-91-97-20240319	JD84758-9F	IRON (FERROUS)	3/19/2024 9:30	3/25/2024 17:50	Estimate (UJ)

Matrix Spikes/Matrix Spike Duplicates

114-MW57C-71.0-20240319 (JD84758-18, -18F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	2.8	12.7	12.9	99.0	101	143	59	1.6	10	OK, Accept
SULFATE	Total	80	522	609	NA	108.8	NA	120	80	NA	15	OK, Accept
Iron, ferrous	Dissolved	3.0	0	2.9	2.9	96.7	96.7	115	85	0	20	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

114-MW72D-102-106-20240319 (JD84758-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	26.1	38.8	38.7	127.0	126	143	59	0.3	10	OK, Accept

114-MW57C-71.0-20240319 (JD84758-18)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	12000	12000	11900	0	-125	125	75	0.8	20	SR >5x spike amount, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW72D-102-106-20240319	JD84758-18	SULFATE	522		534		6.0	mg/l	2.3	OK RPD <20%, Accept

Field Duplicates

114-MW57C-71.0-20240319 (JD84758-18, -18F) & 114-MW57C-71.0-20240319 -X (JD84758-19, -19F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	0.020	U	0.020	U	0.20	mg/l	0	Both ND, Accept

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM	Total	12000		11900		200	ug/l	0.8	RPD < 30%, Accept
SULFATE	Total	522		529		6.0	mg/l	1.3	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	2.8		2.8		1.0	mg/l	0	RPD < 30%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW72D-102-106-20240319	JD84758-1	CHROMIUM	Total	10
114-MW66D-107-111-20240319	JD84758-10	CHROMIUM	Total	10
114-MW66D-118-123-20240319	JD84758-11	CHROMIUM	Total	10
114-MW66D-124-129-20240319	JD84758-12	CHROMIUM	Total	10
114-MW66D-137-140-20240319	JD84758-13	CHROMIUM	Total	10
114-MW61D-131.0-20240319	JD84758-14	CHROMIUM	Total	10
114-MW61D-136.0-20240319	JD84758-15	CHROMIUM	Total	10
114-MW62C-73.0-20240319	JD84758-16	CHROMIUM	Total	10
114-MW53C-47.5-20240319	JD84758-17	SULFATE	Total	2
114-MW53C-47.5-20240319	JD84758-17	CHROMIUM	Total	200
114-MW57C-71.0-20240319	JD84758-18	SULFATE	Total	3
114-MW57C-71.0-20240319	JD84758-18	CHROMIUM	Total	200
114-MW57C-71.0-20240319-X	JD84758-19	SULFATE	Total	3
114-MW57C-71.0-20240319-X	JD84758-19	CHROMIUM	Total	200
114-MW72D-110-114-20240319	JD84758-2	CHROMIUM	Total	10
GW-RI-FB-20240319	JD84758-20	CHROMIUM	Total	2
114-MW72D-116-119-20240319	JD84758-3	CHROMIUM	Total	10
114-MW72D-123-126-20240319	JD84758-4	CHROMIUM	Total	10
114-MW72D-123-126-20240319	JD84758-4	TOC	Total	5
114-MW4D-90-94-20240319	JD84758-5	CHROMIUM	Total	10
114-MW4D-98-102-20240319	JD84758-6	CHROMIUM	Total	10
114-MW4D-98-102-20240319	JD84758-6	TOC	Total	5
114-MW4D-111-115-20240319	JD84758-7	CHROMIUM	Total	10
114-MW4D-111-115-20240319	JD84758-7	TOC	Total	5
114-MW4D-121-125-20240319	JD84758-8	CHROMIUM	Total	10
114-MW4D-121-125-20240319	JD84758-8	TOTAL ORGANIC CARBON	Total	10

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW66D-91-97-20240319	JD84758-9	CHROMIUM	Total	20

Data Validation Report

Project:	PPG 2023 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD84853
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60704509 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 4/16/2024
Reviewed by:	Linda Waters/AECOM File Name: JD84853_2024_4_16 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 March 20, 2024 as part of the PPG 2023 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-PZ-52WR-74.0-20240320	JD84853-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-PZ-52WR-74.0-20240320	JD84853-1F	Groundwater	Fe
114-PZ-66WR-83.0-20240320	JD84853-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-PZ-66WR-83.0-20240320	JD84853-2F	Groundwater	Fe
114-PZ-66WR-83.0-20240320-X (Field Duplicate of 114-PZ-66WR-83.0-20240320)	JD84853-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-PZ-66WR-83.0-20240320-X (Field Duplicate of 114-PZ-66WR-83.0-20240320)	JD84853-3F	Groundwater	Fe
GW-RI-FB-20240320	JD84853-4	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20240320	JD84853-4F	Field Blank	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2023 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-PZ-66WR-83.0-20240320 (JD84853-2), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-PZ-66WR-83.0-20240320 (JD84853-2), was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-PZ-66WR-83.0-20240320 (JD84853-2) and 114-PZ-66WR-83.0-20240320-X (JD84853-3), were analyzed as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were estimated (J/UJ).

Field Blank

The field blank, GW-RI-FB-20240320 (JD84853-4), reported chromium at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results were greater than ten times the amount in the field blank. No qualifications were made.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-PZ-66WR-83.0-20240320 (JD84853-2, -2F), was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met or no qualifications were required.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

Samples 114-PZ-66WR-83.0-20240320 (JD84853-2, -2F) and 114-PZ-66WR-83.0-20240320-X (JD84853-3, -3F), were analyzed as the field duplicate pair for chromium (total) and ferrous iron (dissolved). All QC acceptance criteria were met. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (Sulfate, TOC)**Method Blank**

The sulfate method blank, GP52863/GN52723, reported sulfate at a concentration greater than the MDL but less than the RL. The sample results for GW-RI-FB-20240320 (JD84853-4) were less than three times the amount in the method blank; therefore, the results for GW-RI-FB-20240320 were negated (UB) at the RL. All other sample results were greater than ten times the amount in the MB and no qualifications were made.

Matrix Spike/ Matrix Spike Duplicate

Sample 114-PZ-66WR-83.0-20240320 (JD84853-2), was analyzed as a MS and/or MSD for TOC and sulfate in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-PZ-66WR-83.0-20240320 (JD84853-2), was analyzed as a laboratory duplicate for sulfate in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

Samples 114-PZ-66WR-83.0-20240320 (JD84853-2) and 114-PZ-66WR-83.0-20240320-X (JD84853-3), were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Sample results negated due to method blank contamination, are useable at the reporting limit.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD84853
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240320

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66WR-83.0-20240320	JD84853-2	Total	CHROMIUM (HEXAVALENT)	U	167	167	2.0		
114-PZ-66WR-83.0-20240320-X	JD84853-3	Total	CHROMIUM (HEXAVALENT)	U	182	182	2.0		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD84853
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240320

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-52WR-74.0-20240320	JD84853-1	Total	CHROMIUM	U	474	474	10		
114-PZ-52WR-74.0-20240320	JD84853-1F	Dissolved	IRON (FERROUS)	U	21.7	21.7J	1.0	Qualify	1
114-PZ-52WR-74.0-20240320	JD84853-1F	Dissolved	CHROMIUM	U	466	466	10		
114-PZ-66WR-83.0-20240320	JD84853-2	Total	CHROMIUM	U	195000	195000	5000		
114-PZ-66WR-83.0-20240320	JD84853-2F	Dissolved	IRON (FERROUS)	U	0.067B	0.067J	0.20	Qualify	1,2
114-PZ-66WR-83.0-20240320-X	JD84853-3	Total	CHROMIUM	U	206000	206000	2500		
114-PZ-66WR-83.0-20240320-X	JD84853-3F	Dissolved	IRON (FERROUS)	U	0.059B	0.059J	0.20	Qualify	1,2
GW-RI-FB-20240320	JD84853-4	Total	CHROMIUM	U	0.72B	0.72J	2.0	Qualify	2
GW-RI-FB-20240320	JD84853-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD84853
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240320

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-52WR-74.0-20240320	JD84853-1	SULFATE	U	280	280	40		
114-PZ-66WR-83.0-20240320	JD84853-2	SULFATE	U	390	390	2.0		
114-PZ-66WR-83.0-20240320-X	JD84853-3	SULFATE	U	400	400	2.0		
GW-RI-FB-20240320	JD84853-4	SULFATE	1.1	1.5B	2.0UB	2.0	Negate	1

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

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

NJDEP Validation Footnote

1. Sample result was <RL and <3X the associated blank result. Sample result was negated at the RL.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD84853
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240320

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-52WR-74.0-20240320	JD84853-1	Total	Total Organic Carbon	U	1190	1190	40		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD84853		Project Number: 60704509 GWM.2023	
Validation Level: Full		Date: 4/16/2024	
Number of Samples/Matrix: 3 GW, 1 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 4/18/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.6 °C
Holding Time	Yes	No	Sampled 3/20/2024, analyzed 3/21/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	3/21/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN52584-MB3 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240320 (JD84853-4) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-PZ-66WR-83.0-20240320 (JD84853-2), {102.5%R}
Laboratory Duplicate	Yes	No	114-PZ-66WR-83.0-20240320 (JD84853-2), {RPD 0}
Laboratory Control Standards	Yes	No	GN52584-B3 (102.0 %R)
Field Duplicate	Yes	No	114-PZ-66WR-83.0-20240320 (JD84853-2) & 114-PZ-66WR-83.0-20240320-X (JD84853-3), {RPD 8.6}
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	Yes	No	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-PZ-66WR-83.0-20240320 (JD84853-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	333.7	167	509	NA	102.5	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PZ-66WR-83.0-20240320	JD84853-2	CHROMIUM (Hexavalent)	167		167		2.0	mg/l	0	OK, Accept

Field Duplicates

114-PZ-66WR-83.0-20240320 (JD84853-2) & 114-PZ-66WR-83.0-20240320-X (JD84853-3)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	167		182		2.0	mg/l	8.6	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PZ-52WR-74.0-20240320	JD84590-1	474	10		10	NC	T Cr > T Cr6, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PZ-66WR-83.0-20240320	JD84590-2	195000	5000	167	2.0	200	T Cr > T Cr6, Accept
114-PZ-66WR-83.0-20240320-X	JD84590-3	206000	2500	182	2.0	200	T Cr > T Cr6, Accept
GW-RI-FB-20240320	JD84590-4	0.72	2.0		10	NC	T Cr > T Cr6, Accept

NC- not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PZ-52WR-74.0-20240320	JD84590-1F	466	10		10	NC	D Cr > D Cr6, Accept

NC- not calculated

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PZ-52WR-74.0-20240320	JD84590-1		10		10	0	Both ND, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-66WR-83.0-20240320	JD84853-2	CHROMIUM (HEXAVALENT)	Total	200
114-PZ-66WR-83.0-20240320-X	JD84853-3	CHROMIUM (HEXAVALENT)	Total	200

SDG#: JD84853/ Method 7196

GN52584

Cr+6 ICAL 3/21/24

GW

(p. 1152 of data pkg)

x - concentration	y - response
0	0
0.01	0
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.418
0.8	0.672
1	0.836

(p. 1152
of data
pkg)

AECOM Calculated Intercept	-0.00176	OK	Reported intercept	-0.0018
AECOM Slope	0.8399	OK	Reported Slope	0.8399
AECOM Calculated r	0.99996	OK	Reported r	0.99996

LCS calculation

GN52584-B3

P. 1137, 1152,
1157

Background absorbance 0
Sample absorbance 0.127
LCS Soluble Instrument Response 0.127
Instrument Concentration (mg/L) 0.153

NA: standards
and samples
treated the same

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.153	OK	Reported Result (mg/L)	0.153

%R = Found/True*100

GN52584-B3

P. 1137, 1152,
1157

True Value (mg/L) 0.150

AECOM Calculated %R	102.2	OK	Reported %R	102.0

MS calculation

GN52584-S5

P. 1139, 1152,
1158

114-PZ-66WR-83.0-20240320

Unfiltered

Background reading 0
Total absorbance 0.426
Total absorbance - background 0.426
Instrument Concentration (mg/L) 0.5093

NA: standards
and samples
treated the same

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1000

AECOM Calculated MS Result (mg/L)	509.3	OK	Reported Result (mg/L)	509

%R = Found/True*100

GN52584-S5

P. 1139, 1152,
1158

114-PZ-66WR-83.0-20240320

True Value (mg/L) 333.700

Native concentration (mg/L) 167.0

AECOM Calculated MS Result %R	102.6	OK	Reported %R	102.5

UNFILTERED

Reporting Limit	JD84853-2	P. 16, 1152	114-PZ-66WR-83.0-20240320

Low Standard	0.01

NA: standards
and samples
treated the same

Initial volume (L)	0.5

Final volume (L)	0.5

Dilution Factor 200

AECOM Calculated Reporting Limit	2.0	OK	Reported RL (mg/L)=	2.0

UNFILTERED

Sample Calculations

JD84853-2 P. 16, 1152 114-PZ-66WR-83.0-20240320

Background reading	0

Total absorbance	0.699

Total absorbance - background	0.699

Instrument Response (mg/L)	0.834

NA: standards
and samples
treated the same

Sample volume (L)	0.5

Final Volume (L)	0.5

Dilution Factor 200

AECOM Calculated Result (mg/L)	166.9	OK	Reported Result (mg/L)	167

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD84853		Project Number: 60704509 GWM.2023	
Validation Level: Limited		Date: 4/16/2024	
Number of Samples/Matrix: 3 GW, 1 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 4/18/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.6 °C
Holding Time	No	Yes	Sampled 3/20/2024, analyzed 3/22-3/27/2024 and 4/9/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	No	Yes	MP45599 (total/dissolved) ND Cr, GP52863/GN52723 (1.1J) sulfate, GP52816/GN52723 ND TOC, GP52820/GN52732 ND TOC, GN52637 (dissolved) ND Fe, , GN52759 (dissolved) ND Fe, , GN52838 (dissolved) ND Fe
Field Blanks	No	No	GW-RI-FB-20240320 (JD84853-4), see table below
Matrix Spike	Yes	No	114-PZ-66WR-83.0-20240320 (JD84853-2, -2F) Cr, TOC, sulfate, dissolved Fe,
Matrix Spike Duplicate	Yes	No	114-PZ-66WR-83.0-20240320 (JD84853-2, -2F) Cr, TOC, sulfate, dissolved Fe, none for sulfate
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	Yes	No	114-PZ-66WR-83.0-20240320 (JD84853-2F) sulfate only (RPD 0.8), none for TOC, Cr, Fe
Laboratory Control Standards	Yes	No	MP45599 (total/dissolved) Cr (91.4 %R), GP52863/GN52723 sulfate (101.1%R), GP52816/GN52723 TOC (92.8 %R), GP52820/GN52732 TOC (93.0 %R), GN52637 (dissolved) Fe (93.3 %R), GN52759 (dissolved) Fe (96.7 %R), GN52838 (dissolved) Fe (96.7 %R)
Field Duplicate	Yes	No	114-PZ-66WR-83.0-20240320 (JD84853-2, -2F) and 114-PZ-66WR-83.0-20240320-X (JD84853-3, -3F), see table below
Total Metals vs Dissolved Metals Results	Yes	No	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-PZ-52WR-74.0-20240320	JD84853-1F	IRON (FERROUS)	3/20/2024 13:00	3/22/2024 14:25	Estimate (J)
114-PZ-66WR-83.0-20240320	JD84853-2F	IRON (FERROUS)	3/20/2024 11:55	3/25/2024 17:50	Estimate (J)
114-PZ-66WR-83.0-20240320-X	JD84853-3F	IRON (FERROUS)	3/20/2024 12:05	3/25/2024 17:50	Estimate (J)
GW-RI-FB-20240320	JD84853-4F	IRON (FERROUS)	3/20/2024 14:25	3/27/2024 15:55	Estimate (UJ)

Method Blank

GP52863/GN52723

Analyte	Fraction	SR (mg/l)	Qual	RL	Associated Samples	Action
SULFATE	Total	1.1	J	2.0	All samples	SR GW-RI-FB-20240320 < 3x MB amount. Negate (UB) . All other SR ND or >10x the amount in the MB, Accept

Field Blank

GW-RI-FB-20240320 (JD84853-4)

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
CHROMIUM	Total	0.72	J	2.0	Associated SR >10x FB, Accept

SR – sample result

RL – reporting limit

Matrix Spikes/Matrix Spike Duplicates

114-PZ-66WR-83.0-20240320 (JD84853-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	0	42.7	43.1	85.4	86.2	143	59	0.9	15	OK, Accept
SULFATE	Total	80	390	461	NA	88.8	NA	120	80	NA	15	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

114-PZ-66WR-83.0-20240320 (JD84853-2F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Ferrous Iron	Dissolved	3.0	0.067	2.9	2.9	94.4	92	113	92	0	20	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

114-PZ-66WR-83.0-20240320 (JD84853-2)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	195000	205000	204000	12500	11250	125	75	0.5	20	SR >5x spike amount, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PZ-66WR-83.0-20240320	JD84853-2	SULFATE	390		387		2.0	mg/l	0.8	OK RPD <20%, Accept

Field Duplicates

114-PZ-66WR-83.0-20240320 (JD84853-2, -2F) & 114-PZ-66WR-83.0-20240320-X (JD84853-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	0.067		0.059		0.20	mg/l	12.7	RPD < 30%, Accept
CHROMIUM	Total	195000		206000		5000/2500	ug/l	5.5	RPD < 30%, Accept
SULFATE	Total	390		400		2.0	mg/l	2.5	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total		U		U	5.0	mg/l	0	Both ND, Accept

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PZ-52WR-74.0-20240320	JD84590-1	474	10	466	10	50	8	2	T Cr > D Cr, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-52WR-74.0-20240320	JD84853-1	SULFATE	Total	20
114-PZ-52WR-74.0-20240320	JD84853-1	CHROMIUM	Total	10
114-PZ-52WR-74.0-20240320	JD84853-1	TOC	Total	40
114-PZ-52WR-74.0-20240320	JD84853-1F	IRON (FERROUS)	Dissolved	5
114-PZ-52WR-74.0-20240320	JD84853-1F	CHROMIUM	Dissolved	10
114-PZ-66WR-83.0-20240320	JD84853-2	CHROMIUM	Total	5000
114-PZ-66WR-83.0-20240320	JD84853-2	TOC	Total	5
114-PZ-66WR-83.0-20240320-X	JD84853-3	CHROMIUM	Total	2500
114-PZ-66WR-83.0-20240320-X	JD84853-3	TOC	Total	5
GW-RI-FB-20240320	JD84853-4	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2023 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD84943
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60704509 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 4/11/2024
Reviewed by:	Allison Wamness/AECOM File Name: JD84943_2024_4_11 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 March 21, 2024 as part of the PPG 2023 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW75WR-118.5-20240321	JD84943-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW75WR-118.5-20240321	JD84943-1F	Groundwater	Fe
GW-RI-FB-20240321	JD84943-2	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20240321	JD84943-2F	Field Blank	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2023 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)

Hold Time

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above for evaluation and any action.

Wet Chemistry (Sulfate, TOC)**Field Blank**

The field blank (FB) for sulfate, GW-RI-FB-20240321 (JD84943-2), reported sulfate at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). The associated sample, 114-MW75WR-118.5-20240321 (JD84943-1), reported sulfate at a concentration greater than ten times the amount in the FB. No qualifications were made.

Matrix Spike/ Matrix Spike Duplicate

Sample 114-MW75WR-118.5-20240321 (JD84943-1), was analyzed as a MS/MSD for TOC in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD84943
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240321

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD84943
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240321

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW75WR-118.5-20240321	JD84943-1	Total	CHROMIUM	U	1.6B	1.6F	2.0	Qualify	2
114-MW75WR-118.5-20240321	JD84943-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
GW-RI-FB-20240321	JD84943-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD84943
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240321

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW75WR-118.5-20240321	JD84943-1	SULFATE	U	117	117	2.0		
GW-RI-FB-20240321	JD84943-2	SULFATE	U	1.1B	1.1J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD84943
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240321

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW75WR-118.5-20240321	JD84943-1	Total	Total Organic Carbon	U	3.2	3.2	1.0		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD84943		Project Number: 60704509 GWM.2023	
Validation Level: Full		Date: 4/11/2024	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness 4/2/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.8 °C
Holding Time	Yes	No	Sampled 3/21/2024, analyzed 3/22/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	3/22/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN52639-MB2, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240321 (JD84943-2), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN52639-B2 (99.3 %R)
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW75WR-118.5-20240321	JD84943-1	1.6	2.0		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20240321	JD84943-2		2.0		10	0	Both ND, Accept

NC- not calculated

SDG#: JD84943/ Method 7196

GN52639

Cr+6 ICAL 3/22/24

GW

(p. 1064 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.417
0.8	0.672
1	0.834

(p. 1064
of data
pkg)

AECOM Calculated Intercept	0.00047	OK	Reported intercept	0.0005
AECOM Slope	0.8356	OK	Reported Slope	0.8356
AECOM Calculated r	0.99999	OK	Reported r	0.99999

LCS calculation

GN52639-B2

P. 1052, 1064

Background absorbance	0	
Sample absorbance	0.125	
LCS Soluble Instrument Response	0.125	
Instrument Concentration (mg/L)	0.149	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149

%R = Found/True*100

GN52639-B2

P. 1052, 1064

True Value (mg/L)	0.15			
AECOM Calculated %R	99.4	OK	Reported %R	99.3

MS calculation

GN52639-S1

P. 1054, 1064

Batch QC JD84944-4

Unfiltered

Background reading	0	
Total absorbance	0.126	
Total absorbance - background	0.126	
Instrument Concentration (mg/L)	0.1502	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated MS Result (mg/L)	0.15	OK	Reported Result (mg/L)	0.15

%R = Found/True*100

GN52639-S1

P. 1054, 1064

Batch QC JD84944-4

True Value (mg/L)	0.15			
Native concentration (mg/L)	0.00			
AECOM Calculated MS Result %R	100.9	OK	Reported %R	100.0

UNFILTERED

Reporting Limit

JD84943-1

P. 9, 1064

114-MW75WR-118.5-20240321

Low Standard

0.01

NA: standards
and samples
treated the same

Initial volume (L)

0.5

Final volume (L)

0.5

Dilution Factor

1

AECOM Calculated Reporting Limit

0.010

OK

Reported RL (mg/L)=

0.010

UNFILTERED

Sample Calculations

JD84943-1

P. 9, 1064

114-MW75WR-118.5-20240321

Background reading

0

Total absorbance

0

Total absorbance - background

0

Instrument Response (mg/L)

-0.001

NA: standards
and samples
treated the same

Sample volume (L)

0.5

Final Volume (L)

0.5

Dilution Factor

1

AECOM Calculated Result (mg/L)

0.0

OK, report as
ND

Reported Result (mg/L)

0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD84943		Project Number: 60704509 GWM.2023	
Validation Level: Limited		Date: 4/11/2024	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Allison Wamness	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.8 °C
Holding Time	No	Yes	Sampled 3/21/2024, analyzed 3/23/24, 3/24/24, 3/27/24, and 4/5/2024. Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP45537 (total) ND Cr, GP52865/GN52724 ND sulfate, GP52836/GN52731 ND TOC, GN52838 (dissolved) ND Fe
Field Blanks	No	No	GW-RI-FB-20240321 (JD84943-2), Cr, TOC, Fe, all ND, sulfate (1.1J mg/l)
Matrix Spike	Yes	No	114-MW75WR-118.5-20240321 (JD84943-1) TOC (108.0 %R), Batch QC total Cr, sulfate, dissolved Fe,
Matrix Spike Duplicate	Yes	No	114-MW75WR-118.5-20240321 (JD84943-1) TOC, Batch QC total Cr and Fe, none for sulfate
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	Batch QC sulfate only, none for TOC, Cr, Fe
Laboratory Control Standards	Yes	No	MP45537 Cr (88.6 %R), GP52865/GN52724 sulfate (95.4 %R), GP52836/GN52731 TOC (99.1 %R), GN52838 (dissolved) Fe (96.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW75WR-118.5-20240321	JD84943-1F	IRON (FERROUS)	3/21/2024 9:30	3/27/2024 15:45	Estimate (UJ)
GW-RI-FB-20240321	JD84943-2F	IRON (FERROUS)	3/21/2024 14:40	3/27/2024 15:53	Estimate (UJ)

Field Blank

GW-RI-FB-20240321 (JD84943-2)

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
SULFATE	Total	1.1	J	2.0	Associated SR >10x FB, Accept

SR – sample result

RL – reporting limit

Matrix Spikes/Matrix Spike Duplicates

114-MW75WR-118.5-20240321 (JD84943-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	3.2	14.0	13.7	108.0	105	143	59	2.2	10	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW75WR-118.5-20240321	JD84943-1	CHROMIUM	Total	2
GW-RI-FB-20240321	JD84943-2	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2023 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD85454
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B TOC by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60704509 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 4/18/2024
Reviewed by:	Allison Wamness/AECOM File Name: JD85454_2024_4_18 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 March 29, 2024 as part of the PPG 2023 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW52D-80-83-20240329	JD85454-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20240329	JD85454-1F	Groundwater	Fe
114-MW52D-87-90-20240329	JD85454-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20240329	JD85454-2F	Groundwater	Fe
114-MW52D-102-105-20240329	JD85454-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20240329	JD85454-3F	Groundwater	Fe
114-MW57D-87.5-91.5-20240329	JD85454-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20240329	JD85454-4F	Groundwater	Fe
114-MW57D-96.5-100.5-20240329	JD85454-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20240329	JD85454-5F	Groundwater	Fe
114-MW57D-104-108-20240329	JD85454-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20240329	JD85454-6F	Groundwater	Fe
114-MW57D-109-113-20240329	JD85454-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW52D-80-83-20240329	JD85454-7F	Groundwater	Fe
GW-RI-FB-20240329	JD85454-8	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20240329	JD85454-8F	Groundwater	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2023 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW52D-102-105-20240329 (JD85454-3), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW52D-102-105-20240329 (JD85454-3), was analyzed as a laboratory duplicate for this data set. Both sample results were nondetect. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW52D-80-83-20240329 (JD85454-1) was analyzed as a MS/MSD for ferrous iron (dissolved) in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)

Matrix Spike/ Matrix Spike Duplicate

Sample 114-MW52D-80-83-20240329 (JD85454-1) was analyzed as a MS/MSD for TOC in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Sample results estimated due to poor matrix spike recoveries, are useable with a low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD85454
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240329

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported.			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD85454
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240329

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20240329	JD85454-1	Total	CHROMIUM	U	16.3	16.3	10		
114-MW52D-80-83-20240329	JD85454-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW52D-87-90-20240329	JD85454-2	Total	CHROMIUM	U	20.4	20.4	10		
114-MW52D-87-90-20240329	JD85454-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW52D-102-105-20240329	JD85454-3	Total	CHROMIUM	U	3.2B	3.2J	10	Qualify	2
114-MW52D-102-105-20240329	JD85454-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57D-87.5-91.5-20240329	JD85454-4	Total	CHROMIUM	U	5.3B	5.3J	10	Qualify	2
114-MW57D-87.5-91.5-20240329	JD85454-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57D-96.5-100.5-20240329	JD85454-5	Total	CHROMIUM	U	13.6	13.6	10		
114-MW57D-96.5-100.5-20240329	JD85454-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-104-108-20240329	JD85454-6	Total	CHROMIUM	U	8.4B	8.4J	10	Qualify	2
114-MW57D-104-108-20240329	JD85454-6F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57D-109-113-20240329	JD85454-7	Total	CHROMIUM	U	3.5B	3.5J	10	Qualify	2
114-MW57D-109-113-20240329	JD85454-7F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
GW-RI-FB-20240329	JD85454-8F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD85454
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240329

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20240329	JD85454-1	SULFATE	U	76.1	76.1	2.0		
114-MW52D-87-90-20240329	JD85454-2	SULFATE	U	139	139	2.0		
114-MW52D-102-105-20240329	JD85454-3	SULFATE	U	129	129	2.0		
114-MW57D-87.5-91.5-20240329	JD85454-4	SULFATE	U	86.7	86.7	2.0		
114-MW57D-96.5-100.5-20240329	JD85454-5	SULFATE	U	82.0	82.0	2.0		
114-MW57D-104-108-20240329	JD85454-6	SULFATE	U	76.9	76.9	2.0		
114-MW57D-109-113-20240329	JD85454-7	SULFATE	U	49.7	49.7	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2023 GAG GW Remedial Activities
Sampling Date March 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD85454
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240329

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20240329	JD85454-1	Total	Total Organic Carbon	U	332	332	25	Qualify	1
114-MW52D-87-90-20240329	JD85454-2	Total	Total Organic Carbon	U	45.1	45.1	1.0	Qualify	1
114-MW52D-102-105-20240329	JD85454-3	Total	Total Organic Carbon	U	44.5	44.5	1.0	Qualify	1
114-MW57D-87.5-91.5-20240329	JD85454-4	Total	Total Organic Carbon	U	21.3	21.3	1.0	Qualify	1
114-MW57D-96.5-100.5-20240329	JD85454-5	Total	Total Organic Carbon	U	29.8	29.8	1.0	Qualify	1
114-MW57D-104-108-20240329	JD85454-6	Total	Total Organic Carbon	U	22.1	22.1	1.0	Qualify	1
114-MW57D-109-113-20240329	JD85454-7	Total	Total Organic Carbon	U	21.1	21.1	1.0	Qualify	1

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

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

NJDEP Validation Footnote

1. MS and/or MSD recovery was below the lower acceptance limit.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD85454		Project Number: 60704509 GWM.2023	
Validation Level: Full		Date: 4/18/2024	
Number of Samples/Matrix: 7 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Allison Wamness 4/18/24	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C, 2.6 °C
Holding Time	Yes	No	Sampled 3/29/2024, analyzed 3/30/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	3/30/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN52967-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240329 (JD85454-8) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW52D-102-105-20240329 (JD85454-3), {100.0%R}
Laboratory Duplicate	Yes	No	114-MW52D-102-105-20240329 (JD85454-3), {RPD 0}, Both ND
Laboratory Control Standards	Yes	No	GN52967-B1 (100.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW52D-102-105-20240329 (JD85454-3)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.15	NA	100.0	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW52D-102-105-20240329	JD85454-3	CHROMIUM (Hexavalent)	0.0026	U	0.0	U	0.010	mg/l	0	Both ND, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW52D-80-83-20240329	JD85454-1	16.3	10		10	NC	T Cr > T Cr6, Accept
114-MW52D-87-90-20240329	JD85454-2	20.4	10		10	NC	T Cr > T Cr6, Accept
114-MW52D-102-105-20240329	JD85454-3	3.2	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-87.5-91.5-20240329	JD85454-4	5.3	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-96.5-100.5-20240329	JD85454-5	13.6	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-104-108-20240329	JD85454-6	8.4	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-109-113-20240329	JD85454-7	3.5	10		10	NC	T Cr > T Cr6, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
GW-RI-FB-20240329	JD85454-8		2.0		10	NC	Both ND, Accept

NC- not calculated

SDG#: JD85454/ Method 7196

GN52967

Cr+6 ICAL 3/30/24

GW

(p. 739 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.421
0.8	0.672
1	0.840

(p. 739 of
data pkg)

AECOM Calculated Intercept	0.00022	OK	Reported intercept	0.0002
AECOM Slope	0.8400	OK	Reported Slope	0.8400
AECOM Calculated r	1.00000	OK	Reported r	1.00000

LCS calculation

GN52967-B1

P. 726, 739

Background absorbance	0	NA: standards and samples treated the same
Sample absorbance	0.127	
LCS Soluble Instrument Response	0.127	
Instrument Concentration (mg/L)	0.151	
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100

GN52967-B1

P. 726, 739

True Value (mg/L)	0.150

AECOM Calculated %R	100.6	OK	Reported %R	100.7

MS calculation

GN52967-S1

P. 728, 739

114-MW52D-102-105-20240329

Unfiltered

Background reading	0	NA: standards and samples treated the same
Total absorbance	0.125	
Total absorbance - background	0.125	
Instrument Concentration (mg/L)	0.1486	
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated MS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.15

%R = Found/True*100

GN52967-S1

P. 728, 739

114-MW52D-102-105-20240329

True Value (mg/L)	0.150

Native concentration (mg/L)	0.0

AECOM Calculated MS Result %R	99.0	OK	Reported %R	100.0

UNFILTERED

JD85454-3

114-MW52D-102-105-20240329

0.01

Initial volume (L)

0.5

0.5

1

0.010

OK

Reported RL (mg/L)=

0.010

Sample Calculations

P. 19, 739

114-MW52D-102-105-20240329

0

0

0

0.000

Sample volume (L)

0.5

0.5

1

-0.00026

OK <MDL, report
as ND

Reported Result (mg/L)

0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2023 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD85454		Project Number: 60704509 GWM.2023	
Validation Level: Limited		Date: 4/18/2024	
Number of Samples/Matrix: 7 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Allison Wamness 4/18/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C, 2.6 °C
Holding Time	No	Yes	Sampled 3/29/2024, analyzed 4/1/2024, 4/5/2024, and 4/10/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP45664 (total) ND Cr, GP53041/GN53040 ND sulfate, GP53014/GN53221 ND TOC, GN53011 (dissolved) ND Fe
Field Blanks	Yes	No	GW-RI-FB-20240329 (JD85454-8), all ND
Matrix Spike	Yes	No	114-MW52D-80-83-20240329 (JD85454-1, -1F) TOC, dissolved Fe, Batch QC Cr, and sulfate
Matrix Spike Duplicate	No	Yes	114-MW52D-80-83-20240329 (JD85454-1, -1F) TOC, dissolved Fe, Batch QC Cr, and sulfate
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP45664 (total) Cr (84.1 %R), GP53041/GN53040 sulfate (109.5 %R), GP53014/GN53221 TOC (98.3 %R), GN53011 (dissolved) Fe (96.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW52D-80-83-20240329	JD85454-1F	IRON (FERROUS)	3/29/2024 12:30	4/1/2024 13:54	Estimate (UJ)
114-MW52D-87-90-20240329	JD85454-2F	IRON (FERROUS)	3/29/2024 12:40	4/1/2024 13:54	Estimate (UJ)
114-MW52D-102-105-20240329	JD85454-3F	IRON (FERROUS)	3/29/2024 12:50	4/1/2024 13:54	Estimate (UJ)
114-MW57D-87.5-91.5-20240329	JD85454-4F	IRON (FERROUS)	3/29/2024 9:40	4/1/2024 13:54	Estimate (UJ)
114-MW57D-96.5-100.5-20240329	JD85454-5F	IRON (FERROUS)	3/29/2024 9:50	4/1/2024 13:54	Estimate (UJ)
114-MW57D-104-108-20240329	JD85454-6F	IRON (FERROUS)	3/29/2024 10:15	4/1/2024 13:54	Estimate (UJ)
114-MW57D-109-113-20240329	JD85454-7F	IRON (FERROUS)	3/29/2024 10:30	4/1/2024 13:54	Estimate (UJ)
GW-RI-FB-20240329	JD85454-8F	IRON (FERROUS)	3/29/2024 13:10	4/1/2024 13:54	Estimate (UJ)

Matrix Spikes/Matrix Spike Duplicates

114-MW52D-80-83-20240329 (JD85454-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	250	332	511	468	71.6	54.4	143	59	8.2	15	RPD low, Estimate (J-)

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW52D-80-83-20240329 (JD85454-1F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Ferrous Iron	Dissolved	3.0	0	2.9	2.9	96.7	96.7	113	92	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result**

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW52D-80-83-20240329	JD85454-1	CHROMIUM	Total	10
114-MW52D-80-83-20240329	JD85454-1	TOC	Total	25
114-MW52D-87-90-20240329	JD85454-2	CHROMIUM	Total	10
114-MW52D-102-105-20240329	JD85454-3	CHROMIUM	Total	10
114-MW57D-87.5-91.5-20240329	JD85454-4	CHROMIUM	Total	10
114-MW57D-96.5-100.5-20240329	JD85454-5	CHROMIUM	Total	10
114-MW57D-104-108-20240329	JD85454-6	CHROMIUM	Total	10
114-MW57D-109-113-20240329	JD85454-7	CHROMIUM	Total	10
GW-RI-FB-20240329	JD85454-8	CHROMIUM	Total	2

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD88834, JD88834R
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW-846 5310B Ferrous Iron SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, Sulfate, TOC, Ferrous Iron, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 6/26/2024
Reviewed by:	Linda Waters /AECOM File Name: JD88834_2024_06_26_DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-AES Data Validation, SOP No. HW-3a Revision 1 (September 2016);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated 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 May 20, 2024 as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-MW56C-71.5-20240520	JD88834-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW56C-71.5-20240520	JD88834-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Iron (dissolved), Manganese (dissolved)
114-MW57C-70.9-20240520	JD88834-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW57C-70.9-20240520	JD88834-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Iron (dissolved), Manganese (dissolved)
114-MW57C-70.9-20240520	JD88834-2RF	Groundwater	Iron, Ferrous

Field ID	Laboratory ID	Matrix	Parameter*
P4-IRM-FB-20240520	JD88834-3	Field BLank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW57C-70.9-20240520 (JD88834-2, -2F), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Samples 114-MW57C-70.9-20240520(JD88834-2F), was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240520 (JD88834-3) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese, Ferrous Iron)

Sample Results

Total vs. Dissolved

The results for total and dissolved chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and dissolved results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Metals vs. Dissolved Metals Comparison	Action
Total Concentration Greater than Dissolved Concentration	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the value > the RL and the RL of the ND result is $\leq$ RL	No Qualification
Total Concentration Nondetect and Dissolved Concentration Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Both Sample Results Positive and < 5x RL; Absolute Difference $\leq$ RL	No Qualification
Both Sample Results Positive and < 5x RL; Absolute Difference > RL	Qualify J
Both Sample Results Positive and $\geq$ 5x RL; RPD $\leq$ 30%	No Qualification
Both Sample Results Positive and $\geq$ 5x RL; RPD >30%	Qualify J
Total Concentration Equal to Dissolved Concentration	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Holding Time

Ferrous iron was analyzed outside of the method required holding time for sample 114-MW57C-70.9-20240520 (JD88834-2RF). Results were qualified as estimated (UJ).

Matrix Spikes

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240520 (JD88834-3) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240520 (JD88834-3) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane**Matrix Spikes**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on site sample 114-MW56C-71.5-20240520 (JD88834-1). All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240520 (JD88834-3) was submitted for methane analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

All QC criteria were met. The data was accepted as reported.

Data Quality and Usability

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

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

Results estimated due to holding time exceedance are useable with a low bias.

Several results for hexavalent chromium, chromium, sulfate, and manganese, as presented in Attachments A and B, exceeded the Groundwater Action levels.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD88834
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240520

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW56C-71.5-20240520	JD88834-1	Total	CHROMIUM (HEXAVALENT)	U	35.6	35.6	1.0		
114-MW56C-71.5-20240520	JD88834-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	35.0	35.0	1.0		
114-MW57C-70.9-20240520	JD88834-2	Total	CHROMIUM (HEXAVALENT)	U	16.2	16.2	0.50		
114-MW57C-70.9-20240520	JD88834-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	15.5	15.5	0.50		

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD88834
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240520

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW56C-71.5-20240520	JD88834-1	Total	CHROMIUM	U	37000	37000	500		
114-MW56C-71.5-20240520	JD88834-1F	Dissolved	CHROMIUM	U	36400	36400	500		
114-MW56C-71.5-20240520	JD88834-1F	Dissolved	MANGANESE	U	25.6	25.6	10		
114-MW57C-70.9-20240520	JD88834-2RF	Total	IRON, (Ferrous)	U	U	UJ	0.20	Qualify	1
114-MW57C-70.9-20240520	JD88834-2	Total	CHROMIUM	U	15800	15800	200		
114-MW57C-70.9-20240520	JD88834-2F	Total	CHROMIUM	U	17700	17700	200		
114-MW57C-70.9-20240520	JD88834-2F	Dissolved	MANGANESE	U	99.0	99.0	10		

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD88834
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240520

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-70.9-20240520	JD88834-2	TOTAL ORGANIC CARBON	U	4.6	4.6	1.0	Qualify	1

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD88834
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240520

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW56C-71.5-20240520	JD88834-1	SULFATE	U	283	283	10		
114-MW57C-70.9-20240520	JD88834-2	SULFATE	U	571	571	10		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD88834
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240520

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW56C-71.5-20240520	JD88834-1	METHANE	U	46.9	46.9	0.11		
114-MW57C-70.9-20240520	JD88834-2	METHANE	U	363	363	1.1		

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD88834		Project Number: 60729481.GWM	
Validation Level: Full		Date: 06/26/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 06/26/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.4 °C
Holding Time	Yes	No	Sampled 05/20/2024 analyzed 05/24/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	05/21/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55033-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240520 (JD88834-3), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW57C-70.9-20240520(JD88834-2, -2F), (88 %R, 103.8 %R)
Laboratory Duplicate	Yes	No	114-MW57C-70.9-20240520(JD88834-2F), [RPD 1.3}
Laboratory Control Standards	Yes	No	GN55033-B1 (102.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW56C-71.5-20240520	JD88834-1	37000	500	35600	1000	4	T Cr > T Cr6, Accept
114-MW57C-70.9-20240520	JD88834-2	15800	200	16200	500	3	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
P4-IRM-FB-20240520	JD88834-3		2.0		10	0	Both ND, Accept

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	RL (ug/l)	Dissolved Hexavalent chromium (ug/l)	Dissolved Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW56C-71.5-20240520	JD88834-1F	36400	500	35000	1000	4	D Cr > D Cr6, Accept
114-MW57C-70.9-20240520	JD88834-2F	17700	200	15500	500	13	D Cr > D Cr6, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW56C-71.5-20240520	JD88834-1, -1F	35600	1000	35000	1000	6	T Cr6 > D Cr6, Accept
114-MW57C-70.9-20240520	JD88834-2, -2F	16200	500	15500	500	6	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

NC- not calculated

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW56C-71.5-20240520	JD88834-1	CHROMIUM (HEXAVALENT)	Total	100
114-MW56C-71.5-20240520	JD88834-1F	CHROMIUM (HEXAVALENT)	Dissolved	100
114-MW57C-70.9-20240520	JD88834-2	CHROMIUM (HEXAVALENT)	Total	50
114-MW57C-70.9-20240520	JD88834-2F	CHROMIUM (HEXAVALENT)	Dissolved	50

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW56C-71.5-20240520	JD88834-1	CHROMIUM (HEXAVALENT)	35.6	Y	mg/l	0.07
114-MW56C-71.5-20240520	JD88834-1F	CHROMIUM (HEXAVALENT)	35	Y	mg/l	0.07
114-MW57C-70.9-20240520	JD88834-2	CHROMIUM (HEXAVALENT)	16.2	Y	mg/l	0.07
114-MW57C-70.9-20240520	JD88834-2F	CHROMIUM (HEXAVALENT)	15.5	Y	mg/l	0.07

SDG#: JD88834/ Method 7196**GN55033**

Cr+6 ICAL 5/21/24

GW

(p. 1045 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.088
0.3	0.255
0.5	0.42
0.8	0.665
1	0.845

(p. 1045
of data
pkg)

AECOM Calculated Intercept	0.00223	OK	Reported intercept	0.0022
AECOM Slope	0.8374	OK	Reported Slope	0.8374
AECOM Calculated r	0.99993	OK	Reported r	0.99993

LCS calculation**GN55033-B1****P. 1024, 1045**

Background absorbance	0
Sample absorbance	0.13
LCS Soluble Instrument Response	0.13
Instrument Concentration (mg/L)	0.153

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.153	OK	Reported Result (mg/L)	0.153

%R = Found/True*100**GN55033-B1****P. 1024, 1045**

True Value (mg/L)	0.150

AECOM Calculated %R	101.7	OK	Reported %R	102.0

MS calculation**GN55033-S2****P. 1026, 1045****114-MW57C-70.9-20240520****filtered**

Background reading	0
Total absorbance	0.402
Total absorbance - background	0.402
Instrument Concentration (mg/L)	0.4774

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	100

AECOM Calculated MS Result (mg/L)	47.7	OK	Reported Result (mg/L)	47.7

%R = Found/True*100**GN55033-S2****P. 1026, 1045****114-MW57C-70.9-20240520**

True Value (mg/L)	31.02

Native concentration (mg/L)	15.5

AECOM Calculated MS Result %R	103.9	OK	Reported %R	103.8

UNFILTERED**Reporting Limit****JD88834-2****P. 16, 1045****114-MW57C-70.9-20240520**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	50

AECOM Calculated Reporting Limit	0.50	OK	Reported RL (mg/L)=	0.50

UNFILTERED**Sample Calculations****JD88834-2****P. 16, 1045****114-MW57C-70.9-20240520**

Background reading	0
Total absorbance	0.274
Total absorbance - background	0.274
Instrument Response (mg/L)	0.325

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	50

AECOM Calculated Result (mg/L)	16.2	OK	Reported Result (mg/L)	16.2

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD88834		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 06/26/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 06/26/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	Ferrous iron is not on the COC but was requested for samples with extra volume. (analyzed 114-MW57C-70.9-20240520 (JD88834-2RF))
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.4 °C
Holding Time	No	Yes	Sampled 05/24/2024, analyzed 05/22/2024 - 05/24/2024, and 06/08/2024. Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP46777 ND (Cr, Mn, Fe), GN55832 ND Fe2, GP54157/GN55141 ND Sulfate, GP54907/GN55123 ND TOC, GN54099/GN55283 ND TOC
Field Blanks	Yes	No	P4-IRM-FB-20240520 (JD88834-3), ND
Matrix Spike	NA	NA	Batch QC for all
Matrix Spike Duplicate	NA	NA	Batch QC for all
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP46777 Cr (90.1 %R), Mn (89.1 %R), Fe (93.5 %R), GN55832 Fe2 (93.3 %R), GP54157/GN55141 Sulfate (104.8 %R), GP54907/GN55123 TOC (100.0 %R), GN54099/GN55283 TOC (103.0 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW57C-70.9-20240520	JD88834-2RF	IRON (FERROUS)	5/20/2024 12:30:00 PM	6/8/2024 12:06:00 PM	Estimate (UJ)

Total Chromium vs. Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total RL (ug/l)	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	RPD (%)	Action
114-MW56C-71.5-20240520	JD88834-1, -1F	37000	500	36400	500	2	T Cr > D Cr, Accept
114-MW57C-70.9-20240520	JD88834-2, -2F	15800	200	17700	200	11	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW56C-71.5-20240520	JD88834-1	TOC	Total	5
114-MW56C-71.5-20240520	JD88834-1	CHROMIUM	Total	500
114-MW56C-71.5-20240520	JD88834-1F	CHROMIUM	Dissolved	500
114-MW56C-71.5-20240520	JD88834-1F	IRON	Dissolved	10
114-MW56C-71.5-20240520	JD88834-1F	MANGANESE	Dissolved	10
114-MW56C-71.5-20240520	JD88834-1	SULFATE	Total	5
114-MW57C-70.9-20240520	JD88834-2	TOC	Total	5
114-MW57C-70.9-20240520	JD88834-2	METHANE	NA	10
114-MW57C-70.9-20240520	JD88834-2	CHROMIUM	Total	200
114-MW57C-70.9-20240520	JD88834-2F	CHROMIUM	Dissolved	200
114-MW57C-70.9-20240520	JD88834-2F	IRON	Dissolved	10
114-MW57C-70.9-20240520	JD88834-2F	MANGANESE	Dissolved	10
114-MW57C-70.9-20240520	JD88834-2	SULFATE	Total	5
P4-IRM-FB-20240520	JD88834-3	CHROMIUM	Total	2

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW56C-71.5-20240520	JD88834-1	SULFATE	283	Y	mg/l	250
114-MW56C-71.5-20240520	JD88834-1	CHROMIUM	37000	Y	ug/l	70
114-MW56C-71.5-20240520	JD88834-1F	CHROMIUM	36400	Y	ug/l	70
114-MW57C-70.9-20240520	JD88834-2	SULFATE	571	Y	mg/l	250
114-MW57C-70.9-20240520	JD88834-2	CHROMIUM	15800	Y	ug/l	70
114-MW57C-70.9-20240520	JD88834-2F	MANGANESE	99	Y	ug/l	50
114-MW57C-70.9-20240520	JD88834-2F	CHROMIUM	17700	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD88834		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 06/26/2024		
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 06/26/24		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			3.4 °C
Holding Time	X			Sampled 05/20/2024, Analyzed 05/28/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3054-MB, ND
Trip Blanks/Field Blanks/Equipment Blanks	X			P4-IRM-FB-20240520 (JD88834-3), ND
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate	X			114-MW56C-71.5-20240520 (JD88834-1)
Laboratory Control Standards	X			GAA3054-LCS (95 %R)
Field Duplicate			X	None with this SDG
Percent Solids			X	Aqueous

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW57C-70.9-20240520	JD88834-2	METHANE	10

Data Validation Report

Project:	Phase 3 Groundwater IRM
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD88878
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60666330 6.1B
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 12/24/2024
Reviewed by:	Linda Waters /AECOM File Name: JD88878_2024_12_24 DVReport_ID.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.

- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 May 21, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW77WR-60.0-20240521	JD88878-1	Groundwater	Hexavalent Chromium, Chromium
114-MW76WR-60.0-20240521	JD88878-2	Groundwater	Hexavalent Chromium, Chromium
P4-IRM-FB-20240521	JD88878-3	Field Blank	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The field blank, P4-IRM-FB-20240521 (JD88878-3), was submitted for hexavalent chromium analysis. No contamination was detected.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium)**Matrix Spike (MS)/Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample for chromium in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The field blank, P4-IRM-FB-20240521 (JD88878-3), reported chromium at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results reported results greater than ten times the amount in the FB. No qualifications were made.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

The data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in Attachments A and B below.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date May 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD88878
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs P4-IRM-FB-20240521

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW77WR-60.0-20240521	JD88878-1	Total	CHROMIUM (HEXAVALENT)	U	30.3	30.3	1.0		
114-MW76WR-60.0-20240521	JD88878-2	Total	CHROMIUM (HEXAVALENT)	U	83.4	83.4	1.0		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date May 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD88878
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs P4-IRM-FB-20240521

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW77WR-60.0-20240521	JD88878-1	Total	CHROMIUM	U	27300	27300	500		
114-MW76WR-60.0-20240521	JD88878-2	Total	CHROMIUM	U	87800	87800	2000		
P4-IRM-FB-20240521	JD88878-3	Total	CHROMIUM	U	0.68B	0.68J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: Phase 3 Groundwater IRM	
Laboratory SDG/Job No: JD88878		Project Number: 60666330 6.1B	
Validation Level: Full		Date: 12/24/2024	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 10/6/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	5.5 °C
Holding Time	Yes	No	Sampled 5/21/2024, analyzed 5/22/2024
Quantitation Limits	No	No	See table below
Dilutions	No	Yes	See table below
Initial Calibration	Yes	No	5/22/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55086-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240521 (JD88878-3), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN55086-B1 (100.7 %R)
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW77WR-60.0-20240521	JD88878-1	27300	500	30300	1000	10	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW76WR-60.0-20240521	JD88878-2	87800	2000	83400	1000	5	T Cr > T Cr6, Accept
P4-IRM-FB-20240521	JD88878-3	0.68	2.0		10	NC	T Cr > T Cr6, Accept

NC- not calculated**RL – reporting limit****RPD – relative percent difference****Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW77WR-60.0-20240521	JD88878-1	CHROMIUM (HEXAVALENT)	Total	100
114-MW76WR-60.0-20240521	JD88878-2	CHROMIUM (HEXAVALENT)	Total	100

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW77WR-60.0-20240521	JD88878-1	CHROMIUM (HEXAVALENT)	30.3	Y	mg/l	0.07
114-MW76WR-60.0-20240521	JD88878-2	CHROMIUM (HEXAVALENT)	83.4	Y	mg/l	0.07

SDG#: JD88878/ Method 7196

GN55086

Cr+6 ICAL 12/14/2024

GW

(p. 808 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.087
0.3	0.251
0.5	0.422
0.8	0.659
1	0.839

(p. 808 of
data pkg)

AECOM Calculated Intercept	0.00210	OK	Reported intercept	0.0021
AECOM Slope	0.8320	OK	Reported Slope	0.8320
AECOM Calculated r	0.99991	OK	Reported r	0.99991

LCS calculation

GN55086-B2

P. 804, 808

Background absorbance	0
Sample absorbance	0.128
LCS Soluble Instrument Response	0.128
Instrument Concentration (mg/L)	0.151

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100

GN55086-B2

P. 804, 808

True Value (mg/L)	0.150

AECOM Calculated %R	100.9	OK	Reported %R	100.7

MS calculation

GN55086-S2

P. 806, 808, 809

Batch QC (JD88880-6)

unfiltered

Background reading	0
Total absorbance	0.133
Total absorbance - background	0.133
Instrument Concentration (mg/L)	0.1573

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.157	OK	Reported Result (mg/L)	0.157

%R = Found/True*100

GN55086-S2

P. 806, 808, 809

Batch QC (JD88880-6)

True Value (mg/L)	0.150
Native concentration (mg/L)	0.0000

AECOM Calculated MS Result %R	104.9	OK	Reported %R	104.7

UNFILTERED**Reporting Limit**

JD88878-1

P. 9, 327, 808

114-MW77WR-60.0-20240521

Low Standard 0.01

Initial volume (L) 0.5

Final volume (L) 0.5

Dilution Factor 100

AECOM Calculated Reporting Limit	1.000	OK	Reported RL (mg/L)=	1.000

UNFILTERED

Sample Calculations **JD8878-1** **P. 9, 327, 808** **114-MW77WR-60.0-20240521**

Background reading 0

Total absorbance 0.254

Total absorbance - background 0.254

Instrument Response (mg/L) 0.303

Sample volume (L) 0.5

Final Volume (L) 0.5

Dilution Factor 100

AECOM Calculated Result (mg/L)	30.278	OK	Reported Result (mg/L)	30.3

Laboratory: SGS, Dayton		Client/Site Name: Phase 3 Groundwater IRM	
Laboratory SDG/Job No: JD88878		Project Number: 60666330 6.1B	
Validation Level: Limited		Date: 12/24/2024	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B		Reviewer and Date: Linda Waters 1/6/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	5.5 °C
Holding Time	Yes	No	Sampled 5/21/2024, analyzed 5/24/2024
Quantitation Limits	No	No	See table below
Dilutions	No	No	See table below
Method Blanks	Yes	No	MP446842 Cr ND
Field Blanks	No	No	P4-IRM-FB-20240521 (JD88878-3), (0.68 ug/l)
Matrix Spike	NA	NA	Batch QC
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP46842 Cr (95.8 %R),
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Field Blank

P2-IRM-FB-20230817-PT (460-286400-10)

Analyte	Fraction	SR (ug/l)	Qual	RL	Action
Chromium	Total	0.68	J	2.0	Associated SR >10x FB, Accept

SR – sample result**RL – reporting limit****Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW77WR-60.0-20240521	JD88878-1	CHROMIUM	Total	2000
114-MW76WR-60.0-20240521	JD88878-2	CHROMIUM	Total	2000
P4-IRM-FB-20240521	JD88878-3	CHROMIUM	Total	2.0

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW77WR-60.0-20240521	JD88878-1	CHROMIUM	27300	Y	ug/l	70
114-MW76WR-60.0-20240521	JD88878-2	CHROMIUM	87800	Y	ug/l	70

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD88951
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/10/2024
Reviewed by:	Linda Waters /AECOM File Name: JD88951_2024_07_10_DVReport_F.docx

Introduction

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

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

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated 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 May 22, 2024 as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-MW78WR-79.0-20240522	JD88951-1	Groundwater	Hexavalent Chromium, Chromium,
114-MW78WR-79.0-20240522	JD88951-1F	Groundwater	Dissolved Hexavalent Chromium
P4-IRM-FB-20240522	JD88951-2	Field Blank	Hexavalent Chromium, Chromium

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) indicates total and dissolved analyses for both hexavalent chromium and chromium. The lab noted in the comments of the sample receipt summary that two 500 ml metals volumes were received for sample 114-MW78WR-79.0-20240522 (JD88951-1) and requested clarification. The laboratory was instructed to just analyze for total chromium (no dissolved). Total chromium results are reported.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240522 (JD88951-2) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium)**Matrix Spikes**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240522 (JD88951-2) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

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

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 22, 2024
Lab Name/ID SGS, Dayton
SDG No JD88951
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240522

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)	U					

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 22, 2024
Lab Name/ID SGS, Dayton
SDG No JD88951
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240522

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW78WR-79.0-20240522	JD88951-1	Total	CHROMIUM	U	4.9B	4.9J	10	Qualify	1

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

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

NJDEP Laboratory Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG Phase 3 Groundwater IRM, Jersey City, NJ	
Laboratory SDG/Job No: JD88951		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/10/2024	
Number of Samples/Matrix: 2 GW, 1 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 07/10/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	Yes	No	Sampled 05/22/2024 analyzed 05/23/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	05/23/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55144-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240522 (JD88951-2), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN55144-B1 (100.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	Hexavalent chromium (total/dissolved) only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW78WR-79.0-20240522	JD88951-1	4.9	10		10	NC	T Cr > T Cr6, Accept
P4-IRM-FB-20240522	JD88951-2		2.0		10	0	Both ND, Accept

NC- not calculated**Total Hexavalent Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW78WR-79.0-20240522	JD88834-1, -1F		10		10	0	Both ND, Accept

SDG#: JD88951/ Method 7196**GN55144**

Cr+6 ICAL 5/23/24

GW

(p. 402 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.089
0.3	0.259
0.5	0.433
0.8	0.680
1	0.849

(p. 402 of
data pkg)

AECOM Calculated Intercept	0.00298	OK	Reported intercept	0.0030
AECOM Slope	0.8483	OK	Reported Slope	0.8483
AECOM Calculated r	0.99996	OK	Reported r	0.99996

LCS calculation**GN55144-B1****P. 398, 402**

Background absorbance	0
Sample absorbance	0.13
LCS Soluble Instrument Response	0.13
Instrument Concentration (mg/L)	0.150

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN55144-B1****P. 398, 402**

True Value (mg/L)	0.150

AECOM Calculated %R	99.8	OK	Reported %R	100.0

MS calculation**GN55144-S1****P. 400, 402****Batch QC (JD88961-1)****filtered**

Background reading	0
Total absorbance	0.325
Total absorbance - background	0.325
Instrument Concentration (mg/L)	0.3796

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	2

AECOM Calculated MS Result (mg/L)	0.8	OK	Reported Result (mg/L)	0.8

%R = Found/True*100**GN55144-S1****P. 400, 402****Batch QC (JD88961-1)**

True Value (mg/L)	0.51
Native concentration (mg/L)	0.3

AECOM Calculated MS Result %R	97.5	OK	Reported %R	97.7

UNFILTERED**Reporting Limit****JD88951-1****P. 8, 402****114-MW78WR-79.0-20240522**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED**Sample Calculations****JD88951-1****P. 8, 402****114-MW78WR-79.0-20240522**

Background reading	0
Total absorbance	0
Total absorbance - background	0
Instrument Response (mg/L)	-0.004

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	1

AECOM Calculated Result (mg/L)	0.0	OK, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG Phase 3 Groundwater IRM, Jersey City, NJ	
Laboratory SDG/Job No: JD88951		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/10/2024	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 07/10/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The chain of custody (COC) indicates total and dissolved analyses for chromium. The lab noted in the comments of the sample receipt summary that two 500 ml metals volumes were received for sample 114-MW78WR-79.0-20240522 (JD88951-1) and requested clarification. The laboratory was instructed to just analyze for total chromium (no dissolved). Total chromium results are reported.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	Yes	No	Sampled 05/22/2024, analyzed 05/28/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP46871 ND (Cr)
Field Blanks	Yes	No	P4-IRM-FB-20240522 (JD88951-2), ND
Matrix Spike	NA	NA	Batch QC
Matrix Spike Duplicate	NA	NA	Batch QC
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP46871 Cr (95.5 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	NA	NA	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW78WR-79.0-20240522	JD88951-1	CHROMIUM	Total	10
P4-IRM-FB-20240522	JD88951-2	CHROMIUM	Total	2

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD89297
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B Ferrous Iron SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/15/2024
Reviewed by:	Linda Waters /AECOM File Name: JD89297_2024_07_15 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated 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 May 28, 2024 as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-MW77WR-57.0-20240528	JD89297-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW77WR-57.0-20240528	JD89297-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW77WR-62.0-20240528	JD89297-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW77WR-62.0-20240528	JD89297-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW76WR-57.5-20240528	JD89297-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane

Field ID	Laboratory ID	Matrix	Parameter*
114-MW76WR-57.5-20240528	JD89297-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW76WR-62.5-20240528	JD89297-4	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW76WR-62.5-20240528	JD89297-4F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW53C-47.9-20240528	JD89297-5	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW53C-47.9-20240528	JD89297-5F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW53C-47.9-20240528	JD89297-5RF	Groundwater	Iron (Ferrous)
P4-IRM-FB-20240528	JD89297-6	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240528	JD89297-7	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240528 (JD89297-6) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese, Ferrous Iron)

Holding Time

Ferrous iron was analyzed outside of the method required holding time for sample 114-MW53C-47.9-20240528 (JD89297-5RF). Results were estimated (UJ).

Method Blank

The method blank (MB) reported iron at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results (SR) were non-detect. No qualifications were made.

Matrix Spikes

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240528 (JD89297-6) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240528 (JD89297-6) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane**Matrix Spikes**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was performed on 114-MW77WR-57.0-20240528 (JD89297-1). All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank P4-IRM-FB-20240528 (JD89297-6) was submitted for methane analysis. No contamination was detected, and no samples required qualification.

Trip Blank

Field blank P4-IRM-TB-20240528 (JD89297-7) was submitted for methane analysis. No contamination was detected, and no samples required qualification.

Data Quality and Usability

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

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

Results estimated due to holding time exceedance are useable with a low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 28, 2024
Lab Name/ID SGS, Dayton
SDG No JD89297
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240528

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW77WR-57.0-20240528	JD89297-1	Total	CHROMIUM (HEXAVALENT)	U	22.2	22.2	0.50		
114-MW77WR-57.0-20240528	JD89297-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	21.8	21.8	0.50		
114-MW77WR-62.0-20240528	JD89297-2	Total	CHROMIUM (HEXAVALENT)	U	21.4	21.4	0.50		
114-MW77WR-62.0-20240528	JD89297-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	20.6	20.6	0.50		
114-MW76WR-57.5-20240528	JD89297-3	Total	CHROMIUM (HEXAVALENT)	U	85.7	85.7	1.0		
114-MW76WR-57.5-20240528	JD89297-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	78.0	78.0	1.0		
114-MW76WR-62.5-20240528	JD89297-4	Total	CHROMIUM (HEXAVALENT)	U	74.2	74.2	1.0		
114-MW76WR-62.5-20240528	JD89297-4F	Dissolved	CHROMIUM (HEXAVALENT)	U	67.7	67.7	1.0		
114-MW53C-47.9-20240528	JD89297-5	Total	CHROMIUM (HEXAVALENT)	U	12.6	12.6	0.50		
114-MW53C-47.9-20240528	JD89297-5F	Dissolved	CHROMIUM (HEXAVALENT)	U	12.7	12.7	0.50		

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 28, 2024
Lab Name/ID SGS, Dayton
SDG No JD89297
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs P4-IRM-FB-20240528

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW77WR-57.0-20240528	JD89297-1	Total	CHROMIUM	U	18700	18700	500		
114-MW77WR-57.0-20240528	JD89297-1F	Dissolved	CHROMIUM	U	20600	20600	500		
114-MW77WR-62.0-20240528	JD89297-2	Total	CHROMIUM	U	18400	18400	500		
114-MW77WR-62.0-20240528	JD89297-2F	Dissolved	CHROMIUM	U	19300	19300	500		
114-MW76WR-57.5-20240528	JD89297-3	Total	CHROMIUM	U	76500	76500	2000		
114-MW76WR-57.5-20240528	JD89297-3F	Dissolved	CHROMIUM	U	74500	74500	2000		
114-MW76WR-62.5-20240528	JD89297-4	Total	CHROMIUM	U	71100	71100	1000		
114-MW76WR-62.5-20240528	JD89297-4F	Dissolved	CHROMIUM	U	76200	76200	1000		
114-MW53C-47.9-20240528	JD89297-5	Total	CHROMIUM	U	11000	11000	200		
114-MW53C-47.9-20240528	JD89297-5F	Dissolved	CHROMIUM	U	10900	10900	200		
114-MW53C-47.9-20240528	JD89297-5F	Dissolved	MANGANESE	U	305	305	10		
114-MW53C-47.9-20240528	JD89297-5F	Dissolved	IRON (FERROUS)	U	U	UJ	200	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 Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 28, 2024
Lab Name/ID SGS, Dayton
SDG No JD89297
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240528

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW77WR-57.0-20240528	JD89297-1	TOTAL ORGANIC CARBON	U	4.4B	4.4J	5.0	Qualify	1
114-MW77WR-62.0-20240528	JD89297-2	TOTAL ORGANIC CARBON	U	3.9B	3.9J	5.0	Qualify	1
114-MW76WR-57.5-20240528	JD89297-3	TOTAL ORGANIC CARBON	U	9.0	9.0	5.0		
114-MW76WR-62.5-20240528	JD89297-4	TOTAL ORGANIC CARBON	U	9.0	9.0	5.0		
114-MW53C-47.9-20240528	JD89297-5	TOTAL ORGANIC CARBON	U	4.6B	4.6J	5.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 28, 2024
Lab Name/ID SGS, Dayton
SDG No JD89297
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240528

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW77WR-57.0-20240528	JD89297-1	SULFATE	U	141	141	10		
114-MW77WR-62.0-20240528	JD89297-2	SULFATE	U	130	130	10		
114-MW76WR-57.5-20240528	JD89297-3	SULFATE	U	405	405	10		
114-MW76WR-62.5-20240528	JD89297-4	SULFATE	U	334	334	10		
114-MW53C-47.9-20240528	JD89297-5	SULFATE	U	411	411	10		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 28, 2024
Lab Name/ID SGS, Dayton
SDG No JD89297
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240528
Field Blank ID P4-IRM-FB-20240528

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW77WR-57.0-20240528	JD89297-1	METHANE	U	142	142	0.55		
114-MW77WR-62.0-20240528	JD89297-2	METHANE	U	130	130	0.55		
114-MW76WR-57.5-20240528	JD89297-3	METHANE	U	466	466	0.55		
114-MW76WR-62.5-20240528	JD89297-4	METHANE	U	614	614	1.1		
114-MW53C-47.9-20240528	JD89297-5	METHANE	U	2690	2690	11		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89297		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/15/2024	
Number of Samples/Matrix: 5 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 7/25/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.8 °C
Holding Time	Yes	No	Sampled 05/28/2024 analyzed 05/29/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	05/29/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55345-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240528 (JD89297-6), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN55345-B1 (100.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW77WR-57.0-20240528	JD89297-1	18700	500	22200	500	17	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW77WR-62.0-20240528	JD89297-2	18400	500	21400	500	15	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW76WR-57.5-20240528	JD89297-3	76500	2000	85700	1000	11	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW76WR-62.5-20240528	JD89297-4	71100	1000	74200	1000	4	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW53C-47.9-20240528	JD89297-5	11000	200	12600	500	14	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
P4-IRM-FB-20240528	JD89297-6		2.0		10	0	Both ND, Accept

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW77WR-57.0-20240528	JD89297-1F	20600	500	21800	500	6	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW77WR-62.0-20240528	JD89297-2F	19300	500	20600	500	7	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW76WR-57.5-20240528	JD89297-3F	74500	2000	78000	1000	5	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW76WR-62.5-20240528	JD89297-4F	76200	1000	67700	1000	12	D Cr > D Cr6, Accept
114-MW53C-47.9-20240528	JD89297-5F	10900	200	12700	500	15	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

NC- not calculated

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW77WR-57.0-20240528	JD89297-1, -1F	22200	500	21800	500	2	T Cr6 > D Cr6, Accept
114-MW77WR-62.0-20240528	JD89297-2, -2F	21400	500	20600	500	4	T Cr6 > D Cr6, Accept
114-MW76WR-57.5-20240528	JD89297-3, -3F	85700	1000	78000	1000	9	T Cr6 > D Cr6, Accept
114-MW76WR-62.5-20240528	JD89297-4, -4F	74200	1000	67700	1000	9	T Cr6 > D Cr6, Accept
114-MW53C-47.9-20240528	JD89297-5, -5F	12600	500	12700	500	1	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

NC- not calculated**Reporting Limits GW**

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW53C-47.9-20240528	JD89297-5	CHROMIUM (HEXAVALENT)	12.6	Y	mg/l	0.07
114-MW53C-47.9-20240528	JD89297-5F	CHROMIUM (HEXAVALENT)	12.7	Y	mg/l	0.07
114-MW76WR-57.5-20240528	JD89297-3	CHROMIUM (HEXAVALENT)	85.7	Y	mg/l	0.07
114-MW76WR-57.5-20240528	JD89297-3F	CHROMIUM (HEXAVALENT)	78	Y	mg/l	0.07
114-MW76WR-62.5-20240528	JD89297-4	CHROMIUM (HEXAVALENT)	74.2	Y	mg/l	0.07
114-MW76WR-62.5-20240528	JD89297-4F	CHROMIUM (HEXAVALENT)	67.7	Y	mg/l	0.07
114-MW77WR-57.0-20240528	JD89297-1	CHROMIUM (HEXAVALENT)	22.2	Y	mg/l	0.07
114-MW77WR-57.0-20240528	JD89297-1F	CHROMIUM (HEXAVALENT)	21.8	Y	mg/l	0.07
114-MW77WR-62.0-20240528	JD89297-2	CHROMIUM (HEXAVALENT)	21.4	Y	mg/l	0.07
114-MW77WR-62.0-20240528	JD89297-2F	CHROMIUM (HEXAVALENT)	20.6	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW77WR-57.0-20240528	JD89297-1	CHROMIUM (HEXAVALENT)	Total	50
114-MW77WR-57.0-20240528	JD89297-1F	CHROMIUM (HEXAVALENT)	Dissolved	50
114-MW77WR-62.0-20240528	JD89297-2	CHROMIUM (HEXAVALENT)	Total	50
114-MW77WR-62.0-20240528	JD89297-2F	CHROMIUM (HEXAVALENT)	Dissolved	50
114-MW76WR-57.5-20240528	JD89297-3	CHROMIUM (HEXAVALENT)	Total	100
114-MW76WR-57.5-20240528	JD89297-3F	CHROMIUM (HEXAVALENT)	Dissolved	100
114-MW76WR-62.5-20240528	JD89297-4	CHROMIUM (HEXAVALENT)	Total	100
114-MW76WR-62.5-20240528	JD89297-4F	CHROMIUM (HEXAVALENT)	Dissolved	100
114-MW53C-47.9-20240528	JD89297-5	CHROMIUM (HEXAVALENT)	Total	50
114-MW53C-47.9-20240528	JD89297-5F	CHROMIUM (HEXAVALENT)	Dissolved	50

SDG#: JD89297/ Method 7196**GN55345**

Cr+6 ICAL 5/29/24

GW

(p. 951 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.089
0.3	0.26
0.5	0.43
0.8	0.681
1	0.840

(p. 951 of
data pkg)

AECOM Calculated Intercept	0.00370	OK	Reported intercept	0.0037
AECOM Slope	0.8425	OK	Reported Slope	0.8425
AECOM Calculated r	0.99993	OK	Reported r	0.99993

LCS calculation**GN55345-B1****P. 937, 951**

Background absorbance 0
Sample absorbance 0.13
LCS Soluble Instrument Response 0.13
Instrument Concentration (mg/L) 0.150

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN55345-B1****P. 937, 951**

True Value (mg/L) 0.150

AECOM Calculated %R	99.9	OK	Reported %R	100.0

MS calculation**GN55345-S1****P. 939, 939, 954****Batch QC (JD89292-2)****unfiltered**

Background reading 0.003
Total absorbance 0.273
Total absorbance - background 0.27
Instrument Concentration (mg/L) 0.3161

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

AECOM Calculated MS Result (mg/L)	0.316	OK	Reported Result (mg/L)	0.316

%R = Found/True*100**GN55345-S1****P. 939, 939, 954****Batch QC (JD89292-2)**

True Value (mg/L) 0.208

Native concentration (mg/L) 0.104

AECOM Calculated MS Result %R	102.0	OK	Reported %R	101.9

UNFILTERED**Reporting Limit****JD89297-1****P. 14, 951****114-MW77WR-57.0-20240528**

Low Standard 0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	50

AECOM Calculated Reporting Limit	0.500	OK	Reported RL (mg/L)=	0.500

UNFILTERED**Sample Calculations****JD89297-1****P. 14, 951****114-MW77WR-57.0-20240528**

Background reading	0
Total absorbance	0.377
Total absorbance - background	0.377
Instrument Response (mg/L)	0.443

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	50

AECOM Calculated Result (mg/L)	22.2	OK	Reported Result (mg/L)	22.2

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89297		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/15/2024	
Number of Samples/Matrix: 5 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 7/25/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.8 °C
Holding Time	No	Yes	Sampled 05/28/2024, analyzed 05/29/2024 - 06/08/2043. Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP46977 Metals (see table below), GP54303/GN55398 ND Sulfate, GP54313/GN55597 ND TOC, GP54314/GN55597 ND TOC
Field Blanks	Yes	No	P4-IRM-FB-20240528 (JD89297-6) ND
Matrix Spike	NA	NA	Batch QC
Matrix Spike Duplicate	NA	NA	Batch QC
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP46977 Metals (see table below), GP54303/GN55398 Sulfate (97.1 %R), GP54313/GN55597 TOC (105.0 %R), GP54314/GN55597 TOC (103.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW53C-47.9-20240528	JD89297-5RF	IRON (FERROUS)	5/28/2024 13:05	6/8/2024 12:06:00 PM	Estimate (UJ)

Method Blank

MB46977

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
Iron	Dissolved	26	J	50	Associated SR ND, Accept

SR – sample result

RL – reporting limit

LCS

MP46977

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	77.5	96.9	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	4080	102.0	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	75.7	94.6	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW77WR-57.0-20240528	JD89297-1	TOC	Total	5
114-MW77WR-57.0-20240528	JD89297-1	CHROMIUM	Total	500
114-MW77WR-57.0-20240528	JD89297-1	SULFATE	Total	5
114-MW77WR-57.0-20240528	JD89297-1F	CHROMIUM	Dissolved	500
114-MW77WR-57.0-20240528	JD89297-1F	IRON	Dissolved	10
114-MW77WR-57.0-20240528	JD89297-1F	MANGANESE	Dissolved	10
114-MW77WR-62.0-20240528	JD89297-2	TOC	Total	5

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW77WR-62.0-20240528	JD89297-2	CHROMIUM	Total	500
114-MW77WR-62.0-20240528	JD89297-2	SULFATE	Total	5
114-MW77WR-62.0-20240528	JD89297-2F	CHROMIUM	Dissolved	500
114-MW77WR-62.0-20240528	JD89297-2F	IRON	Dissolved	10
114-MW77WR-62.0-20240528	JD89297-2F	MANGANESE	Dissolved	10
114-MW76WR-57.5-20240528	JD89297-3	TOC	Total	5
114-MW76WR-57.5-20240528	JD89297-3	CHROMIUM	Total	2000
114-MW76WR-57.5-20240528	JD89297-3	SULFATE	Total	5
114-MW76WR-57.5-20240528	JD89297-3F	CHROMIUM	Dissolved	2000
114-MW76WR-57.5-20240528	JD89297-3F	IRON	Dissolved	10
114-MW76WR-57.5-20240528	JD89297-3F	MANGANESE	Dissolved	10
114-MW76WR-62.5-20240528	JD89297-4	TOC	Total	5
114-MW76WR-62.5-20240528	JD89297-4	CHROMIUM	Total	1000
114-MW76WR-62.5-20240528	JD89297-4	SULFATE	Total	5
114-MW76WR-62.5-20240528	JD89297-4F	CHROMIUM	Dissolved	1000
114-MW76WR-62.5-20240528	JD89297-4F	IRON	Dissolved	10
114-MW76WR-62.5-20240528	JD89297-4F	MANGANESE	Dissolved	10
114-MW53C-47.9-20240528	JD89297-5	TOC	Total	5
114-MW53C-47.9-20240528	JD89297-5	CHROMIUM	Total	200
114-MW53C-47.9-20240528	JD89297-5	SULFATE	Total	5
114-MW53C-47.9-20240528	JD89297-5F	CHROMIUM	Dissolved	200
114-MW53C-47.9-20240528	JD89297-5F	IRON	Dissolved	10
114-MW53C-47.9-20240528	JD89297-5F	MANGANESE	Dissolved	10
P4-IRM-FB-20240528	JD89297-6	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-MW77WR-57.0-20240528	JD89297-1F	18700	500	20600	500	2500	1900	10	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-MW77WR-62.0-20240528	JD89297-2F	18400	500	19300	500	2500	900	5	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-MW76WR-57.5-20240528	JD89297-3F	76500	2000	74500	2000	10000	2000	3	T Cr > D Cr, Accept
114-MW76WR-62.5-20240528	JD89297-4F	71100	1000	76200	1000	5000	5100	7	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-MW53C-47.9-20240528	JD89297-5F	11000	200	10900	200	1000	100	1	T Cr > D Cr, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW53C-47.9-20240528	JD89297-5	SULFATE	411	Y	mg/l	250
114-MW53C-47.9-20240528	JD89297-5	CHROMIUM	11000	Y	ug/l	70
114-MW53C-47.9-20240528	JD89297-5F	MANGANESE	305	Y	ug/l	50
114-MW53C-47.9-20240528	JD89297-5F	CHROMIUM	10900	Y	ug/l	70
114-MW76WR-57.5-20240528	JD89297-3	SULFATE	405	Y	mg/l	250
114-MW76WR-57.5-20240528	JD89297-3	CHROMIUM	76500	Y	ug/l	70
114-MW76WR-57.5-20240528	JD89297-3F	CHROMIUM	74500	Y	ug/l	70
114-MW76WR-62.5-20240528	JD89297-4	SULFATE	334	Y	mg/l	250
114-MW76WR-62.5-20240528	JD89297-4	CHROMIUM	71100	Y	ug/l	70
114-MW76WR-62.5-20240528	JD89297-4F	CHROMIUM	76200	Y	ug/l	70
114-MW77WR-57.0-20240528	JD89297-1	CHROMIUM	18700	Y	ug/l	70
114-MW77WR-57.0-20240528	JD89297-1F	CHROMIUM	20600	Y	ug/l	70
114-MW77WR-62.0-20240528	JD89297-2	CHROMIUM	18400	Y	ug/l	70
114-MW77WR-62.0-20240528	JD89297-2F	CHROMIUM	19300	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD89297		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/15/2024		
Number of Samples/Matrix: 5 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 7/25/2024		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			0.8 °C
Holding Time	X			Sampled 05/28/2024, Analyzed 06/05/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3060-MB ND
Trip Blanks/Field Blanks/Equipment Blanks	X			P4-IRM-FB-20240528 (JD89297-6) ND, P4-IRM-TB-20240528 (JD89297-7) ND
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate	X			114-MW77WR-57.0-20240528 (JD89297-1) {RPD 15}
Laboratory Control Standards	X			GAA3060-LCS (95 %R)
Field Duplicate			X	None with this SDG.
Percent Solids			X	Aqueous

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW77WR-57.0-20240528	JD89297-1	METHANE	142
114-MW77WR-62.0-20240528	JD89297-2	METHANE	130
114-MW76WR-57.5-20240528	JD89297-3	METHANE	466
114-MW76WR-62.5-20240528	JD89297-4	METHANE	614
114-MW53C-47.9-20240528	JD89297-5	METHANE	2690

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD89361
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/16/2024
Reviewed by:	Linda Waters /AECOM File Name: JD89361_2024_07_16 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated 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 May 29, 2024 as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PMW-01T-62.8-20240529	JD89361-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PMW-01T-62.8-20240529	JD89361-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PMW-01T-60.8-20240529	JD89361-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PMW-01T-60.8-20240529	JD89361-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW78WR-76.5-20240529	JD89361-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW78WR-76.5-20240529	JD89361-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW78WR-81.5-20240529	JD89361-4	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane

Field ID	Laboratory ID	Matrix	Parameter*
114-MW78WR-81.5-20240529	JD89361-4F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PZ-57I-30.2-20240529	JD89361-5	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PZ-57I-30.2-20240529	JD89361-5F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
P4-IRM-FB-20240529	JD89361-6	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240529	JD89361-7	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $\leq 30\%$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $> 30\%$	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW78WR-76.5-20240529 (JD89361-3F) was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW78WR-76.5-20240529 (JD89361-3F) was analyzed as a laboratory duplicate for this data set. Both samples were non-detect. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240529 (JD89361-6) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese)

Method Blank

The method blank (MB), MB47017, reported dissolved iron at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results (SR) were non-detect. No qualifications were made.

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

Sample 114-MW78WR-76.5-20240529 (JD89361-3F) was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field blank (FB)

The field blank P4-IRM-FB-20240529 (JD89361-6) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met

Field Blank (FB)

Field blank P4-IRM-FB-20240529 (JD89361-6) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane**Field Blank (FB)**

The field blank (FB), P4-IRM-FB-20240529 (JD89361-6), reported methane at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample

results (SR) were greater than ten times the amount in the FB; therefore, no qualifications were made.

Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met

Trip Blank (TB)

The trip blank P4-IRM-TB-20240529 (JD89361-7) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Data Quality and Usability

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

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD89361
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240529

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-01T-62.8-20240529	JD89361-1	Total	CHROMIUM (HEXAVALENT)	U	490	490	5.0		
114-PMW-01T-62.8-20240529	JD89361-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	473	473	5.0		
114-PMW-01T-60.8-20240529	JD89361-2	Total	CHROMIUM (HEXAVALENT)	U	496	496	5.0		
114-PMW-01T-60.8-20240529	JD89361-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	487	487	5.0		
114-PZ-57I-30.2-20240529	JD89361-5	Total	CHROMIUM (HEXAVALENT)	U	53.5	53.5	2.5		
114-PZ-57I-30.2-20240529	JD89361-5F	Dissolved	CHROMIUM (HEXAVALENT)	U	48.4	48.4	2.5		

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD89361
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240529

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-01T-62.8-20240529	JD89361-1	Total	CHROMIUM	U	441000	441000	10000		
114-PMW-01T-62.8-20240529	JD89361-1F	Dissolved	CHROMIUM	U	442000	442000	10000		
114-PMW-01T-62.8-20240529	JD89361-1F	Dissolved	MANGANESE	U	64.6	64.6	10		
114-PMW-01T-60.8-20240529	JD89361-2	Total	CHROMIUM	U	509000	509000	10000		
114-PMW-01T-60.8-20240529	JD89361-2F	Dissolved	CHROMIUM	U	544000	544000	10000		
114-PMW-01T-60.8-20240529	JD89361-2F	Dissolved	MANGANESE	U	63.3	63.3	10		
114-MW78WR-76.5-20240529	JD89361-3	Total	CHROMIUM	U	5.6B	5.6J	10	Qualify	1
114-MW78WR-76.5-20240529	JD89361-3F	Dissolved	CHROMIUM	U	5.7B	5.7J	10	Qualify	1
114-MW78WR-81.5-20240529	JD89361-4	Total	CHROMIUM	U	4.8B	4.8J	10	Qualify	1
114-MW78WR-81.5-20240529	JD89361-4F	Dissolved	CHROMIUM	U	5.9B	5.9J	10	Qualify	1
114-PZ-57I-30.2-20240529	JD89361-5	Total	CHROMIUM	U	44500	44500	1000		
114-PZ-57I-30.2-20240529	JD89361-5F	Dissolved	CHROMIUM	U	45000	45000	1000		
114-PZ-57I-30.2-20240529	JD89361-5F	Dissolved	MANGANESE	U	234	234	10		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD89361
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240529

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW78WR-76.5-20240529	JD89361-3	TOTAL ORGANIC CARBON	U	4.3	4.3	1.0		
114-MW78WR-81.5-20240529	JD89361-4	TOTAL ORGANIC CARBON	U	3.6	3.6	1.0		
114-PZ-57I-30.2-20240529	JD89361-5	TOTAL ORGANIC CARBON	U	7.0	7.0	5.0		

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

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD89361
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240529

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-01T-62.8-20240529	JD89361-1	SULFATE	U	551	551	10		
114-PMW-01T-60.8-20240529	JD89361-2	SULFATE	U	582	582	10		
114-MW78WR-76.5-20240529	JD89361-3	SULFATE	U	448	448	6.0		
114-MW78WR-81.5-20240529	JD89361-4	SULFATE	U	444	444	6.0		
114-PZ-57I-30.2-20240529	JD89361-5	SULFATE	U	918	918	10		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 29, 2024
Lab Name/ID SGS, Dayton
SDG No JD89361
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240529
Field Blank ID P4-IRM-FB-20240529

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-01T-62.8-20240529	JD89361-1	METHANE	U	202	202	0.55		
114-PMW-01T-60.8-20240529	JD89361-2	METHANE	U	248	248	0.55		
114-MW78WR-76.5-20240529	JD89361-3	METHANE	U	131	131	0.55		
114-MW78WR-81.5-20240529	JD89361-4	METHANE	U	144	144	0.55		
114-PZ-57I-30.2-20240529	JD89361-5	METHANE	U	2480	2480	5.5		
P4-IRM-FB-20240529	JD89361-6	METHANE	U	0.10J	0.10J	0.11	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 Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89361		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/16/2024	
Number of Samples/Matrix: 5 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 7/18/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	Yes	No	Sampled 05/29/2024 analyzed 05/30/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	05/30/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55404-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240529 (JD89361-6), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW78WR-76.5-20240529 (JD89361-3F) {106.7 %R}
Laboratory Duplicate	Yes	No	114-MW78WR-76.5-20240529 (JD89361-3F), Both ND
Laboratory Control Standards	Yes	No	GN55404-B1 (100.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PMW-01T-62.8-20240529	JD89361-1	441000	10000	490000	5000	11	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PMW-01T-60.8-20240529	JD89361-2	509000	10000	496000	5000	3	T Cr > T Cr6, Accept
114-MW78WR-76.5-20240529	JD89361-3	5.6	10		10	NC	T Cr > T Cr6, Accept
114-MW78WR-81.5-20240529	JD89361-4	4.8	10		10	NC	T Cr > T Cr6, Accept
114-PZ-57I-30.2-20240529	JD89361-5	44500	1000	53500	2500	18	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
P4-IRM-FB-20240529	JD89361-6		2.0		10	0	Both ND, Accept

NC- not calculated**RL- reporting limit****Dissolved Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-PMW-01T-62.8-20240529	JD89361-1F	442000	10000	473000	5000	7	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PMW-01T-60.8-20240529	JD89361-2F	544000	10000	487000	5000	11	D Cr > D Cr6, Accept
114-MW78WR-76.5-20240529	JD89361-3F	5.7	10		10	NC	D Cr > D Cr6, Accept
114-MW78WR-81.5-20240529	JD89361-4F	5.9	10		10	NC	D Cr > D Cr6, Accept
114-PZ-57I-30.2-20240529	JD89361-5F	45000	1000	48400	2500	7	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

NC- not calculated**RL- reporting limit**

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PMW-01T-62.8-20240529	JD89361-1F	490000	5000	473000	5000	4	T Cr6 > D Cr6, Accept
114-PMW-01T-60.8-20240529	JD89361-2F	496000	5000	487000	5000	2	T Cr6 > D Cr6, Accept
114-MW78WR-76.5-20240529	JD89361-3F		10		10	0	Both ND, Accept
114-MW78WR-81.5-20240529	JD89361-4F		10		10	0	Both ND, Accept
114-PZ-57I-30.2-20240529	JD89361-5F	53500	2500	48400	2500	10	T Cr6 > D Cr6, Accept

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PMW-01T-60.8-20240529	JD89361-2	CHROMIUM (HEXAVALENT)	496	Y	mg/l	0.07
114-PMW-01T-60.8-20240529	JD89361-2F	CHROMIUM (HEXAVALENT)	487	Y	mg/l	0.07
114-PMW-01T-62.8-20240529	JD89361-1	CHROMIUM (HEXAVALENT)	490	Y	mg/l	0.07
114-PMW-01T-62.8-20240529	JD89361-1F	CHROMIUM (HEXAVALENT)	473	Y	mg/l	0.07
114-PZ-57I-30.2-20240529	JD89361-5	CHROMIUM (HEXAVALENT)	53.5	Y	mg/l	0.07
114-PZ-57I-30.2-20240529	JD89361-5F	CHROMIUM (HEXAVALENT)	48.4	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PMW-01T-62.8-20240529	JD89361-1	CHROMIUM (HEXAVALENT)	Total	500
114-PMW-01T-62.8-20240529	JD89361-1F	CHROMIUM (HEXAVALENT)	Dissolved	500
114-PMW-01T-60.8-20240529	JD89361-2	CHROMIUM (HEXAVALENT)	Total	500
114-PMW-01T-60.8-20240529	JD89361-2F	CHROMIUM (HEXAVALENT)	Dissolved	500
114-PZ-57I-30.2-20240529	JD89361-5	CHROMIUM (HEXAVALENT)	Total	250
114-PZ-57I-30.2-20240529	JD89361-5F	CHROMIUM (HEXAVALENT)	Dissolved	250

SDG#: JD89361/ Method 7196**GN55404A**

Cr+6 ICAL 5/30/24

GW

(p. 1148 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.088
0.3	0.255
0.5	0.423
0.8	0.661
1	0.840

(p. 1148
of data
pkg)

AECOM Calculated Intercept	0.00280	OK	Reported intercept	0.0028
AECOM Slope	0.8332	OK	Reported Slope	0.8332
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation**GN55404-B1****P. 1135, 1148**

Background absorbance	0
Sample absorbance	0.129
LCS Soluble Instrument Response	0.129
Instrument Concentration (mg/L)	0.151

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100**GN55404-B1****P. 1135, 1148**

True Value (mg/L)	0.150

AECOM Calculated %R	101.0	OK	Reported %R	100.7

MS calculation**GN55404-S2****P. 1137, 1149****114-MW78WR-76.5-20240529****filtered**

Background reading	0
Total absorbance	0.136
Total absorbance - background	0.136
Instrument Concentration (mg/L)	0.1599

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.160	OK	Reported Result (mg/L)	0.160

%R = Found/True*100**GN55404-S2****P. 1137, 1149****114-MW78WR-76.5-20240529**

True Value (mg/L)	0.150
Native concentration (mg/L)	0.000

AECOM Calculated MS Result %R	106.6	OK	Reported %R	106.7

UNFILTERED**Reporting Limit****JD89361-3****P. 24, 1148****114-MW78WR-76.5-20240529**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED**Sample Calculations****JD89361-3****P. 24, 1148****114-MW78WR-76.5-20240529**

Background reading	0.001
Total absorbance	0.004
Total absorbance - background	0.003
Instrument Response (mg/L)	0.000

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	1

AECOM Calculated Result (mg/L)	0.00	OK, <MDL report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89361		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/16/2024	
Number of Samples/Matrix: 5 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, and Wet Chemistry		Reviewer and Date: Linda Waters 7/18/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	Yes	No	Sampled 05/29/2024, analyzed 06/03/2024 - 06/06/2024
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP47017 Metals (see table below), MP47068 (Cr) ND, GP54354/GN55486 ND Sulfate, GP54316/GN55603 ND TOC, GP54317/GN55603 ND TOC
Field Blanks	Yes	No	P4-IRM-FB-20240529 (JD89361-6) ND
Matrix Spike	Yes	No	114-MW78WR-76.5-20240529 (JD89361-3F) Metals, Batch QC for TOC, sulfate, and metals
Matrix Spike Duplicate	Yes	No	114-MW78WR-76.5-20240529 (JD89361-3F) Metals
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47017 Metals (see table below), MP47068 Cr (see table below), GP54354/GN55486 Sulfate (103.8 %R), GP54316/GN55603 TOC (96.4 %R), GP54317/GN55603 TOC (102.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Method Blank

MB47017

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
Iron	Dissolved	19.9	J	50	Associated SR ND, Accept

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates**

114-MW78WR-76.5-20240529 (JD89361-3F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD	RPD Upper Limit	Action
CHROMIUM	Dissolved	80	5.7	75.8	77.5	87.6	89.8	125	75	2.2	20	OK, Accept
IRON	Dissolved	4000	10.8	3800	3940	94.7	98.2	125	75	3.6	20	OK, Accept
MANGANESE	Dissolved	80	0	70.0	72.1	87.5	90.1	125	75	3.0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****% R – percent recovery****RPD – relative percent recovery****LCS**

MP47017

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	71.4	89.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	3710	92.8	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	70.4	88.0	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable**% R – percent recovery****RPD – relative percent recovery**

MP47017

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	78.9	98.6	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PMW-01T-62.8-20240529	JD89361-1	TOC	Total	5
114-PMW-01T-62.8-20240529	JD89361-1	CHROMIUM	Total	10000
114-PMW-01T-62.8-20240529	JD89361-1	SULFATE	Total	5
114-PMW-01T-62.8-20240529	JD89361-1F	CHROMIUM	Dissolved	10000
114-PMW-01T-62.8-20240529	JD89361-1F	IRON	Dissolved	10
114-PMW-01T-62.8-20240529	JD89361-1F	MANGANESE	Dissolved	10
114-PMW-01T-60.8-20240529	JD89361-2	TOC	Total	5
114-PMW-01T-60.8-20240529	JD89361-2	CHROMIUM	Total	10000
114-PMW-01T-60.8-20240529	JD89361-2	SULFATE	Total	5
114-PMW-01T-60.8-20240529	JD89361-2F	CHROMIUM	Dissolved	10000
114-PMW-01T-60.8-20240529	JD89361-2F	IRON	Dissolved	10
114-PMW-01T-60.8-20240529	JD89361-2F	MANGANESE	Dissolved	10
114-MW78WR-76.5-20240529	JD89361-3	CHROMIUM	Total	10
114-MW78WR-76.5-20240529	JD89361-3	SULFATE	Total	3
114-MW78WR-76.5-20240529	JD89361-3F	CHROMIUM	Dissolved	10
114-MW78WR-76.5-20240529	JD89361-3F	IRON	Dissolved	10
114-MW78WR-76.5-20240529	JD89361-3F	MANGANESE	Dissolved	10
114-MW78WR-81.5-20240529	JD89361-4	CHROMIUM	Total	10
114-MW78WR-81.5-20240529	JD89361-4	SULFATE	Total	3
114-MW78WR-81.5-20240529	JD89361-4F	CHROMIUM	Dissolved	10
114-MW78WR-81.5-20240529	JD89361-4F	IRON	Dissolved	10
114-MW78WR-81.5-20240529	JD89361-4F	MANGANESE	Dissolved	10
114-PZ-57I-30.2-20240529	JD89361-5	TOC	Total	5
114-PZ-57I-30.2-20240529	JD89361-5	CHROMIUM	Total	1000

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-57I-30.2-20240529	JD89361-5	SULFATE	Total	5
114-PZ-57I-30.2-20240529	JD89361-5F	CHROMIUM	Dissolved	1000
114-PZ-57I-30.2-20240529	JD89361-5F	IRON	Dissolved	10
114-PZ-57I-30.2-20240529	JD89361-5F	MANGANESE	Dissolved	10
P4-IRM-FB-20240529	JD89361-6	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PMW-01T-62.8-20240529	JD89361-1F	441000	10000	442000	10000	50000	1000	0	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PMW-01T-60.8-20240529	JD89361-2F	509000	10000	544000	10000	50000	35000	7	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-MW78WR-76.5-20240529	JD89361-3F	5.6	10	5.7	10	50	0	2	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-MW78WR-81.5-20240529	JD89361-4F	4.8	10	5.9	10	50	1	21	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PZ-57I-30.2-20240529	JD89361-5F	44500	1000	45000	1000	5000	500	1	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW78WR-76.5-20240529	JD89361-3	SULFATE	448	Y	mg/l	250
114-MW78WR-81.5-20240529	JD89361-4	SULFATE	444	Y	mg/l	250
114-PMW-01T-60.8-20240529	JD89361-2	SULFATE	582	Y	mg/l	250
114-PMW-01T-60.8-20240529	JD89361-2	CHROMIUM	509000	Y	ug/l	70
114-PMW-01T-60.8-20240529	JD89361-2F	MANGANESE	63.3	Y	ug/l	50
114-PMW-01T-60.8-20240529	JD89361-2F	CHROMIUM	544000	Y	ug/l	70
114-PMW-01T-62.8-20240529	JD89361-1	SULFATE	551	Y	mg/l	250
114-PMW-01T-62.8-20240529	JD89361-1	CHROMIUM	441000	Y	ug/l	70
114-PMW-01T-62.8-20240529	JD89361-1F	MANGANESE	64.6	Y	ug/l	50
114-PMW-01T-62.8-20240529	JD89361-1F	CHROMIUM	442000	Y	ug/l	70
114-PZ-57I-30.2-20240529	JD89361-5	SULFATE	918	Y	mg/l	250
114-PZ-57I-30.2-20240529	JD89361-5	CHROMIUM	44500	Y	ug/l	70
114-PZ-57I-30.2-20240529	JD89361-5F	MANGANESE	234	Y	ug/l	50
114-PZ-57I-30.2-20240529	JD89361-5F	CHROMIUM	45000	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD89361		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/16/2024		
Number of Samples/Matrix: 5 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 7/18/2024		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			2.3 °C
Holding Time	X			Sampled 05/29/2024, Analyzed 06/06/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3061-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240529 (JD89361-6), P4-IRM-TB-20240529 (JD89361-7) ND, see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate			X	Batch QC
Laboratory Control Standards	X			GAA3061-LCS (95 %R)
Field Duplicate			X	None with this SDG.
Percent Solids			X	Aqueous

Field Blank

P4-IRM-FB-20240529 (JD89361-6)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.10	J	0.11	Associated SR>10x FB, Accept

SR – sample result**RL – reporting limit****Dilutions**

Sample ID	Lab ID	Analyte	Dilution
114-PMW-01T-62.8-20240529	JD89361-1	METHANE	5
114-PMW-01T-60.8-20240529	JD89361-2	METHANE	5
114-MW78WR-76.5-20240529	JD89361-3	METHANE	5
114-MW78WR-81.5-20240529	JD89361-4	METHANE	5
114-PZ-57I-30.2-20240529	JD89361-5	METHANE	50

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD89452
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B Ferrous Iron SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/17/2024
Reviewed by:	Linda Waters /AECOM File Name: JD89452_2024_07_17 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated 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 May 30, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-01T-69.0-20240530	JD89452-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-01T-69.0-20240530	JD89452-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-01T-74.0-20240530	JD89452-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-01T-74.0-20240530	JD89452-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW57C-70.9-20240530-X (Field Duplicate 114-MW57C-70.9-20240530)	JD89452-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane

Field ID	Laboratory ID	Matrix	Parameter*
114-MW57C-70.9-20240530-X (Field Duplicate 114-MW57C-70.9-20240530)	JD89452-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PZ-57T-67.5-20240530	JD89452-4	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PZ-57T-67.5-20240530	JD89452-4F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW57C-70.9-20240530	JD89452-5	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW57C-70.9-20240530	JD89452-5F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW75WR-118.0-20240530	JD89452-6	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW75WR-118.0-20240530	JD89452-6F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW75WR-118.0-20240530	JD89452-6RF	Groundwater	Ferrous Iron
114-P3-MW005D-50.3-20240530	JD89452-7	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-P3-MW005D-50.3-20240530	JD89452-7F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
P4-IRM-FB-20240530	JD89452-8	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240530	JD89452-9	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) identifies sample JD89452-8 as P4-IRM-FB-20240529. The corrected ID should be P4-IRM-FB-20240530.

The chain of custody (COC) identifies sample JD89452-9 as P4-IRM-TB-20240529. The corrected ID should be P4-IRM-TB-20240530.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Samples 114-MW75WR-118.0-20240530 (JD89452-6, -6F) total/dissolved, were analyzed as MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Samples 114-MW75WR-118.0-20240530 (JD89452-6, -6F) total/dissolved, were analyzed as laboratory duplicates for this data set. All samples were non-detect. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240530-B (JD89452-8) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW57C-70.9-20240530(JD89452-5, -5F) and 114-MW57C-70.9-20240530-X (JD89452-3, -3F) were analyzed as the field duplicate pairs for hexavalent chromium. All QC acceptance criteria were met.

Metals (Chromium, Iron, Manganese, Ferrous Iron)**Holding Time**

Ferrous iron was analyzed outside of the method required holding time for sample 114-MW75WR-118.0-20240530 (JD89452-6RF). Results were qualified as estimated (UJ).

Method Blank

The method blank (MB), MB47046, reported dissolved iron at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results (SR) were non-detect. No qualifications were made.

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

Samples 114-MW75WR-118.0-20240530 (JD89452-6, -6F, -6RF) were analyzed as MS/MSDs for this data set. Ferrous iron (dissolved) did not meet QC criteria. The ferrous iron result for sample 114-MW75WR-118.0-20240530 (JD89452-6RF) was qualified as estimated (UJ) based on low recoveries for the MS/MSD. All other metals met QC acceptance criteria.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240530-B (JD89452-8) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW57C-70.9-20240530(JD89452-5, -5F) and 114-MW57C-70.9-20240530-X (JD89452-3, -3F) were analyzed as the field duplicate pairs for metals. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)**

Samples 114-MW75WR-118.0-20240530 (JD89452-6, -6F) were analyzed as MS/MSDs for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240530-B (JD89452-8) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW57C-70.9-20240530 (JD89452-5, -5F) and 114-MW57C-70.9-20240530-X (JD89452-3, -3F) were analyzed as the field duplicate pairs for wet chemistry. All QC acceptance criteria were met.

Methane**Trip Blank**

The trip blank (TB), P4-IRM-TB-20240530 (JD89452-9), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was performed on sample 114-MW75WR-118.0-20240530 (JD89452-6) in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240530-B (JD89452-8) was submitted for methane analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW57C-70.9-20240530(JD89452-5, -5F) and 114-MW57C-70.9-20240530-X (JD89452-3, -3F) were analyzed as the field duplicate pairs for methane. All QC acceptance criteria were met.

Data Quality and Usability

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

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

The result qualified as estimated due to low matrix spike/ matrix spike duplicate recoveries and a holding time exceedance is useable with a potential low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 30, 2024
Lab Name/ID SGS, Dayton
SDG No JD89452
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240530

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-01T-69.0-20240530	JD89452-1	Total	CHROMIUM (HEXAVALENT)	U	39.1	39.1	1.0		
114-PW-01T-69.0-20240530	JD89452-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	38.7	38.7	1.0		
114-PW-01T-74.0-20240530	JD89452-2	Total	CHROMIUM (HEXAVALENT)	U	48.6	48.6	1.0		
114-PW-01T-74.0-20240530	JD89452-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	47.3	47.3	1.0		
114-MW57C-70.9-20240530-X	JD89452-3	Total	CHROMIUM (HEXAVALENT)	U	18.2	18.2	0.50		
114-MW57C-70.9-20240530-X	JD89452-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	17.8	17.8	0.50		
114-MW57C-70.9-20240530	JD89452-5	Total	CHROMIUM (HEXAVALENT)	U	18.2	18.2	0.50		
114-MW57C-70.9-20240530	JD89452-5F	Dissolved	CHROMIUM (HEXAVALENT)	U	17.1	17.1	0.50		
114-P3-MW005D-50.3-20240530	JD89452-7	Total	CHROMIUM (HEXAVALENT)	U	281	281	5.0		
114-P3-MW005D-50.3-20240530	JD89452-7F	Dissolved	CHROMIUM (HEXAVALENT)	U	254	254	5.0		

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 30, 2024
Lab Name/ID SGS, Dayton
SDG No JD89452
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240530

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-01T-69.0-20240530	JD89452-1	Total	CHROMIUM	U	35800	35800	1000		
114-PW-01T-69.0-20240530	JD89452-1F	Dissolved	CHROMIUM	U	33900	33900	1000		
114-PW-01T-69.0-20240530	JD89452-1F	Dissolved	MANGANESE	U	133	133	10		
114-PW-01T-74.0-20240530	JD89452-2	Total	CHROMIUM	U	48400	48400	1000		
114-PW-01T-74.0-20240530	JD89452-2F	Dissolved	CHROMIUM	U	41800	41800	1000		
114-PW-01T-74.0-20240530	JD89452-2F	Dissolved	MANGANESE	U	133	133	10		
114-MW57C-70.9-20240530-X	JD89452-3	Total	CHROMIUM	U	17200	17200	500		
114-MW57C-70.9-20240530-X	JD89452-3F	Dissolved	CHROMIUM	U	17200	17200	500		
114-MW57C-70.9-20240530-X	JD89452-3F	Dissolved	MANGANESE	U	95.4	95.4	10		
114-PZ-57T-67.5-20240530	JD89452-4	Total	CHROMIUM	U	16.8	16.8	10		
114-PZ-57T-67.5-20240530	JD89452-4F	Dissolved	CHROMIUM	U	5.7 B	5.7 J	10	Qualify	1
114-PZ-57T-67.5-20240530	JD89452-4F	Dissolved	MANGANESE	U	503	503	10		
114-MW57C-70.9-20240530	JD89452-5	Total	CHROMIUM	U	16000	16000	500		
114-MW57C-70.9-20240530	JD89452-5F	Dissolved	CHROMIUM	U	17300	17300	500		
114-MW57C-70.9-20240530	JD89452-5F	Dissolved	MANGANESE	U	91.9	91.9	10		
114-MW75WR-118.0-20240530	JD89452-6F	Dissolved	MANGANESE	U	157	157	10		

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW75WR-118.0-20240530	JD89452-6RF	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	2,3
114-P3-MW005D-50.3-20240530	JD89452-7	Total	CHROMIUM	U	210000	210000	5000		
114-P3-MW005D-50.3-20240530	JD89452-7F	Dissolved	CHROMIUM	U	206000	206000	5000		
114-P3-MW005D-50.3-20240530	JD89452-7F	Dissolved	MANGANESE	U	386	386	10		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. Field duplicate precision criteria was not met.
3. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 30, 2024
Lab Name/ID SGS, Dayton
SDG No JD89452
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240530

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-01T-74.0-20240530	JD89452-2	TOTAL ORGANIC CARBON	U	2.1	2.1	1.0		
114-PZ-57T-67.5-20240530	JD89452-4	TOTAL ORGANIC CARBON	U	1.7	1.7	1.0		
114-MW75WR-118.0-20240530	JD89452-6	TOTAL ORGANIC CARBON	U	0.76 B	0.76 J	1.0	Qualify	1

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 30, 2024
Lab Name/ID SGS, Dayton
SDG No JD89452
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs P4-IRM-FB-20240530

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-01T-69.0-20240530	JD89452-1	SULFATE	U	236	236	10		
114-PW-01T-74.0-20240530	JD89452-2	SULFATE	U	257	257	10		
114-MW57C-70.9-20240530-X	JD89452-3	SULFATE	U	518	518	10		
114-PZ-57T-67.5-20240530	JD89452-4	SULFATE	U	206	206	2.0		
114-MW57C-70.9-20240530	JD89452-5	SULFATE	U	536	536	10		
114-MW75WR-118.0-20240530	JD89452-6	SULFATE	U	127	127	2.0		
114-P3-MW005D-50.3-20240530	JD89452-7	SULFATE	U	600	600	10		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 30, 2024
Lab Name/ID SGS, Dayton
SDG No JD89452
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240530
Field Blank ID P4-IRM-FB-20240530

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-01T-69.0-20240530	JD89452-1	METHANE	U	134	134	0.55		
114-PW-01T-74.0-20240530	JD89452-2	METHANE	U	134	134	0.55		
114-MW57C-70.9-20240530-X	JD89452-3	METHANE	U	287	287	0.55		
114-PZ-57T-67.5-20240530	JD89452-4	METHANE	U	162	162	0.55		
114-MW57C-70.9-20240530	JD89452-5	METHANE	U	306	306	0.55		
114-MW75WR-118.0-20240530	JD89452-6	METHANE	U	17.4	17.4	0.11		
114-P3-MW005D-50.3-20240530	JD89452-7	METHANE	U	2150	2150	5.5		
P4-IRM-TB-20240530	JD89452-9	METHANE	U	0.15	0.15	0.11		

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89452		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/17/2024	
Number of Samples/Matrix: 7 GW, 7 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 7/31/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody (COC)	No	No	The COC identifies sample JD89452-8 as P4-IRM-FB-20240529 the corrected ID should be P4-IRM-FB-20240530. The chain of custody (COC) identifies sample JD89452-9 as P4-IRM-TB-20240529 the corrected ID should be P4-IRM-TB-20240530.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.6 °C, 2.4 °C, 2.9 °C
Holding Time	Yes	No	Sampled 05/30/2024 analyzed 05/31/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	05/31/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55469-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240530 (JD89452-8), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW75WR-118.0-20240530 (JD89452-6, -6F) {86.7 %R, 86.7 %R}
Laboratory Duplicate	Yes	No	114-MW75WR-118.0-20240530 (JD89452-6, -6F) All ND
Laboratory Control Standards	Yes	No	GN55469-B1 (100.0 %R)
Field Duplicate	Yes	No	114-MW57C-70.9-20240530(JD89452-5, -5F) & 114-MW57C-70.9-20240530-X (JD89452-3, -3F)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Field Duplicates

114-MW57C-70.9-20240530 (JD89452-5, -5F) & 114-MW57C-70.9-20240530-X (JD89452-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	18.2		18.2		1.0	mg/l	0	OK, Accept
HEXAVALENT CHROMIUM	Dissolved	17.8		17.1		0.50	mg/l	4.01	OK, Accept

RPD – relative percent difference

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-PW-01T-69.0-20240530	JD89452-1	35800	1000	39100	1000	9	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-01T-74.0-20240530	JD89452-2	48400	1000	48600	1000	0	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW57C-70.9-20240530-X	JD89452-3	17200	500	18200	500	6	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PZ-57T-67.5-20240530	JD89452-4	16.8	10		10	NC	T Cr > T Cr6, Accept
114-MW57C-70.9-20240530	JD89452-5	16000	500	18200	500	13	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW75WR-118.0-20240530	JD89452-6		10		10	0	Both ND, Accept
114-P3-MW005D-50.3-20240530	JD89452-7	210000	5000	281000	5000	29	
P4-IRM-FB-20240529	JD89452-8		2.0		10	0	Both ND, Accept

NC- not calculated

RPD – relative percent difference

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-01T-69.0-20240530	JD89452-1F	33900	1000	38700	1000	13	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-01T-74.0-20240530	JD89452-2F	41800	1000	47300	1000	12	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW57C-70.9-20240530-X	JD89452-3F	17200	500	17800	500	3	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PZ-57T-67.5-20240530	JD89452-4F	5.7	10		10	NC	D Cr > D Cr6, Accept
114-MW57C-70.9-20240530	JD89452-5F	17300	500	17100	500	1	D Cr > D Cr6, Accept
114-MW75WR-118.0-20240530	JD89452-6F		10		10	0	Both ND, Accept
114-P3-MW005D-50.3-20240530	JD89452-7F	206000	5000	254000	5000	21	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

NC- not calculated**Total Hexavalent Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-01T-69.0-20240530	JD89452-1, -1F	39100	1000	38700	1000	1	T Cr6 > D Cr6, Accept
114-PW-01T-74.0-20240530	JD89452-2, -2F	48600	1000	47300	1000	3	T Cr6 > D Cr6, Accept
114-MW57C-70.9-20240530-X	JD89452-3, -3F	18200	500	17800	500	2	T Cr6 > D Cr6, Accept
114-PZ-57T-67.5-20240530	JD89452-4, -4F		10		10	0	Both ND, Accept
114-MW57C-70.9-20240530	JD89452-5, -5F	18200	500	17100	500	6	T Cr6 > D Cr6, Accept
114-MW75WR-118.0-20240530	JD89452-6, -6F		10		10	0	Both ND, Accept
114-P3-MW005D-50.3-20240530	JD89452-7, -7F	281000	5000	254000	5000	10	T Cr6 > D Cr6, Accept

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW53C-47.9-20240528	JD89297-5	CHROMIUM (HEXAVALENT)	12.6	Y	mg/l	0.07
114-MW53C-47.9-20240528	JD89297-5F	CHROMIUM (HEXAVALENT)	12.7	Y	mg/l	0.07
114-MW76WR-57.5-20240528	JD89297-3	CHROMIUM (HEXAVALENT)	85.7	Y	mg/l	0.07
114-MW76WR-57.5-20240528	JD89297-3F	CHROMIUM (HEXAVALENT)	78	Y	mg/l	0.07
114-MW76WR-62.5-20240528	JD89297-4	CHROMIUM (HEXAVALENT)	74.2	Y	mg/l	0.07
114-MW76WR-62.5-20240528	JD89297-4F	CHROMIUM (HEXAVALENT)	67.7	Y	mg/l	0.07
114-MW77WR-57.0-20240528	JD89297-1	CHROMIUM (HEXAVALENT)	22.2	Y	mg/l	0.07
114-MW77WR-57.0-20240528	JD89297-1F	CHROMIUM (HEXAVALENT)	21.8	Y	mg/l	0.07
114-MW77WR-62.0-20240528	JD89297-2	CHROMIUM (HEXAVALENT)	21.4	Y	mg/l	0.07
114-MW77WR-62.0-20240528	JD89297-2F	CHROMIUM (HEXAVALENT)	20.6	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-01T-69.0-20240530	JD89452-1	CHROMIUM (HEXAVALENT)	Total	100
114-PW-01T-69.0-20240530	JD89452-1F	CHROMIUM (HEXAVALENT)	Dissolved	100
114-PW-01T-74.0-20240530	JD89452-2	CHROMIUM (HEXAVALENT)	Total	100
114-PW-01T-74.0-20240530	JD89452-2F	CHROMIUM (HEXAVALENT)	Dissolved	100
114-MW57C-70.9-20240530-X	JD89452-3	CHROMIUM (HEXAVALENT)	Total	50
114-MW57C-70.9-20240530-X	JD89452-3F	CHROMIUM (HEXAVALENT)	Dissolved	50
114-MW57C-70.9-20240530	JD89452-5	CHROMIUM (HEXAVALENT)	Total	50
114-MW57C-70.9-20240530	JD89452-5F	CHROMIUM (HEXAVALENT)	Dissolved	50
114-P3-MW005D-50.3-20240530	JD89452-7	CHROMIUM (HEXAVALENT)	Total	500
114-P3-MW005D-50.3-20240530	JD89452-7F	CHROMIUM (HEXAVALENT)	Dissolved	500

SDG#: JD89452/ Method 7196**GN55469**

Cr+6 ICAL 5/31/24

GW

(p. 875 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.044
0.1	0.089
0.3	0.259
0.5	0.43
0.8	0.681
1	0.851

(p. 875 of
data pkg)

AECOM Calculated Intercept	0.00232	OK	Reported intercept	0.0023
AECOM Slope	0.8498	OK	Reported Slope	0.8498
AECOM Calculated r	0.99998	OK	Reported r	0.99998

LCS calculation**GN55469-B1****P. 857, 875**

Background absorbance 0
Sample absorbance 0.13
LCS Soluble Instrument Response 0.13
Instrument Concentration (mg/L) 0.150

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN55469-B1****P. 857, 875**

True Value (mg/L) 0.150

AECOM Calculated %R	100.2	OK	Reported %R	100.0

MS calculation**GN55469-S2****P. 859, 875****114-MW75WR-118.0-20240530 filtered**

Background reading 0.002
Total absorbance 0.115
Total absorbance - background 0.113
Instrument Concentration (mg/L) 0.1302

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

AECOM Calculated MS Result (mg/L)	0.130	OK	Reported Result (mg/L)	0.130

%R = Found/True*100**GN55469-S2****P. 859, 875****114-MW75WR-118.0-20240530**

True Value (mg/L) 0.150

Native concentration (mg/L) 0.000

AECOM Calculated MS Result %R	86.8	OK	Reported %R	86.7

UNFILTERED**Reporting Limit****JD89452-6****P. 41, 875****114-MW75WR-118.0-20240530**

Low Standard 0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED**Sample Calculations****JD89452-6****P. 41, 875****114-MW75WR-118.0-20240530**

Background reading	0.014
Total absorbance	0.014
Total absorbance - background	0
Instrument Response (mg/L)	-0.003

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	1

AECOM Calculated Result (mg/L)	0.00	OK, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89452		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/17/2024	
Number of Samples/Matrix: 7 GW, 7 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 7/31/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The chain of custody (COC) identifies sample JD89452-8 as P4-IRM-FB-20240529 the corrected ID should be P4-IRM-FB-20240530. The chain of custody (COC) identifies sample JD89452-9 as P4-IRM-TB-20240529 the corrected ID should be P4-IRM-TB-20240530.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.6 °C, 2.4 °C, 2.9 °C
Holding Time	No	Yes	Sampled 05/30/2024, analyzed 06/04/2024 - 06/08/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP47046 Metals (see table below), GP54436/GN55486 ND Sulfate, GP54357/GN55639 ND TOC, GP54358/GN55643 ND TOC, GP54492/GN55755 ND TOC, GN55832 Ferrous iron ND
Field Blanks	Yes	No	P4-IRM-FB-20240530 (JD89452-8) ND
Matrix Spike	No	Yes	114-MW75WR-118.0-20240530 (JD89452-6, -6F, -6RF) Metals, TOC, Ferrous iron, sulfate, 114-PW-01T-74.0-20240530 (JD89452-2) TOC, also Batch QC for TOC, see tables below
Matrix Spike Duplicate	No	Yes	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47046 Metals (see table below), GP54436/GN55486 Sulfate (105.4 %R), GP54357/GN55639 TOC (95.9 %R), GP54358/GN55643 TOC (97.4 %R), GP54492/GN55755 TOC (102.0 %R), GN55832 Ferrous iron (93.3 %R)
Field Duplicate	Yes	No	114-MW57C-70.9-20240530 (JD89452-5, -5F) & 114-MW57C-70.9-20240530-X (JD89452-3, -3F)

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW75WR-118.0-20240530	JD89452-6RF	IRON (FERROUS)	5/30/2024 9:20:00 AM	6/8/2024 12:06:00 PM	Estimate (UJ)

Method Blank

MB47046

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
Iron	Dissolved	33.1	J	50	Associated SR ND, Accept

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates (MS/MSD)**

114-MW75WR-118.0-20240530 (JD89452-6, -6F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Dissolved	80	0	76.7	77.2	95.9	96.5	125	75	0.6	20	OK, Accept
IRON	Dissolved	4000	65.5	4030	4070	99.1	100.1	125	75	1.0	20	OK, Accept
MANGANESE	Dissolved	80	157	235	234	97.5	96.3	125	75	0.4	20	OK, Accept
CHROMIUM	Total	80	0	77.4	78.3	96.8	97.9	125	75	1.2	20	OK, Accept
IRON	Total	4000	81.8	4120	4090	101.0	100.2	125	75	0.7	20	OK, Accept
MANGANESE	Total	80	158	230	233	90.0	93.8	125	75	1.3	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****RPD – Relative percent difference**

114-MW75WR-118.0-20240530 (JD89452-6, -6RF)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	0.76	11.0	10.2	102.4	94.4	143	59	7.5	10	OK, Accept
SULFATE	Total	80	127	205	205	97.5	97.5	110	80	0	15	OK, Accept
Ferrous iron	Dissolved	3.0	0	2.7	2.7	90.0	90.0	113	92	0	20	Estimate (UJ)

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****RPD – Relative percent difference**

114-PW-01T-74.0-20240530 (JD89452-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	2.1	12.6	12.8	105.0	107	143	59	1.6	10	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****RPD – Relative percent difference****Laboratory Control Sample (LCS)****MP47046**

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	76.6	95.8	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	3830	95.8	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	75.4	94.3	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable**R – recovery****RPD – relative percent recovery**

Field Duplicates

G114-MW57C-70.9-20240530 (JD89452-5, -5F) & 114-MW57C-70.9-20240530-X (JD89452-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
TOTAL ORGANIC CARBON	Total	5.0	U	5.0	U	5.0	mg/l	0	Both ND, Accept
CHROMIUM	Total	16000		17200		500	ug/l	7.2	RPD < 20%, Accept
SULFATE	Total	536		518		10	mg/l	3.4	RPD < 20%, Accept
CHROMIUM	Dissolved	17300		17200		500	ug/l	0.6	RPD < 20%, Accept
IRON	Dissolved	250	U	250	U	250	ug/l	0	Both ND, Accept
MANGANESE	Dissolved	91.9		95.4		10	ug/l	3.7	RPD < 20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-01T-69.0-20240530	JD89452-1	TOC	Total	5
114-PW-01T-69.0-20240530	JD89452-1	CHROMIUM	Total	1000
114-PW-01T-69.0-20240530	JD89452-1	SULFATE	Total	5
114-PW-01T-69.0-20240530	JD89452-1F	CHROMIUM	Dissolved	1000
114-PW-01T-69.0-20240530	JD89452-1F	IRON	Dissolved	10
114-PW-01T-69.0-20240530	JD89452-1F	MANGANESE	Dissolved	10
114-PW-01T-74.0-20240530	JD89452-2	CHROMIUM	Total	1000
114-PW-01T-74.0-20240530	JD89452-2	SULFATE	Total	5
114-PW-01T-74.0-20240530	JD89452-2F	CHROMIUM	Dissolved	1000
114-PW-01T-74.0-20240530	JD89452-2F	IRON	Dissolved	10
114-PW-01T-74.0-20240530	JD89452-2F	MANGANESE	Dissolved	10
114-MW57C-70.9-20240530-X	JD89452-3	TOC	Total	5
114-MW57C-70.9-20240530-X	JD89452-3	CHROMIUM	Total	500
114-MW57C-70.9-20240530-X	JD89452-3	SULFATE	Total	5
114-MW57C-70.9-20240530-X	JD89452-3F	CHROMIUM	Dissolved	500

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW57C-70.9-20240530-X	JD89452-3F	IRON	Dissolved	10
114-MW57C-70.9-20240530-X	JD89452-3F	MANGANESE	Dissolved	10
114-PZ-57T-67.5-20240530	JD89452-4	CHROMIUM	Total	10
114-PZ-57T-67.5-20240530	JD89452-4F	CHROMIUM	Dissolved	10
114-PZ-57T-67.5-20240530	JD89452-4F	IRON	Dissolved	10
114-PZ-57T-67.5-20240530	JD89452-4F	MANGANESE	Dissolved	10
114-MW57C-70.9-20240530	JD89452-5	TOC	Total	5
114-MW57C-70.9-20240530	JD89452-5	CHROMIUM	Total	500
114-MW57C-70.9-20240530	JD89452-5	SULFATE	Total	5
114-MW57C-70.9-20240530	JD89452-5F	CHROMIUM	Dissolved	500
114-MW57C-70.9-20240530	JD89452-5F	IRON	Dissolved	10
114-MW57C-70.9-20240530	JD89452-5F	MANGANESE	Dissolved	10
114-MW75WR-118.0-20240530	JD89452-6	CHROMIUM	Total	10
114-MW75WR-118.0-20240530	JD89452-6F	CHROMIUM	Dissolved	10
114-MW75WR-118.0-20240530	JD89452-6F	IRON	Dissolved	10
114-MW75WR-118.0-20240530	JD89452-6F	MANGANESE	Dissolved	10
114-P3-MW005D-50.3-20240530	JD89452-7	TOC	Total	5
114-P3-MW005D-50.3-20240530	JD89452-7	CHROMIUM	Total	5000
114-P3-MW005D-50.3-20240530	JD89452-7	SULFATE	Total	5
114-P3-MW005D-50.3-20240530	JD89452-7F	CHROMIUM	Dissolved	5000
114-P3-MW005D-50.3-20240530	JD89452-7F	IRON	Dissolved	10
114-P3-MW005D-50.3-20240530	JD89452-7F	MANGANESE	Dissolved	10
P4-IRM-FB-20240529	JD89452-8	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PW-01T-69.0-20240530	JD89452-1, -1F	35800	1000	33900	1000	5000	1900	5	T Cr > D Cr, Accept
114-PW-01T-74.0-20240530	JD89452-2, -2F	48400	1000	41800	1000	5000	6600	15	T Cr > D Cr, Accept
114-MW57C-70.9-20240530-X	JD89452-3, -3F	17200	500	17200	500	2500	0	0	T Cr > D Cr, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PZ-57T-67.5-20240530	JD89452-4, -4F	16.8	10	5.7	10	50	11	99	T Cr > D Cr, Accept
114-MW57C-70.9-20240530	JD89452-5, -5F	16000	500	17300	500	2500	1300	8	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-MW75WR-118.0-20240530	JD89452-6, -6F		10		10	50	0	0	Both ND, Accept
114-P3-MW005D-50.3-20240530	JD89452-7, -7F	210000	5000	206000	5000	25000	4000	2	T Cr > D Cr, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW53C-47.9-20240528	JD89297-5	SULFATE	411	Y	mg/l	250
114-MW53C-47.9-20240528	JD89297-5	CHROMIUM	11000	Y	ug/l	70
114-MW53C-47.9-20240528	JD89297-5F	MANGANESE	305	Y	ug/l	50
114-MW53C-47.9-20240528	JD89297-5F	CHROMIUM	10900	Y	ug/l	70
114-MW76WR-57.5-20240528	JD89297-3	SULFATE	405	Y	mg/l	250
114-MW76WR-57.5-20240528	JD89297-3	CHROMIUM	76500	Y	ug/l	70
114-MW76WR-57.5-20240528	JD89297-3F	CHROMIUM	74500	Y	ug/l	70
114-MW76WR-62.5-20240528	JD89297-4	SULFATE	334	Y	mg/l	250
114-MW76WR-62.5-20240528	JD89297-4	CHROMIUM	71100	Y	ug/l	70
114-MW76WR-62.5-20240528	JD89297-4F	CHROMIUM	76200	Y	ug/l	70
114-MW77WR-57.0-20240528	JD89297-1	CHROMIUM	18700	Y	ug/l	70
114-MW77WR-57.0-20240528	JD89297-1F	CHROMIUM	20600	Y	ug/l	70
114-MW77WR-62.0-20240528	JD89297-2	CHROMIUM	18400	Y	ug/l	70
114-MW77WR-62.0-20240528	JD89297-2F	CHROMIUM	19300	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD89452		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/17/2024		
Number of Samples/Matrix: 7 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 7/31/2024		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody		X		The chain of custody (COC) identifies sample JD89452-8 as P4-IRM-FB-20240529 the corrected ID should be P4-IRM-FB-20240530. The chain of custody (COC) identifies sample JD89452-9 as P4-IRM-TB-20240529 the corrected ID should be P4-IRM-TB-20240530.
Data Completeness	X			
Sample Preservation	X			1.6 °C, 2.4 °C, 2.9 °C
Holding Time	X			Sampled 05/30/2024, Analyzed 06/07/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3062-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240530 (JD89452-8) ND, P4-IRM-TB-20240530 (JD89452-9), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate	X			114-MW75WR-118.0-20240530 (JD89452-6) {RPD 5}
Laboratory Control Standards	X			GAA3062-LCS (89 %R)
Field Duplicate	X			114-MW57C-70.9-20240530 (JD89452-5) & 114-MW57C-70.9-20240530-X (JD89452-3)
Percent Solids			X	Aqueous

Trip Blank

P4-IRM-TB-20240530 (JD89452-9)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.15		0.11	Associated SR>10x TB, Accept

SR – sample result

RL – reporting limit

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW75WR-118.0-20240530	JD89452-6	Methane	17.4		16.6			ug/l	5	OK RPD <20%, Accept

RPD – relative percent difference

Field Duplicates

114-MW57C-70.9-20240530 (JD89452-5) & 114-MW57C-70.9-20240530-X (JD89452-3)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
METHANE	306		287		0.55	ug/l	6.41	OK RPD <20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PW-01T-69.0-20240530	JD89452-1	METHANE	5
114-PW-01T-74.0-20240530	JD89452-2	METHANE	5
114-MW57C-70.9-20240530-X	JD89452-3	METHANE	5
114-PZ-57T-67.5-20240530	JD89452-4	METHANE	5
114-MW57C-70.9-20240530	JD89452-5	METHANE	5
114-P3-MW005D-50.3-20240530	JD89452-7	METHANE	50

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD89525
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 TOC by SW846 5310B Ferrous Iron SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/18/2024
Reviewed by:	Linda Waters /AECOM File Name: JD89525_2024_07_18 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-AES Data Validation, SOP No. HW-3a Revision 1 (September 2016);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated 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 May 31, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PMW-02T-64.0-20240531	JD89525-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PMW-02T-64.0-20240531	JD89525-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PZ-52WR-74.0-20240531	JD89525-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PZ-52WR-74.0-20240531	JD89525-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese

Field ID	Laboratory ID	Matrix	Parameter*
114-PZ-66WR-84.0-20240531	JD89525-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PZ-66WR-84.0-20240531	JD89525-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PZ-66I-39.8-20240531	JD89525-4	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PZ-66I-39.8-20240531	JD89525-4F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PZ-66T-69.8-20240531	JD89525-5	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PZ-66T-69.8-20240531	JD89525-5F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
P4-IRM-FB-20240531	JD89525-6	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240530	JD89525-7	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) identifies sample JD89525-6 as P4-IRM-FB-20240529. The corrected ID should be P4-IRM-FB-20240531.

The chain of custody (COC) identifies sample JD89525-7 as P4-IRM-TB-20240529. The corrected ID should be P4-IRM-TB-20240531.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

Total chromium results were less than the total hexavalent chromium results in samples 114-PMW-02T-64.0-20240531 (JD89525-1) and 114-PZ-66T-69.8-20240531 (JD89525-5). Results were qualified as estimated (J).

The dissolved chromium results were less than the dissolved hexavalent chromium results in sample 114-PZ-66T-69.8-20240531 (JD89525-5F). Results were qualified as estimated (J).

Matrix Spike (MS)

Sample 114-PZ-66T-69.8-20240531 (JD89525-5), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-PZ-66T-69.8-20240531 (JD89525-5), was analyzed as a laboratory duplicate for this data set. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240531 (JD89525-6) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese, Ferrous Iron)**Holding Time**

Ferrous iron was analyzed outside of the method required holding time for samples 114-PZ-52WR-74.0-20240531 (JD89525-2RF) and 114-PZ-66WR-84.0-20240531 (JD89525-3RF). Results were qualified as estimated (J/UJ).

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

Sample 114-PZ-66WR-84.0-20240531(JD89525-3F) was analyzed as a MS/MSD for this data set. All metals met QC acceptance criteria.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240531 (JD89525-6) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240531 (JD89525-6) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane**Field Blank (FB)**

The field blank (FB), P4-IRM-FB-20240531 (JD89525-6), reported methane at a concentration greater than or equal to the RL. All associated sample results were greater than ten times the amount in the FB; therefore, no qualifications were made.

Trip Blank (TB)

The trip blank (TB), P4-IRM-TB-20240531 (JD89525-7), reported methane at a concentration greater than the RL. All associated sample results were greater than ten times the amount in the TB; therefore, no qualifications were made.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

Results estimated due to total/dissolved chromium results lower than total/dissolved hexavalent chromium results are usable with an unknown bias.

Results estimated due to holding time exceedance are useable with a potential low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 31, 2024
Lab Name/ID SGS, Dayton
SDG No JD89525
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240531

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-64.0-20240531	JD89525-1	Total	CHROMIUM (HEXAVALENT)	U	201	201J	5.0	Qualify	1
114-PMW-02T-64.0-20240531	JD89525-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	196	196	5.0		
114-PZ-66WR-84.0-20240531	JD89525-3	Total	CHROMIUM (HEXAVALENT)	U	209	209J	5.0	Qualify	1
114-PZ-66WR-84.0-20240531	JD89525-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	183	183	5.0		
114-PZ-66I-39.8-20240531	JD89525-4	Total	CHROMIUM (HEXAVALENT)	U	578	578	5.0		
114-PZ-66I-39.8-20240531	JD89525-4F	Dissolved	CHROMIUM (HEXAVALENT)	U	558	558	5.0		
114-PZ-66T-69.8-20240531	JD89525-5	Total	CHROMIUM (HEXAVALENT)	U	193	193	5.0		
114-PZ-66T-69.8-20240531	JD89525-5F	Dissolved	CHROMIUM (HEXAVALENT)	U	222	222J	5.0	Qualify	2

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

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

NJDEP Validation Footnote

1. The total chromium result was less than the total hexavalent chromium result, and the difference exceeded established criteria.
2. The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 31, 2024
Lab Name/ID SGS, Dayton
SDG No JD89525
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240531

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-64.0-20240531	JD89525-1	Total	CHROMIUM	U	143000	143000J	5000	Qualify	1
114-PMW-02T-64.0-20240531	JD89525-1F	Dissolved	CHROMIUM	U	164000	164000	5000		
114-PMW-02T-64.0-20240531	JD89525-1F	Dissolved	MANGANESE	U	67.3	67.3	10		
114-PZ-52WR-74.0-20240531	JD89525-2	Total	CHROMIUM	U	640	640	10		
114-PZ-52WR-74.0-20240531	JD89525-2F	Dissolved	CHROMIUM	U	547	547	10		
114-PZ-52WR-74.0-20240531	JD89525-2F	Dissolved	IRON	U	53300	53300	250		
114-PZ-52WR-74.0-20240531	JD89525-2F	Dissolved	MANGANESE	U	2630	2630	50		
114-PZ-52WR-74.0-20240531	JD89525-2RF	Dissolved	IRON (FERROUS)	U	47.6	47.6J	2.0	Qualify	3
114-PZ-66WR-84.0-20240531	JD89525-3	Total	CHROMIUM	U	149000	149000J	5000	Qualify	1
114-PZ-66WR-84.0-20240531	JD89525-3F	Dissolved	CHROMIUM	U	141000	141000	5000		
114-PZ-66WR-84.0-20240531	JD89525-3F	Dissolved	MANGANESE	U	145	145	10		
114-PZ-66WR-84.0-20240531	JD89525-3RF	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	3
114-PZ-66I-39.8-20240531	JD89525-4	Total	CHROMIUM	U	474000	474000	10000		
114-PZ-66I-39.8-20240531	JD89525-4F	Dissolved	CHROMIUM	U	465000	465000	10000		
114-PZ-66I-39.8-20240531	JD89525-4F	Dissolved	MANGANESE	U	289	289	10		
114-PZ-66T-69.8-20240531	JD89525-5	Total	CHROMIUM	U	145000	145000	5000		

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-66T-69.8-20240531	JD89525-5F	Dissolved	CHROMIUM	U	140000	140000J	5000	Qualify	2
114-PZ-66T-69.8-20240531	JD89525-5F	Dissolved	MANGANESE	U	133	133	10		

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

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

NJDEP Validation Footnote

1. The total chromium result was less than the total hexavalent chromium result, and the difference exceeded established criteria.
2. The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.
3. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 31, 2024
Lab Name/ID SGS, Dayton
SDG No JD89525
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240531

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-64.0-20240531	JD89525-1	TOTAL ORGANIC CARBON	U	3.7B	3.7J	5.0	Qualify	1
114-PZ-52WR-74.0-20240531	JD89525-2	TOTAL ORGANIC CARBON	U	1720	1720	100		
114-PZ-66WR-84.0-20240531	JD89525-3	TOTAL ORGANIC CARBON	U	4.6B	4.6J	5.0	Qualify	1
114-PZ-66I-39.8-20240531	JD89525-4	TOTAL ORGANIC CARBON	U	14.7	14.7	5.0		
114-PZ-66T-69.8-20240531	JD89525-5	TOTAL ORGANIC CARBON	U	3.8B	3.8J	5.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 31, 2024
Lab Name/ID SGS, Dayton
SDG No JD89525
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240531

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-64.0-20240531	JD89525-1	SULFATE	U	486	486	10		
114-PZ-52WR-74.0-20240531	JD89525-2	SULFATE	U	39.7	39.7	20		
114-PZ-66WR-84.0-20240531	JD89525-3	SULFATE	U	378	378	10		
114-PZ-66I-39.8-20240531	JD89525-4	SULFATE	U	964	964	10		
114-PZ-66T-69.8-20240531	JD89525-5	SULFATE	U	406	406	10		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date May 31, 2024
Lab Name/ID SGS, Dayton
SDG No JD89525
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240531
Field Blank ID P4-IRM-FB-20240531

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-64.0-20240531	JD89525-1	METHANE	U	446	446	0.55		
114-PZ-52WR-74.0-20240531	JD89525-2	METHANE	U	3330	3330	11		
114-PZ-66WR-84.0-20240531	JD89525-3	METHANE	U	696	696	1.1		
114-PZ-66I-39.8-20240531	JD89525-4	METHANE	U	1790	1790	2.8		
114-PZ-66T-69.8-20240531	JD89525-5	METHANE	U	1050	1050	2.8		
P4-IRM-FB-20240531	JD89525-6	METHANE	U	0.11	0.11	0.11		
P4-IRM-TB-20240531	JD89525-7	METHANE	U	0.14	0.14	0.11		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89525		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/18/2024	
Number of Samples/Matrix: 5 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 7/24/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The chain of custody (COC) identifies sample JD89525-6 as P4-IRM-FB-20240529 the corrected ID should be P4-IRM-FB-20240531. The chain of custody (COC) identifies sample JD89525-7 as P4-IRM-TB-20240529 the corrected ID should be P4-IRM-TB-20240531.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	Yes	No	Sampled 05/31/2024 analyzed 06/01/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	06/01/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55508-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240531 (JD89525-6), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-PZ-66T-69.8-20240531 (JD89525-5) {104.1 %R}
Laboratory Duplicate	Yes	No	114-PZ-66T-69.8-20240531 (JD89525-5) {RPD 0}
Laboratory Control Standards	Yes	No	GN55508-B1 (100.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	No	Yes	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PMW-02T-64.0-20240531	JD89525-1	143000	5000	201000	5000	34	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-PZ-52WR-74.0-20240531	JD89525-2	640	10		20	NC	T Cr > T Cr6, Accept
114-PZ-66WR-84.0-20240531	JD89525-3	149000	5000	209000	5000	34	T Cr < T Cr6, SRs > 4x RL, %RPD > 30%, Qualify J
114-PZ-66I-39.8-20240531	JD89525-4	474000	10000	578000	5000	20	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PZ-66T-69.8-20240531	JD89525-5	145000	5000	193000	5000	28	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
P4-IRM-FB-20240531	JD89525-6		2.0		10	0	Both ND, Accept

NC- not calculated**Dissolved Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PMW-02T-64.0-20240531	JD89525-1F	164000	5000	196000	5000	18	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PZ-52WR-74.0-20240531	JD89525-2F	547	10		20	NC	D Cr > D Cr6, Accept
114-PZ-66WR-84.0-20240531	JD89525-3F	141000	5000	183000	5000	26	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PZ-66I-39.8-20240531	JD89525-4F	465000	10000	558000	5000	18	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PZ-66T-69.8-20240531	JD89525-5F	140000	5000	222000	5000	45	D Cr < D Cr6, SRs > 4x RL, %RPD > 30%, Qualify J

NC- not calculated

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PMW-02T-64.0-20240531	JD89525-1	201000	5000	196000	5000	3	T Cr6 > D Cr6, Accept
114-PZ-52WR-74.0-20240531	JD89525-2		20		20	0	Both ND, Accept
114-PZ-66WR-84.0-20240531	JD89525-3	209000	5000	183000	5000	13	T Cr6 > D Cr6, Accept
114-PZ-66I-39.8-20240531	JD89525-4	578000	5000	558000	5000	4	T Cr6 > D Cr6, Accept
114-PZ-66T-69.8-20240531	JD89525-5	193000	5000	222000	5000	14	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PMW-02T-64.0-20240531	JD89525-1	CHROMIUM (HEXAVALENT)	201	Y	mg/l	0.07
114-PMW-02T-64.0-20240531	JD89525-1F	CHROMIUM (HEXAVALENT)	196	Y	mg/l	0.07
114-PZ-66I-39.8-20240531	JD89525-4	CHROMIUM (HEXAVALENT)	578	Y	mg/l	0.07
114-PZ-66I-39.8-20240531	JD89525-4F	CHROMIUM (HEXAVALENT)	558	Y	mg/l	0.07
114-PZ-66T-69.8-20240531	JD89525-5	CHROMIUM (HEXAVALENT)	193	Y	mg/l	0.07
114-PZ-66T-69.8-20240531	JD89525-5F	CHROMIUM (HEXAVALENT)	222	Y	mg/l	0.07
114-PZ-66WR-84.0-20240531	JD89525-3	CHROMIUM (HEXAVALENT)	209	Y	mg/l	0.07
114-PZ-66WR-84.0-20240531	JD89525-3F	CHROMIUM (HEXAVALENT)	183	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PMW-02T-64.0-20240531	JD89525-1	CHROMIUM (HEXAVALENT)	Total	500
114-PMW-02T-64.0-20240531	JD89525-1F	CHROMIUM (HEXAVALENT)	Dissolved	500
114-PZ-52WR-74.0-20240531	JD89525-2	CHROMIUM (HEXAVALENT)	Total	2
114-PZ-52WR-74.0-20240531	JD89525-2F	CHROMIUM (HEXAVALENT)	Dissolved	2
114-PZ-66WR-84.0-20240531	JD89525-3	CHROMIUM (HEXAVALENT)	Total	500
114-PZ-66WR-84.0-20240531	JD89525-3F	CHROMIUM (HEXAVALENT)	Dissolved	500
114-PZ-66I-39.8-20240531	JD89525-4	CHROMIUM (HEXAVALENT)	Total	500
114-PZ-66I-39.8-20240531	JD89525-4F	CHROMIUM (HEXAVALENT)	Dissolved	500
114-PZ-66T-69.8-20240531	JD89525-5	CHROMIUM (HEXAVALENT)	Total	500
114-PZ-66T-69.8-20240531	JD89525-5F	CHROMIUM (HEXAVALENT)	Dissolved	500

SDG#: JD89525/ Method 7196**GN55508**

Cr+6 ICAL 6/01/24

GW

(p. 933 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.084
0.3	0.252
0.5	0.425
0.8	0.672
1	0.850

(p. 933 of
data pkg)

AECOM Calculated Intercept	0.00003	OK	Reported intercept	0.0000
AECOM Slope	0.8463	OK	Reported Slope	0.8463
AECOM Calculated r	0.99997	OK	Reported r	0.99997

LCS calculation**GN55508-B1****P. 915, 933**

Background absorbance 0
Sample absorbance 0.128
LCS Soluble Instrument Response 0.128
Instrument Concentration (mg/L) 0.151

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100**GN55508-B1****P. 915, 933**

True Value (mg/L) 0.150

AECOM Calculated %R	100.8	OK	Reported %R	100.7

MS calculation**GN55508-S1****P. 917, 933****114-PZ-66T-69.8-20240531****unfiltered**

Background reading 0
Total absorbance 0.325
Total absorbance - background 0.325
Instrument Concentration (mg/L) 0.3840

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1500

AECOM Calculated MS Result (mg/L)	576.0	OK	Reported Result (mg/L)	576.0

%R = Found/True*100**GN55508-S1****P. 917, 933****114-PZ-66T-69.8-20240531**

True Value (mg/L) 368

Native concentration (mg/L) 193

AECOM Calculated MS Result %R	104.1	OK	Reported %R	104.1

UNFILTERED**Reporting Limit****JD89525-5****P. 41, 875****114-PZ-66T-69.8-20240531**

Low Standard 0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	500

AECOM Calculated Reporting Limit	5.0	OK	Reported RL (mg/L)=	5.0

UNFILTERED**Sample Calculations****JD89525-5****P. 41, 875****114-PZ-66T-69.8-20240531**

Background reading	0
Total absorbance	0.327
Total absorbance - background	0.327
Instrument Response (mg/L)	0.386

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	500

AECOM Calculated Result (mg/L)	193.2	OK, report as ND	Reported Result (mg/L)	193

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89525		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/18/2024	
Number of Samples/Matrix: 5 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 7/24/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The chain of custody (COC) identifies sample JD89525-6 as P4-IRM-FB-20240529 the corrected ID should be P4-IRM-FB-20240531. The chain of custody (COC) identifies sample JD89525-7 as P4-IRM-TB-20240529 the corrected ID should be P4-IRM-TB-20240531.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	No	Yes	Sampled 05/31/2024, analyzed 06/05/2024 - 06/08/2024. Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP47067 Metals (Cr, Fe, Mn) ND, GP54478/GN55708 ND Sulfate, GP4479/GN55709 ND Sulfate, GP54412/GN55794 ND TOC, GP54413/GN55787 ND TOC, GN55832 ND Ferrous iron
Field Blanks	Yes	No	P4-IRM-FB-20240531 (JD89525-6) ND
Matrix Spike	Yes	No	114-PZ-66WR-84.0-20240531(JD89525-3F) Metals, Batch QC TOC, Ferrous iron, sulfate, see tables below
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	None
Laboratory Duplicate	NA	NA	Batch QC TOC, Ferrous iron, sulfate
Laboratory Control Standards	Yes	No	MP47067 Metals (Cr, Fe, Mn) see table below, GP54478/GN55708 Sulfate (102.1 %R), GP4479/GN55709 Sulfate (107.9 %R), GP54412/GN55794 TOC (93.3 %R), GP54413/GN55787 TOC (103.0 %R), GN55832 Ferrous iron (93.3 %R)
Field Duplicate	NA	NA	None
Total Metals vs Dissolved Metals	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-PZ-52WR-74.0-20240531	JD89525-2RF	IRON (FERROUS)	5/31/2024 11:50	6/8/2024 12:06	Estimate (J)
114-PZ-66WR-84.0-20240531	JD89525-3RF	IRON (FERROUS)	5/31/2024 14:15	6/8/2024 12:06	Estimate (UJ)

Matrix Spikes/Matrix Spike Duplicates

114-PZ-66WR-84.0-20240531(JD89525-3F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Dissolved	80	141000	162000	137000	26250	-5000	125	75	16.7	20	SR>5x amt. spiked, Accept
IRON	Dissolved	4000	2.8	4210	4210	105.2	105.2	125	75	0	20	OK, Accept
MANGANESE	Dissolved	80	145	216	219	88.8	92.5	125	75	1.4	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****LCS****MP47067**

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	79.2	99.0	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	4170	104.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	78.4	98.0	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PMW-02T-64.0-20240531	JD89525-1	TOC	Total	5
114-PMW-02T-64.0-20240531	JD89525-1	CHROMIUM	Total	1000
114-PMW-02T-64.0-20240531	JD89525-1	SULFATE	Total	5
114-PMW-02T-64.0-20240531	JD89525-1F	CHROMIUM	Dissolved	1000
114-PMW-02T-64.0-20240531	JD89525-1F	IRON	Dissolved	10
114-PMW-02T-64.0-20240531	JD89525-1F	MANGANESE	Dissolved	10
114-PZ-52WR-74.0-20240531	JD89525-2	TOC	Total	1000
114-PZ-52WR-74.0-20240531	JD89525-2	CHROMIUM	Total	5
114-PZ-52WR-74.0-20240531	JD89525-2	SULFATE	Total	1000
114-PZ-52WR-74.0-20240531	JD89525-2F	CHROMIUM	Dissolved	10
114-PZ-52WR-74.0-20240531	JD89525-2F	IRON	Dissolved	10
114-PZ-52WR-74.0-20240531	JD89525-2F	MANGANESE	Dissolved	5
114-PZ-66WR-84.0-20240531	JD89525-3	TOC	Total	500
114-PZ-66WR-84.0-20240531	JD89525-3	CHROMIUM	Total	5
114-PZ-66WR-84.0-20240531	JD89525-3	SULFATE	Total	500
114-PZ-66WR-84.0-20240531	JD89525-3F	CHROMIUM	Dissolved	10
114-PZ-66WR-84.0-20240531	JD89525-3F	IRON	Dissolved	10
114-PZ-66WR-84.0-20240531	JD89525-3F	MANGANESE	Dissolved	10
114-PZ-66I-39.8-20240531	JD89525-4	TOC	Total	10
114-PZ-66I-39.8-20240531	JD89525-4	CHROMIUM	Total	10
114-PZ-66I-39.8-20240531	JD89525-4	SULFATE	Total	10
114-PZ-66I-39.8-20240531	JD89525-4F	CHROMIUM	Dissolved	5
114-PZ-66I-39.8-20240531	JD89525-4F	IRON	Dissolved	500
114-PZ-66I-39.8-20240531	JD89525-4F	MANGANESE	Dissolved	5
114-PZ-66T-69.8-20240531	JD89525-5	TOC	Total	500
114-PZ-66T-69.8-20240531	JD89525-5	CHROMIUM	Total	10
114-PZ-66T-69.8-20240531	JD89525-5	SULFATE	Total	10
114-PZ-66T-69.8-20240531	JD89525-5F	CHROMIUM	Dissolved	10
114-PZ-66T-69.8-20240531	JD89525-5F	IRON	Dissolved	10
114-PZ-66T-69.8-20240531	JD89525-5F	MANGANESE	Dissolved	10
P4-IRM-FB-20240531	JD89525-6	CHROMIUM	Total	10

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PMW-02T-64.0-20240531	JD89525-1	143000	5000	164000	5000	25000	21000	14	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PZ-52WR-74.0-20240531	JD89525-2	640	10	547	10	50	93	16	T Cr > D Cr, Accept
114-PZ-66WR-84.0-20240531	JD89525-3	149000	5000	141000	5000	25000	8000	6	T Cr > D Cr, Accept
114-PZ-66I-39.8-20240531	JD89525-4	474000	10000	465000	10000	50000	9000	2	T Cr > D Cr, Accept
114-PZ-66T-69.8-20240531	JD89525-5	145000	5000	140000	5000	25000	5000	4	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PMW-02T-64.0-20240531	JD89525-1	143000	5000	164000	5000	25000	21000	14	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-P3-MW005D-50.3-20240530	JD89525-7, -7F	210000	5000	206000	5000	25000	4000	2	T Cr > D Cr, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PMW-02T-64.0-20240531	JD89525-1	SULFATE	486	Y	mg/l	250
114-PMW-02T-64.0-20240531	JD89525-1	CHROMIUM	143000	Y	ug/l	70
114-PMW-02T-64.0-20240531	JD89525-1F	MANGANESE	67.3	Y	ug/l	50
114-PMW-02T-64.0-20240531	JD89525-1F	CHROMIUM	164000	Y	ug/l	70
114-PZ-52WR-74.0-20240531	JD89525-2	CHROMIUM	640	Y	ug/l	70
114-PZ-52WR-74.0-20240531	JD89525-2F	CHROMIUM	547	Y	ug/l	70
114-PZ-52WR-74.0-20240531	JD89525-2F	IRON	53300	Y	ug/l	300
114-PZ-52WR-74.0-20240531	JD89525-2F	MANGANESE	2630	Y	ug/l	50
114-PZ-66I-39.8-20240531	JD89525-4	SULFATE	964	Y	mg/l	250
114-PZ-66I-39.8-20240531	JD89525-4	CHROMIUM	474000	Y	ug/l	70
114-PZ-66I-39.8-20240531	JD89525-4F	MANGANESE	289	Y	ug/l	50
114-PZ-66I-39.8-20240531	JD89525-4F	CHROMIUM	465000	Y	ug/l	70

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PZ-66T-69.8-20240531	JD89525-5	SULFATE	406	Y	mg/l	250
114-PZ-66T-69.8-20240531	JD89525-5	CHROMIUM	145000	Y	ug/l	70
114-PZ-66T-69.8-20240531	JD89525-5F	MANGANESE	133	Y	ug/l	50
114-PZ-66T-69.8-20240531	JD89525-5F	CHROMIUM	140000	Y	ug/l	70
114-PZ-66WR-84.0-20240531	JD89525-3	SULFATE	378	Y	mg/l	250
114-PZ-66WR-84.0-20240531	JD89525-3	CHROMIUM	149000	Y	ug/l	70
114-PZ-66WR-84.0-20240531	JD89525-3F	MANGANESE	145	Y	ug/l	50
114-PZ-66WR-84.0-20240531	JD89525-3F	CHROMIUM	141000	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD89525		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/18/2024		
Number of Samples/Matrix: 5 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 07/24/2024		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody		X		The chain of custody (COC) identifies sample JD89525-6 as P4-IRM-FB-20240529 the corrected ID should be P4-IRM-FB-20240531. The chain of custody (COC) identifies sample JD89525-7 as P4-IRM-TB-20240529 the corrected ID should be P4-IRM-TB-20240531.
Data Completeness	X			
Sample Preservation	X			1.4 °C
Holding Time	X			Sampled 05/31/2024, Analyzed 06/10/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3063-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240531 (JD89525-6), P4-IRM-TB-20240531 (JD89525-7), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate			X	Batch QC
Laboratory Control Standards	X			GAA3063-LCS (96 %R)
Field Duplicate			X	None with this SDG
Percent Solids			X	Aqueous

Field Blank

P4-IRM-FB-20240531 (JD89525-6)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.11		0.11	Associated SR>10x FB, Accept

SR – sample result**RL – reporting limit****Trip Blank**

P4-IRM-TB-20240531 (JD89525-7)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.14		0.11	Associated SR>10x TB, Accept

SR – sample result**RL – reporting limit****Dilutions**

Sample ID	Lab ID	Analyte	Dilution
114-PMW-02T-64.0-20240531	JD89525-1	METHANE	5
114-PZ-52WR-74.0-20240531	JD89525-2	METHANE	100
114-PZ-66WR-84.0-20240531	JD89525-3	METHANE	10
114-PZ-66I-39.8-20240531	JD89525-4	METHANE	25
114-PZ-66T-69.8-20240531	JD89525-5	METHANE	25

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD89648
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/18/2024
Reviewed by:	Linda Waters /AECOM File Name: JD89648_2024_07_18 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-AES Data Validation, SOP No. HW-3a Revision 1 (September 2016);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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

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- J: Indicates the result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
- J+: Indicates the analyte was positively identified; the associated numerical value is an estimated quantity with a potential high bias.
- J-: Indicates the analyte was positively identified; the associated numerical value is an estimated quantity with a potential low bias.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 3, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PMW-02T-69.0-20240603	JD89648-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PMW-02T-69.0-20240603	JD89648-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-02T-70.5-20240603	JD89648-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-02T-70.5-20240603	JD89648-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-06WR-81.5-20240603	JD89648-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-06WR-81.5-20240603	JD89648-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-06WR-86.5-20240603	JD89648-4	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-06WR-86.5-20240603	JD89648-4F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-01WR-83.5-20240603	JD89648-5	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-01WR-83.5-20240603	JD89648-5F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-01WR-88.5-20240603	JD89648-6	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-01WR-88.5-20240603	JD89648-6F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
P4-IRM-FB-20240603	JD89648-7	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240603	JD89648-8	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) identifies sample JD89648-4, and JD89648-4F as 114-PW-06WR-20240603. The corrected ID should be 114-PW-06WR-86.5-20240603.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Sample 114-PW-01WR-83.5-20240603 (JD89648-5F), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-PW-01WR-83.5-20240603 (JD89648-5F), was analyzed as a laboratory duplicate for this data set. No qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240603 (JD89648-7) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese)

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

Sample 114-PW-01WR-88.5-20240603 (JD89648-6F) was analyzed as a MS/MSD for this data set. All metals met QC acceptance criteria.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240603 (JD89648-7) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240603 (JD89648-7) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane**Field Blank (FB)**

The field blank (FB), P4-IRM-FB-20240603 (JD89648-7), reported methane at a concentration greater than the method detection limit (MDL) but less than the RL. All associated SRs were greater than ten times the amount in the FB; therefore, no qualifications were made.

Trip Blank (TB)

The trip blank (TB), P4-IRM-TB-20240603 (JD89648-8), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Lab Duplicate

Sample 114-PW-06WR-81.5-20240603 (JD89648-3) was analyzed as a laboratory duplicate for methane. All QC acceptance criteria were met. No qualifications were made.

Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 3, 2024
Lab Name/ID SGS, Dayton
SDG No JD89648
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240603

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-69.0-20240603	JD89648-1	Total	CHROMIUM (HEXAVALENT)	U	137	137	5.0		
114-PMW-02T-69.0-20240603	JD89648-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	177	177	5.0		
114-PW-02T-70.5-20240603	JD89648-2	Total	CHROMIUM (HEXAVALENT)	U	191	191	2.5		
114-PW-02T-70.5-20240603	JD89648-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	178	178	2.5		
114-PW-06WR-81.5-20240603	JD89648-3	Total	CHROMIUM (HEXAVALENT)	U	0.76	0.76	0.010		
114-PW-06WR-81.5-20240603	JD89648-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.78	0.78	0.010		
114-PW-06WR-86.5-20240603	JD89648-4	Total	CHROMIUM (HEXAVALENT)	U	0.91	0.91	0.010		
114-PW-06WR-86.5-20240603	JD89648-4F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.86	0.86	0.010		
114-PW-01WR-83.5-20240603	JD89648-5	Total	CHROMIUM (HEXAVALENT)	U	16.1	16.1	0.25		
114-PW-01WR-83.5-20240603	JD89648-5F	Dissolved	CHROMIUM (HEXAVALENT)	U	16.0	16.0	0.25		
114-PW-01WR-88.5-20240603	JD89648-6	Total	CHROMIUM (HEXAVALENT)	U	35.1	35.1	0.50		
114-PW-01WR-88.5-20240603	JD89648-6F	Dissolved	CHROMIUM (HEXAVALENT)	U	33.0	33.0	0.50		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 3, 2024
Lab Name/ID SGS, Dayton
SDG No JD89648
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240603

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-69.0-20240603	JD89648-1	Total	CHROMIUM	U	133000	133000	5000		
114-PMW-02T-69.0-20240603	JD89648-1F	Dissolved	CHROMIUM	U	146000	146000	5000		
114-PMW-02T-69.0-20240603	JD89648-1F	Dissolved	MANGANESE	U	53.1	53.1	10		
114-PW-02T-70.5-20240603	JD89648-2	Total	CHROMIUM	U	150000	150000	5000		
114-PW-02T-70.5-20240603	JD89648-2F	Dissolved	CHROMIUM	U	142000	142000	5000		
114-PW-02T-70.5-20240603	JD89648-2F	Dissolved	MANGANESE	U	56.7	56.7	10		
114-PW-06WR-81.5-20240603	JD89648-3	Total	CHROMIUM	U	766	766	10		
114-PW-06WR-81.5-20240603	JD89648-3F	Dissolved	CHROMIUM	U	752	752	10		
114-PW-06WR-81.5-20240603	JD89648-3F	Dissolved	MANGANESE	U	86.5	86.5	10		
114-PW-06WR-86.5-20240603	JD89648-4	Total	CHROMIUM	U	901	901	10		
114-PW-06WR-86.5-20240603	JD89648-4F	Dissolved	CHROMIUM	U	908	908	10		
114-PW-06WR-86.5-20240603	JD89648-4F	Dissolved	MANGANESE	U	78.8	78.8	10		
114-PW-01WR-83.5-20240603	JD89648-5	Total	CHROMIUM	U	14700	14700	500		
114-PW-01WR-83.5-20240603	JD89648-5F	Dissolved	CHROMIUM	U	15000	15000	500		
114-PW-01WR-83.5-20240603	JD89648-5F	Dissolved	MANGANESE	U	50.3	50.3	10		
114-PW-01WR-88.5-20240603	JD89648-6	Total	CHROMIUM	U	29800	29800	1000		

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-01WR-88.5-20240603	JD89648-6F	Dissolved	CHROMIUM	U	29400	29400	1000		
114-PW-01WR-88.5-20240603	JD89648-6F	Dissolved	MANGANESE	U	60.9	60.9	10		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 3, 2024
Lab Name/ID SGS, Dayton
SDG No JD89648
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240603

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-69.0-20240603	JD89648-1	TOTAL ORGANIC CARBON	U	3.7B	3.7J	5.0	Qualify	1
114-PW-06WR-81.5-20240603	JD89648-3	TOTAL ORGANIC CARBON	U	1.5	1.5	1.0		
114-PW-06WR-86.5-20240603	JD89648-4	TOTAL ORGANIC CARBON	U	1.6	1.6	1.0		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 3, 2024
Lab Name/ID SGS, Dayton
SDG No JD89648
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240603

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-69.0-20240603	JD89648-1	SULFATE	U	456	456	10		
114-PW-02T-70.5-20240603	JD89648-2	SULFATE	U	491	491	10		
114-PW-06WR-81.5-20240603	JD89648-3	SULFATE	U	184	184	2.0		
114-PW-06WR-86.5-20240603	JD89648-4	SULFATE	U	182	182	2.0		
114-PW-01WR-83.5-20240603	JD89648-5	SULFATE	U	225	225	10		
114-PW-01WR-88.5-20240603	JD89648-6	SULFATE	U	244	244	10		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 3, 2024
Lab Name/ID SGS, Dayton
SDG No JD89648
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240603
Field Blank ID P4-IRM-FB-20240603

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PMW-02T-69.0-20240603	JD89648-1	METHANE	U	537	537	0.55		
114-PW-02T-70.5-20240603	JD89648-2	METHANE	U	507	507	1.1		
114-PW-06WR-81.5-20240603	JD89648-3	METHANE	U	6.31	6.31	0.11		
114-PW-06WR-86.5-20240603	JD89648-4	METHANE	U	4.09	4.09	0.11		
114-PW-01WR-83.5-20240603	JD89648-5	METHANE	U	282	282	0.55		
114-PW-01WR-88.5-20240603	JD89648-6	METHANE	U	273	273	0.55		
P4-IRM-FB-20240603	JD89648-7	METHANE	U	0.10J	0.10J	0.11	Qualify	1
P4-IRM-TB-20240603	JD89648-8	METHANE	U	0.16	0.16	0.11		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89648		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/18/2024	
Number of Samples/Matrix: 6 GW, 6 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 07/23/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The chain of custody (COC) identifies sample JD89648-4, and JD89648-4F as 114-PW-06WR-20240603. The corrected ID should be 114-PW-06WR-86.5-20240603
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.0 °C, 2.5 °C
Holding Time	Yes	No	Sampled 06/03/2024 analyzed 06/04/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	06/04/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55579-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240603 (JD89648-7), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-PW-01WR-83.5-20240603 (JD89648-5F) {105.8 %R}
Laboratory Duplicate	Yes	No	114-PW-01WR-83.5-20240603 (JD89648-5F) {RPD 3.2}
Laboratory Control Standards	Yes	No	GN55579-B1 (100.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PMW-02T-69.0-20240603	JD89648-1	133000	5000	137000	5000	3	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-02T-70.5-20240603	JD89648-2	150000	5000	191000	2500	24	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-06WR-81.5-20240603	JD89648-3	766	10	760	10	1	T Cr > T Cr6, Accept
114-PW-06WR-86.5-20240603	JD89648-4	901	10	910	10	1	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-01WR-83.5-20240603	JD89648-5	14700	500	16100	250	9	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-01WR-88.5-20240603	JD89648-6	29800	1000	35100	500	16	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
P4-IRM-FB-20240603	JD89648-7		2.0		10	0	Both ND, Accept

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PMW-02T-69.0-20240603	JD89648-1F	146000	5000	177000	5000	19	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-02T-70.5-20240603	JD89648-2F	142000	5000	178000	2500	23	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-06WR-81.5-20240603	JD89648-3F	752	10	780	10	4	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-06WR-86.5-20240603	JD89648-4F	908	10	860	10	5	D Cr > D Cr6, Accept
114-PW-01WR-83.5-20240603	JD89648-5F	15000	500	16000	250	6	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-01WR-88.5-20240603	JD89648-6F	29400	1000	33000	500	12	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PMW-02T-69.0-20240603	JD89648-1, -1F	137000	5000	177000	5000	25	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-02T-70.5-20240603	JD89648-2, -2F	191000	2500	178000	2500	7	T Cr6 > D Cr6, Accept
114-PW-06WR-81.5-20240603	JD89648-3, -3F	760	10	780	10	3	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-06WR-86.5-20240603	JD89648-4, -4F	910	10	860	10	6	T Cr6 > D Cr6, Accept
114-PW-01WR-83.5-20240603	JD89648-5, -5F	16100	250	16000	250	1	T Cr6 > D Cr6, Accept
114-PW-01WR-88.5-20240603	JD89648-6, -6F	35100	500	33000	500	6	T Cr6 > D Cr6, Accept

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PMW-02T-69.0-20240603	JD89648-1	CHROMIUM (HEXAVALENT)	137	Y	mg/l	0.07
114-PMW-02T-69.0-20240603	JD89648-1F	CHROMIUM (HEXAVALENT)	177	Y	mg/l	0.07
114-PW-01WR-83.5-20240603	JD89648-5	CHROMIUM (HEXAVALENT)	16.1	Y	mg/l	0.07
114-PW-01WR-83.5-20240603	JD89648-5F	CHROMIUM (HEXAVALENT)	16	Y	mg/l	0.07
114-PW-01WR-88.5-20240603	JD89648-6	CHROMIUM (HEXAVALENT)	35.1	Y	mg/l	0.07
114-PW-01WR-88.5-20240603	JD89648-6F	CHROMIUM (HEXAVALENT)	33	Y	mg/l	0.07
114-PW-02T-70.5-20240603	JD89648-2	CHROMIUM (HEXAVALENT)	191	Y	mg/l	0.07
114-PW-02T-70.5-20240603	JD89648-2F	CHROMIUM (HEXAVALENT)	178	Y	mg/l	0.07
114-PW-06WR-81.5-20240603	JD89648-3	CHROMIUM (HEXAVALENT)	0.76	Y	mg/l	0.07
114-PW-06WR-81.5-20240603	JD89648-3F	CHROMIUM (HEXAVALENT)	0.78	Y	mg/l	0.07
114-PW-06WR-86.5-20240603	JD89648-4	CHROMIUM (HEXAVALENT)	0.91	Y	mg/l	0.07
114-PW-06WR-86.5-20240603	JD89648-4F	CHROMIUM (HEXAVALENT)	0.86	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PMW-02T-69.0-20240603	JD89648-1	CHROMIUM (HEXAVALENT)	Total	500
114-PMW-02T-69.0-20240603	JD89648-1F	CHROMIUM (HEXAVALENT)	Dissolved	500
114-PW-02T-70.5-20240603	JD89648-2	CHROMIUM (HEXAVALENT)	Total	250
114-PW-02T-70.5-20240603	JD89648-2F	CHROMIUM (HEXAVALENT)	Dissolved	250
114-PW-01WR-83.5-20240603	JD89648-5	CHROMIUM (HEXAVALENT)	Total	25
114-PW-01WR-83.5-20240603	JD89648-5F	CHROMIUM (HEXAVALENT)	Dissolved	25
114-PW-01WR-88.5-20240603	JD89648-6	CHROMIUM (HEXAVALENT)	Total	50
114-PW-01WR-88.5-20240603	JD89648-6F	CHROMIUM (HEXAVALENT)	Dissolved	50

SDG#: JD89648/ Method 7196**GN55579**

Cr+6 ICAL 6/04/24

GW

(p. 1525 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.091
0.3	0.27
0.5	0.447
0.8	0.699
1	0.864

(p. 1525
of data
pkg)

AECOM Calculated Intercept	0.00408	OK	Reported intercept	0.0041
AECOM Slope	0.8671	OK	Reported Slope	0.8671
AECOM Calculated r	0.99987	OK	Reported r	0.99987

LCS calculation**GN55579-B1****P. 1510, 1525**

Background absorbance	0
Sample absorbance	0.134
LCS Soluble Instrument Response	0.134
Instrument Concentration (mg/L)	0.150

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN55579-B1****P. 1510, 1525**

True Value (mg/L)	0.150

AECOM Calculated %R	99.9	OK	Reported %R	100.0

MS calculation**GN55579-S1****P. 1512, 1525****114-PW-01WR-83.5-20240603****filtered**

Background reading	0
Total absorbance	0.436
Total absorbance - background	0.436
Instrument Concentration (mg/L)	0.4981

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	100

AECOM Calculated MS Result (mg/L)	49.8	OK	Reported Result (mg/L)	49.8

%R = Found/True*100**GN55579-S1****P. 1512, 1525****114-PW-01WR-83.5-20240603**

True Value (mg/L)	32
Native concentration (mg/L)	16

AECOM Calculated MS Result %R	105.9	OK	Reported %R	105.8

UNFILTERED**Reporting Limit****JD89648-5F****P. 38, 1525****114-PW-01WR-83.5-20240603**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	25

AECOM Calculated Reporting Limit	0.3	OK	Reported RL (mg/L)=	0.3

UNFILTERED**Sample Calculations****JD89648-5F****P. 38, 1525****114-PW-01WR-83.5-20240603**

Background reading	0
Total absorbance	0.558
Total absorbance - background	0.558
Instrument Response (mg/L)	0.639

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	25

AECOM Calculated Result (mg/L)	16.0	OK	Reported Result (mg/L)	16

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89648		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/18/2024	
Number of Samples/Matrix: 6GW, 6 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 07/23/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	The chain of custody (COC) identifies sample JD89648-4, and JD89648-4F as 114-PW-06WR-20240603. The corrected ID should be 114-PW-06WR-86.5-20240603.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.0 °C, 2.5 °C
Holding Time	Yes	No	Sampled 06/03/2024, analyzed 06/05/2024 - 06/12/2024.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP47068 Metals (Cr, Fe, Mn) ND, MP47194 Cr ND, GP54479/GN55709 ND Sulfate, GP54412/GN55794 ND TOC, GP54413/GN55787 ND TOC
Field Blanks	Yes	No	P4-IRM-FB-20240603 (JD89648-7) ND
Matrix Spike	Yes	No	114-PW-01WR-88.5-20240603 (JD89648-6F) Metals, Batch QC TOC, sulfate, see tables below
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47068 Metals (Cr, Fe, Mn) see table below, MP47194 Cr (95.6 %R), GP54479/GN55709 Sulfate (107.9 %R), GP54413/GN55787 TOC (93.3 %R), GP54413/GN55787 TOC (103.0 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Matrix Spikes/Matrix Spike Duplicates

114-PW-01WR-88.5-20240603 (JD89648-6F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Dissolved	80	29400	31600	299000	2750	625.0	125	75	5.5	20	SR>5x amt. spiked, Accept
IRON	Dissolved	4000	0	4380	4190	109.5	104.8	125	75	4.4	20	OK, Accept
MANGANESE	Dissolved	80	60.9	142	137	101.4	95.1	125	75	3.6	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****LCS****MP47068**

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	78.9	98.6	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	4170	104.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	78.5	98.1	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PMW-02T-69.0-20240603	JD89648-1	TOC	Total	5
114-PMW-02T-69.0-20240603	JD89648-1	CHROMIUM	Total	5000
114-PMW-02T-69.0-20240603	JD89648-1	SULFATE	Total	5
114-PMW-02T-69.0-20240603	JD89648-1F	CHROMIUM	Dissolved	5000
114-PMW-02T-69.0-20240603	JD89648-1F	IRON	Dissolved	10
114-PMW-02T-69.0-20240603	JD89648-1F	MANGANESE	Dissolved	10

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-02T-70.5-20240603	JD89648-2	TOC	Total	5
114-PW-02T-70.5-20240603	JD89648-2	CHROMIUM	Total	5000
114-PW-02T-70.5-20240603	JD89648-2	SULFATE	Total	5
114-PW-02T-70.5-20240603	JD89648-2F	CHROMIUM	Dissolved	5000
114-PW-02T-70.5-20240603	JD89648-2F	IRON	Dissolved	10
114-PW-02T-70.5-20240603	JD89648-2F	MANGANESE	Dissolved	10
114-PW-06WR-81.5-20240603	JD89648-3	CHROMIUM	Total	10
114-PW-06WR-81.5-20240603	JD89648-3F	CHROMIUM	Dissolved	10
114-PW-06WR-81.5-20240603	JD89648-3F	IRON	Dissolved	10
114-PW-06WR-81.5-20240603	JD89648-3F	MANGANESE	Dissolved	10
114-PW-06WR-86.5-20240603	JD89648-4	CHROMIUM	Total	10
114-PW-06WR-86.5-20240603	JD89648-4F	CHROMIUM	Dissolved	10
114-PW-06WR-86.5-20240603	JD89648-4F	IRON	Dissolved	10
114-PW-06WR-86.5-20240603	JD89648-4F	MANGANESE	Dissolved	10
114-PW-01WR-83.5-20240603	JD89648-5	TOC	Total	5
114-PW-01WR-83.5-20240603	JD89648-5	CHROMIUM	Total	500
114-PW-01WR-83.5-20240603	JD89648-5	SULFATE	Total	5
114-PW-01WR-83.5-20240603	JD89648-5F	CHROMIUM	Dissolved	500
114-PW-01WR-83.5-20240603	JD89648-5F	IRON	Dissolved	10
114-PW-01WR-83.5-20240603	JD89648-5F	MANGANESE	Dissolved	10
114-PW-01WR-88.5-20240603	JD89648-6	TOC	Total	5
114-PW-01WR-88.5-20240603	JD89648-6	CHROMIUM	Total	1000
114-PW-01WR-88.5-20240603	JD89648-6	SULFATE	Total	5
114-PW-01WR-88.5-20240603	JD89648-6F	CHROMIUM	Dissolved	1000
114-PW-01WR-88.5-20240603	JD89648-6F	IRON	Dissolved	10
114-PW-01WR-88.5-20240603	JD89648-6F	MANGANESE	Dissolved	10
P4-IRM-FB-20240603	JD89648-7	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PMW-02T-69.0-20240603	JD89648-1, -1F	133000	5000	146000	5000	25000	13000	9	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PW-02T-70.5-20240603	JD89648-2, -2F	150000	5000	142000	5000	25000	8000	5	T Cr > D Cr, Accept
114-PW-06WR-81.5-20240603	JD89648-3, -3F	766	10	752	10	50	14	2	T Cr > D Cr, Accept
114-PW-06WR-86.5-20240603	JD89648-4, -4F	901	10	908	10	50	7	1	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PW-01WR-83.5-20240603	JD89648-5, -5F	14700	500	15000	500	2500	300	2	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PW-01WR-88.5-20240603	JD89648-6, -6F	29800	1000	29400	1000	5000	400	1	T Cr > D Cr, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PMW-02T-69.0-20240603	JD89648-1	SULFATE	456	Y	mg/l	250
114-PMW-02T-69.0-20240603	JD89648-1	CHROMIUM	133000	Y	ug/l	70
114-PMW-02T-69.0-20240603	JD89648-1F	MANGANESE	53.1	Y	ug/l	50
114-PMW-02T-69.0-20240603	JD89648-1F	CHROMIUM	146000	Y	ug/l	70
114-PW-01WR-83.5-20240603	JD89648-5	CHROMIUM	14700	Y	ug/l	70
114-PW-01WR-83.5-20240603	JD89648-5F	MANGANESE	50.3	Y	ug/l	50
114-PW-01WR-83.5-20240603	JD89648-5F	CHROMIUM	15000	Y	ug/l	70
114-PW-01WR-88.5-20240603	JD89648-6	CHROMIUM	29800	Y	ug/l	70
114-PW-01WR-88.5-20240603	JD89648-6F	MANGANESE	60.9	Y	ug/l	50
114-PW-01WR-88.5-20240603	JD89648-6F	CHROMIUM	29400	Y	ug/l	70
114-PW-02T-70.5-20240603	JD89648-2	SULFATE	491	Y	mg/l	250
114-PW-02T-70.5-20240603	JD89648-2	CHROMIUM	150000	Y	ug/l	70
114-PW-02T-70.5-20240603	JD89648-2F	MANGANESE	56.7	Y	ug/l	50
114-PW-02T-70.5-20240603	JD89648-2F	CHROMIUM	142000	Y	ug/l	70

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-06WR-81.5-20240603	JD89648-3	CHROMIUM	766	Y	ug/l	70
114-PW-06WR-81.5-20240603	JD89648-3F	CHROMIUM	752	Y	ug/l	70
114-PW-06WR-81.5-20240603	JD89648-3F	MANGANESE	86.5	Y	ug/l	50
114-PW-06WR-86.5-20240603	JD89648-4	CHROMIUM	901	Y	ug/l	70
114-PW-06WR-86.5-20240603	JD89648-4F	CHROMIUM	908	Y	ug/l	70
114-PW-06WR-86.5-20240603	JD89648-4F	MANGANESE	78.8	Y	ug/l	50

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD89648		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/18/2024		
Number of Samples/Matrix: 6 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 0723/2024		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			The chain of custody (COC) identifies sample JD89648-4, and JD89648-4F as 114-PW-06WR-20240603. The corrected ID should be 114-PW-06WR-86.5-20240603.
Data Completeness	X			
Sample Preservation	X			2.0 °C, 2.5 °C
Holding Time	X			Sampled 06/03/2024, Analyzed 06/11/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3064-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240603 (JD89648-7), P4-IRM-TB-20240603 (JD89648-8), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate	X			114-PW-06WR-81.5-20240603 (JD89648-3) {RPD 16}
Laboratory Control Standards	X			GAA3064-LCS (98 %R)
Field Duplicate			X	None with this SDG
Percent Solids			X	Aqueous

Field Blank

P4-IRM-FB-20240603 (JD89648-7)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.10	J	0.11	Associated SR>10x FB, Accept

SR – sample result

RL – reporting limit

Trip Blank

P4-IRM-TB-20240603 (JD89648-8)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.16		0.11	Associated SR>10x TB, Accept

SR – sample result

RL – reporting limit

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PW-06WR-81.5-20240603	JD89648-3	METHANE	6.31		5.35		0.11	ug/l	16	OK RPD <20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PMW-02T-69.0-20240603	JD89648-1	METHANE	5
114-PW-02T-70.5-20240603	JD89648-2	METHANE	10
114-PW-01WR-83.5-20240603	JD89648-5	METHANE	5
114-PW-01WR-88.5-20240603	JD89648-6	METHANE	5

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD89884
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/23/2024
Reviewed by:	Linda Waters /AECOM File Name: JD89884_2024_07_23 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 6, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-02WR-93.8-20240606	JD89884-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-02WR-93.8-20240606	JD89884-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-02WR-88.8-20240606	JD89884-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-02WR-88.8-20240606	JD89884-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-05WR-91.9-20240606	JD89884-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-05WR-91.9-20240606	JD89884-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-05WR-86.9-20240606	JD89884-4	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-05WR-86.9-20240606	JD89884-4F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
P4-IRM-FB-20240606	JD89884-5	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240606	JD89884-6	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240606 (JD89884-5) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese)

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240606 (JD89884-5) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240606 (JD89884-5) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane**Trip Blank (TB)**

The trip blank (TB), P4-IRM-TB-20240606 (JD89884-6), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Field Blank (FB)

Field blank P4-IRM-FB-20240606 (JD89884-5) was submitted for methane analysis. No contamination was detected, and no samples required qualification.

Lab Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 6, 2024
Lab Name/ID SGS, Dayton
SDG No JD89884
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240606

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-02WR-93.8-20240606	JD89884-1	Total	CHROMIUM (HEXAVALENT)	U	110	110	2.0		
114-PW-02WR-93.8-20240606	JD89884-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	104	104	2.0		
114-PW-02WR-88.8-20240606	JD89884-2	Total	CHROMIUM (HEXAVALENT)	U	106	106	2.0		
114-PW-02WR-88.8-20240606	JD89884-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	110	110	2.0		
114-PW-05WR-91.9-20240606	JD89884-3	Total	CHROMIUM (HEXAVALENT)	U	12.9	12.9	0.25		
114-PW-05WR-91.9-20240606	JD89884-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	12.6	12.6	0.25		
114-PW-05WR-86.9-20240606	JD89884-4	Total	CHROMIUM (HEXAVALENT)	U	6.7	6.7	0.25		
114-PW-05WR-86.9-20240606	JD89884-4F	Dissolved	CHROMIUM (HEXAVALENT)	U	7.0	7.0	0.25		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 6, 2024
Lab Name/ID SGS, Dayton
SDG No JD89884
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240606

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-02WR-93.8-20240606	JD89884-1	Total	CHROMIUM	U	110000	110000	2000		
114-PW-02WR-93.8-20240606	JD89884-1F	Dissolved	CHROMIUM	U	121000	121000	2000		
114-PW-02WR-93.8-20240606	JD89884-1F	Dissolved	MANGANESE	U	36.7	36.7	10		
114-PW-02WR-88.8-20240606	JD89884-2	Total	CHROMIUM	U	105000	105000	2000		
114-PW-02WR-88.8-20240606	JD89884-2F	Dissolved	CHROMIUM	U	98400	98400	2000		
114-PW-02WR-88.8-20240606	JD89884-2F	Dissolved	MANGANESE	U	33.9	33.9	10		
114-PW-05WR-91.9-20240606	JD89884-3	Total	CHROMIUM	U	13000	13000	200		
114-PW-05WR-91.9-20240606	JD89884-3F	Dissolved	CHROMIUM	U	12400	12400	200		
114-PW-05WR-91.9-20240606	JD89884-3F	Dissolved	MANGANESE	U	60.6	60.6	10		
114-PW-05WR-86.9-20240606	JD89884-4	Total	CHROMIUM	U	4590	4590	100		
114-PW-05WR-86.9-20240606	JD89884-4F	Dissolved	CHROMIUM	U	6280	6280	100		
114-PW-05WR-86.9-20240606	JD89884-4F	Dissolved	MANGANESE	U	51.0	51.0	10		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 6, 2024
Lab Name/ID SGS, Dayton
SDG No JD89884
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240606

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-02WR-93.8-20240606	JD89884-1	TOTAL ORGANIC CARBON	U	2.5	2.5	1.0		
114-PW-02WR-88.8-20240606	JD89884-2	TOTAL ORGANIC CARBON	U	2.5	2.5	1.0		
114-PW-05WR-91.9-20240606	JD89884-3	TOTAL ORGANIC CARBON	U	1.8	1.8	1.0		
114-PW-05WR-86.9-20240606	JD89884-4	TOTAL ORGANIC CARBON	U	2.1	2.1	1.0		

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

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 6, 2024
Lab Name/ID SGS, Dayton
SDG No JD89884
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240606

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-02WR-93.8-20240606	JD89884-1	SULFATE	U	265	265	10		
114-PW-02WR-88.8-20240606	JD89884-2	SULFATE	U	260	260	10		
114-PW-05WR-91.9-20240606	JD89884-3	SULFATE	U	201	201	10		
114-PW-05WR-86.9-20240606	JD89884-4	SULFATE	U	196	196	10		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 6, 2024
Lab Name/ID SGS, Dayton
SDG No JD89884
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240606
Field Blank ID P4-IRM-FB-20240606

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-02WR-93.8-20240606	JD89884-1	METHANE	U	103	103	0.11		
114-PW-02WR-88.8-20240606	JD89884-2	METHANE	U	91.7	91.7	0.11		
114-PW-05WR-91.9-20240606	JD89884-3	METHANE	U	90.6	90.6	0.11		
114-PW-05WR-86.9-20240606	JD89884-4	METHANE	U	61.2	61.2	0.11		
P4-IRM-TB-20240606	JD89884-6	METHANE	U	0.12	0.12	0.11		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89884		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/23/2024	
Number of Samples/Matrix: 4 GW, 4 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 7/25/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.9 °C
Holding Time	Yes	No	Sampled 06/06/2024 analyzed 06/07/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	06/07/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN55779-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240606 (JD89884-5), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN55779-B1 (99.3 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PW-02WR-93.8-20240606	JD89884-1	110000	2000	110000	2000	0	T Cr $\geq$ T Cr6, Accept
114-PW-02WR-88.8-20240606	JD89884-2	105000	2000	106000	2000	1	T Cr < T Cr6, SRs > 4x RL, %RPD $\leq$ 30%, Accept
114-PW-05WR-91.9-20240606	JD89884-3	13000	200	12900	250	1	T Cr $\geq$ T Cr6, Accept
114-PW-05WR-86.9-20240606	JD89884-4	4590	100	6700	250	37	T Cr < T Cr6, SRs > 4x RL, %RPD $\leq$ 30%, Accept
P4-IRM-FB-20240606	JD89884-5		2.0		10	0	Both ND, Accept

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-02WR-93.8-20240606	JD89884-1F	121000	2000	104000	2000	15	D Cr > D Cr6, Accept
114-PW-02WR-88.8-20240606	JD89884-2F	98400	2000	110000	2000	11	D Cr < D Cr6, SRs > 4x RL, %RPD $\leq$ 30%, Accept
114-PW-05WR-91.9-20240606	JD89884-3F	12400	200	12600	250	2	D Cr < D Cr6, SRs > 4x RL, %RPD $\leq$ 30%, Accept
114-PW-05WR-86.9-20240606	JD89884-4F	6280	100	7000	250	11	D Cr < D Cr6, SRs > 4x RL, %RPD $\leq$ 30%, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-02WR-93.8-20240606	JD89884-1, -1F	110000	2000	104000	2000	6	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-02WR-88.8-20240606	JD89884-2, -2F	106000	2000	110000	2000	4	T Cr6 > D Cr6, Accept
114-PW-05WR-91.9-20240606	JD89884-3, -3F	12900	250	12600	250	2	T Cr6 > D Cr6, Accept
114-PW-05WR-86.9-20240606	JD89884-4, -4F	6700	250	7000	250	4	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-02WR-88.8-20240606	JD89884-2	CHROMIUM (HEXAVALENT)	106	Y	mg/l	0.07
114-PW-02WR-88.8-20240606	JD89884-2F	CHROMIUM (HEXAVALENT)	110	Y	mg/l	0.07
114-PW-02WR-93.8-20240606	JD89884-1	CHROMIUM (HEXAVALENT)	110	Y	mg/l	0.07
114-PW-02WR-93.8-20240606	JD89884-1F	CHROMIUM (HEXAVALENT)	104	Y	mg/l	0.07
114-PW-05WR-86.9-20240606	JD89884-4	CHROMIUM (HEXAVALENT)	6.7	Y	mg/l	0.07
114-PW-05WR-86.9-20240606	JD89884-4F	CHROMIUM (HEXAVALENT)	7	Y	mg/l	0.07
114-PW-05WR-91.9-20240606	JD89884-3	CHROMIUM (HEXAVALENT)	12.9	Y	mg/l	0.07
114-PW-05WR-91.9-20240606	JD89884-3F	CHROMIUM (HEXAVALENT)	12.6	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-02WR-93.8-20240606	JD89884-1	CHROMIUM (HEXAVALENT)	Total	200
114-PW-02WR-93.8-20240606	JD89884-1F	CHROMIUM (HEXAVALENT)	Dissolved	200
114-PW-02WR-88.8-20240606	JD89884-2	CHROMIUM (HEXAVALENT)	Total	200
114-PW-02WR-88.8-20240606	JD89884-2F	CHROMIUM (HEXAVALENT)	Dissolved	200
114-PW-05WR-91.9-20240606	JD89884-3	CHROMIUM (HEXAVALENT)	Total	25
114-PW-05WR-91.9-20240606	JD89884-3F	CHROMIUM (HEXAVALENT)	Dissolved	25
114-PW-05WR-86.9-20240606	JD89884-4	CHROMIUM (HEXAVALENT)	Total	25
114-PW-05WR-86.9-20240606	JD89884-4F	CHROMIUM (HEXAVALENT)	Dissolved	25

SDG#: JD89884/ Method 7196**GN55779**

Cr+6 ICAL 6/07/24

GW

(p. 834 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.09
0.3	0.269
0.5	0.446
0.8	0.695
1	0.867

(p. 834 of
data pkg)

AECOM Calculated Intercept	0.00349	OK	Reported intercept	0.0035
AECOM Slope	0.8674	OK	Reported Slope	0.8674
AECOM Calculated r	0.99991	OK	Reported r	0.99991

LCS calculation**GN55779-B1****P. 820, 834**

Background absorbance	0
Sample absorbance	0.133
LCS Soluble Instrument Response	0.133
Instrument Concentration (mg/L)	0.149

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149

%R = Found/True*100**GN55779-B1****P. 820, 834**

True Value (mg/L)	0.150

AECOM Calculated %R	99.5	OK	Reported %R	99.3

MS calculation**GN55779-S1****P. 822, 834****Batch QC (JD89760-2)****unfiltered**

Background reading	0
Total absorbance	0.038
Total absorbance - background	0.153
Instrument Concentration (mg/L)	0.1290

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.129	OK	Reported Result (mg/L)	0.130

%R = Found/True*100**GN55779-S1****P. 822, 834****Batch QC (JD89760-2)**

True Value (mg/L)	0.150

Native concentration (mg/L)	0.0075

AECOM Calculated MS Result %R	81.0	OK	Reported %R	81.7

FILTERED**Reporting Limit****JD89884-1****P. 13, 834****114-PW-02WR-93.8-20240606**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	200

AECOM Calculated Reporting Limit	2.0	OK	Reported RL (mg/L)=	2.0

UNFILTERED**Sample Calculations****JD89884-1****P. 13, 834****114-PW-02WR-93.8-20240606**

Background reading	0
Total absorbance	0.48
Total absorbance - background	0.48
Instrument Response (mg/L)	0.549

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	200

AECOM Calculated Result (mg/L)	109.9	OK	Reported Result (mg/L)	110

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD89884		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/23/2024	
Number of Samples/Matrix: 4 GW, 4 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 7/25/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.9 °C
Holding Time	Yes	No	Sampled 06/06/2024, analyzed 06/10/2024 - 06/12/2024.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP47194 Metals (Cr, Fe, Mn) see table below, GP54575/GN55877 ND Sulfate, GP54512/GN55886 ND TOC, GP54544/GN55886 ND TOC, GP54547/GN55980 ND TOC
Field Blanks	Yes	No	P4-IRM-FB-20240606 (JD89884-5) ND
Matrix Spike	NA	NA	Batch QC Metals, TOC, sulfate
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47194 Metals (Cr, Fe, Mn) see table below, GP54575/GN55877 Sulfate (100.5 %R), GP54512/GN55886 TOC (108.0 %R), GP54544/GN55886 TOC (103.0 %R), GP54547/GN55980 TOC (109.0 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Method Blank

MP47194-MB1

Analyte	FRACTION	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	TOTAL/DISSOLVED	0.24	U	2.0	ALL	OK, Accept
IRON	DISSOLVED	49.1	J	50	ALL	SR ND, Accept
MANGANESE	DISSOLVED	0.35	U	2.0	ALL	OK, Accept

LCS

MP47194

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	76.5	95.6	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	4090	102.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	76.2	95.3	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-02WR-93.8-20240606	JD89884-1	CHROMIUM	Total	2000
114-PW-02WR-93.8-20240606	JD89884-1	SULFATE	Total	5
114-PW-02WR-93.8-20240606	JD89884-1F	CHROMIUM	Dissolved	2000
114-PW-02WR-93.8-20240606	JD89884-1F	IRON	Dissolved	10
114-PW-02WR-93.8-20240606	JD89884-1F	MANGANESE	Dissolved	10
114-PW-02WR-88.8-20240606	JD89884-2	CHROMIUM	Total	2000
114-PW-02WR-88.8-20240606	JD89884-2	SULFATE	Total	5
114-PW-02WR-88.8-20240606	JD89884-2F	CHROMIUM	Dissolved	2000
114-PW-02WR-88.8-20240606	JD89884-2F	IRON	Dissolved	10
114-PW-02WR-88.8-20240606	JD89884-2F	MANGANESE	Dissolved	10

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-05WR-91.9-20240606	JD89884-3	CHROMIUM	Total	200
114-PW-05WR-91.9-20240606	JD89884-3	SULFATE	Total	5
114-PW-05WR-91.9-20240606	JD89884-3F	CHROMIUM	Dissolved	200
114-PW-05WR-91.9-20240606	JD89884-3F	IRON	Dissolved	10
114-PW-05WR-91.9-20240606	JD89884-3F	MANGANESE	Dissolved	10
114-PW-05WR-86.9-20240606	JD89884-4	CHROMIUM	Total	100
114-PW-05WR-86.9-20240606	JD89884-4	SULFATE	Total	5
114-PW-05WR-86.9-20240606	JD89884-4F	CHROMIUM	Dissolved	100
114-PW-05WR-86.9-20240606	JD89884-4F	IRON	Dissolved	10
114-PW-05WR-86.9-20240606	JD89884-4F	MANGANESE	Dissolved	10
P4-IRM-FB-20240606	JD89884-5	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PW-02WR-93.8-20240606	JD89884-1, -1F	110000	2000	121000	2000	10000	11000	10	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PW-02WR-88.8-20240606	JD89884-2, -2F	105000	2000	98400	2000	10000	6600	6	T Cr > D Cr, Accept
114-PW-05WR-91.9-20240606	JD89884-3, -3F	13000	200	12400	200	1000	600	5	T Cr > D Cr, Accept
114-PW-05WR-86.9-20240606	JD89884-4, -4F	4590	100	6280	100	500	1690	31	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-02WR-88.8-20240606	JD89884-2	CHROMIUM	105000	Y	ug/l	70
114-PW-02WR-88.8-20240606	JD89884-2F	CHROMIUM	98400	Y	ug/l	70
114-PW-02WR-93.8-20240606	JD89884-1	SULFATE	265	Y	mg/l	250
114-PW-02WR-93.8-20240606	JD89884-1	CHROMIUM	110000	Y	ug/l	70
114-PW-02WR-93.8-20240606	JD89884-1F	CHROMIUM	121000	Y	ug/l	70
114-PW-05WR-86.9-20240606	JD89884-4	CHROMIUM	4590	Y	ug/l	70
114-PW-05WR-86.9-20240606	JD89884-4F	MANGANESE	51	Y	ug/l	50
114-PW-05WR-86.9-20240606	JD89884-4F	CHROMIUM	6280	Y	ug/l	70
114-PW-05WR-91.9-20240606	JD89884-3	CHROMIUM	13000	Y	ug/l	70
114-PW-05WR-91.9-20240606	JD89884-3F	MANGANESE	60.6	Y	ug/l	50
114-PW-05WR-91.9-20240606	JD89884-3F	CHROMIUM	12400	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD89884		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/23/2024		
Number of Samples/Matrix: 4 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 7/25/2024		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			0.9 °C
Holding Time	X			Sampled 06/06/2024, Analyzed 06/13/2024
Quantitation Limits	X			
Dilutions	X			No dilutions
Method Blanks	X			GAA3066-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240606 (JD89884-5) ND, P4-IRM-TB-20240606 (JD89884-6), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate	X			114-PW-02WR-93.8-20240606 (JD89884-1) {RPD 2}
Laboratory Control Standards	X			GAA3066-LCS (90 %R)
Field Duplicate			X	None with this SDG
Percent Solids			X	Aqueous

Trip Blank

P4-IRM-TB-20240606 (JD89884-6)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.12		0.11	Associated SR>10x TB, Accept

SR – sample result

RL – reporting limit

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PW-02WR-93.8-20240606	JD89884-1	CHROMIUM	103		101		0.11	ug/l	2	OK RPD <20%, Accept

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD90312
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/24/2024
Reviewed by:	Linda Waters /AECOM File Name: JD90312_2024_07_24 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 12, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-07WR-72.0-20240612	JD90312-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-07WR-72.0-20240612	JD90312-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-07WR-77.0-20240612	JD90312-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-07WR-77.0-20240612	JD90312-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
P4-IRM-FB-20240612	JD90312-3	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240612	JD90312-4	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240612 (JD90312-3) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese)**Method Blank**

The method Blank (MB), MP47257-MB1, reported iron at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results were non-detect for iron. No qualifications were made.

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240612 (JD90312-3) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)

Field Blank

The field blank, P4-IRM-FB-20240612 (JD90312-3), reported sulfate at a concentration greater than the MDL but less than the RL. All associated sample results were greater than ten times the amount in the FB; therefore, no qualifications were made.

Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane

Trip Blank

The trip blank (TB), P4-IRM-TB-20240612 (JD90312-4), reported methane at a concentration greater than the RL. All associated sample results were greater than ten times the amount in the TB; therefore, no qualifications were made.

Field Blank (FB)

Field blank P4-IRM-FB-20240612 (JD90312-3) was submitted for methane analysis. No contamination was detected, and no samples required qualification

Lab Duplicate

Sample 114-PW-07WR-72.0-20240612 (JD90312-1), was analyzed as laboratory duplicate for this data set. The RPD exceeded the QC acceptance criteria. All associated sample results were qualified as estimated (J).

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

Samples estimated due to laboratory duplicate precision, are useable with an unknown bias.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD90312
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240612

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-07WR-72.0-20240612	JD90312-1	Total	CHROMIUM (HEXAVALENT)	U	0.0061	0.0061	0.010		
114-PW-07WR-72.0-20240612	JD90312-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.0084	0.0084	0.010		
114-PW-07WR-77.0-20240612	JD90312-2	Total	CHROMIUM (HEXAVALENT)	U	0.49	0.49	0.010		
114-PW-07WR-77.0-20240612	JD90312-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.49	0.49	0.010		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD90312
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240612

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-07WR-72.0-20240612	JD90312-1	Total	CHROMIUM	U	34.7	34.7	10		
114-PW-07WR-72.0-20240612	JD90312-1F	Dissolved	CHROMIUM	U	16.8	16.8	10		
114-PW-07WR-72.0-20240612	JD90312-1F	Dissolved	MANGANESE	U	13.0	13.0	10		
114-PW-07WR-77.0-20240612	JD90312-2	Total	CHROMIUM	U	479	479	10		
114-PW-07WR-77.0-20240612	JD90312-2F	Dissolved	CHROMIUM	U	443	443	10		
114-PW-07WR-77.0-20240612	JD90312-2F	Dissolved	MANGANESE	U	16.2	16.2	10		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD90312
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240612

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-07WR-72.0-20240612	JD90312-1	TOTAL ORGANIC CARBON	U	1.4	1.4	1.0		
114-PW-07WR-77.0-20240612	JD90312-2	TOTAL ORGANIC CARBON	U	1.4	1.4	1.0		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD90312
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240612

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-07WR-72.0-20240612	JD90312-1	SULFATE	U	270	270	2.0		
114-PW-07WR-77.0-20240612	JD90312-2	SULFATE	U	263	263	2.0		
P4-IRM-FB-20240612	JD90312-3	SULFATE	U	1.1	1.1	2.0		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD90312
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240612
Field Blank ID P4-IRM-FB-20240612

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-07WR-72.0-20240612	JD90312-1	METHANE	U	157	157 J	0.55	Qualify	1
114-PW-07WR-77.0-20240612	JD90312-2	METHANE	U	132	132 J	0.55	Qualify	1
P4-IRM-TB-20240612	JD90312-4	METHANE	U	0.13	0.13	0.11		

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

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

NJDEP Validation Footnote

1. Laboratory duplicate precision criteria were not met.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD90312		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/24/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 7/28/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.9 °C
Holding Time	Yes	No	Sampled 06/12/2024 analyzed 06/13/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	06/13/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56001-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240612 (JD90312-3), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN56001-B1 (100.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PW-07WR-72.0-20240612	JD90312-1	34.7	10	6.1	10	140	T Cr > T Cr6, Accept
114-PW-07WR-77.0-20240612	JD90312-2	479	10	490	10	2	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
P4-IRM-FB-20240612	JD90312-3		2.0		10	0	Both ND, Accept

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-07WR-72.0-20240612	JD90312-1F	16.8	10	8.4	10	67	D Cr > D Cr6, Accept
114-PW-07WR-77.0-20240612	JD90312-2F	443	10	490	10	10	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-07WR-72.0-20240612	JD90312-1, -1F	6.1	10	8.4	10	32	T Cr6 < D Cr6, SRs < 4x RL, ABS ≤ RL, Accept
114-PW-07WR-77.0-20240612	JD90312-2, -2F	490	10	490	10	0	T Cr6 ≥ D Cr6, Accept

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-07WR-77.0-20240612	JD90312-2	CHROMIUM (HEXAVALENT)	0.49	Y	mg/l	0.07
114-PW-07WR-77.0-20240612	JD90312-2F	CHROMIUM (HEXAVALENT)	0.49	Y	mg/l	0.07

SDG#: JD90312/ Method 7196**GN56001**

Cr+6 ICAL 6/13/24

GW

(p. 477 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.091
0.3	0.266
0.5	0.44
0.8	0.689
1	0.861

(p. 477 of
data pkg)

AECOM Calculated Intercept	0.00377	OK	Reported intercept	0.0038
AECOM Slope	0.8597	OK	Reported Slope	0.8597
AECOM Calculated r	0.99994	OK	Reported r	0.99994

LCS calculation**GN56001-B1****P. 465, 477**

Background absorbance 0
Sample absorbance 0.133
LCS Soluble Instrument Response 0.133
Instrument Concentration (mg/L) 0.150

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN56001-B1****P. 465, 477**

True Value (mg/L) 0.150

AECOM Calculated %R	100.2	OK	Reported %R	100.0

MS calculation**GN55941-S1****P. 464, 477, 479****Batch QC (JD90298-10)****unfiltered**

Background reading 0.004
Total absorbance 0.136
Total absorbance - background 0.132
Instrument Concentration (mg/L) 0.1492

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

AECOM Calculated MS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149

%R = Found/True*100**GN55941-S1****P. 464, 477, 479****Batch QC (JD90298-10)**

True Value (mg/L) 0.150

Native concentration (mg/L) 0.000

AECOM Calculated MS Result %R	99.4	OK	Reported %R	99

UNFILTERED**Reporting Limit****JD90312-1****P. 12, 477****114-PW-07WR-72.0-20240612**

Low Standard 0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED**Sample Calculations****JD90312-1****P. 12, 477****114-PW-07WR-72.0-20240612**

Background reading	0.002
Total absorbance	0.011
Total absorbance - background	0.009
Instrument Response (mg/L)	0.006

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	1

AECOM Calculated Result (mg/L)	0.0061	OK	Reported Result (mg/L)	0.0061 J

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD90312		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/24/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 7/28/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.9 °C
Holding Time	Yes	No	Sampled 06/12/2024, analyzed 06/14/2024 -06/15/2024.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP47257 Metals (Cr, Fe, Mn) see table below, GP54713/GN56104 ND Sulfate, GP54667/GN56146 ND TOC
Field Blanks	No	No	P4-IRM-FB-20240612 (JD90312-3), see table below
Matrix Spike	NA	NA	Batch QC Metals, TOC, sulfate
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47257 Metals (Cr, Fe, Mn) see table below, GP54713/GN56104 Sulfate (96.0 %R), GP54667/GN56146 TOC (105.0 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Method Blank

MP47257-MB1

Analyte	FRACTION	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	TOTAL	-0.038	U	2.0	ALL	OK, Accept
IRON	DISSOLVED	23.6	J	50	ALL	SR both ND, Accept
MANGANESE	DISSOLVED	0.24	U	2.0	ALL	OK, Accept

SR – sample result**Field Blank**

P4-IRM-FB-20240612

Analyte	FRACTION	SR	Qual	RL	Units	Associated Samples	Action
TOC	TOTAL	1.0	U	1.0	mg/l	ALL	OK, Accept
SULFATE	TOTAL	1.1	J	2.0	mg/l	ALL	SR>10x FB, Accept
CHROMIUM	TOTAL	2.0	U	2.0	ug/l	ALL	OK, Accept

SR – sample result**LCS****MP47257**

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	79.3	99.1	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	3900	97.5	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	74.5	93.1	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-07WR-72.0-20240612	JD90312-1	CHROMIUM	Total	10
114-PW-07WR-72.0-20240612	JD90312-1F	CHROMIUM	Dissolved	10
114-PW-07WR-72.0-20240612	JD90312-1F	IRON	Dissolved	10
114-PW-07WR-72.0-20240612	JD90312-1F	MANGANESE	Dissolved	10
114-PW-07WR-77.0-20240612	JD90312-2	CHROMIUM	Total	10
114-PW-07WR-77.0-20240612	JD90312-2F	CHROMIUM	Dissolved	10
114-PW-07WR-77.0-20240612	JD90312-2F	IRON	Dissolved	10
114-PW-07WR-77.0-20240612	JD90312-2F	MANGANESE	Dissolved	10
P4-IRM-FB-20240612	JD90312-3	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PW-07WR-72.0-20240612	JD90312-1, -1F	34.7	10	16.8	10	50	18	70	T Cr > D Cr, Accept
114-PW-07WR-77.0-20240612	JD90312-2, -2F	479	10	443	10	50	36	8	T Cr > D Cr, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-07WR-72.0-20240612	JD90312-1	SULFATE	270	Y	mg/l	250
114-PW-07WR-77.0-20240612	JD90312-2	SULFATE	263	Y	mg/l	250
114-PW-07WR-77.0-20240612	JD90312-2	CHROMIUM	479	Y	ug/l	70
114-PW-07WR-77.0-20240612	JD90312-2F	CHROMIUM	443	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD90312		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/24/2024		
Number of Samples/Matrix: 2 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 7/28/2024		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			1.9 °C
Holding Time	X			Sampled 06/12/2024, Analyzed 06/18/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3069-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240612 (JD90312-3) ND, P4-IRM-TB-20240612 (JD90312-4), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate		X		114-PW-07WR-72.0-20240612 (JD90312-1) {RPD 22}
Laboratory Control Standards	X			GAA3069-LCS (92 %R)
Field Duplicate			X	None with this SDG
Percent Solids			X	Aqueous

Trip Blank

P4-IRM-TB-20240612 (JD90312-4)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.13		0.11	Associated SR>10x TB, Accept

SR – sample result

RL – reporting limit

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PW-07WR-72.0-20240612	JD90312-1	METHANE	157		126		0.55	ug/l	22	Estimate (J)

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PW-07WR-72.0-20240612	JD90312-1	METHANE	5
114-PW-07WR-77.0-20240612	JD90312-2	METHANE	5

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD90605
Analysis/Method:	Hexavalent Chromium (Cr6) SW846 3060A/7196A Metals - Chromium (Cr) (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/30/2024
Reviewed by:	Linda Waters/AECOM File Name: JD90605_2024_7_30 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 17, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW66D-91-97-20240617	JD90605-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-91-97-20240617	JD90605-1F	Groundwater	Fe
114-MW66D-107-111-20240617	JD90605-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-107-111-20240617	JD90605-2F	Groundwater	Fe
114-MW66D-118-123-20240617	JD90605-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-118-123-20240617	JD90605-3F	Groundwater	Fe
114-MW66D-124-129-20240617	JD90605-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-124-129-20240617	JD90605-4F	Groundwater	Fe
114-MW66D-137-140-20240617	JD90605-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-137-140-20240617	JD90605-5F	Groundwater	Fe
114-MW4D-90-94-20240617	JD90605-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-90-94-20240617	JD90605-6F	Groundwater	Fe
114-MW4D-98-102-20240617	JD90605-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW4D-98-102-20240617	JD90605-7F	Groundwater	Fe
114-MW4D-111-115-20240617	JD90605-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-111-115-20240617	JD90605-8F	Groundwater	Fe
114-MW4D-121-125-20240617	JD90605-9	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-121-125-20240617	JD90605-9F	Groundwater	Fe
114-MW58C-R-84.5-20240617	JD90605-10	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW58C-R-84.5-20240617	JD90605-10F	Groundwater	Fe
114-MW61D-121.0-20240617	JD90605-11	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-121.0-20240617	JD90605-11F	Groundwater	Fe
114-MW62C-73.0-20240617	JD90605-12	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW62C-73.0-20240617	JD90605-12F	Groundwater	Fe
114-MW61D-117.0-20240617	JD90605-13	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-117.0-20240617	JD90605-13F	Groundwater	Fe
114-MW61D-117.0-20240617-X (Field Duplicate of 114-MW61D-117.0-20240617)	JD90605-14	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-117.0-20240617-X (Field Duplicate of 114-MW61D-117.0-20240617)	JD90605-14F	Groundwater	Fe
GW-RI-FB-20240617	JD90605-15	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20240617	JD90605-15F	Field Blank	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each

sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW58C-R-84.5-20240617 (JD90605-10), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW58C-R-84.5-20240617 (JD90605-10), was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240617 (JD90605152) was submitted for hexavalent chromium analysis. No contamination was detected.

Field Duplicate (FD)

Samples 114-MW61D-117.0-20240617(JD90605-13) and 114-MW61D-117.0-20240617-X (JD90605-14), were analyzed as the field duplicate pair for hexavalent chromium. Both sample results were non-detect. All QC acceptance criteria were met.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were estimated (J/UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Samples 114-MW58C-R-84.5-20240617 (JD90605-10, -10F), were analyzed as MS/MSDs for this data set. All QC acceptance criteria were met or no qualifications were required.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240617 (JD90605-15) was submitted for chromium and ferrous iron analysis. No ferrous iron contamination was detected. However, chromium was reported at a concentration of greater than the method detection limit (MDL) but less than the reporting limit (RL). Samples 114-MW66D-118-123-20240617 (JD90605-3), 114-MW66D-124-129-20240617 (JD90605-4), 114-MW61D-121.0-20240617 (JD90605-11), 114-MW61D-117.0-20240617 (JD90605-13), and 114-MW61D-117.0-20240617-X (JD90605-14) reported chromium at concentrations less than three times the amount in the FB; therefore, the chromium results were negated (UB), at the RL. All other samples were non-detect or greater than ten times the amount in the FB and no qualifications were made.

Field Duplicate (FD)

Samples 114-MW61D-117.0-20240617 (JD90605-13) and 114-MW61D-117.0-20240617-X (JD90605-14), were analyzed as the field duplicate pair for chromium and ferrous iron. All QC acceptance criteria were met.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Method Blank (MB)**

The sulfate MB, GP54821/GN56335, reported sulfate at a concentration greater than the MDL but less than the RL. The associated sample results, 114-MW61D-117.0-20240617 (JD90605-13), 114-MW61D-117.0-20240617-X (JD90605-14), and GW-RI-FB-20240617 (JD90605-15), were non-detect or greater than ten times the amount in the MB. No qualifications were made.

Matrix Spike/ Matrix Spike Duplicate

Samples 114-MW58C-R-84.5-20240617 (JD90605-10) and 114-MW61D-117.0-20240617 (JD90605-13) were analyzed as MS/MSDs for TOC and sulfate in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240617 (JD90605152) was submitted for TOC and sulfate analysis. No contamination was detected

Field Duplicates

Samples 114-MW61D-117.0-20240617(JD90605-13) and 114-MW61D-117.0-20240617-X (JD90605-14), were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Results negated due to field blank contamination are useable at the RL.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD90605
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240617

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20240617	JD90605-1	Total	CHROMIUM (HEXAVALENT)	U	0.66	0.66	0.010		
114-MW4D-111-115-20240617	JD90605-8	Total	CHROMIUM (HEXAVALENT)	U	0.0070 B	0.0070 J	0.010	Qualify	1
114-MW4D-121-125-20240617	JD90605-9	Total	CHROMIUM (HEXAVALENT)	U	0.0070 B	0.0070 J	0.010	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD90605
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240617

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20240617	JD90605-1	Total	CHROMIUM	U	1370	1370	20		
114-MW58C-R-84.5-20240617	JD90605-10F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-121.0-20240617	JD90605-11	Total	CHROMIUM	U	B	UB	10	Qualify	2
114-MW61D-121.0-20240617	JD90605-11F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW62C-73.0-20240617	JD90605-12F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-117.0-20240617	JD90605-13	Total	CHROMIUM	U	B	UB	10	Qualify	2
114-MW61D-117.0-20240617	JD90605-13F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-117.0-20240617-X	JD90605-14	Total	CHROMIUM	U	B	UB	10	Qualify	2
114-MW61D-117.0-20240617-X	JD90605-14F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
GW-RI-FB-20240617	JD90605-15	Total	CHROMIUM	U	0.69B	0.69J	2.0	Qualify	3
GW-RI-FB-20240617	JD90605-15F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-91-97-20240617	JD90605-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-107-111-20240617	JD90605-2	Total	CHROMIUM	U	12.2	12.2	10		
114-MW66D-107-111-20240617	JD90605-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-118-123-20240617	JD90605-3	Total	CHROMIUM	U	B	UB	10	Qualify	2
114-MW66D-118-123-20240617	JD90605-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-124-129-20240617	JD90605-4	Total	CHROMIUM	U	B	UB	10	Qualify	2
114-MW66D-124-129-20240617	JD90605-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-137-140-20240617	JD90605-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW4D-90-94-20240617	JD90605-6F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW4D-98-102-20240617	JD90605-7F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW4D-111-115-20240617	JD90605-8F	Dissolved	IRON (FERROUS)	U	0.14B	0.14J	0.20	Qualify	1,3
114-MW4D-121-125-20240617	JD90605-9F	Dissolved	IRON (FERROUS)	U	0.45	0.45J	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.
2. Sample result was <RL and <3X the associated blank result. Sample result was negated at the RL.
3. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD90605
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240617

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20240617	JD90605-1	SULFATE	U	100	100	2.0		
114-MW58C-R-84.5-20240617	JD90605-10	SULFATE	U	146	146	2.0		
114-MW61D-121.0-20240617	JD90605-11	SULFATE	U	41.7	41.7	2.0		
114-MW62C-73.0-20240617	JD90605-12	SULFATE	U	52.0	52.0	2.0		
114-MW61D-117.0-20240617	JD90605-13	SULFATE	1.5	44.0	44.0	2.0		
114-MW61D-117.0-20240617-X	JD90605-14	SULFATE	1.5	42.7	42.7	2.0		
114-MW66D-107-111-20240617	JD90605-2	SULFATE	U	139	139	2.0		
114-MW66D-118-123-20240617	JD90605-3	SULFATE	U	134	134	2.0		
114-MW66D-124-129-20240617	JD90605-4	SULFATE	U	118	118	2.0		
114-MW66D-137-140-20240617	JD90605-5	SULFATE	U	114	114	2.0		
114-MW4D-90-94-20240617	JD90605-6	SULFATE	U	51.4	51.4	2.0		
114-MW4D-98-102-20240617	JD90605-7	SULFATE	U	59.2	59.2	2.0		
114-MW4D-111-115-20240617	JD90605-8	SULFATE	U	61.1	61.1	2.0		
114-MW4D-121-125-20240617	JD90605-9	SULFATE	U	34.8	34.8	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD90605
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240617

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20240617	JD90605-1	Total	Total Organic Carbon	U	12.0	12.0	1.0		
114-MW58C-R-84.5-20240617	JD90605-10	Total	Total Organic Carbon	U	3.6	3.6	1.0		
114-MW61D-121.0-20240617	JD90605-11	Total	Total Organic Carbon	U	2.5	2.5	1.0		
114-MW62C-73.0-20240617	JD90605-12	Total	Total Organic Carbon	U	2.1	2.1	1.0		
114-MW61D-117.0-20240617	JD90605-13	Total	Total Organic Carbon	U	0.96B	0.96J	1.0	Qualify	1
114-MW66D-107-111-20240617	JD90605-2	Total	Total Organic Carbon	U	2.5	2.5	1.0		
114-MW66D-118-123-20240617	JD90605-3	Total	Total Organic Carbon	U	5.9	5.9	1.0		
114-MW66D-124-129-20240617	JD90605-4	Total	Total Organic Carbon	U	9.8	9.8	1.0		
114-MW66D-137-140-20240617	JD90605-5	Total	Total Organic Carbon	U	28.0	28.0	1.0		
114-MW4D-90-94-20240617	JD90605-6	Total	Total Organic Carbon	U	45.3	45.3	1.0		
114-MW4D-98-102-20240617	JD90605-7	Total	Total Organic Carbon	U	96.9	96.9	5.0		
114-MW4D-111-115-20240617	JD90605-8	Total	Total Organic Carbon	U	86.0	86.0	5.0		
114-MW4D-121-125-20240617	JD90605-9	Total	Total Organic Carbon	U	185	185	10		

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

NJDEP Validation Footnote

- The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD90605		Project Number: 60732743 GWM.2023	
Validation Level: Full		Date: 7/30/2024	
Number of Samples/Matrix: 14 GW, 14 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 8/8/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C, 2.1 °C
Holding Time	Yes	No	Sampled 6/17/2024, analyzed 6/18/2024
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	6/18/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56195-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240617 (JD90605-15) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW58C-R-84.5-20240617 (JD90605-10), {100.0%R}
Laboratory Duplicate	Yes	No	114-MW58C-R-84.5-20240617 (JD90605-10), Both ND, {RPD 0}
Laboratory Control Standards	Yes	No	GN56195-B1 (100.7 %R)
Field Duplicate	Yes	No	114-MW61D-117.0-20240617(JD90605-13) & 114-MW61D-117.0-20240617-X (JD90605-14), Both ND, {RPD 0}
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Cr vs Total Cr6 Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW58C-R-84.5-20240617 (JD90605-10)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.15	NA	100.0	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW58C-R-84.5-20240617	JD90605-10	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RPD – relative percent difference**Field Duplicates**

114-MW61D-117.0-20240617(JD90605-13) & 114-MW61D-117.0-20240617-X (JD90605-14)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RPD – relative percent difference

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW66D-91-97-20240617	JD90605-1	1370	20	660	10	70	T Cr > T Cr6, Accept
114-MW58C-R-84.5-20240617	JD90605-10		10		10	0	Both ND, Accept
114-MW61D-121.0-20240617	JD90605-11	4.3	10		10	NC	T Cr > T Cr6, Accept
114-MW62C-73.0-20240617	JD90605-12		10		10	0	Both ND, Accept
114-MW61D-117.0-20240617	JD90605-13	3.5	10		10	NC	T Cr > T Cr6, Accept
114-MW61D-117.0-20240617-X	JD90605-14	3.4	10		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20240617	JD90605-15	0.69	2.0		10	NC	T Cr > T Cr6, Accept
114-MW66D-107-111-20240617	JD90605-2	12.2	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-118-123-20240617	JD90605-3	5.3	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-124-129-20240617	JD90605-4	3.7	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-137-140-20240617	JD90605-5		10		10	0	Both ND, Accept
114-MW4D-90-94-20240617	JD90605-6		10		10	0	Both ND, Accept
114-MW4D-98-102-20240617	JD90605-7		10		10	0	Both ND, Accept
114-MW4D-111-115-20240617	JD90605-8		10	7.0	10	NC	Both ND, Accept
114-MW4D-121-125-20240617	JD90605-9		10	7.0	10	NC	Both ND, Accept

NC- not calculated

RPD – relative percent difference

RL – reporting limit

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW66D-91-97-20240617	JD90605-1	CHROMIUM (HEXAVALENT)	0.66	Y	mg/l	0.07

SDG#: JD90605/ Method 7196

GN56195

Cr+6 ICAL 6/18/24

GW

(p. 839 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.089
0.3	0.259
0.5	0.422
0.8	0.671
1	0.855

(p. 839 of
data pkg)

AECOM Calculated Intercept	0.00207	OK	Reported intercept	0.0021
AECOM Slope	0.8462	OK	Reported Slope	0.8462
AECOM Calculated r	0.99990	OK	Reported r	0.99990

LCS calculation

GN56195-B1

P. 821, 839

Background absorbance

0

Sample absorbance

0.13

LCS Soluble Instrument Response

0.13

Instrument Concentration (mg/L)

0.151

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100

GN56195-B1

P. 821, 839

True Value (mg/L)

0.150

AECOM Calculated %R	100.8	OK	Reported %R	100.7

MS calculation

GN56195-S1

P. 823, 839, 843

114-MW58C-R-84.5-20240617

Unfiltered

Background reading

0

Total absorbance

0.133

Total absorbance - background

0.133

Instrument Concentration (mg/L)

0.1547

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume	0.05		
Dilution Factor	1		
AECOM Calculated MS Result (mg/L)	0.155	OK	Reported Result (mg/L) 0.155

%R = Found/True*100	GN56195-S1	P. 823, 839, 843	114-MW58C-R-84.5-20240617
True Value (mg/L)	0.150		
Native concentration (mg/L)	0.0		
AECOM Calculated MS Result %R	103.2	OK	Reported %R 103.3

	UNFILTERED		
Reporting Limit	JD90605-10	P. 45, 839	114-MW58C-R-84.5-20240617
Low Standard	0.01		
		NA: standards and samples treated the same	
Initial volume (L)	0.5		
Final volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)= 0.010

	UNFILTERED		
<u>Sample Calculations</u>	JD90605-10	P. 45, 839	114-MW58C-R-84.5-20240617
Background reading	0		
Total absorbance	0		
Total absorbance - background	0		
Instrument Response (mg/L)	-0.002		
		NA: standards and samples treated the same	
Sample volume (L)	0.5		
Final Volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Result (mg/L)	0.0	OK <MDL, report as ND	Reported Result (mg/L) 0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD90605		Project Number: 60732743 GWM.2023	
Validation Level: Limited		Date: 7/30/2024	
Number of Samples/Matrix: 14 GW, 14 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 8/8/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C, 2.1 °C
Holding Time	No	Yes	Sampled 6/17/2024, analyzed 6/19/2024 - 6/21/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP47382 ND Cr, MP47396 ND Cr, GP54794/GN56290 ND sulfate, GP54795/GN56290 ND sulfate, GP54821/GN56335 (1.5 mg/l) sulfate, GP54774/GN56307 ND TOC, GP54775/GN56307 ND TOC, GP54806/GN56351 ND TOC, GN56365(dissolved) ND Fe,
Field Blanks	Yes	No	GW-RI-FB-20240617 (JD90605-15), ND except Cr at 0.69 ug/L
Matrix Spike	Yes	No	114-MW58C-R-84.5-20240617(JD90605-10, -10F) Cr, TOC, sulfate, dissolved Fe, 114-MW61D-117.0-20240617 (JD90605-13) TOC, sulfate, also batch QC TOC, sulfate
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47382 Cr (93.6 %R), MP47396 Cr (94.8 %R), GP54794/GN56290 sulfate (99.9 %R), GP54795/GN56290 sulfate (102.3 %R), GP54821/GN56335 sulfate (103.9 %R), GP54774/GN56307 TOC (107.0 %R), GP54775/GN56307 TOC (100.0 %R), GP54806/GN56351 TOC (98.0 %R), GN56365 (dissolved) Fe (96.7 %R),
Field Duplicate	Yes	No	114-MW61D-117.0-20240617(JD90605-13) & 114-MW61D-117.0-20240617-X (JD90605-14), see table below
Total Metals vs Dissolved Metals	NA	NA	Total only

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW58C-R-84.5-20240617	JD90605-10F	IRON (FERROUS)	6/17/2024 13:55	6/21/2024 16:45	Estimate (UJ)
114-MW61D-121.0-20240617	JD90605-11F	IRON (FERROUS)	6/17/2024 13:40	6/21/2024 16:45	Estimate (UJ)
114-MW62C-73.0-20240617	JD90605-12F	IRON (FERROUS)	6/17/2024 10:55	6/21/2024 16:45	Estimate (UJ)
114-MW61D-117.0-20240617	JD90605-13F	IRON (FERROUS)	6/17/2024 11:05	6/21/2024 16:45	Estimate (UJ)
114-MW61D-117.0-20240617-X	JD90605-14F	IRON (FERROUS)	6/17/2024 11:10	6/21/2024 16:45	Estimate (UJ)
GW-RI-FB-20240617	JD90605-15F	IRON (FERROUS)	6/17/2024 15:30	6/21/2024 16:45	Estimate (UJ)
114-MW66D-91-97-20240617	JD90605-1F	IRON (FERROUS)	6/17/2024 11:00	6/21/2024 17:00	Estimate (UJ)
114-MW66D-107-111-20240617	JD90605-2F	IRON (FERROUS)	6/17/2024 11:10	6/21/2024 17:00	Estimate (UJ)
114-MW66D-118-123-20240617	JD90605-3F	IRON (FERROUS)	6/17/2024 11:35	6/21/2024 17:00	Estimate (UJ)
114-MW66D-124-129-20240617	JD90605-4F	IRON (FERROUS)	6/17/2024 11:45	6/21/2024 17:00	Estimate (UJ)
114-MW66D-137-140-20240617	JD90605-5F	IRON (FERROUS)	6/17/2024 12:05	6/21/2024 17:00	Estimate (UJ)
114-MW4D-90-94-20240617	JD90605-6F	IRON (FERROUS)	6/17/2024 13:40	6/21/2024 17:00	Estimate (UJ)
114-MW4D-98-102-20240617	JD90605-7F	IRON (FERROUS)	6/17/2024 13:50	6/21/2024 17:00	Estimate (UJ)
114-MW4D-111-115-20240617	JD90605-8F	IRON (FERROUS)	6/17/2024 14:00	6/21/2024 17:00	Estimate (J)
114-MW4D-121-125-20240617	JD90605-9F	IRON (FERROUS)	6/17/2024 14:10	6/21/2024 17:00	Estimate (J)

Method Blank

GP54821/GN56335

Analyte	Fraction	SR (mg/l)	Qual	RL	Associated Samples	Action
SULFATE	Total	1.5	J	2.0	JD90605-13, -14, -15	SR ND or >10x the amount in the MB, Accept

Matrix Spikes/Matrix Spike Duplicates

114-MW58C-R-84.5-20240617 (JD90605-10)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	3.6	16.7	16.6	131.0	130	143	59	0.6	15	OK, Accept
SULFATE	Total	80	146	240	236	117.5	112.5	120	80	1.7	15	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****RPD – relative percent difference**

114-MW61D-117.0-20240617 (JD90605-13)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	0.96	12.0	13.6	110.4	126.4	143	59	12.5	15	OK, Accept
SULFATE	Total	80	44.0	122	120	97.5	95.0	120	80	1.7	15	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****RPD – relative percent difference**

114-MW58C-R-84.5-20240617 (JD90605-10F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Ferrous Iron	Dissolved	3.0	0	2.9	2.9	96.7	96.7	113	92	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****RPD – relative percent difference**

114-MW58C-R-84.5-20240617 (JD90605-10)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	0.54	73.6	76.9	91.3	95.5	125	75	4.4	20	OK RPD <20%, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

RPD – relative percent difference

Field Duplicates

114-MW61D-117.0-20240617(JD90605-13, -13F) & 114-MW61D-117.0-20240617-X (JD90605-14, -14F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	0.029	U	0.029	U	0.20	mg/l	0	Both ND, Accept
CHROMIUM	Total	3.5	J	3.4	J	10	ug/l	2.9	RPD < 30%, Accept
SULFATE	Total	44.0		42.7		2.0	mg/l	3.0	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	0.96	J	0.72	U	1.0	mg/l	28.6	SR<5 RL, ABS DIFF <RL, Accept,

RPD – relative percent difference

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW66D-91-97-20240617	JD90605-1	CHROMIUM	1370	Y	ug/l	70

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW66D-91-97-20240617	JD90605-1	CHROMIUM	Total	20
114-MW58C-R-84.5-20240617	JD90605-10	CHROMIUM	Total	10
114-MW61D-121.0-20240617	JD90605-11	CHROMIUM	Total	10
114-MW62C-73.0-20240617	JD90605-12	CHROMIUM	Total	10
114-MW61D-117.0-20240617	JD90605-13	CHROMIUM	Total	10
114-MW61D-117.0-20240617-X	JD90605-14	CHROMIUM	Total	10
GW-RI-FB-20240617	JD90605-15	CHROMIUM	Total	2
114-MW66D-107-111-20240617	JD90605-2	CHROMIUM	Total	10
114-MW66D-118-123-20240617	JD90605-3	CHROMIUM	Total	10
114-MW66D-124-129-20240617	JD90605-4	CHROMIUM	Total	10
114-MW66D-137-140-20240617	JD90605-5	CHROMIUM	Total	10
114-MW4D-90-94-20240617	JD90605-6	CHROMIUM	Total	10
114-MW4D-98-102-20240617	JD90605-7	TOC	Total	5
114-MW4D-98-102-20240617	JD90605-7	CHROMIUM	Total	10
114-MW4D-111-115-20240617	JD90605-8	TOC	Total	5
114-MW4D-111-115-20240617	JD90605-8	CHROMIUM	Total	10
114-MW4D-121-125-20240617	JD90605-9	TOC	Total	10
114-MW4D-121-125-20240617	JD90605-9	CHROMIUM	Total	10

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD90728
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/30/2024
Reviewed by:	Linda Waters/AECOM File Name: JD90728_2024_7_30 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 19, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW61D-126.0-20240619	JD90728-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-126.0-20240619	JD90728-1F	Groundwater	Fe
114-MW61D-131.0-20240619	JD90728-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-131.0-20240619	JD90728-2F	Groundwater	Fe
114-MW61D-136.0-20240619	JD90728-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-136.0-20240619	JD90728-3F	Groundwater	Fe
114-MW60C-R-117.5-20240619	JD90728-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW60C-R-117.5-20240619	JD90728-4F	Groundwater	Fe

Field ID	Laboratory ID	Matrix	Parameter
114-MW60C-R-117.5-20240619-X (Field Duplicate of 114-MW60C-R-117.5-20240619)	JD90728-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW60C-R-117.5-20240619-X (Field Duplicate of 114-MW60C-R-117.5-20240619)	JD90728-5F	Groundwater	Fe
GW-RI-FB-20240619	JD90728-6	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20240619	JD90728-6F	Field Blank	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $> 30\%$	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW61D-126.0-20240619 (JD90728-1), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank GW-RI-FB-20240619 (JD90728-6) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

Samples 114-MW60C-R-117.5-20240619 (JD90728-4) and 114-MW60C-R-117.5-20240619-X (JD90728-5), were analyzed as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)

Hold Time

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (J/UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Samples 114-MW61D-126.0-20240619 (JD90728-1, -1F), were analyzed as MS/MSDs for this data set. All QC acceptance criteria were met or no qualifications were required.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank GW-RI-FB-20240619 (JD90728-6) was submitted for chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

Samples 114-MW60C-R-117.5-20240619 (JD90728-4) and 114-MW60C-R-117.5-20240619-X (JD90728-5), were analyzed as the field duplicate pair for chromium and ferrous iron. All QC acceptance criteria were met.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Method Blank (MB)**

The sulfate MB, GP54848/GN56376, reported sulfate at a concentration greater than the MDL but less than the RL. The sample, GW-RI-FB-20240619 (JD90728-6), reported sulfate at a concentration less than three times the MB; therefore, sulfate was negated at the RL (UB). Samples 114-MW60C-R-117.5-20240619 (JD90728-4) and 114-MW60C-R-117.5-20240619-X (JD90728-5) reported sulfate at concentrations greater than three times but less than ten times the amount in the MB; therefore, sulfate was estimated (JB). All other associated samples reported concentrations greater than ten times the amount in the MB. No qualifications were made to these samples.

Matrix Spike/ Matrix Spike Duplicate

Sample 114-MW61D-126.0-20240619 (JD90728-1) was analyzed as a MS/ MSD for TOC and sulfate in this data set. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank GW-RI-FB-20240619 (JD90728-6) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicates

Samples 114-MW60C-R-117.5-20240619 (JD90728-4) and 114-MW60C-R-117.5-20240619-X (JD90728-5), were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results negated due to method blank contamination are useable at the RL.

Sample results estimated due to method blank contamination are useable with a potential high bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90728
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240619

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-R-117.5-20240619	JD90728-4	Total	CHROMIUM (HEXAVALENT)	U	0.066	0.066	0.010		
114-MW60C-R-117.5-20240619-X	JD90728-5	Total	CHROMIUM (HEXAVALENT)	U	0.070	0.070	0.010		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90728
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240619

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-126.0-20240619	JD90728-1	Total	CHROMIUM	U	5.1 B	5.1 J	10	Qualify	2
114-MW61D-126.0-20240619	JD90728-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-131.0-20240619	JD90728-2	Total	CHROMIUM	U	4.4 B	4.4 J	10	Qualify	2
114-MW61D-131.0-20240619	JD90728-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-136.0-20240619	JD90728-3	Total	CHROMIUM	U	4.6 B	4.6 J	10	Qualify	2
114-MW61D-136.0-20240619	JD90728-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW60C-R-117.5-20240619	JD90728-4	Total	CHROMIUM	U	59.4	59.4	10		
114-MW60C-R-117.5-20240619	JD90728-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW60C-R-117.5-20240619-X	JD90728-5	Total	CHROMIUM	U	59.3	59.3	10		
114-MW60C-R-117.5-20240619-X	JD90728-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
GW-RI-FB-20240619	JD90728-6F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90728
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240619

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-126.0-20240619	JD90728-1	SULFATE	U	39.6	39.6	2.0		
114-MW61D-131.0-20240619	JD90728-2	SULFATE	U	40.9	40.9	2.0		
114-MW61D-136.0-20240619	JD90728-3	SULFATE	U	44.1	44.1	2.0		
114-MW60C-R-117.5-20240619	JD90728-4	SULFATE	1.9	13.5	13.5JB	2.0	Qualify	1
114-MW60C-R-117.5-20240619-X	JD90728-5	SULFATE	1.9	12.9	12.9JB	2.0	Qualify	1
GW-RI-FB-20240619	JD90728-6	SULFATE	1.9	U	UB	2.0	Qualify	2

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

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

NJDEP Validation Footnote

1. Sample result was $\geq 3x$ and $<10X$ the associated blank result.
2. Sample result was $<RL$ and $<3X$ the associated blank result. Sample result was negated at the RL.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90728
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240619

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-131.0-20240619	JD90728-2	Total	Total Organic Carbon	U	2.1	2.1	1.0		
114-MW61D-136.0-20240619	JD90728-3	Total	Total Organic Carbon	U	0.78 B	0.78 J	1.0	Qualify	1
114-MW60C-R-117.5-20240619	JD90728-4	Total	Total Organic Carbon	U	1.0	1.0	1.0		
114-MW60C-R-117.5-20240619-X	JD90728-5	Total	Total Organic Carbon	U	1.1	1.1	1.0		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD90728		Project Number: 60732743 GWM.2023	
Validation Level: Full		Date: 7/30/2024	
Number of Samples/Matrix: 5 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 8/9/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.5 °C
Holding Time	Yes	No	Sampled 6/19/2024, analyzed 6/20/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	6/20/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56297-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240619 (JD90728-6) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW61D-126.0-20240619 (JD90728-1), {100.0%R}
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	GN56297-B1 (100.0 %R)
Field Duplicate	Yes	No	114-MW60C-R-117.5-20240619 (JD90728-4) & 114-MW60C-R-117.5-20240619-X (JD90728-5), {RPD 5.9}
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Cr vs Cr6 Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW61D-126.0-20240619 (JD90728-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.15	NA	100.0	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****Field Duplicates**

114-MW60C-R-117.5-20240619 (JD90728-4) & 114-MW60C-R-117.5-20240619-X (JD90728-5)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.066		0.070		0.010	mg/l	5.9	RPD <20 %, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW61D-126.0-20240619	JD90728-1	5.1	10		10	NC	T Cr > T Cr6, Accept
114-MW61D-131.0-20240619	JD90728-2	4.4	10		10	NC	T Cr > T Cr6, Accept
114-MW61D-136.0-20240619	JD90728-3	4.6	10		10	NC	T Cr > T Cr6, Accept
114-MW60C-R-117.5-20240619	JD90728-4	59.4	10	66	10	11	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW60C-R-117.5-20240619-X	JD90728-5	59.3	10	70	10	17	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
GW-RI-FB-20240619	JD90728-6		2.0		10	0	Both ND, Accept

NC- not calculated

SDG#: JD90728/ Method 7196

GN56297

Cr+6 ICAL 6/20/24

GW

(p. 671 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.089
0.3	0.261
0.5	0.445
0.8	0.680
1	0.860

(p. 671 of
data pkg)

AECOM Calculated Intercept	0.00267	OK	Reported intercept	0.0027
AECOM Slope	0.8575	OK	Reported Slope	0.8575
AECOM Calculated r	0.99982	OK	Reported r	0.99820

LCS calculation

GN56297-B1

P. 659, 671

Background absorbance

0

Sample absorbance

0.131

LCS Soluble Instrument Response

0.131

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN56297-B1

P. 659, 671

True Value (mg/L)

0.150

AECOM Calculated %R	99.8	OK	Reported %R	100.0

MS calculation

GN56297-S1

P. 661, 671, 672

114-MW61D-126.0-20240619

Unfiltered

Background reading

0.006

Total absorbance

0.134

Total absorbance - background	0.128				
Instrument Concentration (mg/L)	0.1462				
			NA: standards and samples treated the same		
Sample aliquot	0.05				
Final volume	0.05				
Dilution Factor	1				
AECOM Calculated MS Result (mg/L)	0.146	OK		Reported Result (mg/L)	0.146

%R = Found/True*100	GN56297-S1	P. 661, 671, 672	114-MW61D-126.0-20240619		
True Value (mg/L)	0.150				
Native concentration (mg/L)	0.0				
AECOM Calculated MS Result %R	97.4	OK		Reported %R	97.3

	UNFILTERED				
Reporting Limit	JD90728-1	P. 12, 671	114-MW61D-126.0-20240619		
Low Standard	0.01				
			NA: standards and samples treated the same		
Initial volume (L)	0.5				
Final volume (L)	0.5				
Dilution Factor	1				
AECOM Calculated Reporting Limit	0.010	OK		Reported RL (mg/L)=	0.010

	UNFILTERED				
<u>Sample Calculations</u>	JD90728-1	P. 12, 671	114-MW61D-126.0-20240619		
Background reading	0.006				
Total absorbance	0.006				
Total absorbance - background	0				
Instrument Response (mg/L)	-0.003				
			NA: standards and samples treated the same		
Sample volume (L)	0.5				
Final Volume (L)	0.5				
Dilution Factor	1				
AECOM Calculated Result (mg/L)	0.0	OK <MDL, report as ND		Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD90728		Project Number: 60732743 GWM.2023	
Validation Level: Limited		Date: 7/30/2024	
Number of Samples/Matrix: 5 GW, 5 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 8/9/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.5 °C
Holding Time	No	Yes	Sampled 6/19/2024, analyzed 6/21/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	No	Yes	MP47422 ND Cr, GP54849/GN56376 (1.9 mg/l) sulfate, GP54830/GN56420 ND TOC, GN56365(dissolved) ND Fe,
Field Blanks	Yes	No	GW-RI-FB-20240619 (JD90728-6, 6F), ND
Matrix Spike	Yes	No	114-MW61D-126.0-20240619 (JD90728-1, -1F) Cr, TOC, sulfate, dissolved Fe
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47422 Cr (94.8 %R, 94.1 %R), GP54849/GN56376 sulfate (108.4 %R), GP54830/GN56420 TOC (101.0 %R), GN56365 (dissolved) Fe (96.7 %R),
Field Duplicate	Yes	No	114-MW60C-R-117.5-20240619 (JD90728-4) & 114-MW60C-R-117.5-20240619-X (JD90728-5), see table below
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW61D-126.0-20240619	JD90728-1F	IRON (FERROUS)	6/19/2024 10:35	6/21/2024 17:22	Estimate (UJ)
114-MW61D-131.0-20240619	JD90728-2F	IRON (FERROUS)	6/19/2024 12:50	6/21/2024 17:22	Estimate (UJ)
114-MW61D-136.0-20240619	JD90728-3F	IRON (FERROUS)	6/19/2024 14:35	6/21/2024 17:22	Estimate (UJ)
114-MW60C-R-117.5-20240619	JD90728-4F	IRON (FERROUS)	6/19/2024 10:55	6/21/2024 17:22	Estimate (UJ)
114-MW60C-R-117.5-20240619-X	JD90728-5F	IRON (FERROUS)	6/19/2024 11:00	6/21/2024 17:22	Estimate (UJ)
GW-RI-FB-20240619	JD90728-6F	IRON (FERROUS)	6/19/2024 14:45	6/21/2024 17:22	Estimate (UJ)

Method Blank

GP54848/GN56376

Analyte	Fraction	SR (mg/l)	Qual	RL	Associated Samples	Action
SULFATE	Total	1.9	J	2.0	All	GW-RI-FB-20240619 (JD90728-6) SR<3x MB, Negate at RL (UB) , 114-MW60C-R-117.5-20240619 (JD90728-4) and 114-MW60C-R-117.5- 20240619-X (JD90728-5) SR >3x but <10x MB, Estimate (JB) All other SR >10x the amount in the MB, Accept

Matrix Spikes/Matrix Spike Duplicates

114-MW61D-126.0-20240619 (JD90728-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	0	12.1	11.5	121	115	143	59	5.1	15	OK RPD <15%, Accept
SULFATE	Total	80	39.6	125	119	106.8	99.25	120	80	4.9	15	OK RPD <15%, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

114-MW61D-126.0-20240619 (JD90728-1F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
Ferrous Iron	Dissolved	3.0	0	2.9	2.9	96.7	96.7	113	92	0	20	OK RPD <20%, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result**

114-MW61D-126.0-20240619 (JD90728-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	5.1	83.7	83.1	98.3	97.5	125	75	0.7	20	OK RPD <20%, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****Field Duplicates**

114-MW60C-R-117.5-20240619 (JD90728-4) & 114-MW60C-R-117.5-20240619-X (JD90728-5)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	0.029	U	0.029	U	0.20	mg/l	0	Both ND, Accept
CHROMIUM	Total	59.4		59.3		10	ug/l	0.17	RPD < 30%, Accept
SULFATE	Total	13.5		12.9		2.0	mg/l	4.55	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	1.0		1.1		1.0	mg/l	9.5	RPD < 20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW61D-126.0-20240619	JD90728-1	CHROMIUM	Total	10
114-MW61D-131.0-20240619	JD90728-2	CHROMIUM	Total	10
114-MW61D-136.0-20240619	JD90728-3	CHROMIUM	Total	10
114-MW60C-R-117.5-20240619	JD90728-4	CHROMIUM	Total	10
114-MW60C-R-117.5-20240619-X	JD90728-5	CHROMIUM	Total	10
GW-RI-FB-20240619	JD90728-6	CHROMIUM	Total	2

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD90731
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/25/2024
Reviewed by:	Linda Waters /AECOM File Name: JD90731_2024_07_25 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 19, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-MW79WR-78.5-20240619	JD90731-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW79WR-78.5-20240619	JD90731-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW79WR-73.0-20240619	JD90731-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW79WR-73.0-20240619	JD90731-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
PA-IRM-FB-20240619	JD90731-3	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240619	JD90731-4	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank PA-IRM-FB-20240619 (JD90731-3) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese)**Method Blank**

The method Blank (MB), MP47422-MB1, reported iron at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results were non-detect for iron. No qualifications were made.

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank PA-IRM-FB-20240619 (JD90731-3) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)

Method Blank

The MB, GP54849/GN56376, reported sulfate at a concentration greater than the MDL but less than the RL. Sample PA-IRM-FB-20240619 (JD90731-3) reported results less than three times the amount in the MB. Sulfate results were negated at the RL (UB), in sample PA-IRM-FB-20240619 (JD90731-3). All other sulfate sample results were greater than ten times the amount in the MB and not considered affected by the implied contamination.

Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank PA-IRM-FB-20240619 (JD90731-3) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane

Trip Blank

The trip blank (TB), P4-IRM-TB-20240619 (JD90731-4), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Lab Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis

Field Blank (FB)

Field blank PA-IRM-FB-20240619 (JD90731-3) was submitted for methane analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

Sample results negated due to method blank contamination, are useable at the RL.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90731
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240619

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW79WR-78.5-20240619	JD90731-1	Total	CHROMIUM (HEXAVALENT)	U	5.6	5.6	0.10		
114-MW79WR-78.5-20240619	JD90731-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	5.5	5.5	0.10		
114-MW79WR-73.0-20240619	JD90731-2	Total	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.050		
114-MW79WR-73.0-20240619	JD90731-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	2.2	2.2	0.050		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90731
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240619

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW79WR-78.5-20240619	JD90731-1	Total	CHROMIUM	U	4810	4810	100		
114-MW79WR-78.5-20240619	JD90731-1F	Dissolved	CHROMIUM	U	5120	5120	100		
114-MW79WR-78.5-20240619	JD90731-1F	Dissolved	MANGANESE	U	3.8B	3.8J	10	Qualify	1
114-MW79WR-73.0-20240619	JD90731-2	Total	CHROMIUM	U	2120	2120	100		
114-MW79WR-73.0-20240619	JD90731-2F	Dissolved	CHROMIUM	U	2210	2210	100		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90731
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240619

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW79WR-78.5-20240619	JD90731-1	TOTAL ORGANIC CARBON	U	3.2	3.2	1.0		
114-MW79WR-73.0-20240619	JD90731-2	TOTAL ORGANIC CARBON	U	2.6	2.6	1.0		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90731
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240619

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW79WR-78.5-20240619	JD90731-1	SULFATE	U	144	144	2.0		
114-MW79WR-73.0-20240619	JD90731-2	SULFATE	U	140	140	2.0		
PA-IRM-FB-20240619	JD90731-3	SULFATE	U	1.1B	UB	2.0	Negate	1

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

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

NJDEP Validation Footnote

1. Sample result was <RL and <3X the associated blank result. Sample result was negated at the RL.

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD90731
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240619
Field Blank ID P4-IRM-FB-20240619

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW79WR-78.5-20240619	JD90731-1	METHANE	U	110	110	0.55		
114-MW79WR-73.0-20240619	JD90731-2	METHANE	U	76.0	76.0	0.11		
PA-IRM-TB-20240619	JD90731-4	METHANE	U	0.12	0.12	0.11		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD90731		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/25/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 07/28/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.0 °C
Holding Time	Yes	No	Sampled 06/19/2024 analyzed 06/20/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	
Initial Calibration	Yes	No	06/20/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56297-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240619 (JD90731-3), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN56297-B1 (100.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW79WR-78.5-20240619	JD90731-1	4810	100	5600	100	15	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW79WR-73.0-20240619	JD90731-2	2120	100	2200	50	4	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
PA-IRM-FB-20240619	JD90731-3		2.0		10	0	Both ND, Accept

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW79WR-78.5-20240619	JD90731-1F	5120	100	5500	100	7	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW79WR-73.0-20240619	JD90731-2F	2210	100	2200	50	0	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW79WR-78.5-20240619	JD90731-1, -1F	5600	100	5500	100	2	T Cr6 < D Cr6, SRs < 4x RL, ABS ≤ RL, Accept
114-MW79WR-73.0-20240619	JD90731-2, -2F	2200	50	2200	50	0	T Cr6 > D Cr6, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW79WR-78.5-20240619	JD90731-1	CHROMIUM (HEXAVALENT)	Total	10
114-MW79WR-78.5-20240619	JD90731-1F	CHROMIUM (HEXAVALENT)	Dissolved	10
114-MW79WR-73.0-20240619	JD90731-2	CHROMIUM (HEXAVALENT)	Total	5
114-MW79WR-73.0-20240619	JD90731-2F	CHROMIUM (HEXAVALENT)	Dissolved	5

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW79WR-73.0-20240619	JD90731-2	CHROMIUM (HEXAVALENT)	2.2	Y	mg/l	0.07
114-MW79WR-73.0-20240619	JD90731-2F	CHROMIUM (HEXAVALENT)	2.2	Y	mg/l	0.07

SDG#: JD90731/ Method 7196**GN56297**

Cr+6 ICAL 6/20/24

GW

(p. 1034 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.089
0.3	0.261
0.5	0.445
0.8	0.680
1	0.860

(p. 1034
of data
pkg)

AECOM Calculated Intercept	0.00267	OK	Reported intercept	0.0027
AECOM Slope	0.8575	OK	Reported Slope	0.8575
AECOM Calculated r	0.99982	OK	Reported r	0.99982

LCS calculation**GN56297-B1****P. 1022, 1034**

Background absorbance	0
Sample absorbance	0.131
LCS Soluble Instrument Response	0.131
Instrument Concentration (mg/L)	0.150

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN56297-B1****P. 1022, 1034**

True Value (mg/L)	0.150

AECOM Calculated %R	99.8	OK	Reported %R	100.0

MS calculation**GN56297-S1****P. 1024, 1034,
1035****Batch QC (JD90728-1)****unfiltered**

Background reading	0.006
Total absorbance	0.134
Total absorbance - background	0.128
Instrument Concentration (mg/L)	0.1462

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.146	OK	Reported Result (mg/L)	0.146

%R = Found/True*100**GN56297-S1****P. 1024, 1034,
1035****Batch QC (JD90728-1)**

True Value (mg/L)	0.150
Native concentration (mg/L)	0.000

AECOM Calculated MS Result %R	97.4	OK	Reported %R	97.4

UNFILTERED**Reporting Limit****JD90731-1****P. 12, 1034****114-MW79WR-78.5-20240619**

Low Standard 0.01

Initial volume (L) 0.5

Final volume (L) 0.5

Dilution Factor 10

AECOM Calculated Reporting Limit	0.10	OK	Reported RL (mg/L)=	0.10

UNFILTERED

Sample Calculations

JD90731-1

P. 12, 1034

114-MW79WR-78.5-20240619

Background reading 0

Total absorbance 0.482

Total absorbance - background 0.482

Instrument Response (mg/L) 0.559

Sample volume (L) 0.5

Final Volume (L) 0.5

Dilution Factor 10

AECOM Calculated Result (mg/L)	5.59	OK	Reported Result (mg/L)	5.6

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD90731		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/25/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 07/28/24	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.0 °C
Holding Time	Yes	No	Sampled 06/19/2024, analyzed 06/21/2024 -06/25/2024.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	Yes	MP47422 Metals (Cr, Fe, Mn) see table below, GP54849/GN56376 Sulfate see table below, GP54831/GN56420 ND TOC
Field Blanks	No	No	P4-IRM-FB-20240619 (JD90731-3), ND
Matrix Spike	NA	NA	Batch QC Metals, TOC, sulfate
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47422 Metals (Cr, Fe, Mn) see table below, GP54849/GN56376 Sulfate (108.4 %R), GP54831/GN56420 TOC (95.8 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Method Blank

MP474227-MB1

Analyte	FRACTION	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	TOTAL	0.11	U	2.0	ALL	OK, Accept
IRON	DISSOLVED	24.0	J	50	ALL	SR both ND, Accept
MANGANESE	DISSOLVED	0.27	U	2.0	ALL	OK, Accept

SR – sample result

GP54849/GN56376

Analyte	FRACTION	SR (ug/l)	Qual	RL	Associated Samples	Action
SULFATE	TOTAL	1.9	U	2.0	ALL	PA-IRM-FB-20240619 (JD90731-3) < 3x MB, negate at RL (UB), all other SR>10x MB, Accept

SR – sample result**LCS**

MP47422

Analyte	Spike Added	LCS Result	LCS %R	LCS2 Result	LCS2% R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	75.8	94.8	75.3	94.1	NA	20	80-120	ug/l	OK, Accept
IRON	4000	4040	101.0	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	75.3	94.1	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW79WR-78.5-20240619	JD90731-1	CHROMIUM	Total	100
114-MW79WR-78.5-20240619	JD90731-1F	CHROMIUM	Dissolved	100
114-MW79WR-78.5-20240619	JD90731-1F	IRON	Dissolved	10
114-MW79WR-78.5-20240619	JD90731-1F	MANGANESE	Dissolved	10
114-MW79WR-73.0-20240619	JD90731-2	CHROMIUM	Total	100
114-MW79WR-73.0-20240619	JD90731-2F	CHROMIUM	Dissolved	100
114-MW79WR-73.0-20240619	JD90731-2F	IRON	Dissolved	10
114-MW79WR-73.0-20240619	JD90731-2F	MANGANESE	Dissolved	10
PA-IRM-FB-20240619	JD90731-3	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-MW79WR-78.5-20240619	JD90731-1, -1F	4810	100	5120	100	500	310	6	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-MW79WR-73.0-20240619	JD90731-2, -2F	2120	100	2210	100	500	90	4	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW79WR-73.0-20240619	JD90731-2	CHROMIUM	2120	Y	ug/l	70
114-MW79WR-73.0-20240619	JD90731-2F	CHROMIUM	2210	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD90731		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/25/2024		
Number of Samples/Matrix: 2 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 07/28/24		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			3.0 °C
Holding Time	X			Sampled 06/19/2024, Analyzed 06/21/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3072-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240619 (JD90731-3) ND, P4-IRM-TB-20240619 (JD90731-4), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate			X	Batch QC
Laboratory Control Standards	X			GAA3072-LCS (94 %R)
Field Duplicate			X	None with this SDG
Percent Solids			X	Aqueous

Trip Blank

P4-IRM-TB-20240619 (JD90731-4)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.12		0.11	Associated SR>10x TB, Accept

SR – sample result**RL – reporting limit****Dilutions**

Sample ID	Lab ID	Analyte	Dilution
114-MW79WR-78.5-20240619	JD90731-1	METHANE	5

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD90827
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/25/2024
Reviewed by:	Linda Waters /AECOM File Name: JD90827_2024_07_25 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 20, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-03WR-87.0-20240620	JD90827-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-03WR-87.0-20240620	JD90827-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-03WR-92.0-20240620	JD90827-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-03WR-92.0-20240620	JD90827-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-03WR-92.0-20240620-X (Field Duplicate of 114-PW-03WR-92.0-20240620)	JD90827-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-03WR-92.0-20240620-X (Field Duplicate of 114-PW-03WR-92.0-20240620)	JD90827-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese

Field ID	Laboratory ID	Matrix	Parameter*
P4-IRM-FB-20240620	JD90827-4	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240620	JD90827-5	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240620 (JD90827-4) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

Samples 114-PW-03WR-92.0-20240620 (JD90827-2, -2F) and 114-PW-03WR-92.0-20240620-X (JD90827-3, -3F) were analyzed as field duplicate pairs for this data set. All QC acceptance criteria were met.

Metals (Chromium, Iron, Manganese)**Method Blank**

The method Blank (MB), MP47449, reported iron at a concentration greater than the reporting limit (RL). Manganese was also reported at a concentration greater than the method detection limit (MDL) but less than the RL. All associated sample results were non-detect for iron and manganese. No qualifications were made.

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240620 (JD90827-4) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

Samples 114-PW-03WR-92.0-20240620 (JD90827-2, -2F) and 114-PW-03WR-92.0-20240620-X (JD90827-3, -3F) were analyzed as field duplicate pairs for this data set. All QC acceptance criteria were met.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)**Method Blank**

The MB, MP47573, reported sulfate at a concentration greater than the MDL but less than the RL. All associated sample results were greater than ten times the amount in the MB; therefore, no qualifications were made.

Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240620 (JD90827-4) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

Sample 114-PW-03WR-92.0-20240620 (JD90827-2) and 114-PW-03WR-92.0-20240620-X (JD90827-3) were analyzed the field duplicate pair for this data set. All QC acceptance criteria were met.

Methane**Trip Blank (TB)**

The trip blank (TB), P4-IRM-TB-20240620 (JD90827-5), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Lab Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240620 (JD90827-4) was submitted for methane analysis. No contamination was detected, and no samples required qualification

Field Duplicate (FD)

Sample 114-PW-03WR-92.0-20240620 (JD90827-2) and 114-PW-03WR-92.0-20240620-X (JD90827-3) were analyzed as the field duplicate pair for this data set. All QC acceptance criteria were met.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD90827
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240620

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-03WR-87.0-20240620	JD90827-1	Total	CHROMIUM (HEXAVALENT)	U	457	457	5.0		
114-PW-03WR-87.0-20240620	JD90827-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	417	417	5.0		
114-PW-03WR-92.0-20240620	JD90827-2	Total	CHROMIUM (HEXAVALENT)	U	460	460	5.0		
114-PW-03WR-92.0-20240620	JD90827-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	398	398	5.0		
114-PW-03WR-92.0-20240620-X	JD90827-3	Total	CHROMIUM (HEXAVALENT)	U	498	498	5.0		
114-PW-03WR-92.0-20240620-X	JD90827-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	419	419	5.0		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD90827
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240620

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-03WR-87.0-20240620	JD90827-1	Total	CHROMIUM	U	432000	432000	10000		
114-PW-03WR-87.0-20240620	JD90827-1F	Dissolved	CHROMIUM	U	440000	440000	10000		
114-PW-03WR-92.0-20240620	JD90827-2	Total	CHROMIUM	U	418000	418000	10000		
114-PW-03WR-92.0-20240620	JD90827-2F	Dissolved	CHROMIUM	U	425000	425000	10000		
114-PW-03WR-92.0-20240620-X	JD90827-3	Total	CHROMIUM	U	452000	452000	10000		
114-PW-03WR-92.0-20240620-X	JD90827-3F	Dissolved	CHROMIUM	U	399000	399000	10000		
P4-IRM-FB-20240620	JD90827-4	Total	CHROMIUM	U	2.9	2.9	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD90827
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID0 P4-IRM-FB-20240620

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-03WR-92.0-20240620	JD90827-2	TOTAL ORGANIC CARBON	U	3.7 B	3.7 J	5.0	Qualify	1
114-PW-03WR-92.0-20240620-X	JD90827-3	TOTAL ORGANIC CARBON	U	3.6 B	3.6 J	5.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD90827
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240620

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-03WR-87.0-20240620	JD90827-1	SULFATE	0.94	427	427	10		
114-PW-03WR-92.0-20240620	JD90827-2	SULFATE	0.94	452	452	10		
114-PW-03WR-92.0-20240620-X	JD90827-3	SULFATE	0.94	447	447	10		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 20, 2024
Lab Name/ID SGS, Dayton
SDG No JD90827
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240620
Field Blank ID P4-IRM-FB-20240620

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-03WR-87.0-20240620	JD90827-1	METHANE	U	261	261	0.55		
114-PW-03WR-92.0-20240620	JD90827-2	METHANE	U	348	348	0.55		
114-PW-03WR-92.0-20240620-X	JD90827-3	METHANE	U	312	312	0.55		
P4-IRM-TB-20240620	JD90827-5	METHANE	U	0.11	0.11	0.11		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD90827		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/25/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 07/29/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	Yes	No	Sampled 06/20/2024 analyzed 06/21/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	06/21/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56346-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240620 (JD90827-4), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN56346-B1 (100.7 %R)
Field Duplicate	Yes	No	114-PW-03WR-92.0-20240620 (JD90827-2, -2F) & 114-PW-03WR-92.0-20240620-X (JD90827-3, -3F)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Field Duplicates

114-PW-03WR-92.0-20240620 (JD90827-2, -2F) & 114-PW-03WR-92.0-20240620-X (JD90827-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	460		498		5.0	mg/l	7.93	OK, Accept
HEXAVALENT CHROMIUM	Dissolved	398		419		5.0	mg/l	5.14	OK, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PW-03WR-87.0-20240620	JD90827-1	432000	10000	457000	5000	6	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-03WR-92.0-20240620	JD90827-2	418000	10000	460000	5000	10	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-03WR-92.0-20240620-X	JD90827-3	452000	10000	498000	5000	10	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
P4-IRM-FB-20240620	JD90827-4	2.9	2.0		10	NC	T Cr > T Cr6, Accept

NC – not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-03WR-87.0-20240620	JD90827-1F	440000	10000	417000	5000	5	D Cr > D Cr6, Accept
114-PW-03WR-92.0-20240620	JD90827-2F	425000	10000	398000	5000	7	D Cr > D Cr6, Accept
114-PW-03WR-92.0-20240620-X	JD90827-3F	399000	10000	419000	5000	5	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-03WR-87.0-20240620	JD90827-1, -1F	457000	5000	417000	5000	9	T Cr6 > D Cr6, Accept
114-PW-03WR-92.0-20240620	JD90827-2, -2F	460000	5000	398000	5000	14	T Cr6 > D Cr6, Accept
114-PW-03WR-92.0-20240620-X	JD90827-3, -3F	498000	5000	419000	5000	17	T Cr6 > D Cr6, Accept

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-03WR-87.0-20240620	JD90827-1	CHROMIUM (HEXAVALENT)	457	Y	mg/l	0.07
114-PW-03WR-87.0-20240620	JD90827-1F	CHROMIUM (HEXAVALENT)	417	Y	mg/l	0.07
114-PW-03WR-92.0-20240620	JD90827-2	CHROMIUM (HEXAVALENT)	460	Y	mg/l	0.07
114-PW-03WR-92.0-20240620	JD90827-2F	CHROMIUM (HEXAVALENT)	398	Y	mg/l	0.07
114-PW-03WR-92.0-20240620-X	JD90827-3	CHROMIUM (HEXAVALENT)	498	Y	mg/l	0.07
114-PW-03WR-92.0-20240620-X	JD90827-3F	CHROMIUM (HEXAVALENT)	419	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-03WR-87.0-20240620	JD90827-1	CHROMIUM (HEXAVALENT)	Total	500
114-PW-03WR-87.0-20240620	JD90827-1F	CHROMIUM (HEXAVALENT)	Dissolved	500
114-PW-03WR-92.0-20240620	JD90827-2	CHROMIUM (HEXAVALENT)	Total	500
114-PW-03WR-92.0-20240620	JD90827-2F	CHROMIUM (HEXAVALENT)	Dissolved	500
114-PW-03WR-92.0-20240620-X	JD90827-3	CHROMIUM (HEXAVALENT)	Total	500
114-PW-03WR-92.0-20240620-X	JD90827-3F	CHROMIUM (HEXAVALENT)	Dissolved	500

SDG#: JD90827/ Method 7196**GN56346**

Cr+6 ICAL 6/21/24

GW

(p. 1247 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.089
0.3	0.261
0.5	0.44
0.8	0.687
1	0.860

(p. 1247
of data
pkg)

AECOM Calculated Intercept	0.00258	OK	Reported intercept	0.0026
AECOM Slope	0.8592	OK	Reported Slope	0.8592
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation**GN56346-B1****P. 1234, 1247**

Background absorbance	0
Sample absorbance	0.132
LCS Soluble Instrument Response	0.132
Instrument Concentration (mg/L)	0.151

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100**GN56346-B1****P. 1234, 1247**

True Value (mg/L)	0.150

AECOM Calculated %R	100.4	OK	Reported %R	100.7

MS calculation**GN55941-S1****P. 1236, 1247****Batch QC (JD90821-5)****unfiltered**

Background reading	0.015
Total absorbance	0.149
Total absorbance - background	0.134
Instrument Concentration (mg/L)	0.1530

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.153	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN55941-S1****P. 1236, 1247****Batch QC (JD90821-5)**

True Value (mg/L)	0.150
Native concentration (mg/L)	0.023

AECOM Calculated MS Result %R	86.6	OK	Reported %R	84.7

UNFILTERED**Reporting Limit****JD90827-1****P. 12, 1247****114-PW-03WR-87.0-20240620**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	500

AECOM Calculated Reporting Limit	5.000	OK	Reported RL (mg/L)=	5.000

UNFILTERED**Sample Calculations****JD90827-1****P. 12, 1247****114-PW-03WR-87.0-20240620**

Background reading	0
Total absorbance	0.788
Total absorbance - background	0.788
Instrument Response (mg/L)	0.914

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	500

AECOM Calculated Result (mg/L)	457.1	OK	Reported Result (mg/L)	457.0

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD90827		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/25/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 07/29/24	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	Yes	No	Sampled 06/20/2024, analyzed 06/24/2024 -06/28/2024.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP47449 Metals (Cr, Fe, Mn), MP47573 (CR), see table below, GP54898/GN56447 (0.94 mg/l) Sulfate see table below, GP54884/GN56494 ND TOC
Field Blanks	No	No	P4-IRM-FB-20240620 (JD90827-4), see table below
Matrix Spike	NA	NA	Batch QC Metals, TOC, sulfate
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47449 Metals (Cr, Fe, Mn), MP47573 (CR), see table below, GP54898/GN56447 Sulfate (108.4 %R), GP54884/GN56494 TOC (102.0 %R)
Field Duplicate	Yes	No	114-PW-03WR-92.0-20240620 (JD90827-2, -2F) & 114-PW-03WR-92.0-20240620-X (JD90827-3, -3F)
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Method Blank

MP47449

Analyte	FRACTION	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	TOTAL/Dissolved	0.29	U	2.0	ALL	OK, Accept
IRON	DISSOLVED	105		50	ALL	SR all ND, Accept
MANGANESE	DISSOLVED	0.73	J	2.0	ALL	SR all ND, Accept

MP47573

Analyte	FRACTION	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	TOTAL	0.12	U	2.0	ALL	OK, Accept

MP47573

Analyte	FRACTION	SR (mg/l)	Qual	RL	Associated Samples	Action
SULFATE	TOTAL	0.94	J	2.0	ALL	All SR>10x MB, Accept

Field Blank

P4-IRM-FB-20240620 (JD90827-4)

Analyte	FRACTION	SR	Qual	RL	Units	Associated Samples	Action
TOC	TOTAL	1.0	U	1.0	mg/l	ALL	OK, Accept
SULFATE	TOTAL	2.0	U	2.0	mg/l	ALL	OK, Accept
CHROMIUM	TOTAL	2.9		2.0	ug/l	ALL	All SR>10x FB, Accept

LCS**MP47449**

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	83.3	104.1	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	4290	107.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	80.6	100.8	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable

MP47573

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	72.2	90.3	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable

Field Duplicates

114-PW-03WR-92.0-20240620 (JD90827-2, -2F) & 114-PW-03WR-92.0-20240620-X (JD90827-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	250000	U	250000	U	250000	ug/l	0	Both ND, Accept
MANGANESE	Dissolved	10000	U	10000	U	10000	ug/l	0	Both ND, Accept
CHROMIUM	Total	418000		452000		10000	ug/l	7.82	RPD < 20%, Accept
CHROMIUM	Dissolved	425000		399000		10000	ug/l	6.31	RPD < 20%, Accept
SULFATE	Total	452		447		10	mg/l	1.11	RPD < 20%, Accept
TOTAL ORGANIC CARBON	Total	3.7	J	3.6	J	5.0	mg/l	2.74	RPD < 20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-03WR-87.0-20240620	JD90827-1	TOC	Total	5
114-PW-03WR-87.0-20240620	JD90827-1	CHROMIUM	Total	10000
114-PW-03WR-87.0-20240620	JD90827-1	SULFATE	Total	5
114-PW-03WR-87.0-20240620	JD90827-1F	CHROMIUM	Dissolved	10000
114-PW-03WR-87.0-20240620	JD90827-1F	IRON	Dissolved	10000
114-PW-03WR-87.0-20240620	JD90827-1F	MANGANESE	Dissolved	10000
114-PW-03WR-92.0-20240620	JD90827-2	TOC	Total	5
114-PW-03WR-92.0-20240620	JD90827-2	CHROMIUM	Total	10000
114-PW-03WR-92.0-20240620	JD90827-2	SULFATE	Total	5
114-PW-03WR-92.0-20240620	JD90827-2F	CHROMIUM	Dissolved	10000
114-PW-03WR-92.0-20240620	JD90827-2F	IRON	Dissolved	10000
114-PW-03WR-92.0-20240620	JD90827-2F	MANGANESE	Dissolved	10000
114-PW-03WR-92.0-20240620-X	JD90827-3	TOC	Total	5
114-PW-03WR-92.0-20240620-X	JD90827-3	CHROMIUM	Total	10000
114-PW-03WR-92.0-20240620-X	JD90827-3	SULFATE	Total	5
114-PW-03WR-92.0-20240620-X	JD90827-3F	CHROMIUM	Dissolved	10000
114-PW-03WR-92.0-20240620-X	JD90827-3F	IRON	Dissolved	10000
114-PW-03WR-92.0-20240620-X	JD90827-3F	MANGANESE	Dissolved	10000
P4-IRM-FB-20240620	JD90827-4	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PW-03WR-87.0-20240620	JD90827-1, -1F	432000	10000	440000	10000	50000	8000	2	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PW-03WR-92.0-20240620	JD90827-2, -2F	418000	10000	425000	10000	50000	7000	2	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-PW-03WR-92.0-20240620-X	JD90827-3, -3F	452000	10000	399000	10000	50000	53000	12	T Cr > D Cr, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-03WR-87.0-20240620	JD90827-1	SULFATE	427	Y	mg/l	250
114-PW-03WR-87.0-20240620	JD90827-1	CHROMIUM	432000	Y	ug/l	70
114-PW-03WR-87.0-20240620	JD90827-1F	CHROMIUM	440000	Y	ug/l	70
114-PW-03WR-87.0-20240620	JD90827-1F	IRON	250000	N	ug/l	300
114-PW-03WR-87.0-20240620	JD90827-1F	MANGANESE	10000	N	ug/l	50
114-PW-03WR-92.0-20240620	JD90827-2	SULFATE	452	Y	mg/l	250
114-PW-03WR-92.0-20240620	JD90827-2	CHROMIUM	418000	Y	ug/l	70
114-PW-03WR-92.0-20240620	JD90827-2F	CHROMIUM	425000	Y	ug/l	70
114-PW-03WR-92.0-20240620	JD90827-2F	IRON	250000	N	ug/l	300
114-PW-03WR-92.0-20240620	JD90827-2F	MANGANESE	10000	N	ug/l	50
114-PW-03WR-92.0-20240620-X	JD90827-3	SULFATE	447	Y	mg/l	250
114-PW-03WR-92.0-20240620-X	JD90827-3	CHROMIUM	452000	Y	ug/l	70
114-PW-03WR-92.0-20240620-X	JD90827-3F	CHROMIUM	399000	Y	ug/l	70
114-PW-03WR-92.0-20240620-X	JD90827-3F	IRON	250000	N	ug/l	300
114-PW-03WR-92.0-20240620-X	JD90827-3F	MANGANESE	10000	N	ug/l	50

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD90827		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/25/2024		
Number of Samples/Matrix: 2 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 07/29/24		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			2.3 °C
Holding Time	X			Sampled 06/20/2024, Analyzed 06/24/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3073-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240620 (JD90827-4) ND, P4-IRM-TB-20240620 (JD90827-5), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate			X	Batch QC
Laboratory Control Standards	X			GAA3073-LCS (87 %R)
Field Duplicate	X			114-PW-03WR-92.0-20240620 (JD90827-2) & 114-PW-03WR-92.0-20240620-X (JD90827-3)
Percent Solids			X	Aqueous

Trip Blank

P4-IRM-TB-20240620 (JD90827-5)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.11		0.11	Associated SR>10x TB, Accept

SR – sample result

RL – reporting limit

Field Duplicates

114-PW-03WR-92.0-20240620 (JD90827-2) & 114-PW-03WR-92.0-20240620-X (JD90827-3)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
METHANE	348		312		0.55	ug/l	10.91	RPD<20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PW-03WR-87.0-20240620	JD90827-1	METHANE	5
114-PW-03WR-92.0-20240620	JD90827-2	METHANE	5
114-PW-03WR-92.0-20240620-X	JD90827-3	METHANE	5

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD90886
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/31/2024
Reviewed by:	Linda Waters/AECOM File Name: JD90886_2024_7_31 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24.

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 21, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW52D-80-83-20240621	JD90886-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20240621	JD90886-1F	Groundwater	Fe
114-MW52D-87-90-20240621	JD90886-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-87-90-20240621	JD90886-2F	Groundwater	Fe
114-MW52D-102-105-20240621	JD90886-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-102-105-20240621	JD90886-3F	Groundwater	Fe
114-MW72D-102-106-20240621	JD90886-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-102-106-20240621	JD90886-4F	Groundwater	Dissolved Hexavalent, Chromium, Dissolved Chromium, Fe

Field ID	Laboratory ID	Matrix	Parameter
114-MW72D-110-114-20240621	JD90886-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-110-114-20240621	JD90886-5F	Groundwater	Dissolved Hexavalent, Chromium, Dissolved Chromium, Fe
114-MW72D-116-119-20240621	JD90886-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-116-119-20240621	JD90886-6F	Groundwater	Dissolved Hexavalent, Chromium, Dissolved Chromium, Fe
114-MW72D-123-126-20240621	JD90886-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-123-126-20240621	JD90886-7F	Groundwater	Dissolved Hexavalent, Chromium, Dissolved Chromium, Fe
114-MW57D-87.5-91.5-20240621	JD90886-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-87.5-91.5-20240621	JD90886-8F	Groundwater	Fe
114-MW57D-96.5-100.5-20240621	JD90886-9	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-96.5-100.5-20240621	JD90886-9F	Groundwater	Fe
114-MW57D-104-108-20240621	JD90886-10	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-104-108-20240621	JD90886-10F	Groundwater	Fe
114-MW57D-109-113-20240621	JD90886-11	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-109-113-20240621	JD90886-11F	Groundwater	Fe
GW-RI-FB-20240621	JD90886-12	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20240621	JD90886-12F	Field Blank	Fe
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW52D-87-90-20240621 (JD90886-2), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW52D-87-90-20240621 (JD90886-2), was analyzed as a laboratory duplicate for hexavalent chromium in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recovery (%R) was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank GW-RI-FB-20240621 (JD90886-12) was submitted for hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW52D-80-83-20240621 (JD90886-1) was analyzed as a MS/MSD for chromium in this data set. All QC acceptance criteria were met or no qualifications were required.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank GW-RI-FB-20240621 (JD90886-12, -12F) was submitted for total chromium and dissolved ferrous iron analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (Sulfate, TOC)**Method Blank (MB)**

The sulfate MB, GP54898/GN56447, reported sulfate at a concentration greater than the MDL but less than the RL. The samples, GW-RI-FB-20240619 (JD90886-6), reported sulfate at a concentration less than three times the MB; therefore, sulfate was negated at the RL (UB). Samples 114-MW72D-102-106-20240621 (JD90886-4) and 114-MW72D-110-114-20240621 (JD90886-5) reported sulfate at concentrations greater than three times but less than ten times the amount in the MB; therefore, sulfate was qualified as estimated (JB). All other associated samples reported concentrations greater than ten times the amount in the MB. No qualifications were made to these samples.

Matrix Spike/ Matrix Spike Duplicate

Sample 114-MW52D-87-90-20240621 (JD90886-2) was analyzed as a MS/ MSD for TOC and sample 114-MW72D-102-106-20240621 (JD90886-4) was analyzed as a MS/ MSD for sulfate. All QC acceptance criteria were met. No qualifications were made.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank GW-RI-FB-20240621 (JD90886-12) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results estimated due to method blank contamination are useable with a potential high bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90886
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240621

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20240621	JD90886-4	Total	CHROMIUM (HEXAVALENT)	U	0.15	0.15	0.010		
114-MW72D-102-106-20240621	JD90886-4F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.13	0.13	0.010		
114-MW72D-110-114-20240621	JD90886-5	Total	CHROMIUM (HEXAVALENT)	U	0.10	0.10	0.010		
114-MW72D-110-114-20240621	JD90886-5F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.069	0.069	0.010		
114-MW72D-116-119-20240621	JD90886-6	Total	CHROMIUM (HEXAVALENT)	U	0.11	0.11	0.010		
114-MW72D-116-119-20240621	JD90886-6F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.030	0.030	0.010		
114-MW72D-123-126-20240621	JD90886-7	Total	CHROMIUM (HEXAVALENT)	U	0.020	0.020	0.010		
114-MW72D-123-126-20240621	JD90886-7F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.019	0.019	0.010		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90886
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240621

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20240621	JD90886-1	Total	CHROMIUM	U	20.7	20.7	10		
114-MW57D-104-108-20240621	JD90886-10	Total	CHROMIUM	U	8.6 B	8.6 J	10	Qualify	2
114-MW57D-104-108-20240621	JD90886-10F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57D-109-113-20240621	JD90886-11	Total	CHROMIUM	U	3.6 B	3.6 J	10	Qualify	2
114-MW57D-109-113-20240621	JD90886-11F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
GW-RI-FB-20240621	JD90886-12F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW52D-80-83-20240621	JD90886-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW52D-87-90-20240621	JD90886-2	Total	CHROMIUM	U	5.5 B	5.5 J	10	Qualify	2
114-MW52D-87-90-20240621	JD90886-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW52D-102-105-20240621	JD90886-3	Total	CHROMIUM	U	7.2 B	7.2 J	10	Qualify	2
114-MW52D-102-105-20240621	JD90886-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-102-106-20240621	JD90886-4	Total	CHROMIUM	U	403	403	10		
114-MW72D-102-106-20240621	JD90886-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-102-106-20240621	JD90886-4F	Dissolved	CHROMIUM	U	154	154	10		

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-110-114-20240621	JD90886-5	Total	CHROMIUM	U	196	196	10		
114-MW72D-110-114-20240621	JD90886-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-110-114-20240621	JD90886-5F	Dissolved	CHROMIUM	U	67.2	67.2	10		
114-MW72D-116-119-20240621	JD90886-6	Total	CHROMIUM	U	168	168	10		
114-MW72D-116-119-20240621	JD90886-6F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-116-119-20240621	JD90886-6F	Dissolved	CHROMIUM	U	26.6	26.6	10		
114-MW72D-123-126-20240621	JD90886-7	Total	CHROMIUM	U	125	125	10		
114-MW72D-123-126-20240621	JD90886-7F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-123-126-20240621	JD90886-7F	Dissolved	CHROMIUM	U	10.6	10.6	10		
114-MW57D-87.5-91.5-20240621	JD90886-8	Total	CHROMIUM	U	7.9 B	7.9 J	10	Qualify	2
114-MW57D-87.5-91.5-20240621	JD90886-8F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57D-96.5-100.5-20240621	JD90886-9	Total	CHROMIUM	U	8.6 B	8.6 J	10	Qualify	2
114-MW57D-96.5-100.5-20240621	JD90886-9F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90886
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240621

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20240621	JD90886-1	SULFATE	0.94	85.9	85.9	2.0		
114-MW57D-104-108-20240621	JD90886-10	SULFATE	U	128	128	2.0		
114-MW57D-109-113-20240621	JD90886-11	SULFATE	U	123	123	2.0		
114-MW52D-87-90-20240621	JD90886-2	SULFATE	0.94	148	148	2.0		
114-MW52D-102-105-20240621	JD90886-3	SULFATE	0.94	156	156	2.0		
114-MW72D-102-106-20240621	JD90886-4	SULFATE	0.94	6.2	6.2 JB	2.0	Qualify	1
114-MW72D-110-114-20240621	JD90886-5	SULFATE	0.94	7.9	7.9 JB	2.0	Qualify	1
114-MW72D-116-119-20240621	JD90886-6	SULFATE	U	9.2	9.2	2.0		
114-MW72D-123-126-20240621	JD90886-7	SULFATE	U	6.8	6.8	2.0		
114-MW57D-87.5-91.5-20240621	JD90886-8	SULFATE	U	84.5	84.5	2.0		
114-MW57D-96.5-100.5-20240621	JD90886-9	SULFATE	U	92.3	92.3	2.0		

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

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

NJDEP Validation Footnote

1. Sample result was $\geq 3x$ and $<10x$ the associated blank result.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90886
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs GW-RI-FB-20240621

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20240621	JD90886-1	Total	Total Organic Carbon	U	172	172	5.0		
114-MW57D-104-108-20240621	JD90886-10	Total	Total Organic Carbon	U	17.4	17.4	1.0		
114-MW57D-109-113-20240621	JD90886-11	Total	Total Organic Carbon	U	20.6	20.6	1.0		
114-MW52D-87-90-20240621	JD90886-2	Total	Total Organic Carbon	U	43.9	43.9	5.0		
114-MW52D-102-105-20240621	JD90886-3	Total	Total Organic Carbon	U	57.2	57.2	5.0		
114-MW72D-102-106-20240621	JD90886-4	Total	Total Organic Carbon	U	15.7	15.7	1.0		
114-MW72D-110-114-20240621	JD90886-5	Total	Total Organic Carbon	U	18.1	18.1	1.0		
114-MW72D-116-119-20240621	JD90886-6	Total	Total Organic Carbon	U	27.1	27.1	1.0		
114-MW72D-123-126-20240621	JD90886-7	Total	Total Organic Carbon	U	24.3	24.3	1.0		
114-MW57D-87.5-91.5-20240621	JD90886-8	Total	Total Organic Carbon	U	31.6	31.6	1.0		
114-MW57D-96.5-100.5-20240621	JD90886-9	Total	Total Organic Carbon	U	28.7	28.7	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD90886		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 7/31/2024	
Number of Samples/Matrix: 11 GW, 4 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 8/12/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	4.0 °C
Holding Time	Yes	No	Sampled 6/21/2024, analyzed 6/22/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	6/22/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56393-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240621 (JD90886-12) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW52D-87-90-20240621 (JD90886-2), {100.0%R}
Laboratory Duplicate	Yes	No	114-MW52D-87-90-20240621 (JD90886-2), Both ND, RPD 0
Laboratory Control Standards	Yes	No	GN56393-B1 (100.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW52D-87-90-20240621 (JD90886-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.15	NA	100.0	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference****R - recovery****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW52D-87-90-20240621	JD90886-2	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RPD – relative percent difference**Total Chromium vs Total Hexavalent Chromium**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW52D-80-83-20240621	JD90886-1	20.7	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-104-108-20240621	JD90886-10	8.6	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-109-113-20240621	JD90886-11	3.6	10		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20240621	JD90886-12		2.0		10	0	Both ND, Accept
114-MW52D-87-90-20240621	JD90886-2	5.5	10		10	NC	T Cr > T Cr6, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW52D-102-105-20240621	JD90886-3	7.2	10		10	NC	T Cr > T Cr6, Accept
114-MW72D-102-106-20240621	JD90886-4	403	10	150	10	92	T Cr > T Cr6, Accept
114-MW72D-110-114-20240621	JD90886-5	196	10	100	10	65	T Cr > T Cr6, Accept
114-MW72D-116-119-20240621	JD90886-6	168	10	110	10	42	T Cr > T Cr6, Accept
114-MW72D-123-126-20240621	JD90886-7	125	10	20	10	145	T Cr > T Cr6, Accept
114-MW57D-87.5-91.5-20240621	JD90886-8	7.9	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-96.5-100.5-20240621	JD90886-9	8.6	10		10	NC	T Cr > T Cr6, Accept

NC- not calculated

RPD – relative percent difference

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW72D-102-106-20240621	JD90886-4F	154	10	130	10	17	D Cr > D Cr6, Accept
114-MW72D-110-114-20240621	JD90886-5F	67.2	10	69	10	3	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-116-119-20240621	JD90886-6F	26.6	10	30	10	12	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-123-126-20240621	JD90886-7F	10.6	10	19	10	57	D Cr < D Cr6, SRs < 4x RL, ABS ≤ RL, Accept

NC- not calculated

RPD – relative percent difference

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-MW72D-102-106-20240621	JD90886-4, -4F	150	10	130	10	14	T Cr6 > D Cr6, Accept
114-MW72D-110-114-20240621	JD90886-5, -5F	100	10	69	10	37	T Cr6 > D Cr6, Accept
114-MW72D-116-119-20240621	JD90886-6, -6F	110	10	30	10	114	T Cr6 > D Cr6, Accept
114-MW72D-123-126-20240621	JD9088-7, -7F	20	10	19	10	5	T Cr6 > D Cr6, Accept

NC- not calculated

RPD – relative percent difference

RL – reporting limit

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW72D-102-106-20240621	JD90886-4	CHROMIUM (HEXAVALENT)	0.15	Y	mg/l	0.07
114-MW72D-102-106-20240621	JD90886-4F	CHROMIUM (HEXAVALENT)	0.13	Y	mg/l	0.07
114-MW72D-110-114-20240621	JD90886-5	CHROMIUM (HEXAVALENT)	0.1	Y	mg/l	0.07
114-MW72D-116-119-20240621	JD90886-6	CHROMIUM (HEXAVALENT)	0.11	Y	mg/l	0.07

SDG#: JD90886/ Method 7196

GN56393

Cr+6 ICAL 6/22/24

GW

(p.961 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.431
0.8	0.672
1	0.861

(p.961 of
data pkg)

AECOM Calculated Intercept	-0.00098	OK	Reported intercept	-0.0010
AECOM Slope	0.8547	OK	Reported Slope	0.8547
AECOM Calculated r	0.99986	OK	Reported r	0.99860

LCS calculation

GN56393-B1

P. 942, 961

Background absorbance

0

Sample absorbance

0.127

LCS Soluble Instrument Response

0.127

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN56393-B1

P. 942, 961

True Value (mg/L)

0.150

AECOM Calculated %R	99.8	OK	Reported %R	100.0

MS calculation

GN56393-S1

P. 944, 961

114-MW52D-87-90-20240621

Unfiltered

Background reading

0

Total absorbance

0.127

Total absorbance - background

0.127

Instrument Concentration (mg/L)

0.1497

Sample aliquot	0.05	NA: standards and samples treated the same		
Final volume	0.05			
Dilution Factor	1			
AECOM Calculated MS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150
%R = Found/True*100	GN56393-S1	P. 944, 961	114-MW52D-87-90-20240621	
True Value (mg/L)	0.150			
Native concentration (mg/L)	0.0			
AECOM Calculated MS Result %R	99.8	OK	Reported %R	100.0
UNFILTERED				
Reporting Limit	JD90886-2	P. 19, 961	114-MW52D-87-90-20240621	
Low Standard	0.01			
		NA: standards and samples treated the same		
Initial volume (L)	0.5			
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
Sample Calculations	JD90886-2	P. 19, 961	114-MW52D-87-90-20240621	
Background reading	0			
Total absorbance	0			
Total absorbance - background	0			
Instrument Response (mg/L)	0.001			
		NA: standards and samples treated the same		
Sample volume (L)	0.5			
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	0.0	OK <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD90886		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 7/31/2024	
Number of Samples/Matrix: 11 GW, 4 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 8/12/2024	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	4.0 °C
Holding Time	No	Yes	Sampled 6/21/2024, analyzed 6/24/2024 – 6/28/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	No	Yes	MP47461 ND Cr, MP47474 ND Cr, MP47531 ND Cr, GP54898/GN56447 (0.94 mg/l) sulfate, GP54899/GN56447 ND sulfate, GP54888/GN56472 ND TOC, GP54899/GN56472 ND TOC, GP54890/GN56580 ND TOC, GN56583 (dissolved) ND Fe,
Field Blanks	Yes	No	GW-RI-FB-20240621 (JD90886-12, 12F), ND
Matrix Spike	Yes	No	114-MW52D-80-83-20240621 (JD90886-1) Cr 114-MW52D-87-90-20240621 (JD90886-2) TOC, 114-MW72D-102-106-20240621(JD90886-4) sulfate, Batch QC dissolved Fe sulfate, TOC
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47461 Cr (93.9 %R), MP47474 Cr (97.4 %R), MP47531 Cr (83.1 %R), GP54898/GN56447 sulfate (108.4 %R), GP54899/GN56447 sulfate (109.1 %R), GP54888/GN56472 TOC (98.6 %R), GP54899/GN56472 TOC (108.0 %R), GP54890/GN56580 TOC (109.0 %R), GN56583 (dissolved) Fe (100.0 %R),
Field Duplicate	NA	NA	none

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW57D-104-108-20240621	JD90886-10F	IRON (FERROUS)	6/21/2024 9:25	6/27/2024 16:43	Estimate (UJ)
114-MW57D-109-113-20240621	JD90886-11F	IRON (FERROUS)	6/21/2024 9:45	6/27/2024 16:43	Estimate (UJ)
GW-RI-FB-20240621	JD90886-12F	IRON (FERROUS)	6/21/2024 15:30	6/27/2024 16:43	Estimate (UJ)
114-MW52D-80-83-20240621	JD90886-1F	IRON (FERROUS)	6/21/2024 14:00	6/28/2024 10:30	Estimate (UJ)
114-MW52D-87-90-20240621	JD90886-2F	IRON (FERROUS)	6/21/2024 14:10	6/28/2024 10:30	Estimate (UJ)
114-MW52D-102-105-20240621	JD90886-3F	IRON (FERROUS)	6/21/2024 14:20	6/28/2024 10:30	Estimate (UJ)
114-MW72D-102-106-20240621	JD90886-4F	IRON (FERROUS)	6/21/2024 11:15	6/27/2024 16:43	Estimate (UJ)
114-MW72D-110-114-20240621	JD90886-5F	IRON (FERROUS)	6/21/2024 11:25	6/27/2024 16:43	Estimate (UJ)
114-MW72D-116-119-20240621	JD90886-6F	IRON (FERROUS)	6/21/2024 11:50	6/27/2024 16:43	Estimate (UJ)
114-MW72D-123-126-20240621	JD90886-7F	IRON (FERROUS)	6/21/2024 12:15	6/27/2024 16:43	Estimate (UJ)
114-MW57D-87.5-91.5-20240621	JD90886-8F	IRON (FERROUS)	6/21/2024 9:10	6/27/2024 16:43	Estimate (UJ)
114-MW57D-96.5-100.5-20240621	JD90886-9F	IRON (FERROUS)	6/21/2024 9:15	6/27/2024 16:43	Estimate (UJ)

Method Blank

GP54898/GN56447

Analyte	Fraction	SR (mg/l)	Qual	RL	Associated Samples	Action
SULFATE	Total	0.94	J	2.0	JD90886-1, -2, -3, -4, -5	114-MW72D-102-106-20240621 (JD90886-4) and 114-MW72D-110-114-20240621 (JD90886-5) SR >3x but <10x MB, Estimate (JB) . All other SR >10x the amount in the MB, Accept

SR – sample result

RL – reporting limit

Matrix Spikes/Matrix Spike Duplicates

114-MW52D-87-90-20240621 (JD90886-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	50	43.9	91.9	91.7	96.0	95.6	143	59	0.2	15	OK RPD <15%, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

RPD – relative percent difference

114-MW72D-102-106-20240621 (JD90886-4)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
SULFATE	Total	80	6.2	95.3	95.0	111.4	111	120	80	0.3	15	OK RPD <15%, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

RPD – relative percent difference

114-MW52D-80-83-20240621 (JD90886-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	20.7	89.7	90.0	86.3	86.6	125	75	0.3	20	OK RPD <20%, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

RPD – relative percent difference

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW72D-102-106-20240621	JD90886-4	CHROMIUM	403	Y	ug/l	70
114-MW72D-102-106-20240621	JD90886-4F	CHROMIUM	154	Y	ug/l	70
114-MW72D-110-114-20240621	JD90886-5	CHROMIUM	196	Y	ug/l	70
114-MW72D-116-119-20240621	JD90886-6	CHROMIUM	168	Y	ug/l	70
114-MW72D-123-126-20240621	JD90886-7	CHROMIUM	125	Y	ug/l	70

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RL X5	Absolute Difference	RPD (%)	Action
114-MW72D-102-106-20240621	JD90886-4, -4F	403	10	154	10	50	249	89	T Cr > D Cr, Accept
114-MW72D-110-114-20240621	JD90886-5, -5F	196	10	67.2	10	50	129	98	T Cr > D Cr, Accept
114-MW72D-116-119-20240621	JD90886-6, -6F	168	10	26.6	10	50	141	145	T Cr > D Cr, Accept
114-MW72D-123-126-20240621	JD9088-7, -7F	125	10	10.6	10	50	114	169	T Cr > D Cr, Accept

RL – reporting limit**RPD – relative percent difference****Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW52D-80-83-20240621	JD90886-1	TOC	Total	5
114-MW52D-80-83-20240621	JD90886-1	CHROMIUM	Total	10
114-MW57D-104-108-20240621	JD90886-10	CHROMIUM	Total	10
114-MW57D-109-113-20240621	JD90886-11	CHROMIUM	Total	10
GW-RI-FB-20240621	JD90886-12	CHROMIUM	Total	2
114-MW52D-87-90-20240621	JD90886-2	TOC	Total	5

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW52D-87-90-20240621	JD90886-2	CHROMIUM	Total	10
114-MW52D-102-105-20240621	JD90886-3	TOC	Total	5
114-MW52D-102-105-20240621	JD90886-3	CHROMIUM	Total	10
114-MW72D-102-106-20240621	JD90886-4	CHROMIUM	Total	10
114-MW72D-102-106-20240621	JD90886-4F	CHROMIUM	Dissolved	10
114-MW72D-110-114-20240621	JD90886-5	CHROMIUM	Total	10
114-MW72D-110-114-20240621	JD90886-5F	CHROMIUM	Dissolved	10
114-MW72D-116-119-20240621	JD90886-6	CHROMIUM	Total	10
114-MW72D-116-119-20240621	JD90886-6F	CHROMIUM	Dissolved	10
114-MW72D-123-126-20240621	JD90886-7	CHROMIUM	Total	10
114-MW72D-123-126-20240621	JD90886-7F	CHROMIUM	Dissolved	10
114-MW57D-87.5-91.5-20240621	JD90886-8	CHROMIUM	Total	10
114-MW57D-96.5-100.5-20240621	JD90886-9	CHROMIUM	Total	10

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD90888
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 TOC by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/26/2024
Reviewed by:	Linda Waters /AECOM File Name: JD90888_2024_07_26 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 21, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-04WR-50.0-20240621	JD90888-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-04WR-50.0-20240621	JD90888-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-04WR-55.0-20240621	JD90888-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-04WR-55.0-20240621	JD90888-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
P4-IRM-FB-20240621	JD90888-3	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240621	JD90888-4	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Sample 114-PW-04WR-50.0-20240621 (JD90888-1, -1F) were analyzed as MSs for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Samples 114-PW-04WR-50.0-20240621 (JD90888-1, -1F) were analyzed as laboratory duplicates for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240621 (JD90888-3) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese)**Method Blank (MB)**

The method Blank, MP47449, reported iron at a concentration greater than the reporting limit (RL). Manganese was reported at a concentration greater than the method detection limit (MDL) but less than the RL. All associated sample results were non-detect for iron and manganese. No qualifications were made.

Field Blank (FB)

Field blank P4-IRM-FB-20240621 (JD90888-3) was submitted for total chromium analysis. Chromium was reported at a concentration greater than the method detection limit (MDL) but less than the RL. All associated sample results were greater than ten times the amount in the field blank; therefore, considered not affected and no qualifications were made.

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

Samples 114-PW-04WR-50.0-20240621 (JD90888-1, -1F) were analyzed as MS/MSDs for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)**

Sample 114-PW-04WR-50.0-20240621 (JD90888-1) was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240621 (JD90888-3) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane**Field Blank (FB)**

The field blank (FB), P4-IRM-FB-20240621 (JD90888-3), reported methane at a concentration greater than the MDL but less than the RL. All associated sample results were greater than ten times the amount in the field blank; therefore, considered not affected and no qualifications were made.

Trip Blank (TB)

The trip blank (TB), P4-IRM-TB-20240621 (JD90888-4), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Lab Duplicate

Sample 114-PW-04WR-50.0-20240621 (JD90888-1) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90888
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240621

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-04WR-50.0-20240621	JD90888-1	Total	CHROMIUM (HEXAVALENT)	U	6.9	6.9	0.50		
114-PW-04WR-50.0-20240621	JD90888-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	7.1	7.1	0.50		
114-PW-04WR-55.0-20240621	JD90888-2	Total	CHROMIUM (HEXAVALENT)	U	7.4	7.4	0.50		
114-PW-04WR-55.0-20240621	JD90888-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	7.4	7.4	0.50		

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

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

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90888
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240621

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-04WR-50.0-20240621	JD90888-1	Total	CHROMIUM	U	6320	6320	10000		
114-PW-04WR-50.0-20240621	JD90888-1F	Dissolved	CHROMIUM	U	6160	6160	10000		
114-PW-04WR-55.0-20240621	JD90888-2	Total	CHROMIUM	U	7240	7240	10000		
114-PW-04WR-55.0-20240621	JD90888-2F	Dissolved	CHROMIUM	U	7260	7260	10000		
P4-IRM-FB-20240621	JD90888-3	Total	CHROMIUM	U	0.73 B	0.73 J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90888
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240621

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-04WR-50.0-20240621	JD90888-1	TOTAL ORGANIC CARBON	U	3.1	3.1	1.0		
114-PW-04WR-55.0-20240621	JD90888-2	TOTAL ORGANIC CARBON	U	2.2	2.2	1.0		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90888
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240621

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-04WR-50.0-20240621	JD90888-1	SULFATE	U	507	507	6.0		
114-PW-04WR-55.0-20240621	JD90888-2	SULFATE	U	542	542	6.0		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 21, 2024
Lab Name/ID SGS, Dayton
SDG No JD90888
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240621
Field Blank ID P4-IRM-FB-20240621

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-04WR-50.0-20240621	JD90888-1	METHANE	U	673	673	1.1		
114-PW-04WR-55.0-20240621	JD90888-2	METHANE	U	705	705	1.1		
P4-IRM-FB-20240621	JD90888-3	METHANE	U	0.080 J	0.080 J	0.11	Qualify	1
P4-IRM-TB-20240621	JD90888-4	METHANE	U	0.14	0.14	0.11		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (J) by the laboratory.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD90888		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/26/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 07/29/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.8 °C
Holding Time	Yes	No	Sampled 06/21/2024 analyzed 06/22/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	06/22/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56393-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240621 (JD90888-3), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-PW-04WR-50.0-20240621 (JD90888-1, -1F) {101.4 %R, and 100.9 %R}
Laboratory Duplicate	Yes	No	114-PW-04WR-50.0-20240621 (JD90888-1, -1F) {RPD 1.5, RPD 0}
Laboratory Control Standards	Yes	No	GN56393-B1 (100.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PW-04WR-50.0-20240621	JD90888-1	6320	100	6900	500	9	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-04WR-55.0-20240621	JD90888-2	7240	100	7400	500	2	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
P4-IRM-FB-20240621	JD90888-3	0.73	2.0		10	NC	T Cr > T Cr6, Accept

NC – not calculated**Dissolved Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-04WR-50.0-20240621	JD90888-1F	6160	100	7100	500	14	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-04WR-55.0-20240621	JD90888-2F	7260	100	7400	500	2	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-04WR-50.0-20240621	JD90888-1, -1F	6900	500	7100	500	3	T Cr6 < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-PW-04WR-55.0-20240621	JD90888-2, -2F	7400	500	7400	500	0	T Cr6 ≥ D Cr6, Accept

Reporting Limits GW

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-04WR-50.0-20240621	JD90888-1	CHROMIUM (HEXAVALENT)	6.9	Y	mg/l	0.07
114-PW-04WR-50.0-20240621	JD90888-1F	CHROMIUM (HEXAVALENT)	7.1	Y	mg/l	0.07
114-PW-04WR-55.0-20240621	JD90888-2	CHROMIUM (HEXAVALENT)	7.4	Y	mg/l	0.07
114-PW-04WR-55.0-20240621	JD90888-2F	CHROMIUM (HEXAVALENT)	7.4	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-04WR-50.0-20240621	JD90888-1	CHROMIUM (HEXAVALENT)	Total	50
114-PW-04WR-50.0-20240621	JD90888-1F	CHROMIUM (HEXAVALENT)	Dissolved	50
114-PW-04WR-55.0-20240621	JD90888-2	CHROMIUM (HEXAVALENT)	Total	50
114-PW-04WR-55.0-20240621	JD90888-2F	CHROMIUM (HEXAVALENT)	Dissolved	50

SDG#: JD90888/ Method 7196**GN56393**

Cr+6 ICAL 6/22/24

GW

(p. 948 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.431
0.8	0.672
1	0.861

(p. 948 of
data pkg)

AECOM Calculated Intercept	-0.00098	OK	Reported intercept	-0.0010
AECOM Slope	0.8547	OK	Reported Slope	0.8547
AECOM Calculated r	0.99986	OK	Reported r	0.99986

LCS calculation**GN56393-B1****P. 932, 948**

Background absorbance	0
Sample absorbance	0.127
LCS Soluble Instrument Response	0.127
Instrument Concentration (mg/L)	0.150

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN56393-B1****P. 932, 948**

True Value (mg/L)	0.150

AECOM Calculated %R	99.8	OK	Reported %R	100.0

MS calculation**GN56393-S2****P. 934, 948****114-PW-04WR-50.0-20240621****unfiltered**

Background reading	0
Total absorbance	0.356
Total absorbance - background	0.356
Instrument Concentration (mg/L)	0.4177

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	50

AECOM Calculated MS Result (mg/L)	20.884	OK	Reported Result (mg/L)	20.900

%R = Found/True*100**GN56393-S2****P. 934, 948****114-PW-04WR-50.0-20240621**

True Value (mg/L)	13.800

Native concentration (mg/L)	6.900

AECOM Calculated MS Result %R	101.3	OK	Reported %R	101.4

UNFILTERED**Reporting Limit****JD90888-1****P. 12, 948****114-PW-04WR-50.0-20240621**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	50

AECOM Calculated Reporting Limit	0.500	OK	Reported RL (mg/L)=	0.500

UNFILTERED**Sample Calculations****JD90888-1****P. 12, 948****114-PW-04WR-50.0-20240621**

Background reading	0
Total absorbance	0.117
Total absorbance - background	0.117
Instrument Response (mg/L)	0.138

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	50

AECOM Calculated Result (mg/L)	6.9	OK	Reported Result (mg/L)	6.9

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD90888		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/26/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 07/29/24	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.8 °C
Holding Time	Yes	No	Sampled 06/21/2024, analyzed 06/25/2024 -06/26/2024.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP47449 Metals (Cr, Fe, Mn), see table below, GP54899/GN56447 ND Sulfate, GP54890/GN56580 ND TOC
Field Blanks	No	No	P4-IRM-FB-20240621 (JD90888-3), see table below
Matrix Spike	Yes	No	114-PW-04WR-50.0-20240621 (JD90888-1, -1F) Metals, TOC, sulfate
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47449 Metals (Cr, Fe, Mn), see table below, GP54899/GN56447 Sulfate (109.1 %R), GP54890/GN56580 TOC (109.0 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Method Blank

MP47449

Analyte	FRACTION	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	TOTAL/Dissolved	0.29	U	2.0	ALL	OK, Accept
IRON	DISSOLVED	105		50	ALL	SR all ND, Accept
MANGANESE	DISSOLVED	0.73	J	2.0	ALL	SR >10x MB, Accept

Field Blank

P4-IRM-FB-20240621 (JD90888-3)

Analyte	FRACTION	SR	Qual	RL	Units	Associated Samples	Action
TOC	TOTAL	1.0	U	1.0	mg/l	ALL	OK, Accept
SULFATE	TOTAL	2.0	U	2.0	mg/l	ALL	OK, Accept
CHROMIUM	TOTAL	0.73	J	2.0	ug/l	ALL	All SR>10x FB, Accept

Matrix Spikes/Matrix Spike Duplicates

114-PW-04WR-50.0-20240621 (JD90888-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	3.1	14.2	13.0	111.0	99	143	59	8.8	15	OK, Accept
SULFATE	Total	80	507	624	617	146.3	135	120	80	4.1	30	SR>5x amt spiked, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-PW-04WR-50.0-20240621 (JD90888-1, -1F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	6320	6340	6930	25.0	762.5	125	75	8.9	20	SR>5x amt spiked, Accept
IRON	Total	4000	164	4510	4550	108.7	109.7	125	75	0.9	20	OK, Accept
MANGANESE	Total	80	111	186	195	93.8	105.0	125	75	4.7	20	OK, Accept
CHROMIUM	Dissolved	80	6160	6400	6080	300.0	-100.0	125	75	5.1	20	SR>5x amt spiked, Accept
IRON	Dissolved	4000	28.6	4370	4260	108.5	105.8	125	75	2.5	20	OK, Accept
MANGANESE	Dissolved	80	112	192	191	100.0	98.8	125	75	0.5	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****LCS****MP47449**

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	83.3	104.1	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	4290	107.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	80.6	100.8	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable**Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-04WR-50.0-20240621	JD90888-1	CHROMIUM	Total	100
114-PW-04WR-50.0-20240621	JD90888-1	SULFATE	Total	3

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-04WR-50.0-20240621	JD90888-1F	CHROMIUM	Dissolved	100
114-PW-04WR-50.0-20240621	JD90888-1F	IRON	Dissolved	10
114-PW-04WR-50.0-20240621	JD90888-1F	MANGANESE	Dissolved	10
114-PW-04WR-55.0-20240621	JD90888-2	CHROMIUM	Total	100
114-PW-04WR-55.0-20240621	JD90888-2	SULFATE	Total	3
114-PW-04WR-55.0-20240621	JD90888-2F	CHROMIUM	Dissolved	100
114-PW-04WR-55.0-20240621	JD90888-2F	IRON	Dissolved	10
114-PW-04WR-55.0-20240621	JD90888-2F	MANGANESE	Dissolved	10
P4-IRM-FB-20240621	JD90888-3	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PW-04WR-50.0-20240621	JD90888-1, -1F	6320	100	6160	100	500	160	3	T Cr > D Cr, Accept
114-PW-04WR-55.0-20240621	JD90888-2, -2F	7240	100	7260	100	500	20	0	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-04WR-50.0-20240621	JD90888-1	CHROMIUM	6320	Y	ug/l	70
114-PW-04WR-50.0-20240621	JD90888-1F	MANGANESE	112	Y	ug/l	50
114-PW-04WR-50.0-20240621	JD90888-1F	CHROMIUM	6160	Y	ug/l	70
114-PW-04WR-55.0-20240621	JD90888-2	SULFATE	542	Y	mg/l	250
114-PW-04WR-55.0-20240621	JD90888-2	CHROMIUM	7240	Y	ug/l	70
114-PW-04WR-55.0-20240621	JD90888-2F	MANGANESE	125	Y	ug/l	50
114-PW-04WR-55.0-20240621	JD90888-2F	CHROMIUM	7260	Y	ug/l	70

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD90888		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/26/2024		
Number of Samples/Matrix: 2 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 07/29/24		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			2.8 °C
Holding Time	X			Sampled 06/21/2024, Analyzed 06/24/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3073-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240621 (JD90888-3), P4-IRM-TB-20240621 (JD90888-4), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate	X			114-PW-04WR-50.0-20240621 (JD90888-1), see table below
Laboratory Control Standards	X			GAA3073-LCS (87 %R)
Field Duplicate			X	None with this SDG
Percent Solids			X	Aqueous

Field Blank

P4-IRM-FB-20240621 (JD90888-3)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.080	J	0.11	Associated SR>10x FB, Accept

SR – sample result**RL – reporting limit****Trip Blank**

P4-IRM-TB-20240621 (JD90888-4)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.14		0.11	Associated SR>10x TB, Accept

SR – sample result**RL – reporting limit****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PW-04WR-50.0-20240621	(JD90888-1)	METHANE	673		560		1.1	ug/l	18	OK RPD <20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PW-04WR-50.0-20240621	JD90888-1	METHANE	10
114-PW-04WR-55.0-20240621	JD90888-2	METHANE	10

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD91036
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/26/2024
Reviewed by:	Linda Waters /AECOM File Name: JD91036_2024_07_26 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 24, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-09WR-82.0-20240624	JD91036-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-09WR-82.0-20240624	JD91036-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-09WR-77.0-20240624	JD91036-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-09WR-77.0-20240624	JD91036-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-09WR-77.0-20240624-X (Field Duplicate of 114-PW-09WR-77.0-20240624)	JD91036-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-09WR-77.0-20240624-X (Field Duplicate of 114-PW-09WR-77.0-20240624)	JD91036-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese

Field ID	Laboratory ID	Matrix	Parameter*
P4-IRM-FB-20240624	JD91036-4	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240624	JD91036-5	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Sample 114-PW-09WR-82.0-20240624 (JD91036-1F) was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-PW-09WR-82.0-20240624 (JD91036-1F) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240624 (JD91036-4) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-PW-09WR-77.0-20240624 (JD91036-2, -2F) and 114-PW-09WR-77.0-20240624-X (JD91036-3, -3F) were analyzed as the field duplicate pairs for hexavalent chromium. All QC acceptance criteria were met.

Metals (Chromium, Iron, Manganese)**Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240624 (JD91036-4) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-PW-09WR-77.0-20240624 (JD91036-2) and 114-PW-09WR-77.0-20240624-X (JD91036-3) were analyzed as the field duplicate pair for chromium, iron, and manganese. All QC acceptance criteria were met.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)

Field Blank (FB)

The field blank (FB), P4-IRM-FB-20240624 (JD91036-4), reported TOC at a concentration greater than the reporting limit (RL). All of the associated samples reported TOC at concentrations greater than the RL but less than three times the amount in the FB; therefore, the TOC results were negated (UB) at the reported concentrations.

Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate (FD)

Samples 114-PW-09WR-77.0-20240624 (JD91036-2) and 114-PW-09WR-77.0-20240624-X (JD91036-3) were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met.

Methane

Trip Blank (TB)

The trip blank (TB), P4-IRM-TB-20240624 (JD91036-5), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Field Blank (FB)

Field blank P4-IRM-FB-20240624 (JD91036-4) was submitted for methane analysis. No contamination was detected, and no samples required qualification.

Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Lab Duplicate

Sample 114-PW-09WR-82.0-20240624 (JD91036-1) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate (FD)

Samples 114-PW-09WR-77.0-20240624 (JD91036-2) and 114-PW-09WR-77.0-20240624-X (JD91036-3) were analyzed as the field duplicate pair for methane. All QC acceptance criteria were met.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

Results negated due to field blank contamination are useable at the reported concentrations.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91036
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240624

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91036
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240624

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-09WR-82.0-20240624	JD91036-1	Total	CHROMIUM	U	3.3 B	3.3 J	10	Qualify	1
114-PW-09WR-82.0-20240624	JD91036-1F	Dissolved	IRON	U	380	380	250		
114-PW-09WR-82.0-20240624	JD91036-1F	Dissolved	MANGANESE	U	90.0	90.0	10		
114-PW-09WR-77.0-20240624	JD91036-2F	Dissolved	IRON	U	414	414	250		
114-PW-09WR-77.0-20240624	JD91036-2F	Dissolved	MANGANESE	U	85.3	85.3	10		
114-PW-09WR-77.0-20240624-X	JD91036-3F	Dissolved	IRON	U	417	417	250		
114-PW-09WR-77.0-20240624-X	JD91036-3F	Dissolved	MANGANESE	U	86.3	86.3	10		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91036
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240624

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-09WR-82.0-20240624	JD91036-1	TOTAL ORGANIC CARBON	U	4.3	UB	4.3	Qualify	1
114-PW-09WR-77.0-20240624	JD91036-2	TOTAL ORGANIC CARBON	U	3.0	UB	3.0	Qualify	1
114-PW-09WR-77.0-20240624-X	JD91036-3	TOTAL ORGANIC CARBON	U	3.9	UB	3.9	Qualify	1
P4-IRM-FB-20240624	JD91036-4	TOTAL ORGANIC CARBON	U	1.8	1.8	1.0		

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

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

NJDEP Validation Footnote

1. Sample result was >RL and <3X the associated blank result. Sample result was negated at the reported concentration.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91036
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240624

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-09WR-82.0-20240624	JD91036-1	SULFATE	U	242	242	2.0		
114-PW-09WR-77.0-20240624	JD91036-2	SULFATE	U	236	236	2.0		
114-PW-09WR-77.0-20240624-X	JD91036-3	SULFATE	U	237	237	2.0		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91036
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240624
Field Blank ID P4-IRM-FB-20240624

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-09WR-82.0-20240624	JD91036-1	METHANE	U	1070	1070	2.8		
114-PW-09WR-77.0-20240624	JD91036-2	METHANE	U	1050	1050	2.8		
114-PW-09WR-77.0-20240624-X	JD91036-3	METHANE	U	1070	1070	2.8		
P4-IRM-TB-20240624	JD91036-5	METHANE	U	0.12	0.12	0.11		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD91036		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/26/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 07/29/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.9 °C
Holding Time	Yes	No	Sampled 06/24/2024 analyzed 06/25/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	06/25/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56451-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240624 (JD91036-4), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-PW-09WR-82.0-20240624 (JD91036-1F) {93.3 %R}
Laboratory Duplicate	Yes	No	114-PW-09WR-82.0-20240624 (JD91036-1F) Both ND, { RPD 0}
Laboratory Control Standards	Yes	No	GN56451-B1 (97.3 %R)
Field Duplicate	Yes	No	114-PW-09WR-77.0-20240624 (JD91036-2) & 114-PW-09WR-77.0-20240624-X (JD91036-3)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Field Duplicates

114-PW-09WR-77.0-20240624 (JD91036-2, -2F) & 114-PW-09WR-77.0-20240624-X (JD91036-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total		U		U	10.0	ug/l	0	Both ND, Accept
HEXAVALENT CHROMIUM	Dissolved		U		U	10.0	ug/l	0	Both ND, Accept

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PW-09WR-82.0-20240624	JD91036-1	3.3	10		10	NC	T Cr > T Cr6, Accept
114-PW-09WR-77.0-20240624	JD91036-2		10		10	0	Both ND, Accept
114-PW-09WR-77.0-20240624-X	JD91036-3		10		10	0	Both ND, Accept
P4-IRM-FB-20240624	JD91036-4		2.0		10	0	Both ND, Accept

NC – not calculated

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-09WR-82.0-20240624	JD91036-1F		10		10	0	Both ND, Accept
114-PW-09WR-77.0-20240624	JD91036-2F		10		10	0	Both ND, Accept
114-PW-09WR-77.0-20240624-X	JD91036-3F		10		10	0	Both ND, Accept

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-09WR-82.0-20240624	JD91036-1, -1F		10		10	0	Both ND, Accept
114-PW-09WR-77.0-20240624	JD91036-2, -2F		10		10	0	Both ND, Accept
114-PW-09WR-77.0-20240624-X	JD91036-3, -3F		10		10	0	Both ND, Accept

SDG#: JD91036/ Method 7196**GN56451**

Cr+6 ICAL 6/25/24

GW

(p. 706 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.09
0.3	0.27
0.5	0.437
0.8	0.694
1	0.872

(p. 706 of
data pkg)

AECOM Calculated Intercept	0.00185	OK	Reported intercept	0.0019
AECOM Slope	0.8696	OK	Reported Slope	0.8696
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation**GN56451-B1****P. 695, 706**

Background absorbance	0
Sample absorbance	0.129
LCS Soluble Instrument Response	0.129
Instrument Concentration (mg/L)	0.146

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.146	OK	Reported Result (mg/L)	0.146

%R = Found/True*100**GN56451-B1****P. 695, 706**

True Value (mg/L)	0.150

AECOM Calculated %R	97.5	OK	Reported %R	97.3

MS calculation**GN56451-S1****P. 697, 706, 707****114-PW-09WR-82.0-20240624****filtered**

Background reading	0
Total absorbance	0.127
Total absorbance - background	0.127
Instrument Concentration (mg/L)	0.1439

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.144	OK	Reported Result (mg/L)	0.144

%R = Found/True*100**GN56451-S1****P. 697, 706, 707****114-PW-09WR-82.0-20240624**

True Value (mg/L)	0.150

Native concentration (mg/L)	0.000

AECOM Calculated MS Result %R	95.9	OK	Reported %R	96.0

UNFILTERED**Reporting Limit****JD91036-1****P. 12, 706****114-PW-09WR-82.0-20240624**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED**Sample Calculations****JD91036-1****P. 12, 706****114-PW-09WR-82.0-20240624**

Background reading	0.002
Total absorbance	0.003
Total absorbance - background	0.001
Instrument Response (mg/L)	-0.001

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	1

AECOM Calculated Result (mg/L)	0.0	OK, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD91036		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/26/2024	
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 07/29/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.9 °C
Holding Time	Yes	No	Sampled 06/24/2024, analyzed 06/25/2024 -06/28/2024.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP47474 Metals (Cr, Fe, Mn) ND, GP54957/GN56554 ND Sulfate, GP54904/GN56642 ND TOC
Field Blanks	No	Yes	P4-IRM-FB-20240624 (JD91036-4), see table below
Matrix Spike	NA	NA	Batch QC Metals, TOC, sulfate
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47474 Metals (Cr, Fe, Mn) see table below, GP54957/GN56554 Sulfate (100.5 %R), GP54904/GN56642 TOC (103.0 %R)
Field Duplicate	Yes	No	114-PW-09WR-77.0-20240624 (JD91036-2) & 114-PW-09WR-77.0-20240624-X (JD91036-3)
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Field Blank

P4-IRM-FB-20240624 (JD91036-4)

Analyte	FRACTION	SR	Qual	RL	Units	Associated Samples	Action
TOC	TOTAL	1.8		1.0	mg/l	ALL	All SR >RL but < 3x FB, Negate (UB) at concentration.
SULFATE	TOTAL	2.0	U	2.0	mg/l	ALL	OK, Accept
CHROMIUM	TOTAL	2.0	U	2.0	ug/l	ALL	OK, Accept

LCS**MP47474**

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	77.9	97.4	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	4050	101.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	77.9	97.4	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable**Field Duplicates**

114-PW-09WR-77.0-20240624 (JD91036-2, -2F) & 114-PW-09WR-77.0-20240624 -X (JD91036-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
IRON	Dissolved	414		417		250	ug/l	0.72	RPD < 20%, Accept
MANGANESE	Dissolved	85.3		86.3		10	ug/l	1.17	RPD < 20%, Accept
CHROMIUM	Dissolved	10	U	10	U		ug/l	0	Both ND, Accept
CHROMIUM	Total	10	U	10	U	10	ug/l	0	Both ND, Accept
SULFATE	Total	236		237		2.0	mg/l	0.42	RPD < 20%, Accept

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
TOTAL ORGANIC CARBON	Total	3.0		3.9		1.0	mg/l	26.1	SR <5xRL, ABS Diff <RL, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-09WR-82.0-20240624	JD91036-1	CHROMIUM	Total	10
114-PW-09WR-82.0-20240624	JD91036-1F	CHROMIUM	Dissolved	10
114-PW-09WR-82.0-20240624	JD91036-1F	IRON	Dissolved	10
114-PW-09WR-82.0-20240624	JD91036-1F	MANGANESE	Dissolved	10
114-PW-09WR-77.0-20240624	JD91036-2	CHROMIUM	Total	10
114-PW-09WR-77.0-20240624	JD91036-2F	CHROMIUM	Dissolved	10
114-PW-09WR-77.0-20240624	JD91036-2F	IRON	Dissolved	10
114-PW-09WR-77.0-20240624	JD91036-2F	MANGANESE	Dissolved	10
114-PW-09WR-77.0-20240624-X	JD91036-3	CHROMIUM	Total	10
114-PW-09WR-77.0-20240624-X	JD91036-3F	CHROMIUM	Dissolved	10
114-PW-09WR-77.0-20240624-X	JD91036-3F	IRON	Dissolved	10
114-PW-09WR-77.0-20240624-X	JD91036-3F	MANGANESE	Dissolved	10
P4-IRM-FB-20240624	JD91036-4	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PW-09WR-82.0-20240624	JD91036-1, -1F	3.3	10		10	50	3	NC	T Cr > D Cr, Accept
114-PW-09WR-77.0-20240624	JD91036-2, -2F		10		10	50	0	0	Both ND, Accept
114-PW-09WR-77.0-20240624-X	JD91036-3, -3F		10		10	50	0	0	Both ND, Accept

NC – not calculated

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-PW-09WR-77.0-20240624	JD91036-2F	IRON	414	Y	ug/l	300
114-PW-09WR-77.0-20240624	JD91036-2F	MANGANESE	85.3	Y	ug/l	50
114-PW-09WR-77.0-20240624-X	JD91036-3F	IRON	417	Y	ug/l	300
114-PW-09WR-77.0-20240624-X	JD91036-3F	MANGANESE	86.3	Y	ug/l	50
114-PW-09WR-82.0-20240624	JD91036-1F	IRON	380	Y	ug/l	300
114-PW-09WR-82.0-20240624	JD91036-1F	MANGANESE	90	Y	ug/l	50

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD91036		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/26/2024		
Number of Samples/Matrix: 2 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 07/29/24		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			2.9 °C
Holding Time	X			Sampled 06/24/2024, Analyzed 06/27/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3077-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240624 (JD91036-4), P4-IRM-TB-20240624 (JD91036-5), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate	X			114-PW-09WR-82.0-20240624 (JD91036-1), see table below
Laboratory Control Standards	X			GAA3077-LCS (106 %R)
Field Duplicate	X			114-PW-09WR-77.0-20240624 (JD91036-2) & 114-PW-09WR-77.0-20240624-X (JD91036-3)
Percent Solids			X	Aqueous

Trip Blank

P4-IRM-TB-20240624 (JD91036-5)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.12		0.11	Associated SR>10x TB, Accept

SR – sample result

RL – reporting limit

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-PW-09WR-82.0-20240624	JD91036-1	METHANE	1070		874		1.1	ug/l	20	OK RPD $\leq$ 20%, Accept

Field Duplicates

114-PW-09WR-77.0-20240624 (JD91036-2) & 114-PW-09WR-77.0-20240624-X (JD91036-3)

Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
METHANE	1050		1070		2.8	ug/l	1.89	RPD< 20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-PW-09WR-82.0-20240624	JD91036-1	METHANE	25
114-PW-09WR-77.0-20240624	JD91036-2	METHANE	25
114-PW-09WR-77.0-20240624-X	JD91036-3	METHANE	25

Data Validation Report

Project:	PPG GAG GW REM BT & WR
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD91283
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Methane by RSK-175 Sulfate by EPA 300.0 Total Organic Carbon (TOC) by SW846 5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, Sulfate, TOC, Methane)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60729481
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/28/2024
Reviewed by:	Linda Waters /AECOM File Name: JD91283_2024_07_28 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- 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);
- RSKSOP-175 Rev. 0, 8/11/94, Sample preparation and Calculations for Dissolved Gas Analysis in Water Samples Using a GC Headspace Equilibration Technique;
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 associated blank 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 associated blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on June 27, 2024, as part of the PPG GAG GW REM BT & WR at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter*
114-PW-10WR-82.0-20240627	JD91283-1	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-10WR-82.0-20240627	JD91283-1F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-PW-10WR-87.0-20240627	JD91283-2	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-PW-10WR-87.0-20240627	JD91283-2F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW80WR-86.5-20240627	JD91283-3	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
114-MW80WR-86.5-20240627	JD91283-3F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
114-MW80WR-91.5-20240627	JD91283-4	Groundwater	Hexavalent Chromium, Chromium, Wet Chemistry, Methane

Field ID	Laboratory ID	Matrix	Parameter*
114-MW80WR-91.5-20240627	JD91283-4F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Dissolved Iron, Dissolved Manganese
P4-IRM-FB-20240627-B	JD91283-5	Field Blank	Hexavalent Chromium, Chromium, Wet Chemistry, Methane
P4-IRM-TB-20240627	JD91283-6	Trip Blank	Methane
Wet chemistry - sulfate and total organic carbon (TOC).			

The samples were collected following the procedures detailed in the Work Order for PPG GAG GW REM BT & WR 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The chain of custody (COC) reported samples P4-IRM-FB-20240624 (JD91283-5) and P4-IRM-TB-20240624 (JD91283-6). The sample IDs were changed to P4-IRM-FB-20240627-B and P4-IRM-TB-20240627 respectively.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $\leq 30\%$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $> 30\%$	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Samples 114-MW80WR-91.5-20240627 (JD91283-4,-4F) were analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Samples 114-MW80WR-91.5-20240627 (JD91283-4,-4F) were analyzed as laboratory duplicates for this data set. All sample results were nondetect. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240627-B (JD91283-5) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Iron, Manganese)

Method Blank

The method blank (MB), MP47573, reported iron at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). Samples 114-MW80WR-86.5-20240627 (JD91283-3F) and 114-MW80WR-91.5-20240627 (JD91283-4F) both reported iron at concentrations greater than three times but less than ten times the amount in the MB. The iron results in these samples were estimated (JB).

Matrix Spikes (MS) /Matrix Spike Duplicates (MSD)

Samples 114-MW80WR-91.5-20240627 (JD91283-4,-4F) were analyzed as MS/MSDs for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240627-B (JD91283-5) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (TOC, Sulfate)**Matrix Spikes (MS)/ Matrix Spike Duplicate (MSD)**

Sample 114-MW80WR-91.5-20240627 (JD91283-4) was analyzed as a MS/MSDs for TOC and sulfate. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank P4-IRM-FB-20240627-B (JD91283-5) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Methane**Field Blank**

The trip blank (FB), P4-IRM-FB-20240627-B (JD91283-5), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Trip Blank

The trip blank (TB), P4-IRM-TB-20240627 (JD91283-6), reported methane at a concentration greater than the RL. All associated SRs were greater than ten times the amount in the TB; therefore, no qualifications were made.

Lab Duplicate

Sample 114-MW80WR-91.5-20240627 (JD91283-4) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data is valid and may be used for decision-making purposes. No data were rejected. When applicable, qualified results are discussed in attachments A and B below.

Results estimated due to field blank contamination are useable with a high bias.

All analytes detected at concentrations less than the RL but greater than the MDL are qualified by the laboratory as estimated (B). This "J" qualifier replaces the "B" used during data validation.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 27, 2024
Lab Name/ID SGS, Dayton
SDG No JD91283
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240627-B

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91283
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240627-B

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-10WR-82.0-20240627	JD91283-1	TOTAL	CHROMIUM	U	3.8B	3.8J	10	Qualify	1
114-PW-10WR-82.0-20240627	JD91283-1F	DISSOLVED	MANGANESE	U	21.9	21.9	10		
114-PW-10WR-87.0-20240627	JD91283-2F	DISSOLVED	MANGANESE	U	24.3	24.3	10		
114-MW80WR-86.5-20240627	JD91283-3	TOTAL	CHROMIUM	U	6.3b	6.3j	10	Qualify	1
114-MW80WR-86.5-20240627	JD91283-3F	DISSOLVED	CHROMIUM	U	4.2	4.2	1.0		
114-MW80WR-86.5-20240627	JD91283-3F	DISSOLVED	IRON	23.7	89.3	89.3JB	89.3	Qualify	2
114-MW80WR-86.5-20240627	JD91283-3F	DISSOLVED	MANGANESE	U	26.3	26.3	1.0		
114-MW80WR-91.5-20240627	JD91283-4	TOTAL	CHROMIUM	U	5.1B	5.1J	10	Qualify	1
114-MW80WR-91.5-20240627	JD91283-4F	DISSOLVED	IRON	23.7	146	146JB	146	Qualify	2
114-MW80WR-91.5-20240627	JD91283-4F	DISSOLVED	MANGANESE	U	46.4	46.4	10		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. Sample result was $\geq 3x$ and $<10X$ the associated blank result.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91283
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240627-B

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-10WR-82.0-20240627	JD91283-1	TOTAL ORGANIC CARBON	U	2.9	2.9	1.0		
114-PW-10WR-87.0-20240627	JD91283-2	TOTAL ORGANIC CARBON	U	3.1	3.1	1.0		
114-MW80WR-86.5-20240627	JD91283-3	TOTAL ORGANIC CARBON	U	9.8	9.8	1.0		
114-MW80WR-91.5-20240627	JD91283-4	TOTAL ORGANIC CARBON	U	9.9	9.9	1.0		

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

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91283
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID P4-IRM-FB-20240627-B

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-10WR-82.0-20240627	JD91283-1	SULFATE	U	168	168	2.0		
114-PW-10WR-87.0-20240627	JD91283-2	SULFATE	U	170	170	2.0		
114-MW80WR-86.5-20240627	JD91283-3	SULFATE	U	70.4	70.4	2.0		
114-MW80WR-91.5-20240627	JD91283-4	SULFATE	U	74.7	74.7	2.0		

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

Target Analyte Summary Hit List (Methane)

Site Name PPG GAG GW REM BT & WR
Sampling Date June 24, 2024
Lab Name/ID SGS, Dayton
SDG No JD91283
Sample Matrix Aqueous
Trip Blank ID P4-IRM-TB-20240627
Field Blank ID P4-IRM-FB-20240627-B

Field Sample ID	Lab Sample ID	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PW-10WR-82.0-20240627	JD91283-1	METHANE	U	57.1	57.1	0.11		
114-PW-10WR-87.0-20240627	JD91283-2	METHANE	U	61.5	61.5	0.11		
114-MW80WR-86.5-20240627	JD91283-3	METHANE	U	11800	11800	22		
114-MW80WR-91.5-20240627	JD91283-4	METHANE	U	8510	8510	22		
P4-IRM-FB-20240624	JD91283-5	METHANE	U	0.49	0.49	0.11		
P4-IRM-TB-20240624	JD91283-6	METHANE	U	0.19	0.19	0.11		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD91283		Project Number: 60729481.GWM	
Validation Level: Full		Date: 07/28/2024	
Number of Samples/Matrix: 4 GW, 4 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 07/30/24	

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	P4-IRM-FB-20240624 (JD91283-5) sample ID was changed to P4-IRM-FB-20240627.
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.4 °C
Holding Time	Yes	No	Sampled 06/27/2024 analyzed 06/28/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	06/28/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56628-MB1, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	P4-IRM-FB-20240627-B (JD91283-4), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW80WR-91.5-20240627 (JD91283-4, -4F) {100.0 %R. 100.0 %R}
Laboratory Duplicate	Yes	No	114-MW80WR-91.5-20240627 (JD91283-4, -4F) Both ND, { RPD 0}
Laboratory Control Standards	Yes	No	GN56628-B1 (99.3 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-PW-10WR-82.0-20240627	JD91283-1	3.8	10		10	NC	T Cr > T Cr6, Accept
114-PW-10WR-87.0-20240627	JD91283-2		10		10	0	Both ND, Accept
114-MW80WR-86.5-20240627	JD91283-3	6.3	10		10	NC	T Cr > T Cr6, Accept
114-MW80WR-91.5-20240627	JD91283-4	5.1	10		10	NC	T Cr > T Cr6, Accept
P4-IRM-FB-20240624	JD91283-5		2.0		10	0	Both ND, Accept

NC – not calculated**Dissolved Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-10WR-82.0-20240627	JD91283-1F		10		10	0	Both ND, Accept
114-PW-10WR-87.0-20240627	JD91283-2F		10		10	0	Both ND, Accept
114-MW80WR-86.5-20240627	JD91283-3F	4.2	1.0		10	NC	D Cr > D Cr6, Accept
114-MW80WR-91.5-20240627	JD91283-4F		10		10	0	Both ND, Accept

NC – not calculated

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-PW-10WR-82.0-20240627	JD91283-1, -1F		10		10	0	Both ND, Accept
114-PW-10WR-87.0-20240627	JD91283-2, -2F		10		10	0	Both ND, Accept
114-MW80WR-86.5-20240627	JD91283-3, -3F		10		10	0	Both ND, Accept
114-MW80WR-91.5-20240627	JD91283-4, -4F		10		10	0	Both ND, Accept

SDG#: JD91283/ Method 7196**GN56628**

Cr+6 ICAL 6/28/24

GW

(p. 462 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.089
0.3	0.269
0.5	0.435
0.8	0.695
1	0.870

(p. 462 of
data pkg)

AECOM Calculated Intercept	0.00152	OK	Reported intercept	0.0015
AECOM Slope	0.8688	OK	Reported Slope	0.8688
AECOM Calculated r	0.99996	OK	Reported r	0.99996

LCS calculation**GN56628-B1****P. 449, 462**

Background absorbance	0
Sample absorbance	0.131
LCS Soluble Instrument Response	0.131
Instrument Concentration (mg/L)	0.149

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149

%R = Found/True*100**GN56628-B1****P. 449, 462**

True Value (mg/L)	0.150

AECOM Calculated %R	99.4	OK	Reported %R	99.3

MS calculation**GN56628-S1****P. 451, 462, 463****114-MW80WR-91.5-20240627****filtered**

Background reading	0.001
Total absorbance	0.132
Total absorbance - background	0.131
Instrument Concentration (mg/L)	0.1490

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149

%R = Found/True*100**GN56628-S1****P. 451, 462, 463****114-MW80WR-91.5-20240627**

True Value (mg/L)	0.150
Native concentration (mg/L)	0.000

AECOM Calculated MS Result %R	99.4	OK	Reported %R	99.3

UNFILTERED**Reporting Limit****JD91284-4****P. 31, 462****114-MW80WR-91.5-20240627**

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED**Sample Calculations****JD91284-4****P. 31, 462****114-MW80WR-91.5-20240627**

Background reading	0.004
Total absorbance	0.005
Total absorbance - background	0.001
Instrument Response (mg/L)	-0.001

Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	1

AECOM Calculated Result (mg/L)	-0.001	OK, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR	
Laboratory SDG/Job No: JD91283		Project Number: 60729481.GWM	
Validation Level: Limited		Date: 07/27/2024	
Number of Samples/Matrix: 4 GW, 4 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500, and Wet Chemistry		Reviewer and Date: Linda Waters 07/30/24	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	P4-IRM-FB-20240624 (JD91283-5) sample ID was changed to P4-IRM-FB-20240627-B
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.4 °C
Holding Time	Yes	No	Sampled 06/27/2024, analyzed 06/28/2024 -06/29/2024.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	No	Yes	MP47573 Metals (Cr, Fe, Mn) see table below, GP55011/GN56664 ND Sulfate, GP54995/GN56710 ND TOC
Field Blanks	Yes	No	P4-IRM-FB-20240627-B (JD91283-5), see table below
Matrix Spike	Yes	No	114-MW80WR-91.5-20240627 (JD91283-4, -4F) Metals, TOC, sulfate
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47573 Metals (Cr, Fe, Mn) see table below, GP55011/GN56664 Sulfate (102.4 %R), GP54995/GN56710 TOC (102.0 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Method Blank

MP47573

Analyte	FRACTION	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	TOTAL/Dissolved	0.12	U	2.0	ALL	OK, Accept
IRON	DISSOLVED	23.7	J	50	ALL	114-MW80WR-86.5-20240627 (JD91283-3F) and 114-MW80WR-91.5-20240627 (JD91283-4F) SR all >3x but <10x FB, Estimate (JB) , All other SR ND, Accept
MANGANESE	DISSOLVED	0.28	U	2.0	ALL	SR >10x MB, Accept

Matrix Spikes/Matrix Spike Duplicates

114-MW80WR-91.5-20240627 (JD91283-4)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	9.9	19.9	20.4	100.0	105	143	59	2.5	15	OK, Accept
SULFATE	Total	80	74.7	154	154	99.1	99.1	120	80	0.0	30	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable**

114-MW80WR-91.5-20240627 (JD91283-4, -4F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	5.1	77.3	76.8	90.3	89.6	125	75	0.6	20	OK, Accept
IRON	Dissolved	4000	416	4420	4400	100.1	99.6	125	75	0.5	20	OK, Accept
MANGANESE	Dissolved	80	43.9	117	118	91.4	92.6	125	75	0.9	20	OK, Accept

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	2.5	72.4	75.8	87.4	91.6	125	75	4.6	20	OK, Accept
IRON	Dissolved	4000	146	3990	4190	96.1	101.1	125	75	4.9	20	OK, Accept
MANGANESE	Dissolved	80	46.4	116	122	87.0	94.5	125	75	5.0	20	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

NA – not applicable

LCS

MP47573

Analyte	Spike Added	LCS Result	LCS %R	LCSD Result	LCSD %R	% RPD	RPD limit	%R limits	Units	Action
CHROMIUM	80	72.2	90.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
IRON	4000	3810	95.3	NA	NA	NA	20	80-120	ug/l	OK, Accept
MANGANESE	80	71.2	89.0	NA	NA	NA	20	80-120	ug/l	OK, Accept

NA – not applicable

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PW-10WR-82.0-20240627	JD91283-1	CHROMIUM	Total	10
114-PW-10WR-82.0-20240627	JD91283-1F	CHROMIUM	Dissolved	10
114-PW-10WR-82.0-20240627	JD91283-1F	IRON	Dissolved	10
114-PW-10WR-82.0-20240627	JD91283-1F	MANGANESE	Dissolved	10
114-PW-10WR-87.0-20240627	JD91283-2	CHROMIUM	Total	10
114-PW-10WR-87.0-20240627	JD91283-2F	CHROMIUM	Dissolved	10
114-PW-10WR-87.0-20240627	JD91283-2F	IRON	Dissolved	10
114-PW-10WR-87.0-20240627	JD91283-2F	MANGANESE	Dissolved	10

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW80WR-86.5-20240627	JD91283-3	CHROMIUM	Total	10
114-MW80WR-91.5-20240627	JD91283-4	CHROMIUM	Total	10
114-MW80WR-91.5-20240627	JD91283-4F	CHROMIUM	Dissolved	10
114-MW80WR-91.5-20240627	JD91283-4F	IRON	Dissolved	10
114-MW80WR-91.5-20240627	JD91283-4F	MANGANESE	Dissolved	10
P4-IRM-FB-20240627-B	JD91283-5	CHROMIUM	Total	2

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Absolute Difference	RPD (%)	Action
114-PW-10WR-82.0-20240627	JD91283-1, -1F	3.8	10		10	50	4	NC	T Cr > D Cr, Accept
114-PW-10WR-87.0-20240627	JD91283-2, -2F		10		10	50	0	0	Both ND, Accept
114-MW80WR-86.5-20240627	JD91283-3, -3F	6.3	10	4.2	1.0	5	2	40	T Cr > D Cr, Accept
114-MW80WR-91.5-20240627	JD91283-4, -4F	5.1	10		10	50	5	NC	T Cr > D Cr, Accept

NC – not calculated

Laboratory: SGS, Dayton		Client/Site Name: PPG GAG GW REM BT & WR		
Laboratory SDG/Job No: JD91283		Project Number: 60729481.GWM		
Validation Level: Limited		Date: 07/27/2024		
Number of Samples/Matrix: 4 GW, 1 FB, 1 TB		Validator: Charlene Flint		
Analysis: Methane by RSK-175		Reviewer and Date: Linda Waters 07/30/24		
ITEM	YES	NO	N/A	COMMENTS
Chain of Custody	X			
Data Completeness	X			
Sample Preservation	X			2.4 °C
Holding Time	X			Sampled 06/27/2024, Analyzed 07/03/2024
Quantitation Limits	X			
Dilutions	X			See table below
Method Blanks	X			GAA3081-MB ND
Trip Blanks/Field Blanks/Equipment Blanks		X		P4-IRM-FB-20240627-B (JD91283-5), P4-IRM-TB-20240627 (JD91283-6), see table below
Matrix Spike			X	None with this SDG
Matrix Spike Duplicate			X	None with this SDG
Laboratory Duplicate	X			114-MW80WR-91.5-20240627 (JD91283-4), see table below
Laboratory Control Standards	X			GAA3081-LCS (108 %R)
Field Duplicate			X	None with this SDG
Percent Solids			X	Aqueous

Field Blank

P4-IRM-FB-20240627-B (JD91283-5)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.49		0.11	Associated SR>10x TB, Accept

SR – sample result

RL – reporting limit

Trip Blank

P4-IRM-TB-20240627 (JD91283-6)

Analyte	SR (ug/l)	Qual	RL	Action
Methane	0.19		0.11	Associated SR>10x TB, Accept

SR – sample result

RL – reporting limit

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW80WR-91.5-20240627	JD91283-4	METHANE	8510		10200		22	ug/l	18	OK RPD ≤20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Dilution
114-MW80WR-86.5-20240627	JD91283-3	METHANE	200
114-MW80WR-91.5-20240627	JD91283-4	METHANE	200

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD91702
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/31/2024
Reviewed by:	Linda Waters/AECOM File Name: JD91702_2024_7_31 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The TOC analysis was evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 July 5, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-103.75-20240705	JD91702-1	Groundwater	Hexavalent Chromium, Chromium, TOC
GW-RI-FB-20240705	JD91702-2	Field Blank	Hexavalent Chromium, Chromium, TOC

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each

sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW76D-103.75-20240705 (JD91702-1), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW76D-103.75-20240705 (JD91702-1), was analyzed as a laboratory duplicate for hexavalent chromium in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240705 (JD91702-2) was submitted for hexavalent chromium analysis. No contamination was detected, and the associated sample result did not require qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium)**Matrix Spike (MS)/Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240705 (JD91702-2) was submitted for chromium analysis. No contamination was detected, and the associated sample result did not require qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action.

Wet Chemistry (TOC)**Matrix Spike/ Matrix Spike Duplicate**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240705 (JD91702-2) was submitted for TOC analysis. No contamination was detected, and the associated sample result did not require qualification.

Field Duplicates (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 5, 2024
Lab Name/ID SGS, Dayton
SDG No JD91702
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240705

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 5, 2024
Lab Name/ID SGS, Dayton
SDG No JD91702
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240705

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20240705	JD91702-1	Total	CHROMIUM	U	0.67 B	0.67 J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 5, 2024
Lab Name/ID SGS, Dayton
SDG No JD91702
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240705

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20240705	JD91702-1	Total	Total Organic Carbon	U	4.4	4.4	1.0		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD91702		Project Number: 60732743 GWM.2023	
Validation Level: Full		Date: 7/31/2024	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 8/2/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	Yes	No	Sampled 7/05/2024, analyzed 7/05/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	7/05/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN56872-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240705 (JD91702-2) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW76D-103.75-20240705 (JD91702-1), {100.0 %R}
Laboratory Duplicate	Yes	No	114-MW76D-103.75-20240705 (JD91702-1), Both ND, RPD 0
Laboratory Control Standards	Yes	No	GN56872-B1 (100.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW76D-103.75-20240705 (JD91702-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.15	NA	100.0	NA	115	85	NA	20	OK, Accept

SR – sample result

SSR – spiked sample result

SDR – sample duplicate result

NA – not applicable

RPD – relative percent difference

Lab Duplicate

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW76D-103.75-20240705	JD91702-1	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RPD – relative percent difference

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW76D-103.75-20240705	JD91702-1	0.67	2.0		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20240705	JD91702-2		2.0		10	0	Both ND, Accept

NC- not calculated

RPD – relative percent difference

SDG#: JD91702/ Method 7196

GN56872

Cr+6 ICAL 7/05/24

GW

(p. 294 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.09
0.3	0.261
0.5	0.443
0.8	0.690
1	0.861

(p. 294 of
data pkg)

AECOM Calculated Intercept	0.00260	OK	Reported intercept	0.0026
AECOM Slope	0.8617	OK	Reported Slope	0.8617
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation

GN56872-B1

P. 286, 294

Background absorbance	0	
Sample absorbance	0.133	
LCS Soluble Instrument Response	0.133	
Instrument Concentration (mg/L)	0.151	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100

GN56872-B1

P. 286, 294

True Value (mg/L)	0.150

AECOM Calculated %R	100.9	OK	Reported %R	100.7

MS calculation

GN56872-S2

P. 288, 294, 296

114-MW76D-103.75-20240705

Unfiltered

Background reading	0.005
Total absorbance	0.136
Total absorbance - background	0.131
Instrument Concentration (mg/L)	0.1490

Sample aliquot	0.05	NA: standards and samples treated the same		
Final volume	0.05			
Dilution Factor	1			
AECOM Calculated MS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149
%R = Found/True*100	GN56872-S2	P . 288, 294, 296	114-MW76D-103.75-20240705	
True Value (mg/L)	0.150			
Native concentration (mg/L)	0.0			
AECOM Calculated MS Result %R	99.3	OK	Reported %R	99.3
UNFILTERED				
Reporting Limit	JD91702-1	P. 19, 294	114-MW76D-103.75-20240705	
Low Standard	0.01			
		NA: standards and samples treated the same		
Initial volume (L)	0.5			
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)	0.010
UNFILTERED				
Sample Calculations	JD91702-1	P. 19, 294	114-MW76D-103.75-20240705	
Background reading	0.003			
Total absorbance	0.004			
Total absorbance - background	0.001			
Instrument Response (mg/L)	-0.002			
		NA: standards and samples treated the same		
Sample volume (L)	0.5			
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	0.0	OK <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD91702		Project Number: 60732743 GWM.2023	
Validation Level: Limited		Date: 7/31/2024	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 8/2/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	Yes	No	Sampled 7/05/2024, analyzed 7/08/2024 – 7/09/2024,
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP47740 ND Cr, GP55153/GN56968 ND TOC,
Field Blanks	Yes	No	GW-RI-FB-20240705 (JD91702-2), ND
Matrix Spike	NA	NA	Batch QC Cr, TOC
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47740 Cr (94.5 %R), GP55153/GN56968 TOC (99.1 %R),
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total Cr vs Total HexCr Results	Yes	No	see hexavalent chromium section for table

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-103.75-20240705	JD91702-1	CHROMIUM	Total	2
GW-RI-FB-20240705	JD91702-2	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD91859
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 7/31/2024
Reviewed by:	Linda Waters/AECOM File Name: JD91859_2024_7_31 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The TOC analysis was evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 July 9, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-108.75-20240709	JD91859-1	Groundwater	Hexavalent Chromium, Chromium, TOC
114-MW76D-108.75-20240709-X	JD91859-2	Groundwater	Hexavalent Chromium, Chromium, TOC
114-MW76D-113.75-20240709	JD91859-3	Groundwater	Hexavalent Chromium, Chromium, TOC
114-MW76D-118.75-20240709	JD91859-4	Groundwater	Hexavalent Chromium, Chromium, TOC
GW-RI-FB-20240709	JD91859-5	Field Blank	Hexavalent Chromium, Chromium, TOC

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW76D-108.75-20240709 (JD91859-1), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW76D-108.75-20240709 (JD91859-1), was analyzed as a laboratory duplicate for hexavalent chromium in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240709 (JD91859-5) was submitted for hexavalent chromium analysis. No contamination was detected, and the associated sample results did not require qualification.

Field Duplicate (FD)

Samples 114-MW76D-108.75-20240709 (JD91859-1) and 114-MW76D-108.75-20240709-X (JD91859-2) were analyzed as the field duplicate pair for hexavalent chromium. Both sample results were nondetect (ND). All QC acceptance criteria were met and no qualifications were made.

Metals (Chromium)**Matrix Spike (MS)/Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240709 (JD91859-5) was submitted for chromium analysis. No contamination was detected, and the associated sample results did not require qualification.

Field Duplicate (FD)

Samples 114-MW76D-108.75-20240709 (JD91859-1) and 114-MW76D-108.75-20240709-X (JD91859-2) were analyzed as the field duplicate pair for chromium. Both sample results were ND. All QC acceptance criteria were met. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action.

Wet Chemistry (TOC)**Matrix Spike/ Matrix Spike Duplicate**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240709 (JD91859-5) was submitted for TOC analysis. No contamination was detected, and the associated sample results did not require qualification.

Field Duplicates (FD)

Samples 114-MW76D-108.75-20240709 (JD91859-1) and 114-MW76D-108.75-20240709-X (JD91859-2) were analyzed as the field duplicate pair for TOC. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 9, 2024
Lab Name/ID SGS, Dayton
SDG No JD91859
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240709

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 9, 2024
Lab Name/ID SGS, Dayton
SDG No JD91859
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240709

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 9, 2024
Lab Name/ID SGS, Dayton
SDG No JD91859
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240709

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-108.75-20240709	JD91859-1	Total	Total Organic Carbon	U	4.4	4.4	1.0		
114-MW76D-108.75-20240709-X	JD91859-2	Total	Total Organic Carbon	U	4.4	4.4	1.0		
114-MW76D-113.75-20240709	JD91859-3	Total	Total Organic Carbon	U	4.2	4.2	1.0		
114-MW76D-118.75-20240709	JD91859-4	Total	Total Organic Carbon	U	4.4	4.4	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton			Client/Site Name: PPG 2024 GAG GW Remedial Activities
Laboratory SDG/Job No: JD91859			Project Number: 60732743 GWM.2023
Validation Level: Full			Date: 7/31/2024
Number of Samples/Matrix: 4 GW, 1 FB			Validator: Charlene Flint
Analysis: Hexavalent Chromium/7196A			Reviewer and Date: Linda Waters 8/2/2024
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.0 °C
Holding Time	Yes	No	Sampled 7/09/2024, analyzed 7/10/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	7/10/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN57005-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240709 (JD91859-5) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW76D-108.75-20240709 (JD91859-1), {106.7 %R}
Laboratory Duplicate	Yes	No	114-MW76D-108.75-20240709 (JD91859-1), Both ND, RPD 0
Laboratory Control Standards	Yes	No	GN57005-B1 (100.0 %R)
Field Duplicate	Yes	No	114-MW76D-108.75-20240709 (JD91859-1) and 114-MW76D-108.75-20240709-X (JD91859-2), Both ND, {RPD 0}
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW76D-108.75-20240709 (JD91859-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.158	NA	105.3	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
114-MW76D-108.75-20240709	JD91859-1	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RPD – relative percent difference**Field Duplicates**

G114-MW76D-108.75-20240709 (JD91859-1) & 114-MW76D-108.75-20240709-X (JD91859-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.0026	U	0.0026	U	10.0	ug/l	0	Both ND, Accept

RPD – relative percent difference

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW76D-108.75-20240709	JD91859-1		10		10	0	Both ND, Accept
114-MW76D-108.75-20240709-X	JD91859-2		10		10	0	Both ND, Accept
114-MW76D-113.75-20240709	JD91859-3		10		10	0	Both ND, Accept
114-MW76D-118.75-20240709	JD91859-4		10		10	0	Both ND, Accept
GW-RI-FB-20240709	JD91859-5		2.0		10	0	Both ND, Accept

RPD – relative percent difference

SDG#: JD91859/ Method 7196**GN57005**

Cr+6 ICAL 7/10/24

GW

(p. 596 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.089
0.3	0.255
0.5	0.431
0.8	0.671
1	0.855

(p. 596 of
data pkg)

AECOM Calculated Intercept	0.00217	OK	Reported intercept	0.0022
AECOM Slope	0.8477	OK	Reported Slope	0.8477
AECOM Calculated r	0.99990	OK	Reported r	0.99990

LCS calculation**GN57005-B1****P. 588, 596**

Background absorbance	0	
Sample absorbance	0.129	
LCS Soluble Instrument Response	0.129	
Instrument Concentration (mg/L)	0.150	
Sample aliquot	0.05	NA: standards and samples treated the same
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.151

%R = Found/True*100**GN57005-B1****P. 588, 596**

True Value (mg/L) 0.150

AECOM Calculated %R	99.7	OK	Reported %R	100.0

MS calculation**GN57005-S1****P. 590, 596, 598****114-MW76D-108.75-20240709****Unfiltered**

Background reading	0	
Total absorbance	0.136	
Total absorbance - background	0.136	
Instrument Concentration (mg/L)	0.1579	
Sample aliquot	0.05	NA: standards and samples treated the same
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated MS Result (mg/L)	0.158	OK	Reported Result (mg/L)	0.158

%R = Found/True*100**GN57005-S1****P. 590, 596, 598****114-MW76D-108.75-20240709**

True Value (mg/L) 0.150

Native concentration (mg/L) 0.0

AECOM Calculated MS Result %R	105.2	OK	Reported %R	105.3

UNFILTERED

Reporting Limit **JD91859-1** **P. 9, 596** **114-MW76D-108.75-20240709**

Low Standard 0.01

NA: standards
and samples
treated the same

Initial volume (L) 0.5

Final volume (L) 0.5

Dilution Factor 1

AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010

UNFILTERED

Sample Calculations **JD91859-1** **P. 9, 596** **114-MW76D-108.75-20240709**

Background reading 0

Total absorbance 0.001

Total absorbance - background 0.001

Instrument Response (mg/L) -0.001

NA: standards
and samples
treated the same

Sample volume (L) 0.5

Final Volume (L) 0.5

Dilution Factor 1

AECOM Calculated Result (mg/L)	0.00	OK <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD91859		Project Number: 60732743 GWM.2023	
Validation Level: Limited		Date: 7/31/2024	
Number of Samples/Matrix: 4 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, and TOC SM5310B		Reviewer and Date: Linda Waters 8/2/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.0 °C
Holding Time	Yes	No	Sampled 7/09/2024, analyzed 7/11/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP47757 ND Cr, GP55210/GN57056 ND TOC, GP55211/GN57056 ND TOC
Field Blanks	Yes	No	GW-RI-FB-20240709 (JD91859-5), ND
Matrix Spike	NA	NA	Batch QC Cr, TOC
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47757 Cr (96.9 %R, 90.5 %R), GP55210/GN57056 TOC (103.0 %R), GP55211/GN57056 TOC (98.5 %R)
Field Duplicate	Yes	No	114-MW76D-108.75-20240709 (JD91859-1) and 114-MW76D-108.75-20240709-X (JD91859-2),
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total Cr vs Total HexCr Results	Yes	No	see hexavalent chromium section for table

Field Duplicates

114-MW76D-108.75-20240709 (JD91859-1) & 114-MW76D-108.75-20240709-X (JD91859-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	QL	Units	RPD	Action
CHROMIUM	Total	3.1	U	3.1	U	10	ug/l	0	Both ND, Accept
TOTAL ORGANIC CARBON	Total	4.4		4.4		1.0	mg/l	0	RPD < 20%, Accept

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-108.75-20240709	JD91859-1	CHROMIUM	Total	10
114-MW76D-108.75-20240709-X	JD91859-2	CHROMIUM	Total	10
114-MW76D-113.75-20240709	JD91859-3	CHROMIUM	Total	10
114-MW76D-118.75-20240709	JD91859-4	CHROMIUM	Total	10
GW-RI-FB-20240709	JD91859-5	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD91932
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2023
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 8/01/2024
Reviewed by:	Linda Waters/AECOM File Name: JD91932_2024_8_01 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

The TOC analysis was evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 July 10, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-123.75-20240710	JD91932-1	Groundwater	Hexavalent Chromium, Chromium, TOC
GW-RI-FB-20240710	JD91932-2	Field Blank	Hexavalent Chromium, Chromium, TOC

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each

sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %R was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240710 (JD91932-2) was submitted for hexavalent chromium analysis. No contamination was detected, and the associated sample result did not require qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium)**Matrix Spike (MS)/Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240710 (JD91932-2) was submitted for chromium analysis. No contamination was detected, and the associated sample result did not require qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action.

Wet Chemistry (TOC)**Matrix Spike/ Matrix Spike Duplicate**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank GW-RI-FB-20240710 (JD91932-2) was submitted for TOC analysis. No contamination was detected, and the associated sample result did not require qualification.

Field Duplicates (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 10, 2024
Lab Name/ID SGS, Dayton
SDG No JD91932
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240710

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 10, 2024
Lab Name/ID SGS, Dayton
SDG No JD91932
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240710

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 10, 2024
Lab Name/ID SGS, Dayton
SDG No JD91932
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240710

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-123.75-20240710	JD91932-1	Total	Total Organic Carbon	U	4.8	4.8	1.0		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD91932		Project Number: 60732743 GWM.2023	
Validation Level: Full		Date: 8/01/2024	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 8/2/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.8 °C
Holding Time	Yes	No	Sampled 7/10/2024, analyzed 7/11/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	7/11/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN57053-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240710 (JD91932-2) ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN57053-B1 (100.0 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW76D-123.75-20240710	JD91932-1		10		10	0	Both ND, Accept
GW-RI-FB-20240710	JD91932-2		2.0		10	0	Both ND, Accept

NC- not calculated

RPD – relative percent difference

SDG#: JD91932/ Method 7196

GN57053

Cr+6 ICAL 7/11/24

GW

(p. 441 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.046
0.1	0.089
0.3	0.255
0.5	0.433
0.8	0.679
1	0.861

(p. 441 of
data pkg)

AECOM Calculated Intercept	0.00156	OK	Reported intercept	0.0016
AECOM Slope	0.8553	OK	Reported Slope	0.8553
AECOM Calculated r	0.99994	OK	Reported r	0.99994

LCS calculation

GN57053-B1

P. 433, 441

Background absorbance

0

Sample absorbance

0.13

LCS Soluble Instrument Response

0.13

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN57053-B1

P. 433, 441

True Value (mg/L)

0.150

AECOM Calculated %R	100.1	OK	Reported %R	100.0

MS calculation

GN57053-S1

P. 435, 441, 442

Batch QC (JD91944-8)

Unfiltered

Background reading

0.007

Total absorbance

0.134

Total absorbance - background

0.127

Instrument Concentration (mg/L)

0.1467

Sample aliquot	0.05	NA: standards and samples treated the same		
Final volume	0.05			
Dilution Factor	1			
AECOM Calculated MS Result (mg/L)	0.147	OK	Reported Result (mg/L)	0.147
%R = Found/True*100	GN57053-S1	P . 435, 441, 442	Batch QC (JD91944-8)	
True Value (mg/L)	0.150			
Native concentration (mg/L)	0.0			
AECOM Calculated MS Result %R	97.8	OK	Reported %R	98.0
UNFILTERED				
Reporting Limit	JD91932-1	P. 9, 441	114-MW76D-123.75-20240710	
Low Standard	0.01			
		NA: standards and samples treated the same		
Initial volume (L)	0.5			
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
Sample Calculations	JD91932-1	P. 9, 441	114-MW76D-123.75-20240710	
Background reading	0.002			
Total absorbance	0.003			
Total absorbance - background	0.001			
Instrument Response (mg/L)	-0.001			
		NA: standards and samples treated the same		
Sample volume (L)	0.5			
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	0.00	OK <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD91932		Project Number: 60732743 GWM.2023	
Validation Level: Limited		Date: 8/01/2024	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, TOC SM5310B		Reviewer and Date: Linda Waters 8/2/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.8 °C
Holding Time	Yes	No	Sampled 7/10/2024, analyzed 7/12/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP47803 ND Cr, GP55230/GN57108 ND TOC,
Field Blanks	Yes	No	GW-RI-FB-20240710 (JD91932-2), ND
Matrix Spike	NA	NA	Batch QC Cr, TOC
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP47803 Cr (94.1 %R), GP55230/GN57108 TOC (99.6 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total Cr vs Total HexCr Results	Yes	No	see hexavalent chromium section for table

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-123.75-20240710	JD91932-1	CHROMIUM	Total	10
GW-RI-FB-20240710	JD91932-2	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD92936
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 9/02/2024
Reviewed by:	Linda Waters/AECOM File Name: JD92936_2024_9_02 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24.

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field 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 July 26, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-PZ-57T-67.5-20240726	JD92936-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-PZ-57T-67.5-20240726	JD92936-1F	Groundwater	Hexavalent Chromium, Chromium
114-MW57C-70.9-20240726	JD92936-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57C-70.9-20240726	JD92936-2F	Groundwater	Hexavalent Chromium, Chromium, Fe
114-P3-MW005D-50.3-20240726	JD92936-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-P3-MW005D-50.3-20240726	JD92936-3F	Groundwater	Hexavalent Chromium, Chromium
FB-20240726	JD92936-4	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

Field ID	Laboratory ID	Matrix	Parameter
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS percent recovery (%R) was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field Blank FB-20240726 (JD92936-4) was submitted for hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank FB-20240726 (JD92936-4) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank FB-20240726 (JD92936-4) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 26, 2024
Lab Name/ID SGS, Dayton
SDG No JD92936
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240726

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-57T-67.5-20240726	JD92936-1	Total	CHROMIUM (HEXAVALENT)	U	0.0092B	0.0092J	0.010	Qualify	1
114-MW57C-70.9-20240726	JD92936-2	Total	CHROMIUM (HEXAVALENT)	U	0.0044B	0.0044J	0.010	Qualify	1
114-MW57C-70.9-20240726	JD92936-2F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.0044B	0.0044J	0.010	Qualify	1
114-P3-MW005D-50.3-20240726	JD92936-3	Total	CHROMIUM (HEXAVALENT)	U	198	198	5.0		
114-P3-MW005D-50.3-20240726	JD92936-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	195	195	5.0		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 26, 2024
Lab Name/ID SGS, Dayton
SDG No JD92936
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240726

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-57T-67.5-20240726	JD92936-1	Total	CHROMIUM	1.2	1890	1890	50		
114-PZ-57T-67.5-20240726	JD92936-1F	Dissolved	CHROMIUM	1.2	1810	1810	50		
114-MW57C-70.9-20240726	JD92936-2	Total	CHROMIUM	1.2	1580	1580	50		
114-MW57C-70.9-20240726	JD92936-2F	Dissolved	CHROMIUM	1.2	1610	1610	50		
114-P3-MW005D-50.3-20240726	JD92936-3	Total	CHROMIUM	U	179000	179000	5000		
114-P3-MW005D-50.3-20240726	JD92936-3F	Dissolved	CHROMIUM	U	181000	181000	5000		

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

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

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 26, 2024
Lab Name/ID SGS, Dayton
SDG No JD92936
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240726

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57C-70.9-20240726	JD92936-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Validation Footnote

- 1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 26, 2024
Lab Name/ID SGS, Dayton
SDG No JD92936
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240726

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-57T-67.5-20240726	JD92936-1	SULFATE	U	261	261	40		
114-MW57C-70.9-20240726	JD92936-2	SULFATE	U	335	335	40		
114-P3-MW005D-50.3-20240726	JD92936-3	SULFATE	U	606	606	10		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date July 26, 2024
Lab Name/ID SGS, Dayton
SDG No JD92936
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20240726

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-PZ-57T-67.5-20240726	JD92936-1	Total	Total Organic Carbon	U	4280	4280	100		
114-MW57C-70.9-20240726	JD92936-2	Total	Total Organic Carbon	U	1150	1150	50		
114-P3-MW005D-50.3-20240726	JD92936-3	Total	Total Organic Carbon	U	5.3	5.3	5.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD92936		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 9/02/2024	
Number of Samples/Matrix: 3 GW, 3 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 9/27/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	Yes	No	Sampled 7/26/2024, analyzed 7/27/2024
Quantitation Limits	Yes	No	See table below
Dilutions	No	No	See table below
Initial Calibration	Yes	No	7/27/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN57700-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	FB-20240726 (JD92936-4) ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN57700 (100.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-PZ-57T-67.5-20240726	JD92936-1	1890	50	9.2	10	198	T Cr > T Cr6, Accept
114-MW57C-70.9-20240726	JD92936-2	1580	50	4.4	10	199	T Cr > T Cr6, Accept
114-P3-MW005D-50.3-20240726	JD92936-3	179000	5000	198000	5000	10	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
FB-20240726	JD92936-4		2.0		10	0	Both ND, Accept

RL – reporting limit

RPD – relative percent difference

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD	Action
114-PZ-57T-67.5-20240726	JD92936-1F	1810	50		10	NC	D Cr > D Cr6, Accept
114-MW57C-70.9-20240726	JD92936-2F	1610	50	4.4	10	199	D Cr > D Cr6, Accept
114-P3-MW005D-50.3-20240726	JD92936-3F	181000	5000	195000	5000	7	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

NC- not calculated

RPD – relative percent difference

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium RL (ug/l)	RPD	Action
114-PZ-57T-67.5-20240726	JD92936-1, -1F	9.2	10		10	NC	T Cr6 > D Cr6, Accept
114-MW57C-70.9-20240726	JD92936-2, -2F	4.4	10	4.4	10	0	T Cr6 > D Cr6, Accept
114-P3-MW005D-50.3-20240726	JD92936-3, -3F	198000	5000	195000	5000	2	T Cr6 > D Cr6, Accept

NC- not calculated

RL – reporting limit

RPD – relative percent difference

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-P3-MW005D-50.3-20240726	JD92936-3	CHROMIUM (HEXAVALENT)	198	Y	mg/l	0.07
114-P3-MW005D-50.3-20240726	JD92936-3F	CHROMIUM (HEXAVALENT)	195	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-P3-MW005D-50.3-20240726	JD92936-3	CHROMIUM (HEXAVALENT)	Total	500
114-P3-MW005D-50.3-20240726	JD92936-3F	CHROMIUM (HEXAVALENT)	Dissolved	500

SDG#: JD92936/ Method 7196

GN57700

Cr+6 ICAL 7/27/24

GW

(p.996 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.085
0.3	0.255
0.5	0.422
0.8	0.680
1	0.845

(p.996 of
data pkg)

AECOM Calculated Intercept	0.00025	OK	Reported intercept	0.0002
AECOM Slope	0.8464	OK	Reported Slope	0.8464
AECOM Calculated r	0.99999	OK	Reported r	0.99999

LCS calculation

GN57700-B1

P. 984, 996

Background absorbance

0

Sample absorbance

0.128

LCS Soluble Instrument Response

0.128

Instrument Concentration (mg/L)

0.151

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100

GN57700-B1

P. 984, 996

True Value (mg/L)

0.150

AECOM Calculated %R	100.6	OK	Reported %R	100.7

MS calculation

GN57700-S1

P. 986, 996

Batch QC (JD92935-1)

Unfiltered

Background reading

0

Total absorbance

0.127

Total absorbance - background

0.127

Instrument Concentration (mg/L)

0.1498

Sample aliquot	0.05	NA: standards and samples treated the same		
Final volume	0.05			
Dilution Factor	1			
AECOM Calculated MS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150
%R = Found/True*100	GN57700-S1	P. 986, 996	Batch QC (JD92935-1)	
True Value (mg/L)	0.150			
Native concentration (mg/L)	0.0			
AECOM Calculated MS Result %R	99.8	OK	Reported %R	100.0
UNFILTERED				
Reporting Limit	JD92936-1	P. 10, 996	114-PZ-57T-67.5-20240726	
Low Standard	0.01			
		NA: standards and samples treated the same		
Initial volume (L)	0.5			
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
Sample Calculations	JD92936-1	P. 10, 996	114-PZ-57T-67.5-20240726	
Background reading	0.76			
Total absorbance	0.768			
Total absorbance - background	0.008			
Instrument Response (mg/L)	0.009			
		NA: standards and samples treated the same		
Sample volume (L)	0.5			
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	0.0092	OK,	Reported Result (mg/L)	0.0092 J

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD92936		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 9/02/2024	
Number of Samples/Matrix: 3 GW, 3 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 9/27/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.3 °C
Holding Time	No	Yes	Sampled 7/26/2024, analyzed 7/30/2024, 8/01/2024–8/03/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP48163 ND Cr, MP48192 Cr (1.2 ug/l), see table below, GP55633/GN57785 ND sulfate, GP55653/GN58030 ND TOC, GN57913 (dissolved) ND Fe,
Field Blanks	Yes	No	FB-20240726 (JD92936-4), ND
Matrix Spike	NA	NA	Batch QC Cr, TOC, sulfate, dissolved Fe
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP48163 Cr (96.9 %R), MP48192 Cr (98.1 %R), GP55633/GN57785 sulfate (104.5 %R), GP55653/GN58030 TOC (92.3 %R), GN57913 (dissolved) Fe (90.0 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW57C-70.9-20240726	JD92936-2F	IRON (FERROUS)	7/26/2024 12:05:00 PM	8/1/2024 11:40:00 AM	Estimate (UJ)

Method Blank

MP48192

Analyte	Fraction	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	Total/Dissolved	1.2	J	2.0	JD92936-1, -2, -1F, -2F	All SR >10x the amount in the MB, Accept

SR – sample result

RL – reporting limit

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW57C-70.9-20240726	JD92936-2	SULFATE	335	Y	mg/l	250
114-MW57C-70.9-20240726	JD92936-2	CHROMIUM	1580	Y	ug/l	70
114-MW57C-70.9-20240726	JD92936-2F	CHROMIUM	1610	Y	ug/l	70
114-P3-MW005D-50.3-20240726	JD92936-3	SULFATE	606	Y	mg/l	250
114-P3-MW005D-50.3-20240726	JD92936-3	CHROMIUM	179000	Y	ug/l	70
114-P3-MW005D-50.3-20240726	JD92936-3F	CHROMIUM	181000	Y	ug/l	70
114-PZ-57T-67.5-20240726	JD92936-1	SULFATE	261	Y	mg/l	250
114-PZ-57T-67.5-20240726	JD92936-1	CHROMIUM	1890	Y	ug/l	70
114-PZ-57T-67.5-20240726	JD92936-1F	CHROMIUM	1810	Y	ug/l	70

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RL X5	Absolute Difference	RPD (%)	Action
114-PZ-57T-67.5-20240726	JD92936-1, -1F	1890	50	1810	50	250	80	4	T Cr > D Cr, Accept
114-MW57C-70.9-20240726	JD92936-2, -2F	1580	50	1610	50	250	30	2	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept
114-P3-MW005D-50.3-20240726	JD92936-3, -3F	179000	5000	181000	5000	25000	2000	1	T Cr < D Cr, SRs > 5x RL, %RPD ≤ 30%, Accept

RL – reporting limit**RPD – relative percent difference****Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-PZ-57T-67.5-20240726	JD92936-1	TOC	Total	100
114-PZ-57T-67.5-20240726	JD92936-1	CHROMIUM	Total	50
114-PZ-57T-67.5-20240726	JD92936-1	SULFATE	Total	20
114-PZ-57T-67.5-20240726	JD92936-1F	CHROMIUM	Dissolved	50
114-MW57C-70.9-20240726	JD92936-2	TOC	Total	50
114-MW57C-70.9-20240726	JD92936-2	CHROMIUM	Total	50
114-MW57C-70.9-20240726	JD92936-2	SULFATE	Total	20
114-MW57C-70.9-20240726	JD92936-2F	CHROMIUM	Dissolved	50
114-P3-MW005D-50.3-20240726	JD92936-3	TOC	Total	5
114-P3-MW005D-50.3-20240726	JD92936-3	CHROMIUM	Total	5000
114-P3-MW005D-50.3-20240726	JD92936-3	SULFATE	Total	5
114-P3-MW005D-50.3-20240726	JD92936-3F	CHROMIUM	Dissolved	5000
FB-20240726	JD92936-4	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD93902
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 9/02/2024
Reviewed by:	Linda Waters/AECOM File Name: JD93902_2024_9_02 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24.

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 12, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-103.75-20240812	JD93902-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-103.75-20240812	JD93902-1F	Groundwater	Fe
114-MW76D-108.75-20240812	JD93902-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-108.75-20240812	JD93902-2F	Groundwater	Fe
FB-20240812	JD93902-3	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW76D-108.75-20240812 (JD93902-2), was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW76D-108.75-20240812 (JD93902-2), was analyzed as a laboratory duplicate for this data set. Both samples were nondetect. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recovery (%R) was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field Blank FB-20240812 (JD93902-3) was submitted for hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW76D-108.75-20240812 (JD93902-2), was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank FB-20240812 (JD93902-3) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW76D-108.75-20240812 (JD93902-2), was analyzed as a MS/MSD for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank

Field blank FB-20240812 (JD93902-3) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD93902
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240812

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No results reported			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Metals)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD93902
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240812

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20240812	JD93902-1F	Total	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW76D-108.75-20240812	JD93902-2F	Dissolved	IRON (FERROUS)	U	U	UJ	200	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 Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD93902
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240812

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20240812	JD93902-1	SULFATE	U	53.6	53.6	40		
114-MW76D-108.75-20240812	JD93902-2	SULFATE	U	51.1	51.1	40		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 12, 2024
Lab Name/ID SGS, Dayton
SDG No JD93902
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20240812

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20240812	JD93902-1	Total	Total Organic Carbon	U	4.4	4.4	1.0		
114-MW76D-108.75-20240812	JD93902-2	Total	Total Organic Carbon	U	4.3	4.3	1.0		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD93902		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 9/02/2024	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 9/27/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.8 °C
Holding Time	Yes	No	Sampled 8/12/2024, analyzed 8/13/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	8/13/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN58359 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	FB-20240812 (JD93902-3) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW76D-108.75-20240812 (JD93902-2), see table below
Laboratory Duplicate	Yes	No	114-MW76D-108.75-20240812 (JD93902-2) Both ND, see table below
Laboratory Control Standards	Yes	No	GN58359 (100.7 %R)
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW76D-108.75-20240812 (JD93902-2)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.145	NA	96.7	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – spiked sample result****SDR – sample duplicate result****NA – not applicable****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
114-MW76D-108.75-20240812	JD93902-2	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RL – reporting limit**RPD – relative percent difference****Total Chromium vs Total Hexavalent Chromium**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW76D-103.75-20240812	JD93902-1		10		10	0	Both ND, Accept
114-MW76D-108.75-20240812	JD93902-2		10		10	0	Both ND, Accept
FB-20240812	JD93902-3		2.0		10	0	Both ND, Accept

RPD – relative percent difference

SDG#: JD93902/ Method 7196

GN58359

Cr+6 ICAL 8/13/2024

GW

(p.374 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.089
0.3	0.261
0.5	0.425
0.8	0.671
1	0.850

(p.374 of
data pkg)

AECOM Calculated Intercept	0.00235	OK	Reported intercept	0.0023
AECOM Slope	0.8443	OK	Reported Slope	0.8443
AECOM Calculated r	0.99993	OK	Reported r	0.99993

LCS calculation

GN58359-B1

P. 362, 374

Background absorbance	0	
Sample absorbance	0.13	
LCS Soluble Instrument Response	0.13	
Instrument Concentration (mg/L)	0.151	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100

GN58359-B1

P. 362, 374

True Value (mg/L)	0.150

AECOM Calculated %R	100.8	OK	Reported %R	100.7

MS calculation

GN58359-S1

P. 364, 374, 375

114-MW76D-108.75-20240812

Unfiltered

Background reading	0.002
Total absorbance	0.127
Total absorbance - background	0.125
Instrument Concentration (mg/L)	0.1453

Sample aliquot	0.05	NA: standards and samples treated the same	
Final volume	0.05		
Dilution Factor	1		
AECOM Calculated MS Result (mg/L)	0.145	OK	Reported Result (mg/L) 0.145
%R = Found/True*100	GN58359-S1	P. 364, 374, 375	114-MW76D-108.75-20240812
True Value (mg/L)	0.150		
Native concentration (mg/L)	0.0		
AECOM Calculated MS Result %R	96.8	OK	Reported %R 96.7
UNFILTERED			
Reporting Limit	JD93902-2	P. 12, 374	114-MW76D-108.75-20240812
Low Standard	0.01		
Initial volume (L)	0.5	NA: standards and samples treated the same	
Final volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)= 0.010
UNFILTERED			
<u>Sample Calculations</u>	JD93902-2	P. 12, 374	114-MW76D-108.75-20240812
Background reading	0.004		
Total absorbance	0.004		
Total absorbance - background	0		
Instrument Response (mg/L)	-0.003		
Sample volume (L)	0.5	NA: standards and samples treated the same	
Final Volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Result (mg/L)	-0.0028	OK, <MDL, report as ND	Reported Result (mg/L) 0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD93902		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 9/02/2024	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 9/27/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.8 °C
Holding Time	No	Yes	Sampled 8/12/2024, analyzed 8/13/2024– 8/16/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP48527 ND Cr, GP56024/GN58445 ND sulfate, GP56013/GN58529 ND TOC, GN58373 (dissolved) ND Fe
Field Blanks	Yes	No	FB-20240812 (JD93902-3), ND
Matrix Spike	Yes	No	114-MW76D-108.75-20240812 (JD93902-2) Cr, TOC, sulfate, Fe
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP48527 Cr (93.6 %R), GP56024/GN58445 sulfate (100.9 %R), GP56013/GN58529 TOC (103.0 %R), GN58373 (dissolved) Fe (100.0 %R, 100.0 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW76D-103.75-20240812	JD93902-1F	IRON (FERROUS)	8/12/2024 11:35	8/13/2024 17:00	Estimate (UJ)
114-MW76D-108.75-20240812	JD93902-2F	IRON (FERROUS)	8/12/2024 13:10	8/13/2024 17:00	Estimate (UJ)

Matrix Spikes/Matrix Spike Duplicates

114-MW76D-108.75-20240812 (JD93902-2, -2F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	0	86.0	82.2	107.5	102.8	125	75	44.5	20	OK, Accept
Iron, Ferrous	Dissolved	3.0	0	3.0	2.9	100.0	96.7	113	92	3.4	20	OK, Accept

SR – sample result**SSR – spiked sample result****SDR – sample duplicate result**

114-MW76D-108.75-20240812 (JD93902-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	4.3	15.2	15.1	109.0	104.7	143	59	0.7	15	OK, Accept
SULFATE	Total	80	51.1	129	130	97.4	98.6	120	80	0.8	15	OK, Accept

SR – sample result**SSR – spiked sample result****SDR – sample duplicate result****Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-103.75-20240812	JD93902-1	CHROMIUM	Total	10
114-MW76D-108.75-20240812	JD93902-2	CHROMIUM	Total	10
FB-20240812	JD93902-3	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD93987
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 9/03/2024
Reviewed by:	Linda Waters/AECOM File Name: JD93987_2024_9_03 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24.

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 13, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-113.75-20240813	JD93987-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-113.75-20240813	JD93987-1F	Groundwater	Fe
114-MW76D-113.75-20240813-X (Field Duplicate of 114-MW76D- 113.75-20240813)	JD93987-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-113.75-20240813-X (Field Duplicate of 114-MW76D- 113.75-20240813)	JD93987-2F	Groundwater	Fe
114-MW76D-118.75-20240813	JD93987-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-118.75-20240813	JD93987-3F	Groundwater	Fe
114-MW76D-123.75-20240813	JD93987-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-123.75-20240813	JD93987-4F	Groundwater	Fe
114-MW72D-102-106-20240813	JD93987-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-102-106-20240813	JD93987-5F	Groundwater	Fe
114-MW72D-110-114-20240813	JD93987-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-110-114-20240813	JD93987-6F	Groundwater	Fe
114-MW72D-116-119-20240813	JD93987-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-116-119-20240813	JD93987-7F	Groundwater	Fe
114-MW72D-123-126-20240813	JD93987-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-123-126-20240813	JD93987-8F	Groundwater	Fe
FB-20240813	JD93987-9	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All quality control (QC) criteria were met. No qualifiers were applied.

Matrix Spike (MS)

Sample 114-MW76D-113.75-20240813 (JD93987-1) was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW76D-113.75-20240813 (JD93987-1) was analyzed as a laboratory duplicate for this data set. Both samples were nondetect. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recovery (%R) was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field Blank FB-20240813 (JD93987-9) was submitted for hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW76D-113.75-20240813 (JD93987-1) and 114-MW76D-113.75-20240813-X (JD93987-2) were analyzed as the field duplicate pair for hexavalent chromium. Both sample results were nondetect (ND). All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)

Hold Time

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW76D-113.75-20240813 (JD93987-1F) was analyzed as a MS/MSD for ferrous iron in this data set. All QC acceptance criteria were met.

A MS/MSD was not performed on a site sample for chromium in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank FB-20240813 (JD93987-9) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW76D-113.75-20240813 (JD93987-1, -1F) and 114-MW76D-113.75-20240813-X (JD93987-2, -2F) were analyzed as the field duplicate pair for chromium and ferrous iron. All sample results were ND. All QC acceptance criteria were met. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW76D-113.75-20240813 (JD93987-1) was analyzed as a MS/MSD for TOC in this data set. All QC acceptance criteria were met.

Sample 114-MW72D-102-106-20240813 (JD93987-5) was analyzed as a MS/MSD for sulfate in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank FB-20240813 (JD93987-9) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW76D-113.75-20240813 (JD93987-1) and 114-MW76D-113.75-20240813-X (JD93987-2) were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 13, 2024
Lab Name/ID SGS, Dayton
SDG No JD93987
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240813

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20240813	JD93987-5	Total	CHROMIUM (HEXAVALENT)	U	0.14	0.14	0.010		
114-MW72D-110-114-20240813	JD93987-6	Total	CHROMIUM (HEXAVALENT)	U	0.13	0.13	0.010		
114-MW72D-116-119-20240813	JD93987-7	Total	CHROMIUM (HEXAVALENT)	U	0.084	0.084	0.010		
114-MW72D-123-126-20240813	JD93987-8	Total	CHROMIUM (HEXAVALENT)	U	0.095	0.095	0.010		

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

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 13, 2024
Lab Name/ID SGS, Dayton
SDG No JD93987
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240813

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-102-106-20240813	JD93987-5	Total	CHROMIUM	U	183	183	10		
114-MW72D-110-114-20240813	JD93987-6	Total	CHROMIUM	U	144	144	10		
114-MW72D-116-119-20240813	JD93987-7	Total	CHROMIUM	U	79.2	79.2	10		
114-MW72D-123-126-20240813	JD93987-8	Total	CHROMIUM	U	72.6	72.6	10		
FB-20240813	JD93987-9	Total	CHROMIUM	U	0.99B	0.99J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 13, 2024
Lab Name/ID SGS, Dayton
SDG No JD93987
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240813

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-113.75-20240813	JD93987-1F	Dissolved	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW76D-113.75-20240813-X	JD93987-2F	Dissolved	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW76D-118.75-20240813	JD93987-3F	Dissolved	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW76D-123.75-20240813	JD93987-4F	Dissolved	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW72D-102-106-20240813	JD93987-5F	Dissolved	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW72D-110-114-20240813	JD93987-6F	Dissolved	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW72D-116-119-20240813	JD93987-7F	Dissolved	IRON (FERROUS)	U	U	UJ	200	Qualify	1
114-MW72D-123-126-20240813	JD93987-8F	Dissolved	IRON (FERROUS)	U	U	UJ	200	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 Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 13, 2024
Lab Name/ID SGS, Dayton
SDG No JD93987
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID FB-20240813

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-113.75-20240813	JD93987-1	SULFATE	U	57.8	57.8	2.0		
114-MW76D-113.75-20240813-X	JD93987-2	SULFATE	U	56.8	56.8	2.0		
114-MW76D-118.75-20240813	JD93987-3	SULFATE	U	56.8	56.8	2.0		
114-MW76D-123.75-20240813	JD93987-4	SULFATE	U	56.4	56.4	2.0		
114-MW72D-102-106-20240813	JD93987-5	SULFATE	U	5.0	5.0	2.0		
114-MW72D-110-114-20240813	JD93987-6	SULFATE	U	3.2	3.2	2.0		
114-MW72D-116-119-20240813	JD93987-7	SULFATE	U	3.3	3.3	2.0		
114-MW72D-123-126-20240813	JD93987-8	SULFATE	U	3.1	3.1	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 13, 2024
Lab Name/ID SGS, Dayton
SDG No JD93987
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank IDs FB-20240813

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-113.75-20240813	JD93987-1	Total	Total Organic Carbon	U	3.8	3.8	1.0		
114-MW76D-113.75-20240813-X	JD93987-2	Total	Total Organic Carbon	U	4.3	4.3	1.0		
114-MW76D-118.75-20240813	JD93987-3	Total	Total Organic Carbon	U	4.1	4.1	1.0		
114-MW76D-123.75-20240813	JD93987-4	Total	Total Organic Carbon	U	3.8	3.8	1.0		
114-MW72D-102-106-20240813	JD93987-5	Total	Total Organic Carbon	U	14.3	14.3	1.0		
114-MW72D-110-114-20240813	JD93987-6	Total	Total Organic Carbon	U	31.9	31.9	1.0		
114-MW72D-116-119-20240813	JD93987-7	Total	Total Organic Carbon	U	27.1	27.1	1.0		
114-MW72D-123-126-20240813	JD93987-8	Total	Total Organic Carbon	U	29.7	29.7	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD93987		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 9/03/2024	
Number of Samples/Matrix: 8 GW, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 9/27/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.3 °C, 3.8 °C
Holding Time	Yes	No	Sampled 8/13/2024, analyzed 8/14/2024
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	8/14/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN58407 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	FB-20240813 (JD93987-9) ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW76D-113.75-20240813 (JD93987-1), see table below
Laboratory Duplicate	Yes	No	114-MW76D-113.75-20240813 (JD93987-1), Both ND, see table below
Laboratory Control Standards	Yes	No	GN58407 (100.0 %R)
Field Duplicate	Yes	No	114-MW76D-113.75-20240813 (JD93987-1) & 114-MW76D-113.75-20240813-X (JD93987-2), Both ND
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW76D-113.75-20240813 (JD93987-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.142	NA	94.7	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****R – recovery****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
114-MW76D-113.75-20240813	JD93987-1	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RL – reporting limit**RPD – relative percent difference****Field Duplicates**

114-MW76D-113.75-20240813 (JD93987-1) & 114-MW76D-113.75-20240813-X (JD93987-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.0026	U	0.0026	U	0.010	mg/l	158	Both ND, Accept

RL – reporting limit**RPD – relative percent difference**

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-MW76D-113.75-20240813	JD93987-1		10		10	0	Both ND, Accept
114-MW76D-113.75-20240813-X	JD93987-2		10		10	0	Both ND, Accept
114-MW76D-118.75-20240813	JD93987-3		10		10	0	Both ND, Accept
114-MW76D-123.75-20240813	JD93987-4		10		10	0	Both ND, Accept
114-MW72D-102-106-20240813	JD93987-5	183	10	140	10	27	T Cr > T Cr6, Accept
114-MW72D-110-114-20240813	JD93987-6	144	10	130	10	10	T Cr > T Cr6, Accept
114-MW72D-116-119-20240813	JD93987-7	79.2	10	84	10	6	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-123-126-20240813	JD93987-8	72.6	10	95	10	27	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
FB-20240813	JD93987-9	0.99	2.0		10	NC	T Cr > T Cr6, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference****Reporting Limits GW Metals**

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW72D-102-106-20240813	JD93987-5	CHROMIUM (HEXAVALENT)	0.14	Y	mg/l	0.07
114-MW72D-110-114-20240813	JD93987-6	CHROMIUM (HEXAVALENT)	0.13	Y	mg/l	0.07
114-MW72D-116-119-20240813	JD93987-7	CHROMIUM (HEXAVALENT)	0.084	Y	mg/l	0.07
114-MW72D-123-126-20240813	JD93987-8	CHROMIUM (HEXAVALENT)	0.095	Y	mg/l	0.07

SDG#: JD93987/ Method 7196

GN58407

Cr+6 ICAL 8/14/2024

GW

(p. 435 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.089
0.3	0.26
0.5	0.424
0.8	0.670
1	0.851

(p. 435 of
data pkg)

AECOM Calculated Intercept	0.00207	OK	Reported intercept	0.0021
AECOM Slope	0.8444	OK	Reported Slope	0.8444
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation

GN58407-B1

P. 424, 435

Background absorbance	0	
Sample absorbance	0.129	
LCS Soluble Instrument Response	0.129	
Instrument Concentration (mg/L)	0.150	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN58407-B1

P. 424, 435

True Value (mg/L)	0.150			
AECOM Calculated %R	100.2	OK	Reported %R	100.0

MS calculation

GN58407-S1

P. 426, 435, 436

114-MW76D-113.75-20240813

Unfiltered

Background reading	0.001
Total absorbance	0.123
Total absorbance - background	0.122
Instrument Concentration (mg/L)	0.1420

Sample aliquot	0.05	NA: standards and samples treated the same	
Final volume	0.05		
Dilution Factor	1		
AECOM Calculated MS Result (mg/L)	0.142	OK	Reported Result (mg/L) 0.142

%R = Found/True*100	GN58407-S1	P. 426, 435, 436	114-MW76D-113.75-20240813
True Value (mg/L)	0.150		
Native concentration (mg/L)	0.0		
AECOM Calculated MS Result %R	94.7	OK	Reported %R 94.7

UNFILTERED			
Reporting Limit	JD93987-1	P. 13, 435	114-MW76D-113.75-20240813
Low Standard	0.01		
Initial volume (L)	0.5	NA: standards and samples treated the same	
Final volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)= 0.010

UNFILTERED			
<u>Sample Calculations</u>	JD93987-1	P. 13, 435	114-MW76D-113.75-20240813
Background reading	0.001		
Total absorbance	0.004		
Total absorbance - background	0.003		
Instrument Response (mg/L)	0.001		
Sample volume (L)	0.5	NA: standards and samples treated the same	
Final Volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Result (mg/L)	0.0011	OK, <MDL, report as ND	Reported Result (mg/L) 0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD93987		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 9/02/2024	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 9/27/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.3 °C, 3.8 °C
Holding Time	No	Yes	Sampled 8/13/2024, analyzed 8/14/2024– 8/17/2024, Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP48527 ND Cr, GP56026/GN58446 ND sulfate, GP56016/GN58543 ND TOC, GN58573 (dissolved) ND Fe
Field Blanks	No	No	FB-20240813 (JD93987-9), see table below
Matrix Spike	Yes	No	114-MW76D-113.75-20240813 (JD93987-1, -1F) TOC, and Fe, 114-MW72D-102-106-20240813 (JD93987-5) sulfate, see tables below, Batch QC Cr
Matrix Spike Duplicate	Yes	No	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP48527 Cr (93.6 %R), GP56026/GN5846 sulfate (97.0 %R), GP56016/GN58543 TOC (95.2 %R), GN58573 (dissolved) Fe (96.7 %R)
Field Duplicate	Yes	No	114-MW76D-113.75-20240813 (JD93987-1) & 114-MW76D-113.75-20240813-X (JD93987-2)
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW76D-113.75-20240813	JD93987-1F	IRON (FERROUS)	8/13/2024 10:10	8/17/2024 15:30	Estimate (UJ)
114-MW76D-113.75-20240813-X	JD93987-2F	IRON (FERROUS)	8/13/2024 10:15	8/17/2024 15:30	Estimate (UJ)
114-MW76D-118.75-20240813	JD93987-3F	IRON (FERROUS)	8/13/2024 12:15	8/17/2024 15:30	Estimate (UJ)
114-MW76D-123.75-20240813	JD93987-4F	IRON (FERROUS)	8/13/2024 13:45	8/17/2024 15:30	Estimate (UJ)
114-MW72D-102-106-20240813	JD93987-5F	IRON (FERROUS)	8/13/2024 9:10	8/17/2024 15:30	Estimate (UJ)
114-MW72D-110-114-20240813	JD93987-6F	IRON (FERROUS)	8/13/2024 9:25	8/17/2024 15:30	Estimate (UJ)
114-MW72D-116-119-20240813	JD93987-7F	IRON (FERROUS)	8/13/2024 9:30	8/17/2024 15:30	Estimate (UJ)
114-MW72D-123-126-20240813	JD93987-8F	IRON (FERROUS)	8/13/2024 9:35	8/17/2024 15:30	Estimate (UJ)

Field Blank

FB-20240813 (JD93987-9)

Analyte	Fraction	SR (ug/l)	Qual	RL	Action
CHROMIUM	Total	0.99	J	2.0	Associated SR ND or >10x FB, Accept

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates**

114-MW76D-113.75-20240813 (JD93987-1, -1F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD	RPD Upper Limit	Action
TOC	Total	10	3.8	14.8	14.4	110.0	106	143	59	2.7	15	OK, Accept
Iron, Ferrous	Dissolved	3.0	0	2.9	2.9	96.7	96.7	115	85	0	15	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****R – recovery****RPD – relative percent difference**

114-MW72D-102-106-20240813 (JD93987-5)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD	RPD Upper Limit	Action
SULFATE	Total	80	5.0	82.7	89.8	97.1	106	120	80	8.2	15	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

R – recovery

RPD – relative percent difference

Field Duplicates

114-MW76D-113.75-20240813 (JD93897-1, -1F) & 114-MW76D-113.75-20240813-X (JD93897-2, -2F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
IRON, Ferrous	Dissolved	0.029	U	0.029	U	0.20	mg/l	0	Both ND, Accept
CHROMIUM	Total	3.1	U	3.1	U	10	ug/l	0	Both ND, Accept
SULFATE	Total	57.8		56.8		2.0	mg/l	1.75	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	3.8		4.3		1.0	mg/l	12.4	RPD < 30%, Accept

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW72D-102-106-20240813	JD93987-5	CHROMIUM	183	Y	ug/l	70
114-MW72D-110-114-20240813	JD93987-6	CHROMIUM	144	Y	ug/l	70
114-MW72D-116-119-20240813	JD93987-7	CHROMIUM	79.2	Y	ug/l	70
114-MW72D-123-126-20240813	JD93987-8	CHROMIUM	72.6	Y	ug/l	70

RL – reporting limit

RPD – relative percent difference

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-113.75-20240813	JD93987-1	CHROMIUM	Total	10
114-MW76D-113.75-20240813-X	JD93987-2	CHROMIUM	Total	10
114-MW76D-118.75-20240813	JD93987-3	CHROMIUM	Total	10
114-MW76D-123.75-20240813	JD93987-4	CHROMIUM	Total	10
114-MW72D-102-106-20240813	JD93987-5	CHROMIUM	Total	10
114-MW72D-110-114-20240813	JD93987-6	CHROMIUM	Total	10
114-MW72D-116-119-20240813	JD93987-7	CHROMIUM	Total	10
114-MW72D-123-126-20240813	JD93987-8	CHROMIUM	Total	10
FB-20240813	JD93987-9	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD94597
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals (ICP/MS) SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0
Validation Level:	Full (Hexavalent Chromium) Limited (Chromium, TOC, Sulfate)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 9/19/2024
Reviewed by:	Linda Waters/AECOM File Name: JD94597_2024_9_19 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods for Chemical Analysis of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater.

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 or field blank. The presence of the analyte in the sample is negated (UB) due to laboratory or field 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 or field blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method or field blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on August 21, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-P3-MW005D-50.3-20240821	JD94597-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-P3-MW005D-50.3-20240821	JD94597-1F	Groundwater	Dissolved Chromium, Dissolved Hexavalent Chromium
114-PZ-57T-67.5-20240821	JD94597-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-PZ-57T-67.5-20240821	JD94597-2F	Groundwater	Dissolved Chromium, Dissolved Hexavalent Chromium
114-MW57C-70.9-20240821	JD94597-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57C-70.9-20240821	JD94597-3F	Groundwater	Dissolved Chromium
114-PZ-57I-30.2-20240821	JD94597-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-PZ-57I-30.2-20240821	JD94597-4F	Groundwater	Dissolved Chromium

Field ID	Laboratory ID	Matrix	Parameter
BT-FB-20240821	JD94597-5	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

The dissolved chromium result in sample 114-PZ-57I-30.2-20240821 (JD94597-4F) was less than the dissolved hexavalent chromium result. The results were qualified as estimated (J) due to the variability observed and an unknown bias.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS percent recovery (%R) was reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

Field blank BT-FB-20240821 (JD94597-5) was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium)**Field Blank (FB)**

Field blank BT-FB-20240821 (JD94597-5) was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. The dissolved chromium result in sample 114-PZ-57I-30.2-20240821 (JD94597-4F) was less than the dissolved hexavalent chromium result. The results were qualified as estimated (J) due to the variability observed and an unknown bias.

Wet Chemistry (TOC, Sulfate)**Field Blank (FB)**

Field blank BT-FB-20240821 (JD94597-5) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Matrix Spike/ Matrix Spike Duplicate

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Duplicates (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 21 2024
Lab Name/ID SGS, Dayton
SDG No JD94597
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BT--FB-20240821

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-P3-MW005D-50.3-20240821	JD94597-1	Total	CHROMIUM (HEXAVALENT)	U	34.8	34.8	1.0		
114-P3-MW005D-50.3-20240821	JD94597-1F	Dissolved	CHROMIUM (HEXAVALENT)	U	35.1	35.1	1.0		
114-MW57C-70.9-20240821	JD94597-3	Total	CHROMIUM (HEXAVALENT)	U	0.057	0.057	0.010		
114-MW57C-70.9-20240821	JD94597-3F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.057	0.057	0.010		
114-PZ-57I-30.2-20240821	JD94597-4	Total	CHROMIUM (HEXAVALENT)	U	54.3	54.3	1.0		
114-PZ-57I-30.2-20240821	JD94597-4F	Dissolved	CHROMIUM (HEXAVALENT)	U	50.4	50.4J	1.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 21 2024
Lab Name/ID SGS, Dayton
SDG No JD94597
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BT--FB-20240821

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-P3-MW005D-50.3-20240821	JD94597-1	Total	CHROMIUM	U	34800	34800	1000		
114-P3-MW005D-50.3-20240821	JD94597-1F	Dissolved	CHROMIUM	U	35600	35600	1000		
114-PZ-57T-67.5-20240821	JD94597-2	Total	CHROMIUM	U	878	878	10		
114-PZ-57T-67.5-20240821	JD94597-2F	Dissolved	CHROMIUM	U	822	822	10		
114-MW57C-70.9-20240821	JD94597-3	Total	CHROMIUM	U	2130	2130	50		
114-MW57C-70.9-20240821	JD94597-3F	Dissolved	CHROMIUM	U	1960	1960	50		
114-PZ-57I-30.2-20240821	JD94597-4	Total	CHROMIUM	U	50700	50700	1000		
114-PZ-57I-30.2-20240821	JD94597-4F	Dissolved	CHROMIUM	U	33100	33100J	1000	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 Validation Footnote

1. The dissolved chromium result was less than the corresponding dissolved hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 21 2024
Lab Name/ID SGS, Dayton
SDG No JD94597
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BT--FB-20240821

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-P3-MW005D-50.3-20240821	JD94597-1	SULFATE	U	401	401	10		
114-PZ-57T-67.5-20240821	JD94597-2	SULFATE	U	158	158	40		
114-MW57C-70.9-20240821	JD94597-3	SULFATE	U	419	419	40		
114-PZ-57I-30.2-20240821	JD94597-4	SULFATE	U	1040	1040	10		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date August 21 2024
Lab Name/ID SGS, Dayton
SDG No JD94597
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BT--FB-20240821

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-P3-MW005D-50.3-20240821	JD94597-1	Total	TOC	U	5.0	5.0	5.0		
114-PZ-57T-67.5-20240821	JD94597-2	Total	TOC	U	100	100	100		
114-MW57C-70.9-20240821	JD94597-3	Total	TOC	U	100	100	100		
114-PZ-57I-30.2-20240821	JD94597-4	Total	TOC	U	5.0	5.0	5.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD94597		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 9/19/2024	
Number of Samples/Matrix: 4 GW, 4 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 10/1/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.4 °C
Holding Time	Yes	No	Sampled 8/21/2024, analyzed 8/22/2024
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	8/22/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	GN58736-MB1 ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	BT-FB-20240821 (JD94597-5) ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN58736-B1 (99.3 %R, 100.0 %R)
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	No	Yes	See table below
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium vs Total Hexavalent Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD (%)	Action
114-P3-MW005D-50.3-20240821	JD94597-1	34800	1000	34800	1000	0	T Cr $\geq$ T Cr6, Accept
114-PZ-57T-67.5-20240821	JD94597-2	878	10		10	NC	T Cr $\geq$ T Cr6, Accept
114-MW57C-70.9-20240821	JD94597-3	2130	50	57	10	190	T Cr $\geq$ T Cr6, Accept
114-PZ-57I-30.2-20240821	JD94597-4	50700	1000	54300	1000	7	T Cr < T Cr6, SRs > 4x RL, RPD $\leq$ 30%, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference****Dissolved Chromium vs Dissolved Hexavalent Chromium**

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium RL (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-P3-MW005D-50.3-20240821	JD94597-1F	35600	1000	35100	1000	1	D Cr > D Cr6, Accept
114-PZ-57T-67.5-20240821	JD94597-2F	822	10		10	NC	D Cr > D Cr6, Accept
114-MW57C-70.9-20240821	JD94597-3F	1960	50	57	10	189	D Cr > D Cr6, Accept
114-PZ-57I-30.2-20240821	JD94597-4F	33100	1000	50400	1000	41	D Cr < D Cr6, SRs > 4x RL, RPD > 30%, Qualify J

NC – not calculated**RPD – relative percent difference****RL – reporting limit**

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium RL (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium RL (ug/l)	RPD (%)	Action
114-P3-MW005D-50.3-20240821	JD94597-1, -1F	34800	1000	35100	1000	1	T Cr6 < D Cr6, SRs < 4x RL, ABS ≤ RL, Accept
114-PZ-57T-67.5-20240821	JD94597-2, -2F		10		10	0	Both ND, Accept
114-MW57C-70.9-20240821	JD94597-3, -3F	57	10	57	10	0	T Cr6 > D Cr6, Accept
114-PZ-57I-30.2-20240821	JD94597-4, -4F	54300	1000	50400	1000	7	T Cr6 > D Cr6, Accept

RPD – relative percent difference

RL – reporting limit

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-P3-MW005D-50.3-20240821	JD94597-1	CHROMIUM (HEXAVALENT)	34.8	Y	mg/l	0.07
114-P3-MW005D-50.3-20240821	JD94597-1F	CHROMIUM (HEXAVALENT)	35.1	Y	mg/l	0.07
114-PZ-57I-30.2-20240821	JD94597-4	CHROMIUM (HEXAVALENT)	54.3	Y	mg/l	0.07
114-PZ-57I-30.2-20240821	JD94597-4F	CHROMIUM (HEXAVALENT)	50.4	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-P3-MW005D-50.3-20240821	JD94597-1	CHROMIUM (HEXAVALENT)	Total	100
114-P3-MW005D-50.3-20240821	JD94597-1F	CHROMIUM (HEXAVALENT)	Dissolved	100
114-PZ-57I-30.2-20240821	JD94597-4	CHROMIUM (HEXAVALENT)	Total	100
114-PZ-57I-30.2-20240821	JD94597-4F	CHROMIUM (HEXAVALENT)	Dissolved	100

SDG#: JD94597/ Method 7196

GN58736

Cr+6 ICAL 8/22/2024

GW

(p. 2390 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.089
0.3	0.265
0.5	0.445
0.8	0.681
1	0.851

(p. 2390
of data
pkg)

AECOM Calculated Intercept	0.00403	OK	Reported intercept	0.0031
AECOM Slope	0.8521	OK	Reported Slope	0.8584
AECOM Calculated r	0.99978	OK	Reported r	0.99982

LCS calculation

GN58736-B1

P. 2377, 2390

Background absorbance	0	
Sample absorbance	0.131	
LCS Soluble Instrument Response	0.131	
Instrument Concentration (mg/L)	0.149	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149

%R = Found/True*100

GN58736-B1

P. 2377, 2390

True Value (mg/L) 0.150

AECOM Calculated %R	99.3	OK	Reported %R	99.3

MS calculation

GN58736-S1

P. 2379, 2390,
2393

Batch QC (JD94614-1)

Unfiltered

Background reading	0	
Total absorbance	0.129	
Total absorbance - background	0.129	
Instrument Concentration (mg/L)	0.1467	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated MS Result (mg/L)	0.147	OK	Reported Result (mg/L)	0.15

%R = Found/True*100

GN58736-S1

P. 2379, 2390,
2393

Batch QC (JD94614-1)

True Value (mg/L) 0.150

Native concentration (mg/L) 0.0

AECOM Calculated MS Result %R	97.8	OK	Reported %R	98.0

UNFILTERED

Reporting Limit

JD94597-1

P. 12, 2390

114-P3-MW005D-50.3-
20240821

Low Standard

0.01

NA: standards
and samples
treated the same

Initial volume (L)

0.5

Final volume (L)

0.5

Dilution Factor

100

AECOM Calculated Reporting Limit

1.000

OK

Reported RL (mg/L)=

1.000

UNFILTERED

Sample Calculations

JD94597-1

P. 12, 2390

114-P2-MW-12D-20240815

Background reading

0

Total absorbance

0.304

Total absorbance - background

0.304

Instrument Response (mg/L)

0.352

NA: standards
and samples
treated the same

Sample volume (L)

0.5

Final Volume (L)

0.5

Dilution Factor

100

AECOM Calculated Result (mg/L)

35.2

OK

Reported Result (mg/L)

35

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD94597		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 9/19/2024	
Number of Samples/Matrix: 4 GW, 4 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, and Wet Chemistry		Reviewer and Date: Linda Waters 10/1/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	3.4 °C
Holding Time	Yes	No	Sampled 8/21/2024, analyzed 8/23/2024 - 8/29/2024,
Quantitation Limits	Yes	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP48718 ND Cr, MP48750 ND Cr, MP48815 ND Cr, GP56207/GN58811 ND Sulfate, GP56199/GN58878 ND TOC, GN56200/GN58878 ND TOC
Field Blanks	Yes	No	BT-FB-20240821 (JD94597-5), all ND
Matrix Spike	NA	NA	Batch QC
Matrix Spike Duplicate	NA	NA	See above
Post Digestion Spike	NA	NA	none
Laboratory Duplicate	NA	NA	none
Laboratory Control Standards	Yes	No	MP48718 Cr (101.0 %R), MP48750 Cr (1-2.0 %R), MP48815 Cr (97.0 %R), GP56207/GN58811 Sulfate (98.5 %R), GP56199/GN58878 TOC (99.5 %R), GN56200/GN58878 TOC (97.6 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	Yes	No	See table below
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section for table

Total Chromium vs Dissolved Chromium

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-P3-MW005D-50.3-20240821	JD94597-1, -1F	34800	1000	35600	1000	5000	800	2	T Cr < D Cr, SRs > 5x RL, RPD ≤ 30%, Accept
114-PZ-57T-67.5-20240821	JD94597-2, -2F	878	10	822	10	50	56	7	T Cr6 > D Cr6, Accept
114-MW57C-70.9-20240821	JD94597-3,-3F	2130	50	1960	50	250	170	8	T Cr6 > D Cr6, Accept
114-PZ-57I-30.2-20240821	JD94597-4, -4F	50700	1000	33100	1000	5000	17600	42	T Cr6 > D Cr6, Accept

RL – reporting limit**RPD – relative percent difference****Reporting Limits GW Metals**

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW57C-70.9-20240821	JD94597-3	SULFATE	419	Y	mg/l	250
114-MW57C-70.9-20240821	JD94597-3	CHROMIUM	2130	Y	ug/l	70
114-MW57C-70.9-20240821	JD94597-3F	CHROMIUM	1960	Y	ug/l	70
114-P3-MW005D-50.3-20240821	JD94597-1	SULFATE	401	Y	mg/l	250
114-P3-MW005D-50.3-20240821	JD94597-1	CHROMIUM	34800	Y	ug/l	70
114-P3-MW005D-50.3-20240821	JD94597-1F	CHROMIUM	35600	Y	ug/l	70
114-PZ-57I-30.2-20240821	JD94597-4	SULFATE	1040	Y	mg/l	250
114-PZ-57I-30.2-20240821	JD94597-4	CHROMIUM	50700	Y	ug/l	70
114-PZ-57I-30.2-20240821	JD94597-4F	CHROMIUM	33100	Y	ug/l	70
114-PZ-57T-67.5-20240821	JD94597-2	CHROMIUM	878	Y	ug/l	70
114-PZ-57T-67.5-20240821	JD94597-2F	CHROMIUM	822	Y	ug/l	70

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-P3-MW005D-50.3-20240821	JD94597-1	TOC	Total	5
114-P3-MW005D-50.3-20240821	JD94597-1	CHROMIUM	Total	1000
114-P3-MW005D-50.3-20240821	JD94597-1	SULFATE	Total	5
114-P3-MW005D-50.3-20240821	JD94597-1F	CHROMIUM	Dissolved	1000
114-PZ-57T-67.5-20240821	JD94597-2	TOC	Total	100
114-PZ-57T-67.5-20240821	JD94597-2	CHROMIUM	Total	10
114-PZ-57T-67.5-20240821	JD94597-2	SULFATE	Total	20
114-PZ-57T-67.5-20240821	JD94597-2F	CHROMIUM	Dissolved	10
114-MW57C-70.9-20240821	JD94597-3	TOC	Total	100
114-MW57C-70.9-20240821	JD94597-3	CHROMIUM	Total	50
114-MW57C-70.9-20240821	JD94597-3	SULFATE	Total	20
114-MW57C-70.9-20240821	JD94597-3F	CHROMIUM	Dissolved	50
114-PZ-57I-30.2-20240821	JD94597-4	TOC	Total	5
114-PZ-57I-30.2-20240821	JD94597-4	CHROMIUM	Total	1000
114-PZ-57I-30.2-20240821	JD94597-4	SULFATE	Total	5
114-PZ-57I-30.2-20240821	JD94597-4F	CHROMIUM	Dissolved	1000
BT-FB-20240821	JD94597-5	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD96195
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 9/30/2024
Reviewed by:	Linda Waters/AECOM File Name: JD96195_2024_09_30DVRReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 16, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-103.75-20240916	JD96195-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-103.75-20240916	JD96195-1F	Groundwater	Ferrous Iron (dissolved)
114-MW76D-108.75-20240916	JD96195-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-108.75-20240916	JD96195-2F	Groundwater	Ferrous Iron (dissolved)
114-MW61D-117.0-20240916	JD96195-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-117.0-20240916	JD96195-3F	Groundwater	Ferrous Iron (dissolved)
114-MW61D-121.0-20240916	JD96195-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-121.0-20240916	JD96195-4F	Groundwater	Ferrous Iron (dissolved)

Field ID	Laboratory ID	Matrix	Parameter
114-MW61D-121.0-20240916-X	JD96195-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-121.0-20240916-X	JD96195-5F	Groundwater	Ferrous Iron (dissolved)
GW-RI-FB-20240916	JD96195-6	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Sample 114-MW76D-103.75-20240916 (JD96195-1) was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW76D-103.75-20240916 (JD96195-1) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240916 (JD96195-6), was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW61D-121.0-20240916 (JD96195-4) and 114-MW61D-121.0-20240916-X (JD96195-5) were analyzed as the field duplicate pair for hexavalent chromium. Both results were nondetect. All QC acceptance criteria were met.

Metals (Chromium, Ferrous Iron)

Hold Time

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW76D-103.75-20240916 (JD96195-1) was analyzed as a MS/MSD for chromium and ferrous iron.

The reported ferrous iron MS/MSD recoveries were below QC acceptance criteria. All associated ferrous iron results were qualified as estimated (UJ).

Chromium MS/MSD results met QC acceptance criteria. No qualifications were required.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240916, was submitted for total chromium and ferrous iron analysis. Chromium was reported at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results were nondetect for chromium. No qualifications were made.

The ferrous iron result for the field blank was nondetect; therefore, no associated sample results required qualification.

Field Duplicate (FD)

Samples 114-MW61D-121.0-20240916 (JD96195-4, -4F) and 114-MW61D-121.0-20240916-X (JD96195-5, -5F) were analyzed as the field duplicate pair for chromium and ferrous iron. All results were nondetect. All QC acceptance criteria were met.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW76D-103.75-20240916 (JD96195-1) was analyzed as a MS/MSD for TOC and sulfate.

While sulfate recoveries met criteria, the relative percent difference (RPD) did not meet QC acceptance criteria. Associated positive results were qualified as estimated (J) with an unknown bias due to the high implied variability between results.

The TOC MS/MSD results met all QC acceptance criteria and no qualifications were required.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, FB-20240726 (JD92936-4,) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW61D-121.0-20240916 (JD96195-4) and 114-MW61D-121.0-20240916-X (JD96195-5) were analyzed as the field duplicate pair for TOC and sulfate and met the QC acceptance limits. No qualifications were required.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Results estimated due to matrix spike/matrix spike duplicate or field duplicate precision are useable with an unknown bias.

Results estimated due to matrix spike recoveries are useable with a low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD96195
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240916

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD96195
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240916

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
GW-RI-FB-20240916	JD96195-6	Total	CHROMIUM	U	0.67B	0.67J	1.0	Qualify	1

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD96195
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240916

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20240916	JD96195-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1, 2
114-MW76D-108.75-20240916	JD96195-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1, 2
114-MW61D-117.0-20240916	JD96195-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1, 2
114-MW61D-121.0-20240916	JD96195-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1, 2
114-MW61D-121.0-20240916-X	JD96195-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	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 Validation Footnote

1. Technical holding time was exceeded.
2. MS and/or MSD recovery was below the lower acceptance limit.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD96195
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240916

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20240916	JD96195-1	SULFATE	U	62.6	62.6J	2.0	Qualify	1
114-MW76D-108.75-20240916	JD96195-2	SULFATE	U	63.3	63.3J	2.0	Qualify	1
114-MW61D-117.0-20240916	JD96195-3	SULFATE	U	39.3	39.3J	2.0	Qualify	1
114-MW61D-121.0-20240916	JD96195-4	SULFATE	U	39.1	39.1J	2.0	Qualify	1
114-MW61D-121.0-20240916-X	JD96195-5	SULFATE	U	38.9	38.9J	2.0	Qualify	1

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

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

NJDEP Validation Footnote

1. MS/MSD RPD exceeded the acceptance limit.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 16, 2024
Lab Name/ID SGS, Dayton
SDG No JD96195
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240916

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20240916	JD96195-1	Total	Total Organic Carbon	U	1.7	1.7	1.0		
114-MW76D-108.75-20240916	JD96195-2	Total	Total Organic Carbon	U	2.8	2.8	1.0		
114-MW61D-121.0-20240916	JD96195-4	Total	Total Organic Carbon	U	0.95B	0.95J	1.0	Qualify	1
114-MW61D-121.0-20240916-X	JD96195-5	Total	Total Organic Carbon	U	0.74B	0.74J	1.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD96195		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 9/30/2024	
Number of Samples/Matrix: 5 GW, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 10/1/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.2 °C
Holding Time	Yes	No	Sampled 9/16/2024, analyzed 9/17/2024
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	9/17/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN59743, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240916 (JD96195-6), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW76D-103.75-20240916 (JD96195-1), see table below
Laboratory Duplicate	Yes	No	114-MW76D-103.75-20240916 (JD96195-1), Both ND, see table below
Laboratory Control Standards	Yes	No	GN59743 {100.0 %R}
Field Duplicate	Yes	No	114-MW61D-121.0-20240916 (JD96195-4) & 143-114-MW61D-121.0-20240916-X (JD96195-5), Both ND, See table
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW76D-103.75-20240916 (JD96195-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	MS % R	Upper Limit	Lower Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.151	100.7	115	85	OK, Accept

SR – sample result**SSR – Spiked sample result****R – recovery****Lab Duplicate (Dup)**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	RPD Limit	Action
114-MW76D-103.75-20240916	JD96195-1	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	20	OK, Accept

RL – reporting limit**RPD – relative percent difference****Field Duplicates**

114-MW61D-121.0-20240916 (JD96195-4) & 143-114-MW61D-121.0-20240916-X (JD96195-5)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RL – reporting limit**RPD – relative percent difference**

Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW76D-103.75-20240916	JD96195-1		10		10	0	Both ND, Accept
114-MW76D-108.75-20240916	JD96195-2		10		10	0	Both ND, Accept
114-MW61D-117.0-20240916	JD96195-3		10		10	0	Both ND, Accept
114-MW61D-121.0-20240916	JD96195-4		10		10	0	Both ND, Accept
114-MW61D-121.0-20240916-X	JD96195-5		10		10	0	Both ND, Accept
GW-RI-FB-20240916	JD96195-6	0.67	1.0		10	NC	T Cr > T Cr6, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference**

**SDG#: JD96195/ Method 7196
GN59743**

Cr+6 ICAL 9/17/2024
GW
(p. 720 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.09
0.3	0.267
0.5	0.442
0.8	0.689
1	0.866

(p. 720 of
data pkg)

AECOM Calculated Intercept	0.00271	OK	Reported intercept	0.0027
AECOM Slope	0.8643	OK	Reported Slope	0.8643
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation
GN59743-B1
P. 705, 720

Background absorbance	0	
Sample absorbance	0.132	
LCS Soluble Instrument Response	0.132	
Instrument Concentration (mg/L)	0.150	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100
GN59743-B1
P. 705, 720

True Value (mg/L) 0.150

AECOM Calculated %R	99.7	OK	Reported %R	100.0

MS calculation
GN59743-S2
P. 707, 720,722
114-MW76D-103.75-20240916
Unfiltered

Background reading	0.001	
Total absorbance	0.134	
Total absorbance - background	0.133	
Instrument Concentration (mg/L)	0.1508	
		NA: standards and samples treated the same
Sample aliquot	0.05	
Final volume	0.05	
Dilution Factor	1	

AECOM Calculated MS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100
GN59743-S2
P. 707, 720,722
114-MW76D-103.75-20240916

True Value (mg/L) 0.150

Native concentration (mg/L) 0.0

AECOM Calculated MS Result %R	100.5	OK	Reported %R	100.7

UNFILTERED
Reporting Limit
JD96195-1
P. 13, 720
114-MW76D-103.75-20240916

Low Standard 0.01

Initial volume (L)	0.5	NA: standards and samples treated the same		
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JD96195-1	P. 13, 720	114-MW76D-103.75-20240916	
Background reading	0.001			
Total absorbance	0.001			
Total absorbance - background	0			
Instrument Response (mg/L)	-0.003			
		NA: standards and samples treated the same		
Sample volume (L)	0.5			
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	-0.0031	OK, <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD96195		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 9/30/2024	
Number of Samples/Matrix: 6 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 10/1/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.2 °C
Holding Time	No	Yes	Sampled 9/16/2024, analyzed 9/17/2024 - 9/21/2024 Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP49286 Cr ND, GN59761 Fe ND, GP56643/GN59923 TOC ND, GP56677/GN59923 TOC ND, GP56669/GN59970 sulfate ND
Field Blanks	No	No	GW-RI-FB-20240916 (JD96195-6), see table below
Matrix Spike	No	Yes	114-MW76D-103.75-20240916 (JD96195-1) Cr, Fe, TOC, and sulfate, all batch QC TOC, see tables below
Matrix Spike Duplicate	No	Yes	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP49286 Cr (90.3 %R), GN59761 Fe (90.0 %R), GP56643/GN59923 TOC (105.0 %R), GP56677/GN59923 TOC (100.0 %R), GP56669/GN59970 sulfate (103.9 %R)
Field Duplicate	No	Yes	114-MW61D-121.0-20240916 (JD96195-4) & 143-114- MW61D-121.0-20240916-X (JD96195-5), See table below
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW76D-103.75-20240916	JD96195-1F	IRON (FERROUS)	9/16/2024 10:10	9/17/2024 14:30	Estimate (UJ)
114-MW76D-108.75-20240916	JD96195-2F	IRON (FERROUS)	9/16/2024 12:55	9/17/2024 14:30	Estimate (UJ)
114-MW61D-117.0-20240916	JD96195-3F	IRON (FERROUS)	9/16/2024 11:00	9/17/2024 14:30	Estimate (UJ)
114-MW61D-121.0-20240916	JD96195-4F	IRON (FERROUS)	9/16/2024 12:45	9/17/2024 14:30	Estimate (UJ)
114-MW61D-121.0-20240916-X	JD96195-5F	IRON (FERROUS)	9/16/2024 12:50	9/17/2024 14:30	Estimate (UJ)

Field Blank

GW-RI-FB-20240916 (JD96195-6)

Analyte	Fraction	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	Total	0.67	J	1.0	All	All SR ND, Accept

SR – sample result

RL – reporting limit

Matrix Spikes/Matrix Spike Duplicates

114-MW76D-103.75-20240916 (JD96195-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
TOC	Total	10	1.7	12.5	11.4	108.0	97	115	85	9.2	10	OK, Accept
SULFATE	Total	80	62.6	143	145	100.5	103	110	90	66.2	15	RPD> 15, Estimate (J)
Ferrous iron	Dissolved	3.0	0	2.7	2.7	90.0	90.0	113	92	0	20	Estimate (UJ)

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

RPD – relative percent difference

114-MW76D-103.75-20240916 (JD96195-1, -1F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
CHROMIUM	Total	80.0	0	70.9	67.6	88.6	84.5	125	75	4.8	20	OK, Accept

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

RPD – relative percent difference

Field Duplicates

114-MW61D-121.0-20240916 (JD96195-4, -4F) & 114-MW61D-121.0-20240916-X (JD96195-5, -5F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
FERROUS, IRON	Dissolved	0.029	U	0.029	U	0.20	ug/l	0	Both ND, Accept
CHROMIUM	Total	3.1	U	3.1	U	10	ug/l	0	Both ND, Accept
SULFATE	Total	39.1		38.9		2.0	mg/l	0.51	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	0.95		0.74		1.0	mg/l	24.9	RPD < 30%, Accept

RL – reporting limit

RPD – relative percent difference

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-103.75-20240916	JD96195-1	CHROMIUM	Total	10
114-MW76D-108.75-20240916	JD96195-2	CHROMIUM	Total	10
114-MW61D-117.0-20240916	JD96195-3	CHROMIUM	Total	10
114-MW61D-121.0-20240916	JD96195-4	CHROMIUM	Total	10
114-MW61D-121.0-20240916-X	JD96195-5	CHROMIUM	Total	10

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD96274
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 9/30/2024
Reviewed by:	Linda Waters/AECOM File Name: JD96274_2024_09_30 DVRReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 17, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-113.75-20240917	JD96274-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
GW-RI-FB-20240917	JD96274-10	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-113.75-20240917	JD96274-1F	Groundwater	Ferrous Iron
114-MW76D-118.75-20240917	JD96274-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-118.75-20240917	JD96274-2F	Groundwater	Ferrous Iron
114-MW61D-126.0-20240917	JD96274-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-126.0-20240917	JD96274-3F	Groundwater	Ferrous Iron
114-MW61D-131.0-20240917	JD96274-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW61D-131.0-20240917	JD96274-4F	Groundwater	Ferrous Iron
114-MW66D-91-97-20240917	JD96274-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-91-97-20240917	JD96274-5F	Groundwater	Ferrous Iron
114-MW66D-107-111-20240917	JD96274-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-107-111-20240917	JD96274-6F	Groundwater	Ferrous Iron
114-MW66D-118-123-20240917	JD96274-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-118-123-20240917	JD96274-7F	Groundwater	Ferrous Iron
114-MW66D-124-129-20240917	JD96274-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-124-129-20240917	JD96274-8F	Groundwater	Ferrous Iron
114-MW66D-137-140-20240917	JD96274-9	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-137-140-20240917	JD96274-9F	Groundwater	Ferrous Iron
Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Sample 114-MW76D-118.75-20240917 (JD96274-2) was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW76D-118.75-20240917 (JD96274-2) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240917 (JD96274-10), was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)

Hold Time

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240917(JD96274-10), was submitted for total chromium and ferrous iron analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW76D-113.75-20240917 (JD962744-1) was analyzed as a MS/MSD for TOC. A high percent recovery was report for the MS and did not meet QC acceptance criteria. Positive results for TOC were qualified as estimated (J+) based on the implied high bias. Nondetected results were considered not affected.

Sulfate met all QC acceptance criteria. No qualifications were made.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240917(JD96274-10), was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results qualified as estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Results qualified as estimated due to matrix spike recoveries are useable with a high bias.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD96274
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240917

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-91-97-20240917	JD96274-5	Total	CHROMIUM (HEXAVALENT)	U	4.3	4.3	0.050		

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD96274
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240917

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-126.0-20240917	JD96274-3	Total	CHROMIUM	U	3.8B	3.8J	10	Qualify	1
114-MW66D-91-97-20240917	JD96274-5	Total	CHROMIUM	U	4710	4710	100		
114-MW66D-107-111-20240917	JD96274-6	Total	CHROMIUM	U	41.5	41.5	10		
114-MW66D-118-123-20240917	JD96274-7	Total	CHROMIUM	U	34.7	34.7	10		
114-MW66D-124-129-20240917	JD96274-8	Total	CHROMIUM	U	8.3B	8.3J	10	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 Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD96274
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240917

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-113.75-20240917	JD96274-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW76D-118.75-20240917	JD96274-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-126.0-20240917	JD96274-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-131.0-20240917	JD96274-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-91-97-20240917	JD96274-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-107-111-20240917	JD96274-6F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-118-123-20240917	JD96274-7F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-124-129-20240917	JD96274-8F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW66D-137-140-20240917	JD96274-9F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD96274
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240917

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-113.75-20240917	JD96274-1	SULFATE	U	65.5	65.5	2.0		
114-MW76D-118.75-20240917	JD96274-2	SULFATE	U	65.5	65.5	2.0		
114-MW61D-126.0-20240917	JD96274-3	SULFATE	U	39.1	39.1	2.0		
114-MW61D-131.0-20240917	JD96274-4	SULFATE	U	39.7	39.7	2.0		
114-MW66D-91-97-20240917	JD96274-5	SULFATE	U	114	114	2.0		
114-MW66D-107-111-20240917	JD96274-6	SULFATE	U	128	128	2.0		
114-MW66D-118-123-20240917	JD96274-7	SULFATE	U	135	135	2.0		
114-MW66D-124-129-20240917	JD96274-8	SULFATE	U	128	128	2.0		
114-MW66D-137-140-20240917	JD96274-9	SULFATE	U	127	127	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 17, 2024
Lab Name/ID SGS, Dayton
SDG No JD96274
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240917

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-118.75-20240917	JD96274-2	Total	Total Organic Carbon	U	4.5	4.5J+	1.0	Qualify	1
114-MW66D-91-97-20240917	JD96274-5	Total	Total Organic Carbon	U	6.1	6.1J+	1.0	Qualify	1
114-MW66D-107-111-20240917	JD96274-6	Total	Total Organic Carbon	U	0.87B	0.87J	1.0	Qualify	1, 2
114-MW66D-118-123-20240917	JD96274-7	Total	Total Organic Carbon	U	3.4	3.4J+	1.0	Qualify	1
114-MW66D-124-129-20240917	JD96274-8	Total	Total Organic Carbon	U	6.0	6.0J+	1.0	Qualify	1
114-MW66D-137-140-20240917	JD96274-9	Total	Total Organic Carbon	U	16.1	16.1J+	1.0	Qualify	1

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

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

NJDEP Validation Footnote

- 1 MS and/or MSD recovery was above the upper acceptance limit.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD96274		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 9/30/2024	
Number of Samples/Matrix: 9 GW, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 10/3/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.4 °C, 2.2 °C
Holding Time	Yes	No	Sampled 9/17/2024, analyzed 9/18/2024
Quantitation Limits	No	No	See table below
Dilutions	No	No	See table below
Initial Calibration	Yes	No	9/18/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN59802, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240917 (JD96274-10), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW76D-118.75-20240917 (JD96274-2), see table below
Laboratory Duplicate	Yes	No	114-MW76D-118.75-20240917 (JD96274-2), Both ND, see table below
Laboratory Control Standards	Yes	No	GN59802 {100.0 %R, 100.0 %R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW76D-118.75-20240917 (JD96274-2)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	MS % R	Upper Limit	Lower Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.156	104	115	85	OK, Accept

SR – sample result**SSR – Spiked sample result****R – recovery****Lab Duplicate (Dup)**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	RPD Limit	Action
114-MW76D-118.75-20240917	JD96274-2	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	20	Both ND, Accept

RL – reporting limit**RPD – relative percent difference****Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW76D-113.75-20240917	JD96274-1		10		10	0	Both ND, Accept
GW-RI-FB-20240917	JD96274-10		2.0		10	0	Both ND, Accept
114-MW76D-118.75-20240917	JD96274-2		10		10	0	Both ND, Accept
114-MW61D-126.0-20240917	JD96274-3	3.8	10		10	NC	T Cr > T Cr6, Accept
114-MW61D-131.0-20240917	JD96274-4		10		10	0	Both ND, Accept
114-MW66D-91-97-20240917	JD96274-5	4710	100	4300	50	9	T Cr > T Cr6, Accept
114-MW66D-107-111-20240917	JD96274-6	41.5	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-118-123-20240917	JD96274-7	34.7	10		10	NC	T Cr > T Cr6, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW66D-124-129-20240917	JD96274-8	8.3	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-137-140-20240917	JD96274-9		10		10	0	Both ND, Accept

NC – not calculated

RL – reporting limit

RPD – relative percent difference

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW66D-91-97-20240917	JD96274-5	CHROMIUM (HEXAVALENT)	4.3	Y	mg/l	0.07

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW66D-91-97-20240917	JD96274-5	CHROMIUM (HEXAVALENT)	Total	5

SDG#: JD96274/ Method 7196

GN59802

Cr+6 ICAL 9/18/2024

GW

(p. 934 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.044
0.1	0.089
0.3	0.266
0.5	0.441
0.8	0.690
1	0.865

(p. 934 of
data pkg)

AECOM Calculated Intercept	0.00235	OK	Reported intercept	0.0024
AECOM Slope	0.8642	OK	Reported Slope	0.8642
AECOM Calculated r	0.99994	OK	Reported r	0.99994

LCS calculation

GN59802-B1

P. 916, 934

Background absorbance

0

Sample absorbance

0.132

LCS Soluble Instrument Response

0.132

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN59802-B1

P. 916, 934

True Value (mg/L)

0.150

AECOM Calculated %R	100.0	OK	Reported %R	100.0

MS calculation

GN59802-S1

P. 918, 934, 939

114-MW76D-118.75-20240917

Unfiltered

Background reading

0.002

Total absorbance

0.139

Total absorbance - background

0.137

Instrument Concentration (mg/L)

0.1558

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated MS Result (mg/L)	0.156	OK	Reported Result (mg/L)	0.156

%R = Found/True*100

GN59802-S1

P. 918, 934, 939

114-MW76D-118.75-20240917

True Value (mg/L)

0.150

Native concentration (mg/L)

0.0

AECOM Calculated MS Result %R	103.9	OK	Reported %R	104.0

UNFILTERED**Reporting Limit**

JD96274-2

P. 17,

114-MW76D-118.75-20240917

Low Standard

0.01

Initial volume (L)	0.5	NA: standards and samples treated the same		
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JD96274-2	P. 17,	114-MW76D-118.75-20240917	
Background reading	0.001			
Total absorbance	0.001			
Total absorbance - background	0			
Instrument Response (mg/L)	-0.003			
Sample volume (L)	0.5	NA: standards and samples treated the same		
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	-0.0027	OK, <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD96274		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 9/30/2024	
Number of Samples/Matrix: 9 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 10/3/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.4 °C, 2.2 °C
Holding Time	No	Yes	Sampled 9/17/2024, analyzed 9/19/2024 - 9/25/2024 Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP49332 Cr ND, GN59861 Fe ND, GP56724/GN60125 TOC ND, GP56720/GN59895 sulfate ND, GP56721/GN59896 sulfate ND
Field Blanks	Yes	No	GW-RI-FB-20240917 (JD96274-10), ND
Matrix Spike	No	Yes	114-MW76D-113.75-20240917 (JD96274-1) TOC, Batch QC Cr, Fe, and sulfate, see tables below
Matrix Spike Duplicate	No	Yes	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP49332 Cr (100.5 %R), GN59861 Fe (100.0 %R), GP56724/GN60125 TOC (106.0 %R), GP56720/GN59895 sulfate (103.9 %R), GP56721/GN59896 sulfate (107.3 %R)
Field Duplicate	NA	NA	None with this SDG
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW76D-113.75-20240917	JD96274-1F	IRON (FERROUS)	9/17/2024 9:55	9/19/2024 12:00	Estimate (UJ)
114-MW76D-118.75-20240917	JD96274-2F	IRON (FERROUS)	9/17/2024 12:35	9/19/2024 12:00	Estimate (UJ)
114-MW61D-126.0-20240917	JD96274-3F	IRON (FERROUS)	9/17/2024 10:00	9/19/2024 12:00	Estimate (UJ)
114-MW61D-131.0-20240917	JD96274-4F	IRON (FERROUS)	9/17/2024 12:15	9/19/2024 12:00	Estimate (UJ)
114-MW66D-91-97-20240917	JD96274-5F	IRON (FERROUS)	9/17/2024 10:05	9/19/2024 12:00	Estimate (UJ)
114-MW66D-107-111-20240917	JD96274-6F	IRON (FERROUS)	9/17/2024 10:10	9/19/2024 12:00	Estimate (UJ)
114-MW66D-118-123-20240917	JD96274-7F	IRON (FERROUS)	9/17/2024 10:30	9/19/2024 12:00	Estimate (UJ)
114-MW66D-124-129-20240917	JD96274-8F	IRON (FERROUS)	9/17/2024 10:40	9/19/2024 12:00	Estimate (UJ)
114-MW66D-137-140-20240917	JD96274-9F	IRON (FERROUS)	9/17/2024 10:50	9/19/2024 12:00	Estimate (UJ)

Matrix Spikes/Matrix Spike Duplicates

114-MW76D-113.75-20240917 (JD96274-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	1.8	13.5	12.8	117.0	110	115	85	5.3	15	Estimate (J+)

SR – sample result

SSR – Spiked sample result

SDR – Sample duplicate result

RPD – relative percent difference

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW66D-91-97-20240917	JD96274-5	CHROMIUM	4710	Y	ug/l	70

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-113.75-20240917	JD96274-1	CHROMIUM	Total	10
GW-RI-FB-20240917	JD96274-10	CHROMIUM	Total	2
114-MW76D-118.75-20240917	JD96274-2	CHROMIUM	Total	10
114-MW61D-126.0-20240917	JD96274-3	CHROMIUM	Total	10
114-MW61D-131.0-20240917	JD96274-4	CHROMIUM	Total	10
114-MW66D-91-97-20240917	JD96274-5	CHROMIUM	Total	100
114-MW66D-107-111-20240917	JD96274-6	CHROMIUM	Total	10
114-MW66D-118-123-20240917	JD96274-7	CHROMIUM	Total	10
114-MW66D-124-129-20240917	JD96274-8	CHROMIUM	Total	10
114-MW66D-137-140-20240917	JD96274-9	CHROMIUM	Total	10

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD96352
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 10/02/2024
Reviewed by:	Linda Waters/AECOM File Name: JD96352_2024_10_02 DVRReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 18, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-123.75-20240918	JD96352-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-87.5-91.5-20240918	JD96352-10	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-87.5-91.5-20240918	JD96352-10F	Groundwater	Ferrous Iron
114-MW57D-96.5-100.5-20240918	JD96352-11	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-96.5-100.5-20240918	JD96352-11F	Groundwater	Ferrous Iron
114-MW57D-104-108-20240918	JD96352-12	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-104-108-20240918	JD96352-12F	Groundwater	Ferrous Iron
114-MW57D-109-113-20240918	JD96352-13	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW57D-109-113-20240918	JD96352-13F	Groundwater	Ferrous Iron
GW-RI-FB-20240918	JD96352-14	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-123.75-20240918	JD96352-1F	Groundwater	Ferrous Iron
114-MW60C-R-117.5-20240918	JD96352-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW60C-R-117.5-20240918	JD96352-2F	Groundwater	Ferrous Iron
114-MW60C-R-117.5-20240918-X (Field Duplicate of 114-MW60C-R-117.5-20240918)	JD96352-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW60C-R-117.5-20240918-X (Field Duplicate of 114-MW60C-R-117.5-20240918)	JD96352-3F	Groundwater	Ferrous Iron
114-MW61D-136.0-20240918	JD96352-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-136.0-20240918	JD96352-4F	Groundwater	Ferrous Iron
114-MW62C-73.0-20240918	JD96352-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW62C-73.0-20240918	JD96352-5F	Groundwater	Ferrous Iron
114-MW4D-90-94-20240918	JD96352-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-90-94-20240918	JD96352-6F	Groundwater	Ferrous Iron
114-MW4D-98-102-20240918	JD96352-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-98-102-20240918	JD96352-7F	Groundwater	Ferrous Iron
114-MW4D-111-115-20240918	JD96352-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-111-115-20240918	JD96352-8F	Groundwater	Ferrous Iron
114-MW4D-121-125-20240918	JD96352-9	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-121-125-20240918	JD96352-9F	Groundwater	Ferrous Iron
Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium**Sample Results**

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Sample 114-MW62C-73.0-20240918 (JD96352-5) was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW62C-73.0-20240918 (JD96352-5) was analyzed as a laboratory duplicate for this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240918 (JD96352-14), was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW60C-R-117.5-20240918 (JD96352-2) and 114-MW60C-R-117.5-20240918-X (JD96352-3) were analyzed as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)**Hold Time**

Ferrous iron samples, 114-MW76D-123.75-20240918 (JD96352-1F), 114-MW61D-136.0-20240918 (JD96352-4F), 114-MW57D-87.5-91.5-20240918 (JD96352-10F), 114-MW57D-96.5-100.5-20240918 (JD96352-11F), 114-MW57D-104-108-20240918 (JD96352-12F), and 114-MW57D-109-113-20240918 (JD96362-13F) were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW62C-73.0-20240918 (JD96352-5, 5F) was analyzed as MS/MSD for chromium and ferrous iron. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240918 (JD96352-14), was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

Samples 114-MW60C-R-117.5-20240918 (JD96352-2, -2F) and 114-MW60C-R-117.5-20240918-X (JD96352-3, -3F) were analyzed as the field duplicate pair for chromium and ferrous iron. All QC acceptance criteria were met. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW62C-73.0-20240918 (JD96352-5) was analyzed as MS/MSD for TOC and sulfate. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. The LCS, GP56726/GN60198, for TOC recovered below the lower limit and did not meet QC acceptance criteria. The associated TOC sample results were qualified as estimated (J-) based on the implied low bias.

All QC acceptance criteria were met for sulfate. No qualifications were required.

Field Blank (FB)

The FB, GW-RI-FB-20240918 (JD96352-14), was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW60C-R-117.5-20240918 (JD96352-2) and 114-MW60C-R-117.5-20240918-X (JD96352-3) were analyzed as the field duplicate pair for TOC and sulfate. The TOC results did not meet the relative percent difference (RPD) QC acceptance criteria. Both associated results were qualified as estimated (J,UJ) with an unknown bias due to the implied high variability between results.

Sulfate met all QC acceptance criteria. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Results estimated due to field duplicate precision are useable with an unknown bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD96352
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240918

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW60C-R-117.5-20240918	JD96352-2	Total	CHROMIUM (HEXAVALENT)	U	0.076	0.076	0.010		
114-MW60C-R-117.5-20240918-X	JD96352-3	Total	CHROMIUM (HEXAVALENT)	U	0.075	0.075	0.010		
114-MW4D-111-115-20240918	JD96352-8	Total	CHROMIUM (HEXAVALENT)	U	0.015	0.015	0.010		
114-MW4D-121-125-20240918	JD96352-9	Total	CHROMIUM (HEXAVALENT)	U	0.017	0.017	0.010		

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

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD96352
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240918

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-123.75-20240918	JD96352-1	Total	CHROMIUM	U	3.4B	3.4J	10	Qualify	1
114-MW57D-87.5-91.5-20240918	JD96352-10	Total	CHROMIUM	U	6.1B	6.1J	10	Qualify	1
114-MW57D-96.5-100.5-20240918	JD96352-11	Total	CHROMIUM	U	6.4B	6.4J	10	Qualify	1
114-MW57D-104-108-20240918	JD96352-12	Total	CHROMIUM	U	5.5B	5.5J	10	Qualify	1
114-MW57D-109-113-20240918	JD96352-13	Total	CHROMIUM	U	5.2B	5.2J	10	Qualify	1
114-MW60C-R-117.5-20240918	JD96352-2	Total	CHROMIUM	U	68.3	68.3	10		
114-MW60C-R-117.5-20240918-X	JD96352-3	Total	CHROMIUM	U	66.8	66.8	10		
114-MW61D-136.0-20240918	JD96352-4	Total	CHROMIUM	U	4.2B	4.2J	10	Qualify	1
114-MW62C-73.0-20240918	JD96352-5	Total	CHROMIUM	U	4.7B	4.7J	10	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 Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD96352
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240918

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-87.5-91.5-20240918	JD96352-10F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57D-96.5-100.5-20240918	JD96352-11F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57D-104-108-20240918	JD96352-12F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW57D-109-113-20240918	JD96352-13F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW76D-123.75-20240918	JD96352-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-136.0-20240918	JD96352-4F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD96352
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240918

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-123.75-20240918	JD96352-1	SULFATE	U	63.1	63.1	2.0		
114-MW57D-87.5-91.5-20240918	JD96352-10	SULFATE	U	87.8	87.8	2.0		
114-MW57D-96.5-100.5-20240918	JD96352-11	SULFATE	U	90.2	90.2	2.0		
114-MW57D-104-108-20240918	JD96352-12	SULFATE	U	107	107	2.0		
114-MW57D-109-113-20240918	JD96352-13	SULFATE	U	100	100	2.0		
114-MW60C-R-117.5-20240918	JD96352-2	SULFATE	U	23.0	23.0	2.0		
114-MW60C-R-117.5-20240918-X	JD96352-3	SULFATE	U	24.1	24.1	2.0		
114-MW61D-136.0-20240918	JD96352-4	SULFATE	U	39.1	39.1	2.0		
114-MW62C-73.0-20240918	JD96352-5	SULFATE	U	61.2	61.2	2.0		
114-MW4D-90-94-20240918	JD96352-6	SULFATE	U	52.9	52.9	2.0		
114-MW4D-98-102-20240918	JD96352-7	SULFATE	U	53.7	53.7	2.0		
114-MW4D-111-115-20240918	JD96352-8	SULFATE	U	30.9	30.9	2.0		
114-MW4D-121-125-20240918	JD96352-9	SULFATE	U	26.4	26.4	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 18, 2024
Lab Name/ID SGS, Dayton
SDG No JD96352
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240918

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-87.5-91.5-20240918	JD96352-10	Total	Total Organic Carbon	U	22.2	22.2	1.0		
114-MW57D-96.5-100.5-20240918	JD96352-11	Total	Total Organic Carbon	U	18.7	18.7J-	1.0	Qualify	1
114-MW57D-104-108-20240918	JD96352-12	Total	Total Organic Carbon	U	14.7	14.7J-	1.0	Qualify	1
114-MW57D-109-113-20240918	JD96352-13	Total	Total Organic Carbon	U	16.8	16.8J-	1.0	Qualify	1
GW-RI-FB-20240918	JD96352-14	Total	Total Organic Carbon	U	U	UJ	1.0	Qualify	1
114-MW60C-R-117.5-20240918	JD96352-2	Total	Total Organic Carbon	U	1.9	1.9J	1.0	Qualify	3
114-MW60C-R-117.5-20240918-X	JD96352-3	Total	Total Organic Carbon	U	U	UJ	1.0	Qualify	3
114-MW61D-136.0-20240918	JD96352-4	Total	Total Organic Carbon	U	0.73B	0.73J	1.0	Qualify	2
114-MW4D-90-94-20240918	JD96352-6	Total	Total Organic Carbon	U	17.6	17.6	1.0		
114-MW4D-98-102-20240918	JD96352-7	Total	Total Organic Carbon	U	54.1	54.1	5.0		
114-MW4D-111-115-20240918	JD96352-8	Total	Total Organic Carbon	U	55.6	55.6	5.0		
114-MW4D-121-125-20240918	JD96352-9	Total	Total Organic Carbon	U	182	182	10		

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

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

NJDEP Validation Footnote

1 Laboratory duplicate precision criteria were not met.

2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
3. Field duplicate precision criteria was not met.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD96352		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 10/02/2024	
Number of Samples/Matrix: 13 GW, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 10/4/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.0 °C, 2.8 °C
Holding Time	Yes	No	Sampled 9/18/2024, analyzed 9/19/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	9/19/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN59857, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240918 (JD96352-14), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW62C-73.0-20240918 (JD96352-5), see table below
Laboratory Duplicate	Yes	No	114-MW62C-73.0-20240918 (JD96352-5), Both ND, see table below
Laboratory Control Standards	Yes	No	GN59857 {100.0 %R}
Field Duplicate	Yes	No	114-MW60C-R-117.5-20240918 (JD96352-2) & 114-MW60C-R-117.5-20240918-X (JD96352-3), see table below
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Cr vs Cr6 Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW62C-73.0-20240918 (JD96352-5)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	MS % R	Upper Limit	Lower Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.149	99.3	115	85	OK, Accept

SR – sample result**SSR – Spiked sample result****R – recovery****Lab Duplicate (Dup)**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	RPD Limit	Action
114-MW62C-73.0-20240918	JD96352-5	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	20	Both ND, Accept

RL – reporting limit**RPD – relative percent difference****Field Duplicates**

114-MW60C-R-117.5-20240918 (JD96352-2) & 114-MW60C-R-117.5-20240918-X (JD96352-3)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.076		0.075		0.010	mg/l	1.32	OK, Accept

RL – reporting limit**RPD – relative percent difference**

Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW76D-123.75-20240918	JD96352-1	3.4	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-87.5-91.5-20240918	JD96352-10	6.1	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-96.5-100.5-20240918	JD96352-11	6.4	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-104-108-20240918	JD96352-12	5.5	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-109-113-20240918	JD96352-13	5.2	10		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20240918	JD96352-14		2.0		10	0	Both ND, Accept
114-MW60C-R-117.5-20240918	JD96352-2	68.3	10	76	10	11	T Cr < T Cr6, SRs < 4x RL, ABS ≤ RL, Accept
114-MW60C-R-117.5-20240918-X	JD96352-3	66.8	10	75	10	12	T Cr < T Cr6, SRs < 4x RL, ABS ≤ RL, Accept
114-MW61D-136.0-20240918	JD96352-4	4.2	10		10	NC	T Cr > T Cr6, Accept
114-MW62C-73.0-20240918	JD96352-5	4.7	10		10	NC	T Cr > T Cr6, Accept
114-MW4D-90-94-20240918	JD96352-6		10		10	0	Both ND, Accept
114-MW4D-98-102-20240918	JD96352-7		10		10	0	Both ND, Accept
114-MW4D-111-115-20240918	JD96352-8		10	15	10	NC	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL ≤ RL, Accept
114-MW4D-121-125-20240918	JD96352-9		10	17	10	NC 0	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL ≤ RL, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference****Reporting Limits GW Metals**

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW60C-R-117.5-20240918	JD96352-2	CHROMIUM (HEXAVALENT)	0.076	Y	mg/l	0.07
114-MW60C-R-117.5-20240918-X	JD96352-3	CHROMIUM (HEXAVALENT)	0.075	Y	mg/l	0.07

SDG#: JD96352/ Method 7196**GN59857**

Cr+6 ICAL 9/19/2024

GW

(p. 744 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.09
0.3	0.265
0.5	0.444
0.8	0.688
1	0.866

(p. 744 of
data pkg)

AECOM Calculated Intercept	0.00306	OK	Reported intercept	0.0031
AECOM Slope	0.8636	OK	Reported Slope	0.8636
AECOM Calculated r	0.99991	OK	Reported r	0.99991

LCS calculation**GN59857-B1****P. 732, 744**

Background absorbance

0

Sample absorbance

0.133

LCS Soluble Instrument Response

0.133

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN59857-B1****P. 732, 744**

True Value (mg/L)

0.150

AECOM Calculated %R	100.3	OK	Reported %R	100.0

MS calculation**GN59857-S2****P. 734, 744, 747****114-MW62C-73.0-20240918****Unfiltered**

Background reading

0

Total absorbance

0.132

Total absorbance - background

0.132

Instrument Concentration (mg/L)

0.1493

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated MS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149

%R = Found/True*100**GN59857-S2****P. 734, 744, 747****114-MW62C-73.0-20240918**

True Value (mg/L)

0.150

Native concentration (mg/L)

0.0

AECOM Calculated MS Result %R	99.5	OK	Reported %R	99.3

UNFILTERED**Reporting Limit****JD96352-5****P. 28, 744****114-MW62C-73.0-20240918**

Low Standard

0.01

Initial volume (L)	0.5	NA: standards and samples treated the same		
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JD96352-5	P. 28, 744	114-MW62C-73.0-20240918	
Background reading	0			
Total absorbance	0			
Total absorbance - background	0			
Instrument Response (mg/L)	-0.004			
Sample volume (L)	0.5	NA: standards and samples treated the same		
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	-0.0035	OK, <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD96352		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 10/02/2024	
Number of Samples/Matrix: 13 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 10/4/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.0 °C, 2.8 °C
Holding Time	No	Yes	Sampled 9/18/2024, analyzed 9/19/2024 - 9/27/2024 Ferrous iron samples (JD96352-1F, -4F, -10F, -11F, -12F, and -13F) analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP49362 Cr ND, GN59861 Fe ND, GP56726/GN60198 TOC ND, GP56802/GN60198 TOC ND, GP56773/GN59998 sulfate ND, GP56774/GN59998 sulfate ND,
Field Blanks	Yes	No	GW-RI-FB-20240918 (JD96352-14), ND
Matrix Spike	Yes	No	114-MW62C-73.0-20240918 (JD96352-5) Cr, Fe, sulfate, TOC, Also, Batch QC Cr, TOC, and sulfate, see tables below
Matrix Spike Duplicate	Yes	No	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	No	Yes	MP49362 Cr (100.5 %R), GN59861 Fe (100.0 %R), GP56726/GN60198 TOC (83.6 %R) see table below GP56802/GN60198 TOC (105.0 %R), GP56773/GN59998 sulfate (102.9 %R), GP56774/GN59998 sulfate (104.6 %R)
Field Duplicate	No	Yes	114-MW60C-R-117.5-20240918 (JD96352-2) & 114- MW60C-R-117.5-20240918-X (JD96352-3), see table below
Total Metals vs Dissolved Metals Results	NA	NA	Total only

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW57D-87.5-91.5-20240918	JD96352-10F	IRON (FERROUS)	9/18/2024 11:00	9/19/2024 12:00	Estimate (UJ)
114-MW57D-96.5-100.5-20240918	JD96352-11F	IRON (FERROUS)	9/18/2024 11:10	9/19/2024 12:00	Estimate (UJ)
114-MW57D-104-108-20240918	JD96352-12F	IRON (FERROUS)	9/18/2024 11:20	9/19/2024 12:00	Estimate (UJ)
114-MW57D-109-113-20240918	JD96352-13F	IRON (FERROUS)	9/18/2024 11:30	9/19/2024 12:00	Estimate (UJ)
114-MW76D-123.75-20240918	JD96352-1F	IRON (FERROUS)	9/18/2024 10:05	9/19/2024 12:00	Estimate (UJ)
114-MW60C-R-117.5-20240918	JD96352-2F	IRON (FERROUS)	9/18/2024 13:15	9/19/2024 12:00	<24hr, Accept
114-MW60C-R-117.5-20240918-X	JD96352-3F	IRON (FERROUS)	9/18/2024 13:20	9/19/2024 12:00	<24hr, Accept
114-MW61D-136.0-20240918	JD96352-4F	IRON (FERROUS)	9/18/2024 10:35	9/19/2024 12:00	Estimate (UJ)
114-MW62C-73.0-20240918	JD96352-5F	IRON (FERROUS)	9/18/2024 13:20	9/19/2024 12:00	<24hr, Accept
114-MW4D-90-94-20240918	JD96352-6F	IRON (FERROUS)	9/18/2024 13:20	9/19/2024 12:00	<24hr, Accept
114-MW4D-98-102-20240918	JD96352-7F	IRON (FERROUS)	9/18/2024 13:30	9/19/2024 12:00	<24hr, Accept
114-MW4D-111-115-20240918	JD96352-8F	IRON (FERROUS)	9/18/2024 13:40	9/19/2024 12:00	<24hr, Accept
114-MW4D-121-125-20240918	JD96352-9F	IRON (FERROUS)	9/18/2024 13:50	9/19/2024 12:00	<24hr, Accept

Matrix Spikes/Matrix Spike Duplicates

114-MW62C-73.0-20240918 (JD96352-5, -5F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	0	10.7	10.8	107.0	108	115	85	0.9	15	OK, Accept
SULFATE	Total	80	61.2	142	142	101	101	120	80	0	20	OK, Accept
FERROUS, IRON	Total	3.0	0	2.9	2.9	96.7	96.7	113	92	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW62C-73.0-20240918 (JD96352-5)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
CHROMIUM	Total	80.0	4.7	83.3	81.0	98.3	95.4	125	75	2.8	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference****Laboratory Control Spike**

GP56726/GN60198

Analyte	Fraction	Spike added (mg/l)	SSR (mg/l)	SDR (mg/l)	LCS % R	LCSD % R	Upper Limit	Lower Limit	Associated Samples	Action
TOC	Total	1.0	0.836	NA	83.6	NA	110	90	JD96352-11, -12, -13, -14	Estimate (J-)

SSR – Spiked sample result**SDR – Sample duplicate result****NA – not applicable****Field Duplicates**

114-MW60C-R-117.5-20240918 (JD96352-2, -2F) & 114-MW60C-R-117.5-20240918-X (JD96352-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
FERROUS, IRON	Dissolved	0.029	U	0.029	U	0.20	ug/l	0	Both ND, Accept
CHROMIUM	Total	68.3		66.8		10	ug/l	2.2	RPD < 30%, Accept

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
SULFATE	Total	23.0		24.1		2.0	mg/l	4.7	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	1.9		0.72	U	1.0	mg/l	90.1	SR<5xRL, ABS Diff >RL, Estimate (J/UJ)

RL – reporting limit

RPD – relative percent difference

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-123.75-20240918	JD96352-1	CHROMIUM	Total	10
114-MW57D-87.5-91.5-20240918	JD96352-10	CHROMIUM	Total	10
114-MW57D-96.5-100.5-20240918	JD96352-11	CHROMIUM	Total	10
114-MW57D-104-108-20240918	JD96352-12	CHROMIUM	Total	10
114-MW57D-109-113-20240918	JD96352-13	CHROMIUM	Total	10
GW-RI-FB-20240918	JD96352-14	CHROMIUM	Total	2
114-MW60C-R-117.5-20240918	JD96352-2	CHROMIUM	Total	10
114-MW60C-R-117.5-20240918-X	JD96352-3	CHROMIUM	Total	10
114-MW61D-136.0-20240918	JD96352-4	CHROMIUM	Total	10
114-MW62C-73.0-20240918	JD96352-5	CHROMIUM	Total	10
114-MW4D-90-94-20240918	JD96352-6	CHROMIUM	Total	10
114-MW4D-98-102-20240918	JD96352-7	TOC	Total	5
114-MW4D-98-102-20240918	JD96352-7	CHROMIUM	Total	10
114-MW4D-111-115-20240918	JD96352-8	TOC	Total	5
114-MW4D-111-115-20240918	JD96352-8	CHROMIUM	Total	10
114-MW4D-121-125-20240918	JD96352-9	TOC	Total	10
114-MW4D-121-125-20240918	JD96352-9	CHROMIUM	Total	10

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JD96459
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 10/03/2024
Reviewed by:	Linda Waters/AECOM File Name: JD96459_2024_10_03 DVRReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- UJ: Indicates the analyte was not detected above the reporting limit and the reporting limit was approximate.
- UB: The analyte concentration is less than or equal to three (3) times the concentration in the associated method/prep blank. The presence of the analyte in the sample is negated (UB) due to laboratory contamination.
- JB: The analyte concentration is greater than three (3) times, but less than or equal to ten (10) times the concentration in the associated method/prep blank. The presence of that analyte in the sample is considered "real." The concentration is quantitatively qualified (JB) due to method blank contamination.
- R: The sample result was rejected due to serious deficiencies; the presence or absence of the analyte could not be confirmed.
- RA: The sample result was rejected but is still considered usable.

Sample Information

The samples listed below were collected by AECOM on September 19, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW58C-R-84.5-20240919	JD96459-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW58C-R-84.5-20240919	JD96459-1F	Groundwater	Ferrous Iron
114-MW52D-80-83-20240919	JD96459-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-87-90-20240919	JD96459-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-102-105-20240919	JD96459-4	Groundwater	Ferrous Iron
114-MW72D-102-106-20240919	JD96459-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-102-106-20240919	JD96459-5F	Groundwater	Ferrous Iron
114-MW72D-110-114-20240919	JD96459-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW72D-110-114-20240919	JD96459-6F	Groundwater	Ferrous Iron
114-MW72D-116-119-20240919	JD96459-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-116-119-20240919	JD96459-7F	Groundwater	Ferrous Iron
114-MW72D-123-126-20240919	JD96459-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-123-126-20240919	JD96459-8F	Groundwater	Ferrous Iron
GW-RI-FB-20240919	JD96459-9	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
Wet Chemistry – Total Organic Carbon (TOC), Sulfate			
Fe – Ferrous iron (dissolved)			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times \text{RL}$; RPD $> 30\%$	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

The total chromium result was less than the total hexavalent chromium result in sample 114-MW52D-87-90-20240919 (JD96459-3). The total chromium and total hexavalent chromium results in this sample were qualified as estimated (J).

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240919 (JD96459-9), was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)

Hold Time

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW58C-R-84.5-20240919 (JD96459-1F) was analyzed as a MS/MSD for ferrous iron. All QC acceptance criteria were met.

A MS/MSD was not performed on a site sample for chromium in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240919 (JD96459-9), was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW58C-R-84.5-20240919 (JD96459-1) was analyzed as a MS/MSD for sulfate. All QC acceptance criteria were met.

Sample 114-MW72D-102-106-20240919 (JD96459-5) was analyzed as a MS/MSD for TOC. Results exceeded the QC acceptance criteria. All associated sample results were estimated (J+). High percent recoveries were reported for two MSs and did not meet QC acceptance criteria. Positive results for TOC were qualified as estimated (J+) based on the implied high bias.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20240919 (JD96459-9), was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results estimated due to analysis outside of holding time, are useable with a low bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

Results estimated due to matrix spike/matrix spike duplicate recoveries are useable with a high bias.

Results estimated due to total chromium results lower than total hexavalent chromium results are usable with an unknown bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD96459
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240919

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20240919	JD96459-2	Total	CHROMIUM (HEXAVALENT)	U	0.066	0.066	0.010		
114-MW52D-87-90-20240919	JD96459-3	Total	CHROMIUM (HEXAVALENT)	U	0.053	0.053J	0.010	Qualify	1
114-MW72D-102-106-20240919	JD96459-5	Total	CHROMIUM (HEXAVALENT)	U	0.30	0.30	0.010		
114-MW72D-110-114-20240919	JD96459-6	Total	CHROMIUM (HEXAVALENT)	U	0.22	0.22	0.010		
114-MW72D-116-119-20240919	JD96459-7	Total	CHROMIUM (HEXAVALENT)	U	0.093	0.093	0.010		
114-MW72D-123-126-20240919	JD96459-8	Total	CHROMIUM (HEXAVALENT)	U	0.066	0.066	0.010		

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

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

NJDEP Validation Footnote

1. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD96459
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240919

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW52D-80-83-20240919	JD96459-2	Total	CHROMIUM	U	455	455	10		
114-MW52D-87-90-20240919	JD96459-3	Total	CHROMIUM	U	29.5	29.5J	10	Qualify	2
114-MW52D-102-105-20240919	JD96459-4	Total	CHROMIUM	U	7.2B	7.2J	10	Qualify	1
114-MW72D-102-106-20240919	JD96459-5	Total	CHROMIUM	U	285	285	10		
114-MW72D-110-114-20240919	JD96459-6	Total	CHROMIUM	U	204	204	10		
114-MW72D-116-119-20240919	JD96459-7	Total	CHROMIUM	U	89.0	89.0	10		
114-MW72D-123-126-20240919	JD96459-8	Total	CHROMIUM	U	55.1	55.1	10		

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. The total chromium result was less than the corresponding total hexavalent chromium result, and the difference exceeded established criteria.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD96459
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240919

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW58C-R-84.5-20240919	JD96459-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-102-106-20240919	JD96459-5F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-110-114-20240919	JD96459-6F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-116-119-20240919	JD96459-7F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW72D-123-126-20240919	JD96459-8F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD96459
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240919

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW58C-R-84.5-20240919	JD96459-1	SULFATE	U	117	117	2.0		
114-MW52D-80-83-20240919	JD96459-2	SULFATE	U	52.0	52.0	2.0		
114-MW52D-87-90-20240919	JD96459-3	SULFATE	U	66.1	66.1	2.0		
114-MW52D-102-105-20240919	JD96459-4	SULFATE	U	120	120	2.0		
114-MW72D-102-106-20240919	JD96459-5	SULFATE	U	6.8	6.8	2.0		
114-MW72D-110-114-20240919	JD96459-6	SULFATE	U	3.8	3.8	2.0		
114-MW72D-116-119-20240919	JD96459-7	SULFATE	U	3.8	3.8	2.0		
114-MW72D-123-126-20240919	JD96459-8	SULFATE	U	3.6	3.6	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date September 19, 2024
Lab Name/ID SGS, Dayton
SDG No JD96459
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20240919

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW58C-R-84.5-20240919	JD96459-1	Total	Total Organic Carbon	U	1.1	1.1J+	1.0	Qualify	1
114-MW52D-80-83-20240919	JD96459-2	Total	Total Organic Carbon	U	145	145J+	1.0	Qualify	1
114-MW52D-87-90-20240919	JD96459-3	Total	Total Organic Carbon	U	87.8	87.8J+	1.0	Qualify	1
114-MW52D-102-105-20240919	JD96459-4	Total	Total Organic Carbon	U	142	142J+	1.0	Qualify	1
114-MW72D-102-106-20240919	JD96459-5	Total	Total Organic Carbon	U	12.7	12.7J+	1.0	Qualify	1
114-MW72D-110-114-20240919	JD96459-6	Total	Total Organic Carbon	U	17.2	17.2J+	1.0	Qualify	1
114-MW72D-116-119-20240919	JD96459-7	Total	Total Organic Carbon	U	23.3	23.3J+	1.0	Qualify	1
114-MW72D-123-126-20240919	JD96459-8	Total	Total Organic Carbon	U	11.8	11.8J+	1.0	Qualify	1

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

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

NJDEP Validation Footnote

1 MS and/or MSD recovery exceeded upper acceptance limit.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD96459		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 10/03/2024	
Number of Samples/Matrix: 8 GW, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 10/4/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7 °C
Holding Time	Yes	No	Sampled 9/19/2024, analyzed 9/20/2024
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	9/20/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN59912, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20240919 (JD96459-9), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN59912 {100.0 %R, 100.0 %R}
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	No	Yes	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW58C-R-84.5-20240919	JD96459-1		10		10	0	Both ND, Accept
114-MW52D-80-83-20240919	JD96459-2	455	10	66	10	149	T Cr > T Cr6, Accept
114-MW52D-87-90-20240919	JD96459-3	29.5	10	53	10	57	T Cr < T Cr6, SRs < 4x RL, ABS > RL, Qualify J
114-MW52D-102-105-20240919	JD96459-4	7.2	10		10	NC	T Cr > T Cr6, Accept
114-MW72D-102-106-20240919	JD96459-5	285	10	300	10	5	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-110-114-20240919	JD96459-6	204	2.0	220	10	8	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-116-119-20240919	JD96459-7	89.0	10	93	10	4	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-123-126-20240919	JD96459-8	55.1	10	66	10	18	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
GW-RI-FB-20240919	JD96459-9		10		10	0	Both ND, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference****Reporting Limits GW Metals**

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW72D-102-106-20240919	JD96459-5	CHROMIUM (HEXAVALENT)	0.30	Y	mg/l	0.07
114-MW72D-110-114-20240919	JD96459-6	CHROMIUM (HEXAVALENT)	0.22	Y	mg/l	0.07
114-MW72D-116-119-20240919	JD96459-7	CHROMIUM (HEXAVALENT)	0.093	Y	mg/l	0.07

SDG#: JD96459/ Method 7196

GN59912

Cr+6 ICAL 9/20/2024

GW

(p. 787 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.089
0.3	0.26
0.5	0.441
0.8	0.690
1	0.861

(p. 787 of
data pkg)

AECOM Calculated Intercept	0.00210	OK	Reported intercept	0.0021
AECOM Slope	0.8617	OK	Reported Slope	0.8617
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation

GN59912-B1

P. 772, 787

Background absorbance

0

Sample absorbance

0.131

LCS Soluble Instrument Response

0.131

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN59912-B1

P. 772, 787

True Value (mg/L)

0.150

AECOM Calculated %R	99.7	OK	Reported %R	100.0

MS calculation

GN59912-S1

P. 774, 787, 788

Batch QC (JD96462-14)

Unfiltered

Background reading

0.004

Total absorbance

0.137

Total absorbance - background

0.133

Instrument Concentration (mg/L)

0.1519

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated MS Result (mg/L)	0.152	OK	Reported Result (mg/L)	0.152

%R = Found/True*100

GN59912-S1

P. 774, 787, 788

Batch QC (JD96462-14)

True Value (mg/L)

0.150

Native concentration (mg/L)

0.0

AECOM Calculated MS Result %R	101.3	OK	Reported %R	101.3

UNFILTERED**Reporting Limit**

JD96459-1

P. 14, 787

114-MW58C-R-84.5-20240919

Low Standard

0.01

Initial volume (L)	0.5	NA: standards and samples treated the same		
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JD96459-1	P. 14, 787	114-MW58C-R-84.5-20240919	
Background reading	0			
Total absorbance	0			
Total absorbance - background	0			
Instrument Response (mg/L)	-0.002			
Sample volume (L)	0.5	NA: standards and samples treated the same		
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	-0.0024	OK, <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JD96459		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 10/03/2024	
Number of Samples/Matrix: 8 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 10/4/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7 °C
Holding Time	No	Yes	Sampled 9/19/2024, analyzed 9/20/2024 - 9/30/2024 All Ferrous iron samples analyzed out of 24 hr. HT.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP49388 Cr ND, GN59921 Fe ND, GP56805/GN60287 TOC ND, GP56806/GN60287 TOC ND, GP56814/GN60081 sulfate ND
Field Blanks	Yes	No	GW-RI-FB-20240919 (JD96459-9), ND
Matrix Spike	No	Yes	114-MW58C-R-84.5-20240919 (JD96459-1, -1F) Fe, TOC, sulfate, Also Batch QC Cr, TOC, see tables below
Matrix Spike Duplicate	No	Yes	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP49388 Cr (95.1 %R), GN59921 Fe (100.0 %R), GP56805/GN60287 TOC (105.%R), GP56806/GN60287 TOC (98.7 %R), GP56814/GN60081 sulfate (102.1%R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	No	Yes	see hexavalent chromium section

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW58C-R-84.5-20240919	JD96459-1F	IRON (FERROUS)	9/19/2024 10:15	9/20/2024 17:00	Estimate (UJ)
114-MW72D-102-106-20240919	JD96459-5F	IRON (FERROUS)	9/19/2024 9:55	9/20/2024 17:00	Estimate (UJ)
114-MW72D-110-114-20240919	JD96459-6F	IRON (FERROUS)	9/19/2024 10:10	9/20/2024 17:00	Estimate (UJ)
114-MW72D-116-119-20240919	JD96459-7F	IRON (FERROUS)	9/19/2024 10:20	9/20/2024 17:00	Estimate (UJ)
114-MW72D-123-126-20240919	JD96459-8F	IRON (FERROUS)	9/19/2024 10:30	9/20/2024 17:00	Estimate (UJ)

Matrix Spikes/Matrix Spike Duplicates

114-MW58C-R-84.5-20240919 (JD96459-1, -1F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
SULFATE	Total	80	117	199	196	102.5	98.8	120	80	1.5	20	OK, Accept
FERROUS, IRON	Total	3.0	0	3.0	3.0	100	100	113	92	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW72D-102-106-20240919 (JD96459-5)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	12.7	24.3	25.0	116.0	123	115	85	2.8	15	Estimate (J+)

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW52D-80-83-20240919	JD96459-2	CHROMIUM	455	Y	ug/l	70
114-MW72D-102-106-20240919	JD96459-5	CHROMIUM	285	Y	ug/l	70
114-MW72D-110-114-20240919	JD96459-6	CHROMIUM	204	Y	ug/l	70
114-MW72D-116-119-20240919	JD96459-7	CHROMIUM	89	Y	ug/l	70

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW58C-R-84.5-20240919	JD96459-1	CHROMIUM	Total	10
114-MW52D-80-83-20240919	JD96459-2	TOC	Total	10
114-MW52D-80-83-20240919	JD96459-2	CHROMIUM	Total	10
114-MW52D-87-90-20240919	JD96459-3	TOC	Total	5
114-MW52D-87-90-20240919	JD96459-3	CHROMIUM	Total	10
114-MW52D-102-105-20240919	JD96459-4	TOC	Total	10
114-MW52D-102-105-20240919	JD96459-4	CHROMIUM	Total	10
114-MW72D-102-106-20240919	JD96459-5	CHROMIUM	Total	10
114-MW72D-110-114-20240919	JD96459-6	CHROMIUM	Total	10
114-MW72D-116-119-20240919	JD96459-7	CHROMIUM	Total	10
114-MW72D-123-126-20240919	JD96459-8	CHROMIUM	Total	10
GW-RI-FB-20240919	JD96459-9	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JE2642
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 12/28/2024
Reviewed by:	Linda Waters/AECOM File Name: JE2642_2024_12_28 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 December 13, 2024, as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW62C-73.0-20241213	JE2642-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW62C-73.0-20241213	JE2642-1F	Groundwater	Ferrous Iron (dissolved)
114-MW58C-R-84.5-20241213	JE2642-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW58C-R-84.5-20241213	JE2642-2F	Groundwater	Ferrous Iron (dissolved)
114-MW61D-117.0-20241213	JE2642-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-117.0-20241213	JE2642-3F	Groundwater	Ferrous Iron (dissolved)
GW-RI-FB-2024	JE2642-4	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Holding Time

Samples 114-MW58C-R-84.5-20241213 (JE2642-2) and 114-MW61D-117.0-20241213 (JE2642-3) were qualified as estimated (UJ) due to sample holding time period exceedances. The remaining samples were prepared analyzed within the specified holding time periods.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-2024 (JE2642-4), was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four-hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW62C-73.0-20241213 (JE2642-1F) was analyzed as a MS/MSD for ferrous iron. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-2024 (JE2642-4), was submitted for total chromium analysis. The chromium result for the field blank was nondetect; therefore, no associated sample results required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW62C-73.0-20241213 (JE2642-1) was analyzed as a MS/MSD for TOC. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, FB-2024 (JE2642-4) was submitted for TOC and sulfate analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results qualified as estimated due to sample holding time period exceedances, are useable with a potential low bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 13, 2024
Lab Name/ID SGS, Dayton
SDG No JE2642
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-2024

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW58C-R-84.5-20241213	JE2642-2	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	0.010	Qualify	1
114-MW61D-117.0-20241213	JE2642-3	Total	CHROMIUM (HEXAVALENT)	U	U	UJ	0.010	Qualify	1

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Validation Footnote

- 1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 13, 2024
Lab Name/ID SGS, Dayton
SDG No JE2642
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-2024

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			CHROMIUM						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 13, 2024
Lab Name/ID SGS, Dayton
SDG No JE2642
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-2024

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW62C-73.0-20241213	JE2642-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW58C-R-84.5-20241213	JE2642-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW61D-117.0-20241213	JE2642-3F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 13, 2024
Lab Name/ID SGS, Dayton
SDG No JE2642
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241213

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW62C-73.0-20241213	JE2642-1	SULFATE	U	65.3	65.3	2.0		
114-MW58C-R-84.5-20241213	JE2642-2	SULFATE	U	149	149	2.0		
114-MW61D-117.0-20241213	JE2642-3	SULFATE	U	32.9	32.9	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 13, 2024
Lab Name/ID SGS, Dayton
SDG No JE2642
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-2024

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW62C-73.0-20241213	JE2642-1	Total	Total Organic Carbon	U	2.0	2.0	1.0		
114-MW58C-R-84.5-20241213	JE2642-2	Total	Total Organic Carbon	U	2.3	2.3	1.0		
114-MW61D-117.0-20241213	JE2642-3	Total	Total Organic Carbon	U	1.4	1.4	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE2642		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 12/28/2024	
Number of Samples/Matrix: 3 GW, 3 GWF, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 1/14/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7 °C
Holding Time	No	Yes	Sampled 12/13/2024, analyzed 12/14/2024. Samples 114 - MW58C-R-84.5-20241213 (JE2642-2) and 114-MW61D-117.0-20241213 (JE2642-3) were analyzed outside of HT by <1 hr. Results were estimated (UJ).
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	12/14/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN63211, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-2024 (JE2642-4), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN63211 {100.0 %R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Cr vs Total Cr6 Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW62C-73.0-20241213	JE2642-1	CHROMIUM (HEXAVALENT)	12/13/2024 14:55	12/14/2024 11:45	OK, Accept
114-MW58C-R-84.5-20241213	JE2642-2	CHROMIUM (HEXAVALENT)	12/13/2024 11:05	12/14/2024 11:45	Estimate (UJ)
114-MW61D-117.0-20241213	JE2642-3	CHROMIUM (HEXAVALENT)	12/13/2024 11:35	12/14/2024 11:45	Estimate (UJ)
GW-RI-FB-2024	JE2642-4	CHROMIUM (HEXAVALENT)	12/13/2024 15:10	12/14/2024 11:45	OK, Accept

Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW62C-73.0-20241213	JE2642-1		10		10	0	Both ND, Accept
114-MW58C-R-84.5-20241213	JE2642-2		10		10	0	Both ND, Accept
114-MW61D-117.0-20241213	JE2642-3		10		10	0	Both ND, Accept
GW-RI-FB-20241213	JE2642-4		2.0		10	0	Both ND, Accept

RL – reporting limit**RPD – relative percent difference**

SDG#: JE2642/ Method 7196

GN63211

Cr+6 ICAL 12/14/2024

GW

(p. 334 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.085
0.3	0.252
0.5	0.425
0.8	0.680
1	0.851

(p. 334 of
data pkg)

AECOM Calculated Intercept	-0.00051	OK	Reported intercept	-0.0005
AECOM Slope	0.8507	OK	Reported Slope	0.8507
AECOM Calculated r	0.99999	OK	Reported r	0.99999

LCS calculation

GN63211-B1

P. 320, 334

Background absorbance

0

Sample absorbance

0.127

LCS Soluble Instrument Response

0.127

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN63211-B1

P. 320, 334

True Value (mg/L)

0.150

AECOM Calculated %R	99.9	OK	Reported %R	100.0

MS calculation

GN63211-S1

P. 322,

Batch QC (JE2640-1)

Unfiltered

Background reading

0

Total absorbance

0.125

Total absorbance - background

0.125

Instrument Concentration (mg/L)

0.1475

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated MS Result (mg/L)	0.148	OK	Reported Result (mg/L)	0.148

%R = Found/True*100

GN63211-S1

P. 322,

Batch QC (JE2640-1)

True Value (mg/L)

0.150

Native concentration (mg/L)

0.0

AECOM Calculated MS Result %R	98.3	OK	Reported %R	98.7

UNFILTERED**Reporting Limit**

JE2642-1

P. 9, 334

114-MW62C-73.0-20241213

Low Standard

0.01

Initial volume (L)	0.5	NA: standards and samples treated the same		
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JE2642-1	P. 9, 334	114-MW62C-73.0-20241213	
Background reading	0			
Total absorbance	0			
Total absorbance - background	0			
Instrument Response (mg/L)	0.001			
Sample volume (L)	0.5	NA: standards and samples treated the same		
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	0.0006	OK, <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE2642		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 12/28/2024	
Number of Samples/Matrix: 3 GW, 3 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 1/14/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.7 °C
Holding Time	No	Yes	Sampled 12/13/2024, analyzed 12/16/2024 - 12/25/2024 Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP51708 Cr (0.76 ug/l), GN63227 Fe ND, GP58485/GN63585 TOC ND, GP58423/GN63438 sulfate ND
Field Blanks	Yes	No	GW-RI-FB-20241213 (JE2642-4), ND
Matrix Spike	Yes	No	114-MW62C-73.0-20241213 (JE2642-1, -1F) Fe and TOC, batch QC Cr and sulfate, see tables below
Matrix Spike Duplicate	Yes	No	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP51708 Cr (92.6 %R), GN63227 Fe (93.3 %R), GP58485/GN63585 TOC (97.8 %R), GP58423/GN63438 sulfate (90.5 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW62C-73.0-20241213	JE2642-1F	IRON (FERROUS)	12/13/2024 14:55	12/16/2024 10:00	Estimate (UJ)
114-MW58C-R-84.5-20241213	JE2642-2F	IRON (FERROUS)	12/13/2024 11:05	12/16/2024 10:00	Estimate (UJ)
114-MW61D-117.0-20241213	JE2642-3F	IRON (FERROUS)	12/13/2024 11:35	12/16/2024 10:00	Estimate (UJ)

Method Blank

MP51708

Analyte	Fraction	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	Total	0.76	J	2.0	All samples	SR ND, Accept

SR – sample result

RL – reporting limit

Matrix Spikes/Matrix Spike Duplicates

114-MW62C-73.0-20241213 (JE2642-1, -1F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
TOC	Total	10	2.0	11.6	11.6	96.0	96.0	115	85	0	10	OK, Accept
Ferrous iron	Dissolved	3.0	0	2.8	2.8	93.3	93.3	113	92	0	20	OK, Accept

SR – sample result

SSR – spiked sample result

SDR – sample duplicate result

RPD – relative percent difference

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW62C-73.0-20241213	JE2642-1	CHROMIUM	Total	10
114-MW58C-R-84.5-20241213	JE2642-2	CHROMIUM	Total	10
114-MW61D-117.0-20241213	JE2642-3	CHROMIUM	Total	10
GW-RI-FB-2024	JE2642-4	CHROMIUM	Total	2.0

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JE2768
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/13/2025
Reviewed by:	Linda Waters/AECOM File Name: JE2768_2025_1_13 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 December 16, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-103.75-20241216	JE2768-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-103.75-20241216	JE2768-1F	Groundwater	Ferrous Iron (dissolved)
114-MW76D-108.75-20241216	JE2768-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-108.75-20241216	JE2768-2F	Groundwater	Ferrous Iron (dissolved)
GW-RI-FB-20241216	JE2768-3	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey and the Field Sampling

General Comments

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

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20241216 (JE2768-3), was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Hold Time**

All ferrous iron samples were received by the laboratory and analyzed outside of the twenty-four hour holding time. The sample results were qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20241216 (JE2768-3), was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, FB-20241216 (JE2768-3) was submitted for TOC and sulfate analysis. TOC was reported at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). The associated TOC sample results were greater than three times but less than ten times the amount in the FB; therefore, the results were qualified as estimated (UB).

No FB contamination was reported for sulfate. No qualifications were required.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Sample results qualified as estimated due to holding time exceedances are useable with a low bias.

Results qualified as estimated due to FB contamination are useable at the reported concentration.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 16, 2024
Lab Name/ID SGS, Dayton
SDG No JE2768
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241216

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported.			CHROMIUM (HEXAVALENT)						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 16, 2024
Lab Name/ID SGS, Dayton
SDG No JE2768
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241216

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			CHROMIUM						

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 16, 2024
Lab Name/ID SGS, Dayton
SDG No JE2768
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241216

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20241216	JE2768-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW76D-108.75-20241216	JE2768-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Validation Footnote

- 1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 16, 2024
Lab Name/ID SGS, Dayton
SDG No JE2768
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241216

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20241216	JE2768-1	SULFATE	U	69.7	69.7	2.0	Qualify	
114-MW76D-108.75-20241216	JE2768-2	SULFATE	U	68.7	68.7	2.0	Qualify	

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 16, 2024
Lab Name/ID SGS, Dayton
SDG No JE2768
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241216

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-103.75-20241216	JE2768-1	Total	Total Organic Carbon	U	3.0	3.0JB	1.0	Qualify	2
114-MW76D-108.75-20241216	JE2768-2	Total	Total Organic Carbon	U	3.2	3.2JB	1.0	Qualify	2
GW-RI-FB-20241216	JE2768-3	Total	Total Organic Carbon	U	0.86B	0.86J	1.0	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. Sample result was $\geq 3x$ and $<10X$ the associated blank result.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE2768		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 1/13/2025	
Number of Samples/Matrix: 2GW, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 1/14/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C
Holding Time	Yes	No	Sampled 12/16/2024, analyzed 12/17/2024.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	12/17/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN63276, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20241216 (JE2768-3), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN63276 {100.0 %R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW76D-103.75-20241216	JE2768-1		10		10	0	Both ND, Accept
114-MW76D-108.75-20241216	JE2768-2		10		10	0	Both ND, Accept
GW-RI-FB-20241216	JE2768-3		2.0		10	0	Both ND, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference**

SDG#: JE2768/ Method 7196

GN63276

Cr+6 ICAL 12/17/2024

GW

(p. 328 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.089
0.3	0.26
0.5	0.43
0.8	0.679
1	0.861

(p. 328 of
data pkg)

AECOM Calculated Intercept	0.00158	OK	Reported intercept	0.0016
AECOM Slope	0.8552	OK	Reported Slope	0.8552
AECOM Calculated r	0.99995	OK	Reported r	0.99995

LCS calculation

GN63276-B1

P. 316, 328

Background absorbance

0

Sample absorbance

0.13

LCS Soluble Instrument Response

0.13

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN63276-B1

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True Value (mg/L)

0.150

AECOM Calculated %R	100.1	OK	Reported %R	100.0

MS calculation

GN63276-S1

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Batch QC (JE2745-6)

Unfiltered

Background reading

0.005

Total absorbance

0.133

Total absorbance - background

0.128

Instrument Concentration (mg/L)

0.1478

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated MS Result (mg/L)	0.148	OK	Reported Result (mg/L)	0.148

%R = Found/True*100

GN63276-S1

P. 318, 328

Batch QC (JE2745-6)

True Value (mg/L)

0.150

Native concentration (mg/L)

0.0

AECOM Calculated MS Result %R	98.5	OK	Reported %R	98.7

UNFILTERED**Reporting Limit**

JE2768-1

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114-MW76D-103.75-20241216

Low Standard

0.01

Initial volume (L)	0.5	NA: standards and samples treated the same		
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JE2768-1	P. 9, 328	114-MW76D-103.75-20241216	
Background reading	0.001			
Total absorbance	0.001			
Total absorbance - background	0			
Instrument Response (mg/L)	-0.002			
Sample volume (L)	0.5	NA: standards and samples treated the same		
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	-0.0018	OK, <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE2768		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 1/13/2025	
Number of Samples/Matrix: 2 GW, 2F, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 1/14/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	2.1 °C
Holding Time	No	Yes	Sampled 12/16/2024, analyzed 12/18/2024 - 12/19/2024 and 1/10/2025 Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP51708 Cr (0.76 ug/l), GN6331 Fe ND, GP58717/GN64010 TOC ND, GP58423/GN63438 sulfate ND
Field Blanks	No	Yes	GW-RI-FB-20241216 (JE2768-3) TOC (0.86 J)
Matrix Spike	NA	NA	batch QC Cr, TOC, sulfate and Fe
Matrix Spike Duplicate	NA	NA	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP51708 Cr (92.6 %R), GN6331 Fe (93.3%R), GP58717/GN64010 TOC (102.0 %R), GP58423/GN63438 sulfate (90.5 %R)
Field Duplicate	NA	NA	none
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW76D-103.75-20241216	JE2768-1F	IRON (FERROUS)	12/16/2024 11:35	12/18/2024 11:10	Estimate (UJ)
114-MW76D-108.75-20241216	JE2768-2F	IRON (FERROUS)	12/16/2024 12:50	12/18/2024 11:10	Estimate (UJ)

Method Blank

MP51708

Analyte	Fraction	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	Total	0.76	J	2.0	All samples	SR ND, Accept

SR – sample result

RL – reporting limit

Field Blank

GW-RI-FB-20241216

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
TOC	Total	0.86	J	1.0	Associated SR >3x but <10x FB, Estimate (JB)

SR – sample result

RL – reporting limit

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-103.75-20241216	JE2768-1	CHROMIUM	Total	10
114-MW76D-108.75-20241216	JE2768-2	CHROMIUM	Total	10
GW-RI-FB-20241216	JE2768-3	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JE2865
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/16/2025
Reviewed by:	Linda Waters/AECOM File Name: JE2865_2025_1_16 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 December 17, 2024 as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-113.75-20241217	JE2865-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-113.75-20241217	JE2865-1F	Groundwater	Ferrous Iron (dissolved)
114-MW76D-118.75-20241217	JE2865-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-118.75-20241217	JE2865-2F	Groundwater	Ferrous Iron (dissolved)
114-MW61D-121.0-20241217	JE2865-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-121.0-20241217	JE2865-3F	Groundwater	Ferrous Iron (dissolved)
114-MW61D-121.0-20241217-X (Field Duplicate of 114-MW61D- 121.0-20241217)	JE2865-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW61D-121.0-20241217-X (Field Duplicate of 114-MW61D-121.0-20241217)	JE2865-4F	Groundwater	Ferrous Iron (dissolved)
114-MW61D-126.0-20241217	JE2865-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-126.0-20241217	JE2865-5F	Groundwater	Ferrous Iron (dissolved)
114-MW66D-91-97-20241217	JE2865-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-91-97-20241217	JE2865-6F	Groundwater	Ferrous Iron (dissolved)
114-MW66D-107-111-20241217	JE2865-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-107-111-20241217	JE2865-7F	Groundwater	Ferrous Iron (dissolved)
114-MW66D-118-123-20241217	JE2865-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-118-123-20241217	JE2865-8F	Groundwater	Ferrous Iron (dissolved)
114-MW66D-124-129-20241217	JE2865-9	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-124-129-20241217	JE2865-9F	Groundwater	Ferrous Iron (dissolved)
114-MW66D-137-140-20241217	JE2865-10	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW66D-137-140-20241217	JE2865-10F	Groundwater	Ferrous Iron (dissolved)
114-MW72D-102-106-20241217	JE2865-11	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-102-106-20241217	JE2865-11F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Ferrous Iron (dissolved)
114-MW72D-110-114-20241217	JE2865-12	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-110-114-20241217	JE2865-12F	Groundwater	Ferrous Iron (dissolved)
114-MW72D-116-119-20241217	JE2865-13	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-116-119-20241217	JE2865-13F	Groundwater	Ferrous Iron (dissolved)
114-MW72D-123-126-20241217	JE2865-14	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW72D-123-126-20241217	JE2865-14F	Groundwater	Ferrous Iron (dissolved)
GW-RI-FB-20241217	JE2865-15	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Sample 114-MW76D-113.75-20241217 (JE2865-1) was analyzed as a MS for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW76D-113.75-20241217 (JE2865-1) was analyzed as a laboratory duplicate for hexavalent chromium in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20241217 (JE2865-15), was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW61D-121.0-20241217 (JE2865-3) and 114-MW61D-121.0-20241217-X (JE865-4) were analyzed as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)**Hold Time**

Sample 114-MW72D-116-119-20241217 (JE2865-13F) was received by the laboratory and analyzed for ferrous iron outside of the twenty-four-hour holding time. The sample result was qualified as estimated (UJ).

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW76D-113.75-20241217 (JE2865-1, -1F) was analyzed as a MS/MSD for chromium and ferrous iron in this data set. All QC acceptance criteria were met.

Sample 114-MW72D-116-119-20241217 (JE28655-13F) was also analyzed as a MS/MSD for ferrous iron in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20241217 (JE2865-15), was submitted for total chromium analysis. Chromium was reported at a concentration of greater than the method detection limit (MDL) but less than the reporting limit (RL). Samples 114-MW66D-124-129-20241217 (JE2865-9) and 114-MW66D-137-140-20241217 (JE2865-10) reported results greater than three times but less than ten times the amount in the FB. Results were estimated (J+). All other sample results were nondetect or greater than ten times the amount in the FB and not considered affected by the implied contamination. No qualifications were required.

Field Duplicate (FD)

Samples 114-MW61D-121.0-20241217 (JE2865-3) and 114-MW61D-121.0-20241217-X (JE865-4) were analyzed as the field duplicate pair for chromium and ferrous iron. All results were nondetect. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

Sample 114-MW76D-113.75-20241217 (JE2865-1) was analyzed as a MS/MSD for TOC and sulfate in this data set. All QC acceptance criteria were met.

Sample 114-MW72D-123-126-20241217 (JE2865-14) was analyzed as a MS/MSD for sulfate in this data set. All QC acceptance criteria were met.

Sample 114-MW61D-121.0-20241217 (JE2865-3) and 114-MW72D-110-114-20241217 (JE28655-12) were analyzed as MS/MSDs for TOC in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20241217 (JE2865-15), was submitted for TOC and sulfate analysis. TOC was reported at a concentration greater than the MDL but less than the RL. Samples 114-MW66D-137-140-20241217 (JE2865-1), 114-MW76D-118.75-20241217 (JE2865-2), 114-MW61D-121.0-20241217 (JE2865-3), 114-MW61D-121.0-20241217-X (JE2865-4), 114-MW61D-126.0-20241217 (JE2865-5), and 114-MW66D-107-111-20241217 (JE2865-7) reported TOC results greater than three times but less than ten times the amount in the FB. TOC sample results were estimated (J+). All other TOC sample results were nondetect or greater than ten times the amount in the FB and not considered affected by the implied contamination. No qualifications were required.

No FB contamination was reported for sulfate. No qualifications were required.

Field Duplicate (FD)

Samples 114-MW61D-121.0-20241217 (JE2865-3) and 114-MW61D-121.0-20241217-X (JE865-4) were analyzed as the field duplicate pair for TOC and sulfate. All QC acceptance criteria was met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

The sample results qualified as estimated due to holding time exceedances are useable with a low bias.

Sample results qualified as estimated due to field blank contamination are useable with a high bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 17, 2024
Lab Name/ID SGS, Dayton
SDG No JE2865
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241217

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW61D-121.0-20241217-X	JE2865-4	Total	CHROMIUM (HEXAVALENT)	U	0.0042B	0.0042J	0.010	Qualify	1
114-MW66D-91-97-20241217	JE2865-6	Total	CHROMIUM (HEXAVALENT)	U	3.3	3.3	0.10		
114-MW72D-102-106-20241217	JE2865-11	Total	CHROMIUM (HEXAVALENT)	U	0.53	0.53	0.010		
114-MW72D-102-106-20241217	JE2865-11F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.52	0.52	0.010		
114-MW72D-110-114-20241217	JE2865-12	Total	CHROMIUM (HEXAVALENT)	U	0.34	0.34	0.010		
114-MW72D-116-119-20241217	JE2865-13	Total	CHROMIUM (HEXAVALENT)	U	0.15	0.15	0.010		
114-MW72D-123-126-20241217	JE2865-14	Total	CHROMIUM (HEXAVALENT)	U	0.12	0.12	0.010		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 17, 2024
Lab Name/ID SGS, Dayton
SDG No JE2865
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241217

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW66D-137-140-20241217	JE2865-10	Total	CHROMIUM	U	4.1B	4.1J	10	Qualify	1, 2
114-MW72D-102-106-20241217	JE2865-11	Total	CHROMIUM	U	517	517	10		
114-MW72D-102-106-20241217	JE2865-11F	Dissolved	CHROMIUM	U	407	407	10		
114-MW72D-110-114-20241217	JE2865-12	Total	CHROMIUM	U	259	259	10		
114-MW72D-116-119-20241217	JE2865-13	Total	CHROMIUM	U	145	145	10		
114-MW72D-123-126-20241217	JE2865-14	Total	CHROMIUM	U	103	103	10		
GW-RI-FB-20241217	JE2865-15	Total	CHROMIUM	U	0.68B	0.68J	2.0	Qualify	1
114-MW66D-91-97-20241217	JE2865-6	Total	CHROMIUM	U	2540	2540	50		
114-MW66D-107-111-20241217	JE2865-7	Total	CHROMIUM	U	39.1	39.1	10		
114-MW66D-118-123-20241217	JE2865-8	Total	CHROMIUM	U	40.0	40.0	10		
114-MW66D-124-129-20241217	JE2865-9	Total	CHROMIUM	U	6.0B	6.0J	10	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 Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. Sample result was $\geq 3x$ and $<10X$ the associated blank result.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 17, 2024
Lab Name/ID SGS, Dayton
SDG No JE2865
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241217

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW72D-116-119-20241217	JE2865-13F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

Note: A “U” under Method Blank column indicates a nondetect result.
A “U” under the Laboratory Sample Result and Validation Sample Result columns indicates a nondetect result at the RL.

NJDEP Validation Footnote

- 1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 17, 2024
Lab Name/ID SGS, Dayton
SDG No JE2865
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241217

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-113.75-20241217	JE2865-1	SULFATE	U	70.0	70.0	2.0		
114-MW66D-137-140-20241217	JE2865-10	SULFATE	U	98.4	98.4	2.0		
114-MW72D-102-106-20241217	JE2865-11	SULFATE	U	10.0	10.0	2.0		
114-MW72D-110-114-20241217	JE2865-12	SULFATE	U	5.6	5.6	2.0		
114-MW72D-116-119-20241217	JE2865-13	SULFATE	U	5.6	5.6	2.0		
114-MW72D-123-126-20241217	JE2865-14	SULFATE	U	5.5	5.5	2.0		
114-MW76D-118.75-20241217	JE2865-2	SULFATE	U	70.4	70.4	2.0		
114-MW61D-121.0-20241217	JE2865-3	SULFATE	U	33.8	33.8	2.0		
114-MW61D-121.0-20241217-X	JE2865-4	SULFATE	U	33.4	33.4	2.0		
114-MW61D-126.0-20241217	JE2865-5	SULFATE	U	33.3	33.3	2.0		
114-MW66D-91-97-20241217	JE2865-6	SULFATE	U	109	109	2.0		
114-MW66D-107-111-20241217	JE2865-7	SULFATE	U	116	116	2.0		
114-MW66D-118-123-20241217	JE2865-8	SULFATE	U	116	116	2.0		
114-MW66D-124-129-20241217	JE2865-9	SULFATE	U	106	106	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 17, 2024
Lab Name/ID SGS, Dayton
SDG No JE2865
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241217

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-113.75-20241217	JE2865-1	Total	Total Organic Carbon	U	3.2	3.2J-	1.0	Qualify	2
114-MW66D-137-140-20241217	JE2865-10	Total	Total Organic Carbon	U	22.5	22.5	1.0		
114-MW72D-102-106-20241217	JE2865-11	Total	Total Organic Carbon	U	11.9	11.9	1.0		
114-MW72D-110-114-20241217	JE2865-12	Total	Total Organic Carbon	U	19.7	19.7	1.0		
114-MW72D-116-119-20241217	JE2865-13	Total	Total Organic Carbon	U	27.8	27.8	1.0		
114-MW72D-123-126-20241217	JE2865-14	Total	Total Organic Carbon	U	27.1	27.1	1.0		
GW-RI-FB-20241217	JE2865-15	Total	Total Organic Carbon	U	0.75B	0.75J	1.0	Qualify	1
114-MW76D-118.75-20241217	JE2865-2	Total	Total Organic Carbon	U	2.8	2.8J+	1.0	Qualify	2
114-MW61D-121.0-20241217	JE2865-3	Total	Total Organic Carbon	U	2.7	2.7J+	1.0	Qualify	2
114-MW61D-121.0-20241217-X	JE2865-4	Total	Total Organic Carbon	U	2.6	2.6J+	1.0	Qualify	2
114-MW61D-126.0-20241217	JE2865-5	Total	Total Organic Carbon	U	2.6	2.6J+	1.0	Qualify	2
114-MW66D-91-97-20241217	JE2865-6	Total	Total Organic Carbon	U	15.8	15.8	1.0		
114-MW66D-107-111-20241217	JE2865-7	Total	Total Organic Carbon	U	4.1	4.1J+	1.0	Qualify	2
114-MW66D-118-123-20241217	JE2865-8	Total	Total Organic Carbon	U	9.6	9.6	1.0		
114-MW66D-124-129-20241217	JE2865-9	Total	Total Organic Carbon	U	12.1	12.1	1.0		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. Sample result was $\geq 3x$ and $<10X$ the associated blank result.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE2865		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 1/16/2025	
Number of Samples/Matrix: 14 GW, 1 GWF, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 1/22/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.6 °C, 1.1 °C
Holding Time	Yes	No	Sampled 12/17/2024, analyzed 12/18/2024.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Initial Calibration	Yes	No	12/18/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN63329, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20241217 (JE2865-15), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW76D-113.75-20241217 (JE2865-1)
Laboratory Duplicate	Yes	No	114-MW76D-113.75-20241217 (JE2865-1), Both ND
Laboratory Control Standards	Yes	No	GN63329 {100.0 %R}
Field Duplicate	Yes	No	114-MW61D-121.0-20241217 (JE2865-3) & 114-MW61D-121.0-20241217-X (JE865-4)
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW76D-113.75-20241217 (JE2865-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.147	NA	98.0	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
114-MW76D-113.75-20241217	JE2865-1	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept

RL – reporting limit**RPD – relative percent difference****Field Duplicates**

114-MW61D-121.0-20241217 (JE2865-3) & 114-MW61D-121.0-20241217-X (JE865-4)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.0026	U	0.0042	J	0.010	mg/l	0	SR <5xRL, ABS DIFF <RL, Accept

RL – reporting limit**RPD – relative percent difference**

Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW76D-113.75-20241217	JE2865-1		10		10	0	Both ND, Accept
114-MW76D-118.75-20241217	JE2865-2		10		10	0	Both ND, Accept
114-MW61D-121.0-20241217	JE2865-3		10		10	0	Both ND, Accept
114-MW61D-121.0-20241217-X	JE2865-4		10	4.2	10	4	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL ≤ RL, Accept
114-MW61D-126.0-20241217	JE2865-5		10		10	0	Both ND, Accept
114-MW66D-91-97-20241217	JE2865-6	2540	50	3300	100	26	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW66D-107-111-20241217	JE2865-7	39.1	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-118-123-20241217	JE2865-8	40.0	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-124-129-20241217	JE2865-9	6.0	10		10	NC	T Cr > T Cr6, Accept
114-MW66D-137-140-20241217	JE2865-10	4.1	10		10	NC	T Cr > T Cr6, Accept
114-MW72D-102-106-20241217	JE2865-11	517	10	530	10	2	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-110-114-20241217	JE2865-12	259	10	340	10	27	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-116-119-20241217	JE2865-13	145	10	150	10	3	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW72D-123-126-20241217	JE2865-14	103	10	120	10	15	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
GW-RI-FB-20241217	JE2865-15	0.68	2.0		10	NC	T Cr > T Cr6, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference**

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW72D-102-106-20241217	JE2865-11	407	10	520	10	24	D Cr < D Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept

RL – reporting

RPD – relative percent difference

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW72D-102-106-20241217	JE2865-11, -11F	530	10	520	10	26	T Cr6 > D Cr6, Accept

RL – reporting limit

RPD – relative percent difference

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW66D-91-97-20241217	JE2865-6	CHROMIUM (HEXAVALENT)	Total	10

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS Action Level
114-MW66D-91-97-20241217	JE2865-6	CHROMIUM (HEXAVALENT)	3.3	Y	mg/l	0.07
114-MW72D-102-106-20241217	JE2865-11	CHROMIUM (HEXAVALENT)	0.53	Y	mg/l	0.07
114-MW72D-102-106-20241217	JE2865-11F	CHROMIUM (HEXAVALENT)	0.52	Y	mg/l	0.07
114-MW72D-110-114-20241217	JE2865-12	CHROMIUM (HEXAVALENT)	0.34	Y	mg/l	0.07
114-MW72D-116-119-20241217	JE2865-13	CHROMIUM (HEXAVALENT)	0.15	Y	mg/l	0.07
114-MW72D-123-126-20241217	JE2865-14	CHROMIUM (HEXAVALENT)	0.12	Y	mg/l	0.07

SDG#: JE2865/ Method 7196

GN63329

Cr+6 ICAL 12/18/2024

GW

(p. 506 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.089
0.3	0.261
0.5	0.443
0.8	0.690
1	0.861

(p. 506 of
data pkg)

AECOM Calculated Intercept	0.00239	OK	Reported intercept	0.0024
AECOM Slope	0.8619	OK	Reported Slope	0.8619
AECOM Calculated r	0.99992	OK	Reported r	0.99992

LCS calculation

GN63329-B1

P. 486, 506

Background absorbance

0

Sample absorbance

0.132

LCS Soluble Instrument Response

0.132

Instrument Concentration (mg/L)

0.150

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100

GN63329-B1

P. 486, 506

True Value (mg/L)

0.150

AECOM Calculated %R	100.2	OK	Reported %R	100.0

MS calculation

GN63329-S1

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114-MW76D-113.75-20241217

Unfiltered

Background reading

0.002

Total absorbance

0.131

Total absorbance - background

0.129

Instrument Concentration (mg/L)

0.1469

NA: standards
and samples
treated the same

Sample aliquot

0.05

Final volume

0.05

Dilution Factor

1

AECOM Calculated MS Result (mg/L)	0.147	OK	Reported Result (mg/L)	0.147

%R = Found/True*100

GN63329-S1

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114-MW76D-113.75-20241217

True Value (mg/L)

0.150

Native concentration (mg/L)

0.0

AECOM Calculated MS Result %R	97.9	OK	Reported %R	98.0

UNFILTERED**Reporting Limit**

JE2865-1

P. 18, 506

114-MW76D-113.75-20241217

Low Standard

0.01

Initial volume (L)	0.5	NA: standards and samples treated the same		
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JE2865-1	P. 18, 506	114-MW76D-113.75-20241217	
Background reading	0			
Total absorbance	0.001			
Total absorbance - background	0.001			
Instrument Response (mg/L)	-0.002			
Sample volume (L)	0.5	NA: standards and samples treated the same		
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	-0.0016	OK, <MDL, report as ND	Reported Result (mg/L)	0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE2865		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 1/16/2025	
Number of Samples/Matrix: 14 GW, 1 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 1/17/2024	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.6 °C, 1.1 °C
Holding Time	No	Yes	Sampled 12/17/2024, analyzed 12/18/2024 - 12/24/2024 and 1/3/2025- 1/14/2024 Sample 114-MW72D-116-119-20241217 (JE2865-13F) Ferrous iron analyzed out of 24 hr. HT.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	Yes	No	MP51787 Cr ND, GN6331 Fe ND, GN63817 Fe ND, GP58717/GN64010 TOC ND, GP58719/GN64113 TOC ND, GP58720/GN64113 TOC ND, GP58425/GN63438 sulfate ND, GP58448/GN63486 sulfate ND
Field Blanks	No	Yes	GW-RI-FB-20241217 (JE2865-15) Chromium (0.68 J), TOC (0.75 J), see table below
Matrix Spike	Yes	No	114-MW76D-113.75-20241217 (JE28655-1) Cr, TOC, sulfate and Fe, 114-MW72D-116-119-20241217 (JE2865-13F) FE, 114-MW72D-123-126-20241217 (JE2865-14) sulfate, 114-MW61D-121.0-20241217 (JE2865-3) TOC, and 114-MW72D-110-114-20241217 (JE2865-12) TOC
Matrix Spike Duplicate	Yes	No	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP51787 Cr ND, GN63331 Fe (93.3 %R), GN63817 Fe (93.3 %R), GP58717/GN64010 TOC (102.0 %R), GP58719/GN64113 TOC (100.0), GP58720/GN64113 TOC (102.0), GP58425/GN63438 sulfate (95.5 %R),

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
			GP58448/GN63486 sulfate (94.1 %R)
Field Duplicate	Yes	No	114-MW61D-121.0-20241217 (JE2865-3) & 114-MW61D-121.0-20241217-X (JE2865-4)
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW66D-137-140-20241217	JE2865-10F	IRON (FERROUS)	12/17/2024 12:05	12/18/2024 11:30	<24 hr., Accept
114-MW72D-102-106-20241217	JE2865-11F	IRON (FERROUS)	12/17/2024 14:15	12/18/2024 11:30	<24 hr., Accept
114-MW72D-110-114-20241217	JE2865-12F	IRON (FERROUS)	12/17/2024 14:10	12/18/2024 11:30	<24 hr., Accept
114-MW72D-116-119-20241217	JE2865-13F	IRON (FERROUS)	12/17/2024 14:20	1/3/2025 13:20	Estimate (UJ)
114-MW72D-123-126-20241217	JE2865-14F	IRON (FERROUS)	12/17/2024 14:15	12/18/2024 11:30	<24 hr., Accept
114-MW76D-113.75-20241217	JE2865-1F	IRON (FERROUS)	12/17/2024 10:40	12/18/2024 11:10	<24 hr., Accept
114-MW76D-118.75-20241217	JE2865-2F	IRON (FERROUS)	12/17/2024 13:00	12/18/2024 11:10	<24 hr., Accept
114-MW61D-121.0-20241217	JE2865-3F	IRON (FERROUS)	12/17/2024 10:25	12/18/2024 11:10	<24 hr., Accept
114-MW61D-121.0-20241217-X	JE2865-4F	IRON (FERROUS)	12/17/2024 10:30	12/18/2024 11:30	<24 hr., Accept
114-MW61D-126.0-20241217	JE2865-5F	IRON (FERROUS)	12/17/2024 12:35	12/18/2024 11:30	<24 hr., Accept
114-MW66D-91-97-20241217	JE2865-6F	IRON (FERROUS)	12/17/2024 11:40	12/18/2024 11:30	<24 hr., Accept
114-MW66D-107-111-20241217	JE2865-7F	IRON (FERROUS)	12/17/2024 11:50	12/18/2024 11:30	<24 hr., Accept
114-MW66D-118-123-20241217	JE2865-8F	IRON (FERROUS)	12/17/2024 11:55	12/18/2024 11:30	<24 hr., Accept
114-MW66D-124-129-20241217	JE2865-9F	IRON (FERROUS)	12/17/2024 12:00	12/18/2024 11:30	<24 hr., Accept

Field Blank

GW-RI-FB-20241217 (JE2865-15)

Analyte	Fraction	SR (ug/l)	Qual	RL	Action
Chromium	Total	0.68	J	2.0	Samples 114-MW66D-124-129-20241217 (JE2865-9) and 114-MW66D-137-140-20241217 (JE2865-10) were >3x but < 10x FB. Estimate (J+) . All other SR ND or >10x FB. Accept
TOC	Total	0.75	J	1.0	Samples 114-MW66D-137-140-20241217 (JE2865-1), 114-MW76D-118.75-20241217 (JE2865-2), 114-MW61D-121.0-20241217 (JE2865-3), 114-MW61D-121.0-20241217-X (JE2865-4), 114-MW61D-126.0-20241217 (JE2865-5), 114-MW66D-107-111-20241217 (JE2865-7) > 3x but < 10x FB. Estimate (J+) All other SR >10x FB. Accept

SR – sample result

RL – reporting limit

Matrix Spikes/Matrix Spike Duplicates

114-MW76D-113.75-20241217 (JE2865-1, -1F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	0	79.1	73.8	98.9	92.3	125	75	6.9	20	OK, Accept
IRON	Dissolved	3.0	0	2.8	2.8	93.3	93.3	125	75	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW72D-116-119-20241217 (JE28655-13F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
IRON	Dissolved	3.0	0	2.8	2.8	93.3	93.3	125	75	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW76D-113.75-20241217 (JE28655-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	3.2	13.7	13.7	105.0	105.0	115	85	0	10	OK, Accept
SULFATE	Total	80	70.0	147	145	96.3	93.8	120	80	1.4	15	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW72D-123-126-20241217 (JE28655-14)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
SULFATE	Total	80	5.5	79.6	79.5	92.6	92.5	120	80	0.1	15	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW61D-121.0-20241217 (JE28655-3)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	2.7	13.5	13.5	108.0	108.0	115	85	0	10	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW72D-110-114-20241217 (JE28655-12)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	19.7	31.1	31.1	114.0	114.0	115	85	0	10	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference****Total Chromium vs Dissolved Chromium**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-MW72D-102-106-20241217	JE2865-11, -11F	517	10	407	10	50	110	24	T Cr > D Cr, Accept

NC- not calculated**RL – reporting limit****RPD – relative percent difference**

Field Duplicates

114-MW61D-121.0-20241217 (JE2865-3, -3F) & 114-MW61D-121.0-20241217-X (JE865-4, -4F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
IRON	Dissolved	0.029	U	0.029	U	0.20	ug/l	0	Both ND, Accept
CHROMIUM	Total	3.1	U	3.1	U	10	ug/l	0	Both ND, Accept
SULFATE	Total	33.8		33.4		2.0	mg/l	1.2	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	2.7		2.6		1.0	mg/l	3.8	RPD < 30%, Accept

RL – reporting limit

RPD – relative percent difference

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-113.75-20241217	JE2865-1	CHROMIUM	Total	10
114-MW76D-118.75-20241217	JE2865-2	CHROMIUM	Total	10
114-MW61D-121.0-20241217	JE2865-3	CHROMIUM	Total	10
114-MW61D-121.0-20241217-X	JE2865-4	CHROMIUM	Total	10
114-MW61D-126.0-20241217	JE2865-5	CHROMIUM	Total	10
114-MW66D-91-97-20241217	JE2865-6	CHROMIUM	Total	50
114-MW66D-107-111-20241217	JE2865-7	CHROMIUM	Total	10
114-MW66D-118-123-20241217	JE2865-8	CHROMIUM	Total	10
114-MW66D-124-129-20241217	JE2865-9	CHROMIUM	Total	10
114-MW66D-137-140-20241217	JE2865-10	CHROMIUM	Total	10
114-MW72D-102-106-20241217	JE2865-11	CHROMIUM	Total	10
114-MW72D-102-106-20241217	JE2865-11F	CHROMIUM	Total	10
114-MW72D-110-114-20241217	JE2865-12	CHROMIUM	Total	10
114-MW72D-116-119-20241217	JE2865-13	CHROMIUM	Total	10
114-MW72D-123-126-20241217	JE2865-14	CHROMIUM	Total	10
GW-RI-FB-20241217	JE2865-15	CHROMIUM	Total	2

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS
114-MW66D-91-97-20241217	JE2865-6	CHROMIUM	2540	Y	ug/l	70
114-MW72D-102-106-20241217	JE2865-11	CHROMIUM	517	Y	ug/l	70
114-MW72D-102-106-20241217	JE2865-11F	CHROMIUM	407	Y	ug/l	70
114-MW72D-110-114-20241217	JE2865-12	CHROMIUM	259	Y	ug/l	70
114-MW72D-116-119-20241217	JE2865-13	CHROMIUM	145	Y	ug/l	70
114-MW72D-123-126-20241217	JE2865-14	CHROMIUM	103	Y	ug/l	70

Data Validation Report

Project:	PPG 2024 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JE2940
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/22/2025
Reviewed by:	Linda Waters/AECOM File Name: JE2940_2025_1_22 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 December 18, 2024, as part of the PPG 2024 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	Laboratory ID	Matrix	Parameter
114-MW76D-123.75-20241218	JE2940-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-123.75-20241218	JE2940-1F	Groundwater	Ferrous Iron (dissolved)
114-MW60C-R-117.5-20241218	JE2940-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW60C-R-117.5-20241218	JE2940-2F	Groundwater	Ferrous Iron (dissolved)
114-MW76D-123.75-20241218-X (Field Duplicate of 114-MW76D-123.75-20241218)	JE2940-3	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW76D-123.75-20241218-X (Field Duplicate of 114-MW76D-123.75-20241218)	JE2940-3F	Groundwater	Ferrous Iron (dissolved)
114-MW61D-131.0-20241218	JE2940-4	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry

Field ID	Laboratory ID	Matrix	Parameter
114-MW61D-131.0-20241218	JE2940-4F	Groundwater	Ferrous Iron (dissolved)
114-MW61D-136.0-20241218	JE2940-5	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW61D-136.0-20241218	JE2940-5F	Groundwater	Ferrous Iron (dissolved)
114-MW4D-90-94-20241218	JE2940-6	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-90-94-20241218	JE2940-6F	Groundwater	Ferrous Iron (dissolved)
114-MW4D-98-102-20241218	JE2940-7	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-98-102-20241218	JE2940-7F	Groundwater	Ferrous Iron (dissolved)
114-MW4D-111-115-20241218	JE2940-8	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-111-115-20241218	JE2940-8F	Groundwater	Ferrous Iron (dissolved)
114-MW4D-121-125-20241218	JE2940-9	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW4D-121-125-20241218	JE2940-9F	Groundwater	Ferrous Iron (dissolved)
114-MW57D-87.5-91.5-20241218	JE2940-10	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-87.5-91.5-20241218	JE2940-10F	Groundwater	Dissolved Hexavalent Chromium, Dissolved Chromium, Ferrous Iron (dissolved)
114-MW57D-96.5-100.5-20241218	JE2940-11	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-96.5-100.5-20241218	JE2940-11F	Groundwater	Dissolved Hexavalent Chromium, Ferrous Iron (dissolved)
114-MW57D-104-108-20241218	JE2940-12	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-104-108-20241218	JE2940-12F	Groundwater	Dissolved Hexavalent Chromium, Ferrous Iron (dissolved)
114-MW57D-109-113-20241218	JE2940-13	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW57D-109-113-20241218	JE2940-13F	Groundwater	Dissolved Hexavalent Chromium, Ferrous Iron (dissolved)
114-MW52D-80-83-20241218	JE2940-14	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-80-83-20241218	JE2940-14F	Groundwater	Ferrous Iron (dissolved)
114-MW52D-87-90-20241218	JE2940-15	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW52D-87-90-20241218	JE2940-15F	Groundwater	Ferrous Iron (dissolved)
114-MW52D-102-105-20241218	JE2940-16	Groundwater	Hexavalent Chromium, Chromium
114-MW52D-102-105-20241218	JE2940-16F	Groundwater	Ferrous Iron (dissolved)
GW-RI-FB-20241218	JE2940-17	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

The samples were collected following the procedures detailed in the Work Order for PPG 2024 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

Hexavalent Chromium

Sample Results

The results for total hexavalent chromium and dissolved hexavalent chromium were compared to ensure that the total concentration was greater than the dissolved concentration in each sample. In addition, the results for total and dissolved chromium were compared to the results for total and dissolved hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Samples 114-MW61D-131.0-20241218 (JE2940-4) and 114-MW61D-136.0-20241218 (JE2940-5) were analyzed as MSs for this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Samples 114-MW61D-131.0-20241218 (JE2940-4) and 114-MW61D-136.0-20241218 (JE2940-5) were analyzed as laboratory duplicates for hexavalent chromium in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20241218 (JE2940-17), was submitted for total hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW76D-123.75-20241218 (JE2940-1) and 114-MW76D-123.75-20241218-X (JE2940-3) were analyzed as the field duplicate pair for hexavalent chromium. Sample results were nondetect. All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)**Hold Time**

Samples 114-MW57D-109-113-20241218 (JE2940-13F), 114-MW52D-80-83-20241218 (JE2940-14F), and 114-MW52D-87-90-20241218 (JE2940-15F) were received by the laboratory and analyzed for ferrous iron outside of the twenty-four-hour holding time. The sample results were qualified as estimated (UJ).

Method Blank

The MB, MP52001, reported chromium at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). All sample results were either nondetect or greater than ten times the amount in the MB and were not considered affected by the implied contamination.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW61D-131.0-20241218 (JE2940-4, -4F) was analyzed as a MS/MSD for chromium and ferrous iron in this data set. All QC acceptance criteria were met.

Samples 114-MW57D-87.5-91.5-20241218 (JE2940-10) and 114-MW52D-80-83-20241218 (JE2940-14) were also analyzed as MS/MSDs for chromium in this data set. All QC acceptance criteria were met.

Sample 114-MW57D-104-108-20241218 (JE2940-12F) was also analyzed as a MS/MSD for ferrous iron in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20241218 (JE2940-17), was submitted for total chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW76D-123.75-20241218 (JE2940-1, -1F) and 114-MW76D-123.75-20241218-X (JE2940-3, -3F) were analyzed as the field duplicate pairs for chromium and ferrous iron. All results were nondetect. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action. In addition, the total chromium results were compared to the dissolved chromium results. All QC acceptance criteria were met.

Wet Chemistry (Sulfate, TOC)**Hold Time**

Samples 114-MW57D-104-108-20241218 (JE2940-12), 114-MW72D-116-119-20241217 (JE2940-13), 114-MW52D-80-83-20241218 (JE2940-14), 114-MW52D-87-90-20241218 (JE2940-15), GW-RI-FB-20241218 (JE2940-17), 114-MW4D-111-115-20241218 (JE2940-8), and 114-MW4D-121-125-20241218 (JE2940-9) were analyzed outside of the 28 day holding time. Positive TOC sample results were estimated (J-). Non-detect sample results were rejected (R).

Matrix Spike/ Matrix Spike Duplicate

Sample 114-MW61D-131.0-20241218 (JE2940-4) was analyzed as a MS/MSD for TOC and sulfate in this data set. All QC acceptance criteria were met.

Sample 114-MW4D-90-94-20241218 (JE2940-6) was analyzed as a MS/MSD for TOC in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20241218 (JE2940-17), was submitted for TOC and sulfate analysis. Sulfate was reported at a concentration greater than the MDL but less than the RL. Samples 114-MW57D-87.5-91.5-20241218 (JE2940-10), 114-MW57D-96.5-100.5-20241218 (JE2940-11), 114-MW57D-104-108-20241218 (JE2940-12), and 114-MW57D-109-113-20241218 (JE2940-13), reported sulfate results greater than three times but less than ten times the amount in the FB. Sulfate sample results were qualified as estimated (J+). All other TOC sample results were greater than ten times the amount in the FB and not considered affected. No qualifications were required.

No FB contamination was reported for TOC. No qualifications were required.

Field Duplicate (FD)

Samples 114-MW76D-123.75-20241218 (JE2940-1) and 114-MW76D-123.75-20241218-X (JE2940-3) were analyzed as the field duplicate pairs for TOC and sulfate. All QC acceptance criteria were met. No qualifications were made

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes with the exception of the TOC FB result. When applicable, qualified results are discussed in attachments A and B below.

The sample results qualified as estimated due to analysis holding time exceedances are useable with a low bias.

Sample results rejected due to analysis holding time exceedances are not useable.

Sample results qualified as estimated due to field blank contamination are useable with a high bias.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 18, 2024
Lab Name/ID SGS, Dayton
SDG No JE2940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241218

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-87.5-91.5-20241218	JE2940-10F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.0034B	0.0034J	0.010	Qualify	1
114-MW57D-104-108-20241218	JE2940-12F	Dissolved	CHROMIUM (HEXAVALENT)	U	0.0058B	0.0058J	0.010	Qualify	1
114-MW57D-109-113-20241218	JE2940-13	Total	CHROMIUM (HEXAVALENT)	U	0.0046B	0.0046J	0.010	Qualify	1
114-MW52D-80-83-20241218	JE2940-14	Total	CHROMIUM (HEXAVALENT)	U	0.067	0.067	0.010		
114-MW60C-R-117.5-20241218	JE2940-2	Total	CHROMIUM (HEXAVALENT)	U	0.060	0.060	0.010		
114-MW61D-136.0-20241218	JE2940-5	Total	CHROMIUM (HEXAVALENT)	U	0.0034B	0.0034J	0.010	Qualify	1
114-MW4D-111-115-20241218	JE2940-8	Total	CHROMIUM (HEXAVALENT)	U	0.012	0.012	0.010		
114-MW4D-121-125-20241218	JE2940-9	Total	CHROMIUM (HEXAVALENT)	U	0.013	0.013	0.010		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 18, 2024
Lab Name/ID SGS, Dayton
SDG No JE2940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241218

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-87.5-91.5-20241218	JE2940-10	Total	CHROMIUM	U	78.4	78.4	10		
114-MW57D-87.5-91.5-20241218	JE2940-10F	Total	CHROMIUM	U	63.7	63.7	10		
114-MW57D-96.5-100.5-20241218	JE2940-11	Dissolved	CHROMIUM	U	67.3	67.3	10		
114-MW57D-104-108-20241218	JE2940-12	Total	CHROMIUM	U	87.4	87.4	10		
114-MW57D-109-113-20241218	JE2940-13	Total	CHROMIUM	U	77.0	77.0	10		
114-MW52D-80-83-20241218	JE2940-14	Total	CHROMIUM	0.71	884	884	33		
114-MW52D-87-90-20241218	JE2940-15	Total	CHROMIUM	0.71	19.6	19.6	10		
114-MW52D-102-105-20241218	JE2940-16	Total	CHROMIUM	U	8.2B	8.2J	10	Qualify	1
114-MW60C-R-117.5-20241218	JE2940-2	Total	CHROMIUM	U	50.8	50.8	10		

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

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

NJDEP Validation Footnote

- The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 18, 2024
Lab Name/ID SGS, Dayton
SDG No JE2940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241218

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW57D-109-113-20241218	JE2940-13F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW52D-80-83-20241218	JE2940-14F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW52D-87-90-20241218	JE2940-15F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 18, 2024
Lab Name/ID SGS, Dayton
SDG No JE2940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241218

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-123.75-20241218	JE2940-1	SULFATE	U	71.7	71.7	2.0		
114-MW57D-87.5-91.5-20241218	JE2940-10	SULFATE	U	3.0	3.0J+	2.0	Qualify	2
114-MW57D-96.5-100.5-20241218	JE2940-11	SULFATE	U	5.4	5.4J+	2.0	Qualify	2
114-MW57D-104-108-20241218	JE2940-12	SULFATE	U	4.6	4.6J+	2.0	Qualify	2
114-MW57D-109-113-20241218	JE2940-13	SULFATE	U	7.4	7.4J+	2.0	Qualify	2
114-MW52D-80-83-20241218	JE2940-14	SULFATE	U	70.0	70.0	2.0		
114-MW52D-87-90-20241218	JE2940-15	SULFATE	U	75.9	75.9	2.0		
GW-RI-FB-20241218	JE2940-17	SULFATE	U	0.89B	0.89J	2.0	Qualify	1
114-MW60C-R-117.5-20241218	JE2940-2	SULFATE	U	34.6	34.6	2.0		
114-MW76D-123.75-20241218-x	JE2940-3	SULFATE	U	71.7	71.7	2.0		
114-MW61D-131.0-20241218	JE2940-4	SULFATE	U	33.4	33.4	2.0		
114-MW61D-136.0-20241218	JE2940-5	SULFATE	U	34.2	34.2	2.0		
114-MW4D-90-94-20241218	JE2940-6	SULFATE	U	56.4	56.4	2.0		
114-MW4D-98-102-20241218	JE2940-7	SULFATE	U	54.7	54.7	2.0		
114-MW4D-111-115-20241218	JE2940-8	SULFATE	U	23.7	23.7	2.0		
114-MW4D-121-125-20241218	JE2940-9	SULFATE	U	20.2	20.2	2.0		

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.
2. Sample result was $\geq 3x$ and $<10X$ the associated blank result.

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2024 GAG GW Remedial Activities
Sampling Date December 18, 2024
Lab Name/ID SGS, Dayton
SDG No JE2940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20241218

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW76D-123.75-20241218	JE2940-1	Total	Total Organic Carbon	U	2.9	2.9	1.0		
114-MW57D-87.5-91.5-20241218	JE2940-10	Total	Total Organic Carbon	U	232	232	5.0		
114-MW57D-96.5-100.5-20241218	JE2940-11	Total	Total Organic Carbon	U	214	214	5.0		
114-MW57D-104-108-20241218	JE2940-12	Total	Total Organic Carbon	U	387	387J-	20	Qualify	1
114-MW57D-109-113-20241218	JE2940-13	Total	Total Organic Carbon	U	355	355J-	20	Qualify	1
114-MW52D-80-83-20241218	JE2940-14	Total	Total Organic Carbon	U	196	196J-	10	Qualify	1
114-MW52D-87-90-20241218	JE2940-15	Total	Total Organic Carbon	U	131	131J-	5.0	Qualify	1
GW-RI-FB-20241218	JE2940-17	Total	Total Organic Carbon	U	U	R	1.0	Reject	1
114-MW60C-R-117.5-20241218	JE2940-2	Total	Total Organic Carbon	U	1.5	1.5	1.0		
114-MW76D-123.75-20241218-x	JE2940-3	Total	Total Organic Carbon	U	3.0	3.0	1.0		
114-MW61D-131.0-20241218	JE2940-4	Total	Total Organic Carbon	U	2.2	2.2	1.0		
114-MW61D-136.0-20241218	JE2940-5	Total	Total Organic Carbon	U	2.3	2.3	1.0		
114-MW4D-90-94-20241218	JE2940-6	Total	Total Organic Carbon	U	14.4	14.4	1.0		
114-MW4D-98-102-20241218	JE2940-7	Total	Total Organic Carbon	U	44.3	44.3	1.0		
114-MW4D-111-115-20241218	JE2940-8	Total	Total Organic Carbon	U	71.4	71.4J-	5.0	Qualify	1
114-MW4D-121-125-20241218	JE2940-9	Total	Total Organic Carbon	U	118	118J-	5.0	Qualify	1
114-MW76D-123.75-20241218	JE2940-1	Total	Total Organic Carbon	U	2.9	2.9	1.0		

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton			Client/Site Name: PPG 2024 GAG GW Remedial Activities
Laboratory SDG/Job No: JE2940			Project Number: 60732743 GWM.2024
Validation Level: Full			Date: 1/22/2025
Number of Samples/Matrix: 16 GW, 4 GWF, 1FB			Validator: Charlene Flint
Analysis: Hexavalent Chromium/7196A			Reviewer and Date: Linda Waters 1/24/2025
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C, 1.1 °C
Holding Time	Yes	No	Sampled 12/18/2024, analyzed 12/19/2024.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	12/19/2024
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN63382, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20241218 (JE2940-17), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW61D-131.0-20241218 (JE2940-4), 114-MW61D-136.0-20241218 (JE2940-5), see table below
Laboratory Duplicate	Yes	No	114-MW61D-131.0-20241218 (JE2940-4), 114-MW61D-136.0-20241218 (JE2940-5), see table below
Laboratory Control Standards	Yes	No	GN63382 {100.7, 99.3 %R}
Field Duplicate	Yes	No	114-MW76D-123.75-20241218 (JE2940-1) & 114-MW76D-123.75-20241218-X (JE865-3), Both ND
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	Yes	No	
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW61D-131.0-20241218 (JE2940-4)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.153	NA	102	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW61D-136.0-20241218 (JE2940-5)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0	0.158	NA	105.3	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
114-MW61D-131.0-20241218	JE2940-4	CHROMIUM (Hexavalent)	0.0026	U	0.0026	U	0.010	mg/l	0	Both ND, Accept
114-MW61D-136.0-20241218	JE2940-5	CHROMIUM (Hexavalent)	0.0034	J	0.0026	U	0.010	mg/l	NC	SR<4xRL, ABS DIFF <RL, Accept

RL – reporting limit**RPD – relative percent difference**

Field Duplicates

114-MW76D-123.75-20241218 (JE2940-1) & 114-MW76D-123.75-20241218-X (JE865-3)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.0026	U	0.0026	U	0.010	mg/l	0	RPD <30%, Accept

RL – reporting limit**RPD – relative percent difference****Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW76D-123.75-20241218	JE2940-1		10		10	0	Both ND, Accept
114-MW57D-87.5-91.5-20241218	JE2940-10	78.4	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-96.5-100.5-20241218	JE2940-11	67.3	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-104-108-20241218	JE2940-12	87.4	10		10	NC	T Cr > T Cr6, Accept
114-MW57D-109-113-20241218	JE2940-13	77.0	10	4.6	10	177	T Cr > T Cr6, Accept
114-MW52D-80-83-20241218	JE2940-14	884	33	67	10	172	T Cr > T Cr6, Accept
114-MW52D-87-90-20241218	JE2940-15	19.6	10		10	NC	T Cr > T Cr6, Accept
114-MW52D-102-105-20241218	JE2940-16	8.2	10		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20241218	JE2940-17		2.0		10	0	Both ND, Accept
114-MW60C-R-117.5-20241218	JE2940-2	50.8	10	60	10	17	T Cr < T Cr6, SRs > 4x RL, %RPD ≤ 30%, Accept
114-MW76D-123.75-20241218-x	JE2940-3		10		10	0	Both ND, Accept
114-MW61D-131.0-20241218	JE2940-4		10		10	0	Both ND, Accept
114-MW61D-136.0-20241218	JE2940-5		10	3.4	10	NC	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL ≤ RL, Accept
114-MW4D-90-94-20241218	JE2940-6		10		10	0	Both ND, Accept
114-MW4D-98-102-20241218	JE2940-7		10		10	0	Both ND, Accept

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW4D-111-115-20241218	JE2940-8		10	12	10	NC	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL ≤ RL, Accept
114-MW4D-121-125-20241218	JE2940-9		10	13	10	NC	T Cr ND, T Cr6 positive; ABS of positive result and ND result RL ≤ RL, Accept

NC – not calculated

RL – reporting limit

RPD – relative percent difference

Dissolved Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Dissolved Chromium (ug/l)	Dissolved Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW57D-87.5-91.5-20241218	JE2940-10F	63.7	10	3.4	10	180	D Cr > D Cr6, Accept

RL – reporting limit

RPD – relative percent difference

Total Hexavalent Chromium vs Dissolved Hexavalent Chromium

Sample ID	Lab Sample ID	Total Hexavalent Chromium (ug/l)	Total Hexavalent Chromium Reporting Limit (ug/l)	Dissolved Hexavalent Chromium (ug/l)	Dissolved Hexavalent Chromium Reporting Limit (ug/l)	RPD (%)	Action
114-MW57D-87.5-91.5-20241218	JE2940-10, -10F		10	3.4	10	NC	T Cr6 ND, D Cr6 positive; ABS of positive result and ND result RL ≤ RL, Accept
114-MW57D-96.5-100.5-20241218	JE2940-11, -11F		10		10	0	Both ND, accept

114-MW57D-104-108-20241218	JE2940-12, -12F		10	5.8	10	NC	T Cr6 ND, D Cr6 positive; ABS of positive result and ND result $RL \leq RL$, Accept
114-MW57D-109-113-20241218	JE2940-13, -13F	4.6	10		10	NC	T Cr6 > D Cr6, Accept

NC- not calculated

RL – reporting limit

RPD – relative percent difference

SDG#: JE2940/ Method 7196

GN63382

Cr+6 ICAL 12/19/2024

GW

(p. 1189 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.088
0.3	0.26
0.5	0.444
0.8	0.690
1	0.862

(p. 1189
of data
pkg)

AECOM Calculated Intercept	0.00203	OK	Reported intercept	0.0020
AECOM Slope	0.8630	OK	Reported Slope	0.8630
AECOM Calculated r	0.99991	OK	Reported r	0.99991

LCS calculation

GN63382-B1

P. 1169, 1189

Background absorbance	0
Sample absorbance	0.132
LCS Soluble Instrument Response	0.132
Instrument Concentration (mg/L)	0.151

NA: standards and
samples treated
the same

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.151	OK	Reported Result (mg/L)	0.151

%R = Found/True*100

GN63382-B1

P. 1169, 1189

True Value (mg/L)	0.150

AECOM Calculated %R	100.4	OK	Reported %R	100.7

MS calculation

GN63382-S1

P. 1171, 1189,
1191

114-MW61D-131.0-20241218

Unfiltered

Background reading	0.005
Total absorbance	0.139
Total absorbance - background	0.134
Instrument Concentration (mg/L)	0.1529

NA: standards and
samples treated
the same

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.153	OK	Reported Result (mg/L)	0.153

%R = Found/True*100

GN63382-S1

P. 1171, 1189,
1191

114-MW61D-131.0-20241218

True Value (mg/L)	0.150
Native concentration (mg/L)	0.0

AECOM Calculated MS Result %R	102.0	OK	Reported %R	102.0

UNFILTERED

Reporting Limit	JE2940-4	P. 28, 1189	114-MW61D-131.0-20241218
Low Standard	0.01	NA: standards and samples treated the same	
Initial volume (L)	0.5		
Final volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)= 0.010
UNFILTERED			
<u>Sample Calculations</u>	JE2940-4	P. 28, 1189	114-MW61D-131.0-20241218
Background reading	0.004		
Total absorbance	0.005		
Total absorbance - background	0.001		
Instrument Response (mg/L)	-0.001	NA: standards and samples treated the same	
Sample volume (L)	0.5		
Final Volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Result (mg/L)	-0.0012	OK, <MDL, report as ND	Reported Result (mg/L) 0.0026 U

Laboratory: SGS, Dayton		Client/Site Name: PPG 2024 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE2940		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 1/22/2025	
Number of Samples/Matrix: 16 GW, 1 GWF, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 1/24/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	No	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C, 1.1 °C
Holding Time	No	Yes	Sampled 12/18/2024, analyzed 12/19/2024 - 12/30/2024 and 1/2/2025- 1/17/2024 Several Ferrous iron samples analyzed out of 24 hr. HT. Estimate (UJ). Several TOC samples analyzed out of 28 - day HT. Positive results estimated (J-). Non-detect reject R.
Quantitation Limits	No	No	See table below
Dilutions	Yes	No	See table below
Method Blanks	No	No	MP51788 Cr ND, MP51941 Cr ND, MP52001 Cr (0.71 ug/l), GN63386 Fe ND, GN63629 Fe ND, GN63817 Fe ND, GP58768/GN64126 TOC ND, GP58792/GN64192 TOC ND, GP58793/GN64192 TOC ND, GP58482/GN63543 sulfate ND, GP58644/GN63837 sulfate ND
Field Blanks	No	Yes	GW-RI-FB-20241218 (JE2940-17) Sulfate (0.89 mg/l), see table below
Matrix Spike	Yes	No	114-MW61D-131.0-20241218 (JE2940-4) Cr, TOC, sulfate and Fe, 114-MW57D-87.5-91.5-20241218 (JE2940-10) Cr, 114-MW52D-80-83-20241218 (JE2940-14) Cr, 114-MW57D-104-108-20241218 (JE2940-12F) FE, and 114-MW4D-90-94-20241218 (JE2940-6) TOC, also batch QC TOC
Matrix Spike Duplicate	Yes	No	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP51788 Cr (101.3 %R), MP51941 Cr (103.8 %R), MP52001 Cr (92.1 %R), GN63386 Fe (93.3 %R),

Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
			GN63629 Fe (93.3 %R), GN63817 Fe (93.3 %R), GP58768/GN64126 TOC(103.0 %R), GP58792/GN64192 TOC(95.0 %R), GP58793/GN64192 TOC(92.30 %R), GP58482/GN63543 sulfate (101.8 %R), GP58644/GN63837 sulfate (96.0 %R)
Field Duplicate	Yes	No	114-MW76D-123.75-20241218 (JE2940-1) 114-MW76D-123.75-20241218-X (JE2940-3)
Total Metals vs Dissolved Metals Results	Yes	No	
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW57D-109-113-20241218	JE2940-13F	IRON (FERROUS)	12/18/2024 11:50	12/19/2024 12:00	Estimate (UJ)
114-MW52D-80-83-20241218	JE2940-14F	IRON (FERROUS)	12/18/2024 13:50	1/3/2025 13:20	Estimate (UJ)
114-MW52D-87-90-20241218	JE2940-15F	IRON (FERROUS)	12/18/2024 13:55	1/3/2025 13:20	Estimate (UJ)
114-MW57D-104-108-20241218	JE2940-12	TOC	12/18/2024 11:45	1/17/2025 4:56	Estimate (J-)
114-MW57D-109-113-20241218	JE2940-13	TOC	12/18/2024 11:50	1/17/2025 5:17	Estimate (J-)
114-MW52D-80-83-20241218	JE2940-14	TOC	12/18/2024 13:50	1/17/2025 5:38	Estimate (J-)
114-MW52D-87-90-20241218	JE2940-15	TOC	12/18/2024 13:55	1/17/2025 6:00	Estimate (J-)
GW-RI-FB-20241218	JE2940-17	TOC	12/18/2024 15:00	1/16/2025 0:17	SR ND, Reject (R)
114-MW4D-111-115-20241218	JE2940-8	TOC	12/18/2024 10:25	1/17/2025 4:13	Estimate (J-)
114-MW4D-121-125-20241218	JE2940-9	TOC	12/18/2024 10:40	1/17/2025 4:34	Estimate (J-)

SR – sample result**Method Blank**

MP52001

Analyte	Fraction	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	Total	0.71		2.0	samples: 114-MW52D-80-83-20241218 (JE2940-14), 114-MW52D-87-90-20241218 (JE2940-15)	SR >10x the amount in the MB, Accept

Field Blank

GW-RI-FB-20241218 (JE2940-17)

Analyte	Fraction	SR (mg/l)	Qual	RL	Action
Sulfate	Total	0.89	J	2.0	Samples 114-MW57D-87.5-91.5-20241218 (JE2940-10), 114-MW57D-96.5-100.5-20241218 (JE2940-11), 114-MW57D-104-108-20241218 (JE2940-12), and 114-MW57D-109-113-20241218 (JE2940-13), > 3x but < 10x FB. Estimate (J+) All other SR >10x FB. Accept

Matrix Spikes/Matrix Spike Duplicates

114-MW61D-131.0-20241218 (JE2940-4, -4F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80.0	1.3	71.1	70.7	87.3	86.8	125	75	0.6	20	OK, Accept
IRON	Dissolved	3.0	0	2.8	2.8	93.3	93.3	125	75	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW57D-87.5-91.5-20241218 (JE2940-10)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	80	78.4	148	148	87.,0	87.0	125	75	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW52D-80-83-20241218 (JE2940-14)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM	Total	267	884	1130	1170	92.2	107.3	125	75	3.5	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW57D-104-108-20241218 (JE29405-12F)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
IRON	Dissolved	3.0	0	2.8	2.8	93.3	93.3	125	75	0	20	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW61D-131.0-20241218 (JE29405-4)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	2.2	12.3	12.3	101.0	101.0	115	85	0	10	OK, Accept
SULFATE	Total	80	33.4	108	109	93.3	94.5	120	80	0.9	15	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference**

114-MW4D-90-94-20241218 (JE29405-6)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
TOC	Total	10	14.4	23.7	23.0	93.0	86.0	115	85	3.0	10	OK, Accept

SR – sample result**SSR – Spiked sample result****SDR – Sample duplicate result****NA – not applicable****RPD – relative percent difference****Field Duplicates**

114-MW76D-123.75-20241218 (JE2940-1, -1F) 114-MW76D-123.75-20241218-X (JE2940-3, -3F)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
IRON	Dissolved	0.029	U	0.029	U	0.20	ug/l	0	Both ND, Accept
CHROMIUM	Total	3.1	U	3.1	U	10	ug/l	0	Both ND, Accept
SULFATE	Total	71.7		71.7		2.0	mg/l	0	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	2.9		3.0		1.0	mg/l	3.4	RPD < 30%, Accept

RL – reporting limit**RPD – relative percent difference****Total Chromium vs Dissolved Chromium**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	RL (ug/l)	Dissolved Chromium (ug/l)	RL (ug/l)	RLX5	Abs Diff	RPD (%)	Action
114-MW57D-87.5-91.5-20241218	JE2940-10, -10F	78.4	10	63.7	10	50	15	21	T Cr > D Cr, Accept

NC- not calculated**RL – reporting limit****RPD – relative percent difference**

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW76D-123.75-20241218	JE2940-1	CHROMIUM	Total	10
114-MW57D-87.5-91.5-20241218	JE2940-10	TOTAL ORGANIC CARBON	Total	5
114-MW57D-87.5-91.5-20241218	JE2940-10	CHROMIUM	Total	10
114-MW57D-87.5-91.5-20241218	JE2940-10F	CHROMIUM	Dissolved	10
114-MW57D-96.5-100.5-20241218	JE2940-11	TOTAL ORGANIC CARBON	Total	5
114-MW57D-96.5-100.5-20241218	JE2940-11	CHROMIUM	Total	10
114-MW57D-104-108-20241218	JE2940-12	TOTAL ORGANIC CARBON	Total	20
114-MW57D-104-108-20241218	JE2940-12	CHROMIUM	Total	10
114-MW57D-109-113-20241218	JE2940-13	TOTAL ORGANIC CARBON	Total	20
114-MW57D-109-113-20241218	JE2940-13	CHROMIUM	Total	10
114-MW52D-80-83-20241218	JE2940-14	TOTAL ORGANIC CARBON	Total	10
114-MW52D-80-83-20241218	JE2940-14	CHROMIUM	Total	10
114-MW52D-87-90-20241218	JE2940-15	TOTAL ORGANIC CARBON	Total	5
114-MW52D-87-90-20241218	JE2940-15	CHROMIUM	Total	10
114-MW52D-102-105-20241218	JE2940-16	CHROMIUM	Total	10
GW-RI-FB-20241218	JE2940-17	CHROMIUM	Total	2
114-MW60C-R-117.5-20241218	JE2940-2	CHROMIUM	Total	10
114-MW76D-123.75-20241218-x	JE2940-3	CHROMIUM	Total	10
114-MW61D-131.0-20241218	JE2940-4	CHROMIUM	Total	10
114-MW61D-136.0-20241218	JE2940-5	CHROMIUM	Total	10
114-MW4D-90-94-20241218	JE2940-6	CHROMIUM	Total	10
114-MW4D-98-102-20241218	JE2940-7	CHROMIUM	Total	10
114-MW4D-111-115-20241218	JE2940-8	TOTAL ORGANIC CARBON	Total	5
114-MW4D-111-115-20241218	JE2940-8	CHROMIUM	Total	10
114-MW4D-121-125-20241218	JE2940-9	TOTAL ORGANIC CARBON	Total	5
114-MW4D-121-125-20241218	JE2940-9	CHROMIUM	Total	10

Reporting Limits GW Metals

Sample ID	Lab ID	Analyte	Result	Detect Flag	Units	GWQS
114-MW52D-80-83-20241218	JE2940-14	CHROMIUM	884	Y	ug/l	70
114-MW57D-104-108-20241218	JE2940-12	CHROMIUM	87.4	Y	ug/l	70
114-MW57D-109-113-20241218	JE2940-13	CHROMIUM	77	Y	ug/l	70
114-MW57D-87.5-91.5-20241218	JE2940-10	CHROMIUM	78.4	Y	ug/l	70

Data Validation Report

Project:	PPG 2025 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JE4228, JE4228X
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 1/29/2025
Reviewed by:	Linda Waters/AECOM File Name: JE4228_X_2025_1_29 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 January 15, 2025 as part of the PPG 2025 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	SGS Laboratory ID	Eurofins Laboratory ID	Matrix	Parameter
114-MW81D-103.5-20250115	JE4228-1	NA	Groundwater	Hexavalent Chromium, Chromium, Sulfate
114-MW81D-103.5-20250115	JE4228-1F	NA	Groundwater	Ferrous Iron (dissolved)
114-MW81D-103.5-20250115	JE4228-1X	460-319040-1	Groundwater	TOC
114-MW81D-107.5-20250115	JE4228-2	NA	Groundwater	Hexavalent Chromium, Chromium, Sulfate
114-MW81D-107.5-20250115	JE4228-2F	NA	Groundwater	Ferrous Iron (dissolved)
114-MW81D-107.5-20250115	JE4228-2X	460-319040-2	Groundwater	TOC
GW-RI-FB-20250115	JE4228-3	NA	Field Blank	Hexavalent Chromium, Chromium, Sulfate
GW-RI-FB-20250115	JE4228-3X	460-319040-3	Field Blank	TOC

The samples were collected following the procedures detailed in the Work Order for PPG 2025 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The TOC sample analysis was completed at Eurofins Edison laboratory due to instrument issues at SGS Dayton.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

Sample 114-MW81D-103.5-20250115 (JE4228-1) was analyzed as a MS for hexavalent chromium in this data set. All QC acceptance criteria were met.

Laboratory Duplicate

Sample 114-MW81D-103.5-20250115 (JE4228-1) was analyzed as a laboratory duplicate for hexavalent chromium in this data set. All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250115 (JE4228-3), was submitted for hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Method Blank (MB)**

The chromium MB, MP52251, reported chromium at a concentration greater than the method detection limit (MDL) but less than the reporting limit (RL). The associated sample results were greater than ten times the amount in the MB and not considered affected by the implied contamination; therefore, no qualifications were made.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Samples 114-MW81D-103.5-20250115 (JE4228-1, -1F) were analyzed as MS/MSDs for chromium and ferrous iron (dissolved). All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250115 (JE4228-3), was submitted for total chromium analysis. The chromium result for the field blank was nondetect; therefore, no associated sample results required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)

Matrix Spike/ Matrix Spike Duplicate

Sample 114-MW81D-103.5-20250115 (JE4228-1, 460-319040-1) was analyzed as a MS/MSD for sulfate and TOC. All QC acceptance criteria were met.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250115 (JE4228-3), was submitted for TOC and sulfate analysis. . The TOC and sulfate results for the field blank were nondetect; therefore, no associated sample results required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 15, 2025
Lab Name/ID SGS, Dayton
SDG No JE4228
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250115

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-103.5-20250115	JE4228-1	Total	CHROMIUM (HEXAVALENT)	U	0.0074B	0.0074J	0.010	Qualify	1
114-MW81D-107.5-20250115	JE4228-2	Total	CHROMIUM (HEXAVALENT)	U	0.011	0.011	0.010		

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 15, 2025
Lab Name/ID SGS, Dayton
SDG No JE4228
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250115

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-103.5-20250115	JE4228-1	Total	CHROMIUM	0.63	10.0	10.0	10		
114-MW81D-107.5-20250115	JE4228-2	Total	CHROMIUM	0.63	10.6	10.6	10		

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

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 15, 2025
Lab Name/ID SGS, Dayton
SDG No JE4228
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250115

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			IRON (FERROUS)						

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

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 15, 2025
Lab Name/ID SGS, Dayton
SDG No JE4228
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250115

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-103.5-20250115	JE4228-1	SULFATE	U	33.3	33.3	2.0		
114-MW81D-107.5-20250115	JE4228-2	SULFATE	U	33.5	33.5	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 15, 2025
Lab Name/ID SGS, Dayton (subbed to Eurofins Edison)
SDG No JE4228X
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250115

Field Sample ID	SGS Lab Sample ID	Eurofins Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-103.5-20250115	JE4228-1	460-319040-1	Total	Total Organic Carbon	U	2.0	2.0	1.0		
114-MW81D-107.5-20250115	JE4228-2	460-319040-2	Total	Total Organic Carbon	U	2.0	2.0	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2025 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE4228		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 1/29/2025	
Number of Samples/Matrix: 2 GW, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 2/4/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.4 °C
Holding Time	Yes	No	Sampled 1/15/2025, analyzed 1/16/2025.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	1/16/2025
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN64187, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20250115 (JE4228-3), ND
Eh/pH	Yes	No	
Matrix Spike	Yes	No	114-MW81D-103.5-20250115 (JE4228-1)
Laboratory Duplicate	Yes	No	114-MW81D-103.5-20250115 (JE4228-1)
Laboratory Control Standards	Yes	No	GN64187 {100.0 %R}
Field Duplicate	NA	NA	None with this SDG.
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Matrix Spikes

114-MW81D-103.5-20250115 (JE4228-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD %	RPD Upper Limit	Action
CHROMIUM (Hexavalent)	Total	0.150	0.0074	0.163	NA	103.7	NA	115	85	NA	20	OK, Accept

SR – sample result**SSR – spiked sample result****SDR – sample duplicate result****RPD – relative percent difference****Lab Duplicate**

Sample ID	Lab ID	Analyte	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
114-MW81D-103.5-20250115	JE4228-1	CHROMIUM (Hexavalent)	0.0074	J	0.0063	J	0.010	mg/l	16.1	<20%, Accept

RL – reporting limit**RPD – relative percent difference****Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW81D-103.5-20250115	JE4228-1	10.0	10	7.4	10	30	T Cr > T Cr6, Accept
114-MW81D-107.5-20250115	JE4228-2	10.6	10	11	10	4	T Cr < T Cr6, SRs < 4x RL, ABS ≤ RL, Accept
GW-RI-FB-20250115	JE4228-3		2.0		10	0	Both ND, Accept

RL – reporting limit**RPD – relative percent difference**

SDG#: JE4228/ Method 7196**GN64187**

Cr+6 ICAL 1/16/2025

GW

(p. 1213 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.091
0.3	0.26
0.5	0.426
0.8	0.671
1	0.855

(p. 1213
of data
pkg)

AECOM Calculated Intercept	0.00269	OK	Reported intercept	0.0027
AECOM Slope	0.8465	OK	Reported Slope	0.8465
AECOM Calculated r	0.99990	OK	Reported r	0.99990

LCS calculation**GN64187-B1****P. 1200, 1213, 1217**

Background absorbance 0
Sample absorbance 0.13
LCS Soluble Instrument Response 0.13
Instrument Concentration (mg/L) 0.150

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

NA: standards
and samples
treated the same

AECOM Calculated LCS Result (mg/L)	0.150	OK	Reported Result (mg/L)	0.150

%R = Found/True*100**GN64187-B1****P. 1200, 1213, 1217**

True Value (mg/L) 0.150

AECOM Calculated %R	100.3	OK	Reported %R	102.0

MS calculation**GN64187-S4****P. 1202, 1213****114-MW81D-103.5-20250115****unfiltered**

Background reading 0.005
Total absorbance 0.145
Total absorbance - background 0.14
Instrument Concentration (mg/L) 0.1622

Sample aliquot 0.05
Final volume 0.05
Dilution Factor 1

NA: standards
and samples
treated the same

AECOM Calculated MS Result (mg/L)	0.162	OK	Reported Result (mg/L)	0.163

%R = Found/True*100**GN64187-S4****P. 1202, 1213****114-MW81D-103.5-20250115**

True Value (mg/L) 0.150

Native concentration (mg/L) 0.0

AECOM Calculated MS Result %R	108.1	OK	Reported %R	108.7

UNFILTERED

Reporting Limit	JE4228-1	P. 9, 1213	114-MW81D-103.5-20250115
Low Standard	0.01	NA: standards and samples treated the same	
Initial volume (L)	0.5		
Final volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)= 0.010
UNFILTERED			
<u>Sample Calculations</u>	JE4228-1	P. 9, 1213	114-MW81D-103.5-20250115
Background reading	0.002	NA: standards and samples treated the same	
Total absorbance	0.011		
Total absorbance - background	0.009		
Instrument Response (mg/L)	0.007		
Sample volume (L)	0.5		
Final Volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Result (mg/L)	0.0074	OK	Reported Result (mg/L) 0.0074 J

Laboratory: SGS, Dayton		Client/Site Name: PPG 2025 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE4228, JE4228X		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 1/29/2025	
Number of Samples/Matrix: 2 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 2/4/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	TOC was analyzed at Eurofins Edison laboratory.
Sample Preservation	Yes	No	1.4 °C
Holding Time	Yes	No	Sampled 1/15/2025, analyzed 1/16/2025 - 1/21/2025. TOC was analyzed 1/22/2025.
Quantitation Limits	Yes	No	
Dilutions	No	No	See table below
Method Blanks	No	No	MP52222 Cr ND, MP52251 Cr (0.63 ug/l), GN64189 Fe ND, GP58840/GN64221 sulfate ND, MB 460-1017677/6 TOC ND
Field Blanks	Yes	No	GW-RI-FB-20250115 (JE4228-1, 460-319040-3), Cr ND, TOC ND, sulfate ND
Matrix Spike	Yes	No	114-MW81D-103.5-20250115 (JE4228-1, -1F, 460-319040-1) Cr, Fe, sulfate, TOC
Matrix Spike Duplicate	Yes	No	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP52222 Cr (99.9 %R), MP52251 Cr (100.3 %R), GN64189 Fe (93.3 %R), GP58840/GN64221 sulfate (98.0 %R), 460-1017677/6 TOC (96.1 %R)
Field Duplicate	NA	NA	None with this SDG.
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Method Blank

MP52251

Analyte	Fraction	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	Total	0.63	J	2.0	114-MW81D-103.5-20250115 (JE4228-1), 114-MW81D-107.5-20250115 (JE228-2)	SR >10x MB, Accept

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates**

114-MW81D-103.5-20250115 (JE4228-1, -1F, 460-319040-1)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
SULFATE	Total	80	33.3	113	112	99.6	98.4	120	80	0.9	10	OK, Accept
Ferrous iron	Dissolved	3.0	0	2.8	2.8	93.3	93.3	113	92	0	20	OK, Accept
TOC	Total	50.0	2.0	50.38	50.09	97	96	115	85	1	15	OK, Accept

SR – sample result**SSR – spiked sample result****SDR – sample duplicate result****RPD – relative percent difference**

114-MW81D-103.5-20250115 (JE4228-1)

Analyte	Fraction	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
CHROMIUM	Dissolved	80	10.0	84.9	82.2	93.6	90.3	125	75	3.2	20	OK, Accept

SR – sample result**SSR – spiked sample result****SDR – sample duplicate result****RPD – relative percent difference**

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW81D-103.5-20250115	JE4228-1	CHROMIUM	Total	10
114-MW81D-107.5-20250115	JE4228-2	CHROMIUM	Total	10
GW-RI-FB-20250115	JE4228-3	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2025 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JE4326, JE4326X
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 2/03/2025
Reviewed by:	Linda Waters/AECOM File Name: JE4326_X_2025_2_03 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 January 16, 2025 as part of the PPG 2025 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	SGS Laboratory ID	Eurofins Laboratory ID	Matrix	Parameter
114-MW81D-115.0-20250116	JE4326-1	NA	Groundwater	Hexavalent Chromium, Chromium, Sulfate
114-MW81D-115.0-20250116	JE4326-1F	NA	Groundwater	Ferrous Iron (dissolved)
114-MW81D-115.0-20250116	JE4326-1X	460-319083-1	Groundwater	TOC
114-MW81D-115.0-20250116-X	JE4326-2	NA	Groundwater	Hexavalent Chromium, Chromium, Sulfate
114-MW81D-115.0-20250116-X	JE4326-2F	NA	Groundwater	Ferrous Iron (dissolved)
114-MW81D-115.0-20250116-X	JE4326-2X	460-319083-2	Groundwater	TOC
114-MW81D-123.0-20250116	JE4326-3	NA	Groundwater	Hexavalent Chromium, Chromium, Sulfate
114-MW81D-123.0-20250116	JE4326-3F	NA	Groundwater	Ferrous Iron (dissolved)

Field ID	SGS Laboratory ID	Eurofins Laboratory ID	Matrix	Parameter
114-MW81D-123.0-20250116	JE4326-3X	460-319083-3	Groundwater	TOC
GW-RI-FB-20250116	JE4326-4	NA	Field Blank	Hexavalent Chromium, Chromium, Sulfate
GW-RI-FB-20250116	JE4326-4X	460-319083-4	Field Blank	TOC

The samples were collected following the procedures detailed in the Work Order for PPG 2025 GAG GW Remedial Activities 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 Aqueous Target Analyte Summary Hit List(s) in Attachment A for a listing of all detected results, qualified results, and associated qualifications, where applicable. The nonconformances for each section discussed below are presented in Attachment B.

The TOC sample analysis was completed at Eurofins Edison laboratory due to instrument issues at SGS Dayton.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250116 (JE4326-4), was submitted for hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

Samples 114-MW81D-115.0-20250116 (JE4326-1) and 114-MW81D-115.0-20250116-X (JE4326-2), were analyzed as the field duplicate pair for hexavalent chromium. All QC acceptance criteria were met. No qualifications were made.

Metals (Chromium, Ferrous Iron)

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Sample 114-MW81D-103.5-20250115 (JE4326-1F) was analyzed as a MS/MSD for ferrous iron (dissolved). All QC acceptance criteria were met.

A MS/MSD was not performed on a site sample in this data set for chromium. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250116 (JE4326-4), was submitted for total chromium analysis. The chromium result for the field blank was greater than the method detection limit (MDL) but less than the reporting limit (RL). All associated sample results were greater than ten times the amount in the FB; therefore, no qualifications were made.

Field Duplicate (FD)

Samples 114-MW81D-115.0-20250116 (JE4326-1,-1F) & 114-MW81D-115.0-20250116 (JE4326-2, -2F) were analyzed as the field duplicate pair for chromium and ferrous iron. All QC acceptance criteria were met. No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250116 (JE4326-4, 460-319083-4), was submitted for TOC and sulfate analysis. . The TOC and sulfate results for the field blank were nondetect; therefore, no associated sample results required qualification.

Field Duplicate (FD)

Samples 114-MW81D-115.0-20250116 (JE4326-1, 460-319083-1) & 114-MW81D-115.0-20250116 (JE4326-2, 460-319083-2) were analyzed as the field duplicate pair for sulfate and TOC. All QC acceptance criteria were met. No qualifications were made.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 16, 2025
Lab Name/ID SGS, Dayton
SDG No JE4326
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250116

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-115.0-20250116	JE4326-1	Total	CHROMIUM (HEXAVALENT)	U	0.0030B	0.0030J	0.010	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 16, 2025
Lab Name/ID SGS, Dayton
SDG No JE4326
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250116

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-115.0-20250116	JE4326-1	Total	CHROMIUM	U	9.7B	9.7J	10	Qualify	1
114-MW81D-115.0-20250116-X	JE4326-2	Total	CHROMIUM	U	10.3	10.3	10		
114-MW81D-123.0-20250116	JE4326-3	Total	CHROMIUM	U	10.2	10.2	10		
GW-RI-FB-20250116	JE4326-4	Total	CHROMIUM	U	0.73B	0.73J	2.0	Qualify	1

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 16, 2025
Lab Name/ID SGS, Dayton
SDG No JE4326
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250116

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			IRON (FERROUS)						

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

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 16, 2025
Lab Name/ID SGS, Dayton
SDG No JE4326
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250116

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-115.0-20250116	JE4326-1	SULFATE	U	33.5	33.5	2.0		
114-MW81D-115.0-20250116-X	JE4326-2	SULFATE	U	33.2	33.2	2.0		
114-MW81D-123.0-20250116	JE4326-3	SULFATE	U	32.7	32.7	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 16, 2025
Lab Name/ID SGS, Dayton (subbed to Eurofins Edison)
SDG No JE4326X
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250116

Field Sample ID	SGS Lab Sample ID	Eurofins Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-115.0-20250116	JE4326-1	460-319083-1	Total	Total Organic Carbon	U	2.4	2.4	1.0		
114-MW81D-115.0-20250116-X	JE4326-2	460-319083-2	Total	Total Organic Carbon	U	2.4	2.4	1.0		
114-MW81D-123.0-20250116	JE4326-3	460-319083-3	Total	Total Organic Carbon	U	2.4	2.4	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton			Client/Site Name: PPG 2025 GAG GW Remedial Activities
Laboratory SDG/Job No: JE4326			Project Number: 60732743 GWM.2024
Validation Level: Full			Date: 2/03/2025
Number of Samples/Matrix: 3 GW, 1FB			Validator: Charlene Flint
Analysis: Hexavalent Chromium/7196A			Reviewer and Date: Linda Waters 2/4/2025
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	0.7 °C
Holding Time	Yes	No	Sampled 1/16/2025, analyzed 1/17/2025.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	1/17/2025
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN64230, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20250116 (JE4326-4), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN64230, {99.3 %R}
Field Duplicate	Yes	No	114-MW81D-115.0-20250116(JE4326-1) & 114-MW81D-115.0-20250116 (JE4326-2), see table below
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Field Duplicates

114-MW81D-115.0-20250116 (JE4326-1) & 114-MW81D-115.0-20250116 (JE4326-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
HEXAVALENT CHROMIUM	Total	0.0030	J	0.0026	U	0.010	mg/l	0	SR <4xRL, ABS DIFF <RL, Accept

RL – reporting limit**RPD – relative percent difference****Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)**

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW81D-115.0-20250116	JE4326-1	9.7	10	3.0	10	106	T Cr > T Cr6, Accept
114-MW81D-115.0-20250116-X	JE4326-2	10.3	10		10	NC	T Cr > T Cr6, Accept
114-MW81D-123.0-20250116	JE4326-3	10.2	10		10	NC	T Cr > T Cr6, Accept
GW-RI-FB-20250116	JE4326-4	0.73	2.0		10	NC	T Cr > T Cr6, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference**

SDG#: JE4326/ Method 7196

GN64230

Cr+6 ICAL 1/17/2025

GW

(p. 335 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.045
0.1	0.09
0.3	0.264
0.5	0.43
0.8	0.681
1	0.851

(p. 335 of
data pkg)

AECOM Calculated Intercept	0.00345	OK	Reported intercept	0.0035
AECOM Slope	0.8491	OK	Reported Slope	0.8491
AECOM Calculated r	0.99996	OK	Reported r	0.99996

LCS calculation

GN64230-B1

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Background absorbance	0
Sample absorbance	0.13
LCS Soluble Instrument Response	0.13
Instrument Concentration (mg/L)	0.149

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.149	OK	Reported Result (mg/L)	0.149

%R = Found/True*100

GN64230-B1

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True Value (mg/L)	0.150

AECOM Calculated %R	99.4	OK	Reported %R	99.3

MS calculation

GN64230-S1

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Batch QC

Unfiltered

Background reading	0.008
Total absorbance	0.126
Total absorbance - background	0.118
Instrument Concentration (mg/L)	0.1349

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.135	OK	Reported Result (mg/L)	0.135

%R = Found/True*100

GN64230-S1

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Batch QC

True Value (mg/L)	0.150
Native concentration (mg/L)	0.0065

AECOM Calculated MS Result %R	85.6	OK	Reported %R	85.7

UNFILTERED**Reporting Limit**

JE4326-1

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114-MW81D-115.0-20250116

Low Standard	0.01

Initial volume (L)	0.5			
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JE4326-1	P. 9, 335	114-MW81D-115.0-20250116	
Background reading	0			
Total absorbance	0.006			
Total absorbance - background	0.006			
Instrument Response (mg/L)	0.003			
Sample volume (L)	0.5			
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	0.0030	OK	Reported Result (mg/L)	0.0030 J

Laboratory: SGS, Dayton		Client/Site Name: PPG 2025 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE4326, JE4326X		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 2/03/2025	
Number of Samples/Matrix: 3 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 2/4/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	TOC was analyzed at Eurofins Edison laboratory.
Sample Preservation	Yes	No	0.7 °C
Holding Time	Yes	No	Sampled 1/16/2025, analyzed 1/17/2025, 1/20/2025. TOC was analyzed 1/28/2025.
Quantitation Limits	Yes	No	
Dilutions	No	No	See table below
Method Blanks	Yes	No	MP52280 Cr ND, GN64234 Fe ND, GP58896/GN64314 sulfate ND, MB 460-1018541/6 TOC ND
Field Blanks	No	No	GW-RI-FB-20250116 (JE4326-4, 460-319083-4), Cr (0.73 ug/l), TOC ND, sulfate ND, see table below
Matrix Spike	Yes	No	114-MW81D-103.5-20250115 (JE4326-1F) Fe, Batch QC Cr, sulfate, TOC
Matrix Spike Duplicate	Yes	No	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP52280 Cr (95.3 %R), GN64234 Fe (93.3 %R), GP58896/GN64314 sulfate (102.6 %R), 460-1018541/7 TOC (97.2%R)
Field Duplicate	Yes	No	114-MW81D-115.0-20250116(JE4326-1,-1F, 460- 319083-1) & 114-MW81D-115.0-20250116 (JE4326- 2,-2F, 460-319083-2), see table below
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Field Blank

GW-RI-FB-20250116 (JE4326-4)

Analyte	Fraction	SR (ug/l)	Qual	RL	Action
CHROMIUM	Total	0.73	J	2.0	Associated SR >10x FB, Accept

SR – sample result**RL – reporting limit****Matrix Spikes/Matrix Spike Duplicates**

114-MW81D-103.5-20250115 (JE4326-1F)

Analyte	Fraction	Spike added (mg/l)	SR (mg/l)	SSR MS (mg/l)	SDR (mg/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
Ferrous iron	Dissolved	3.0	0	2.8	2.8	93.3	93.3	113	92	0	20	OK, Accept

SR – sample result**SSR – spiked sample result****SDR – sample duplicate result****RPD – relative percent difference****Field Duplicates**

114-MW81D-115.0-20250116 (JE4326-1,-1F, 460-39083-1) & 114-MW81D-115.0-20250116 (JE4326-2, -2F, 460-39083-2)

Analyte	Fraction	Sample Result	Qual	Dup Result	Qual	RL	Units	RPD	Action
IRON	Dissolved	0.0029	U	0.0029	U	0.20	mg/l	0	RPD < 30%, Accept
CHROMIUM	Total	9.7		10.3		10	ug/l	6.0	RPD < 30%, Accept
SULFATE	Total	33.5		33.2		2.0	mg/l	0.90	RPD < 30%, Accept
TOTAL ORGANIC CARBON	Total	2.4		2.4		1.0	mg/l	0	RPD < 30%, Accept

RL – reporting limit**RPD – relative percent difference**

Dilutions

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW81D-115.0-20250116	JE4326-1	CHROMIUM	Total	10
114-MW81D-115.0-20250116-X	JE4326-2	CHROMIUM	Total	10
114-MW81D-123.0-20250116	JE4326-3	CHROMIUM	Total	10
GW-RI-FB-20250116	JE4326-4	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2025 GAG GW Remedial Activities
Laboratory:	SGS, Dayton
Laboratory Job No.:	JE4369, JE4369X
Analysis/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)
Site Location/Address:	70 Carteret Avenue, Jersey City, NJ
AECOM Project No:	60732743 GWM.2024
Prepared by:	Charlene Livingston Flint/AECOM Completed on: 2/04/2025
Reviewed by:	Linda Waters/AECOM File Name: JE4369_X_2025_2_04 DVReport_F.docx

Introduction

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

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

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:

- 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.
- U: Indicates the analyte was not detected in the sample above the sample reporting limit.
- 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 January 17, 2025 as part of the PPG 2025 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Field ID	SGS Laboratory ID	Eurofins Laboratory ID	Matrix	Parameter
114-MW81D-127.0-20250117	JE4369-1	NA	Groundwater	Hexavalent Chromium, Chromium, Sulfate
114-MW81D-127.0-20250117	JE4369-1F	NA	Groundwater	Ferrous Iron (dissolved)
114-MW81D-127.0-20250117	JE4369-1X	460-319144-1	Groundwater	TOC
GW-RI-FB-20250117	JE4369-2	NA	Field Blank	Hexavalent Chromium, Chromium, Sulfate
GW-RI-FB-20250117	JE4369-2X	460-319144-2	Field Blank	TOC

The samples were collected following the procedures detailed in the Work Order for PPG 2025 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey and the Field Sampling

General Comments

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

The TOC sample analysis was completed at Eurofins Edison laboratory due to instrument issues at SGS Dayton.

Hexavalent Chromium

Sample Results

The results for total chromium and total hexavalent chromium were compared to ensure that the total chromium concentration was greater than the total hexavalent concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤ 30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Matrix Spike (MS)

A MS was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS percent recoveries (%R) were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250117 (JE4369-2), was submitted for hexavalent chromium analysis. No contamination was detected, and no samples required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Metals (Chromium, Ferrous Iron)**Matrix Spike (MS)/Matrix Spike Duplicate (MSD)**

A MS/MSD was not performed on a site sample in this data set for chromium or ferrous iron. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250117 (JE4369-2), was submitted for total chromium analysis. The chromium result for the field blank was greater than the method detection limit (MDL) but less than the reporting limit (RL). The associated sample result was greater than ten times the amount in the FB and considered not affected by the implied contamination; therefore, no qualifications were made.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. See table above in hexavalent chromium section for evaluation and action.

Wet Chemistry (Sulfate, TOC)**Matrix Spike/ Matrix Spike Duplicate**

A MS/MSD was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Duplicate

A laboratory duplicate was not performed on a site sample in this data set. No validation actions were taken on this basis.

Laboratory Control Sample (LCS) Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Field Blank (FB)

The FB, GW-RI-FB-20250117 (JE4369-2, 460-319144-2), was submitted for sulfate and TOC analysis. The TOC and sulfate results for the field blank were nondetect; therefore, no associated sample results required qualification.

Field Duplicate (FD)

A field duplicate pair was not submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability Summary

In general, the data appear to be valid and may be used for decision-making purposes. When applicable, qualified results are discussed in attachments A and B below.

Sample results reported between the MDL and RL are usable as estimated values with an unknown directional bias.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Data Validation Report Form

Attachment A

Target Analyte Summary Hit List(s)

Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE4369
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250117

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-127.0-20250117	JE4369-1	Total	CHROMIUM (HEXAVALENT)	U	0.014	0.014	0.010		

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

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE4369
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250117

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-127.0-20250117	JE4369-1	Total	CHROMIUM	U	10.1	10.1	10		
GW-RI-FB-20250117	JE4369-2	Total	CHROMIUM	U	0.71B	0.71J	2.0	Qualify	1

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE4369
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250117

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			IRON (FERROUS)						

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

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE4369
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250117

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-127.0-20250117	JE4369-1	SULFATE	U	30.4	30.4	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date January 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE4369X
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250117

Field Sample ID	SGS Lab Sample ID	Eurofins Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-127.0-20250117	JE4369-1	460-319144-1	Total	Total Organic Carbon	U	2.2	2.2	1.0		

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

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

Attachment B

Data Validation Report Form

Laboratory: SGS, Dayton		Client/Site Name: PPG 2025 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE4369		Project Number: 60732743 GWM.2024	
Validation Level: Full		Date: 2/04/2025	
Number of Samples/Matrix: 1 GW, 1FB		Validator: Charlene Flint	
Analysis: Hexavalent Chromium/7196A		Reviewer and Date: Linda Waters 2/4/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	
Sample Preservation	Yes	No	1.2 °C
Holding Time	Yes	No	Sampled 1/17/2025, analyzed 1/18/2025.
Quantitation Limits	Yes	No	
Dilutions	Yes	No	No dilutions
Initial Calibration	Yes	No	1/18/2025
Calibration Check Standard (CCS)	Yes	No	
Method Blanks	Yes	No	MB GN64283, ND
Calibration Blanks	Yes	No	
Field Blanks	Yes	No	GW-RI-FB-20250117 (JE4369-2), ND
Eh/pH	Yes	No	
Matrix Spike	NA	NA	Batch QC
Laboratory Duplicate	NA	NA	Batch QC
Laboratory Control Standards	Yes	No	GN64283, {101.3 %R}
Field Duplicate	NA	NA	None with this SDG
Method 7196 Sample Prep	Yes	No	pH 1.5-2.5
Total Chromium vs Hexavalent Chromium Results	Yes	No	See table below
Total vs Dissolved Results	NA	NA	Total only
Calculation Spot Checks	Yes	No	See calculations below

Total Chromium (Cr) vs Total Hexavalent Chromium (Cr6)

Sample ID	Lab Sample ID	Total Chromium (ug/l)	Total Chromium RL (ug/l)	Total Hexavalent chromium (ug/l)	Total Hexavalent chromium RL (ug/l)	RPD	Action
114-MW81D-127.0-20250117	JE4369-1	10.1	10	14	10	32	T Cr < T Cr6, SRs < 4x RL, ABS ≤ RL, Accept
GW-RI-FB-20250117	JE4369-2	0.71	10		10	NC	T Cr > T Cr6, Accept

NC – not calculated**RL – reporting limit****RPD – relative percent difference**

SDG#: JE4369/ Method 7196

GN64283

Cr+6 ICAL 1/18/2025

GW

(p. 360 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.042
0.1	0.084
0.3	0.252
0.5	0.426
0.8	0.672
1	0.852

(p. 360 of
data pkg)

AECOM Calculated Intercept	-0.00052	OK	Reported intercept	-0.0005
AECOM Slope	0.8483	OK	Reported Slope	0.8483
AECOM Calculated r	0.99996	OK	Reported r	0.99996

LCS calculation

GN64283-B1

P. 347, 360

Background absorbance	0
Sample absorbance	0.128
LCS Soluble Instrument Response	0.128
Instrument Concentration (mg/L)	0.152

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.152	OK	Reported Result (mg/L)	0.152

%R = Found/True*100

GN64283-B1

P. 347, 360

True Value (mg/L)	0.150

AECOM Calculated %R	101.0	OK	Reported %R	101.3

MS calculation

GN64283-S1

P. 349, 360

Batch QC (JE4370-6)

Unfiltered

Background reading	0.014
Total absorbance	0.142
Total absorbance - background	0.128
Instrument Concentration (mg/L)	0.1515

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.152	OK	Reported Result (mg/L)	0.152

%R = Found/True*100

GN64283-S1

P. 349, 360

Batch QC (JE4370-6)

True Value (mg/L)	0.150
Native concentration (mg/L)	0.0000

AECOM Calculated MS Result %R	101.0	OK	Reported %R	101.3

UNFILTERED**Reporting Limit**

JE4369-1

P. 9, 360

114-MW81D-127.0-20250117

Low Standard	0.01

Initial volume (L)	0.5			
Final volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Reporting Limit	0.010	OK	Reported RL (mg/L)=	0.010
UNFILTERED				
<u>Sample Calculations</u>	JE4369-1	P. 9, 360	114-MW81D-127.0-20250117	
Background reading	0			
Total absorbance	0.011			
Total absorbance - background	0.011			
Instrument Response (mg/L)	0.014			
Sample volume (L)	0.5			
Final Volume (L)	0.5			
Dilution Factor	1			
AECOM Calculated Result (mg/L)	0.0136	OK	Reported Result (mg/L)	0.014

Laboratory: SGS, Dayton		Client/Site Name: PPG 2025 GAG GW Remedial Activities	
Laboratory SDG/Job No: JE4369, JE4369X		Project Number: 60732743 GWM.2024	
Validation Level: Limited		Date: 2/04/2025	
Number of Samples/Matrix: 1 GW, 1 FB		Validator: Charlene Flint	
Analysis: Metals/6020B, SM3500 and Wet Chemistry		Reviewer and Date: Linda Waters 2/4/2025	
Review Item	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Yes	No	
Data Completeness	Yes	No	TOC was analyzed at Eurofins Edison laboratory.
Sample Preservation	Yes	No	1.2 °C
Holding Time	Yes	No	Sampled 1/17/2025, analyzed 1/17/2025, 1/20/2025. TOC was analyzed 1/28/2025.
Quantitation Limits	Yes	No	
Dilutions	No	No	See table below
Method Blanks	Yes	No	MP52280 Cr ND, GN64234 Fe ND, GP58898/GN64315 sulfate ND, MB 460-1018541/22 TOC ND
Field Blanks	No	No	GW-RI-FB-20250117 (JE4369-2, 460-319144-1), Cr (0.71 ug/l), TOC ND, sulfate ND, see table below
Matrix Spike	NA	NA	Batch QC Cr, Fe, sulfate, TOC
Matrix Spike Duplicate	NA	NA	Same as MS
Post Digestion Spike	NA	NA	None with this SDG
Laboratory Duplicate	NA	NA	None with this SDG
Laboratory Control Standards	Yes	No	MP52280 Cr (95.3 %R), GN64234 Fe (93.3 %R), GP58898/GN64315 sulfate (94.3 %R), 460-1018541/23 TOC (95.2 %R)
Field Duplicate	NA	NA	None with this SDG
Total Metals vs Dissolved Metals Results	NA	NA	Total only
Total/Dissolved Cr vs Total/Dissolved HexCr Results	Yes	No	see hexavalent chromium section

Field Blank

GW-RI-FB-20250117 (JE4369-1)

Analyte	Fraction	SR (ug/l)	Qual	RL	Action
CHROMIUM	Total	0.71	J	2.0	Associated SR >10x FB, Accept

SR – sample result**RL – reporting limit****Dilutions**

Sample ID	Lab ID	Analyte	Fraction	Dilution
114-MW81D-127.0-20250117	JE4369-1	CHROMIUM	Total	10
GW-RI-FB-20250117	JE4369-2	CHROMIUM	Total	2

Data Validation Report

Project:	PPG 2025 GAG GW Remedial Activities		
Laboratory:	SGS North America Inc., Dayton NJ		
Service Request:	JE5758		
Analyses/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500		
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)		
AECOM Project Number: 60732743 GWM.2024			
Prepared by:	Charlene Flint/AECOM	Completed Date: 3/04/2025	
Reviewed by:	Linda Waters/AECOM	File Name: JE5758 Memo	

SUMMARY

The samples listed below were collected by AECOM on February 14, 2025 as part of the PPG 2025 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Sample ID	Laboratory ID	Matrix/Sample Type	Parameter
114-MW81D-103.5-20250214	JE5758-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW81D-103.5-20250214	JE5758-1F	Groundwater	Ferrous Iron (dissolved)
BR-RI-FB-20250214	JE5758-2	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

Data validation activities were conducted in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes, EPA-600/4-79-020, March 1983 And Subsequent Revisions;

- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness (chain-of-custody [COC]/sample integrity)
✗	Holding times and sample preservation
✓	Initial calibration/continuing calibration verification
✓	Laboratory blanks/field blanks
✓	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory duplicate results
✓	Laboratory control sample (LCS) and/or laboratory control sample duplicate (LCSD) results
NA	Field duplicate results
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a quality control (QC) nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. There were no data points qualified as a result of this data review.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Hexavalent Chromium (Full Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Initial Calibration/Calibration Check Standard (CCS)

Initial and continuing calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The instrument must be calibrated daily (once every 24 hours) or each time the instrument is set up;
- A calibration blank and at least four (4) standards in graduated amounts and in the appropriate range for Method 7196A;
- The calibration curve must have a correlation coefficient (r) of 0.995 or greater for Method 7196A

All QC acceptance criteria were met.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spikes (MS)

The MS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

All QC acceptance criteria were met.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is $>RL$	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $< 4 \times RL$; Absolute Difference $\leq RL$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $< 4 \times RL$; Absolute Difference $> RL$	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times RL$; RPD $\leq 30\%$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times RL$; RPD $> 30\%$	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Metals (Limited Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

Nonconformances are summarized in Attachment B Table B-1. Sample results were qualified as follows:

Actions: (Based on NJDEP SOP 5.A.16)

Criteria		Actions	
		Detect	Nondetect
Sample temperature > 6°C upon receipt at the laboratory		J	UJ
Aqueous Metals	<180 day	No qualification	No qualification
Aqueous Ferrous iron >24 hours but <48 hours		J	UJ
Aqueous sample analyzed >180 days		R	R

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met or did not require qualification.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no laboratory duplicate samples submitted with this data set. No validation actions were taken on this basis.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry – Sulfate and TOC (Limited Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met or did not require qualification.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no laboratory duplicate samples submitted with this data set. No validation actions were taken on this basis.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data in the selected group of validated samples appears to be valid and may be used for decision-making purposes. Qualified results are discussed in attachments A and B below.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Nonconformance Summary Tables

Attachment C: Qualifier Codes and Explanations

Attachment D: Validation Checklists

Attachment E: Hexavalent Chromium Calculations

Attachment A**Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)**

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 14, 2025
Lab Name/ID SGS, Dayton
SDG No JE5758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported.			CHROMIUM (HEXAVALENT)						

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

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 14, 2025
Lab Name/ID SGS, Dayton
SDG No JE5758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			CHROMIUM						

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

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

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 14, 2025
Lab Name/ID SGS, Dayton
SDG No JE5758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-103.5-20250214	JE5758-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 14, 2025
Lab Name/ID SGS, Dayton
SDG No JE5758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250214

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-103.5-20250214	JE57588-1	SULFATE	U	26.0	26.0	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 14, 2025
Lab Name/ID SGS, Dayton
SDG No JE5758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250214

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-103.5-20250214	JE57588-1	TOC	U	1.8	1.8	1.0		

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

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

Attachment B**Nonconformance Summary Tables****Table B-1 - Hold Time**

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW81D-103.5-20250214	JE5758-1F	IRON (FERROUS)	2/14/2025 11:20:00 AM	2/14/2025 10:00:00 PM	Estimate (UJ)

Attachment C**Qualifier Codes and Explanations**

Qualifier	Explanation
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.
U	Indicates the analyte was not detected in the sample above the sample reporting limit.
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.

Attachment D
Validation Checklists

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5758
Validation Level: Full
Number of Samples/Matrix: 1 GW, 1 FB
Analysis (Include Method #): Hexavalent Chromium / 7196A

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/4/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/13/2025

NJDEP SOP 5.A.10, Rev 3 (Sept 2009)
USEPA SW-846 Methods 3060A, 7196A and 7199

SGS SOP: EGN214-18 Method 7198A

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Sample IDs on COC match data package and EDD, COCs signed	Yes	No	
Data Completeness	Results for each sample on COC, case narrative included, method reference included	Yes	No	
Sample Preservation	Sample receipt temperature 2-6°C	Yes	No	1.4°C
Holding Time	Holding time criteria met (<24h from collection). Sample collection dates, analysis dates included in lab report NJDEP SOP 5.A.10 ---HT >24 hours but <48 hours flag J or UJ ---HT >48 hours flag R	Yes	No	sampled 2/14/2025, analysis 2/15/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Method 7196A-Daily, blank +4 standards, r≥0.995 Method 7199-Daily, blank +3 standards, r≥0.999 NJDEP SOP 5.A.10 ---not performed or calibrated daily, then all associated data are rejected "R" ---r for the calibration curve outside QC rejected "R" ---correct number of standards was not analyzed then qualify "J"	Yes	No	
Calibration Check Standard (CCS)	CCS every 10 samples, %R 90-110% NJDEP SOP 5.A.10 ---not performed or calibrated daily, then all associated data are rejected "R" ---r for the calibration curve outside QC rejected "R" ---correct number of standards was not analyzed then qualify "J"	Yes	No	
Method Blanks	With each prep batch, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	MB GN65124, ND
Calibration Blanks	Prior to ICAL, after each CCV, abs value should not exceed MDL	Yes	No	

	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.10: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.			
Field Blanks		Yes	No	BR-RI-FB-20250214 (JE5758-2), ND
Eh/pH	Included for each sample	Yes	No	
Matrix Spike	One per 20 samples (total and dissolved), soluble MS 85-115%R. Qualify all samples in batch. (see MS Requirement tab)	Yes	No	114-MW81D-103.5-20250214 (JE5758-1), 100%R
Laboratory Duplicate	One per 20 samples, RPD ≤20% if both results are ≥4x RL, or absolute difference ±RL if either or both results are <4xRL. Qualify all samples in batch.	Yes	No	114-MW81D-103.5-20250214 (JE5758-1), Both ND
Laboratory Control Standards	One per 20 samples or one per batch, 80-120%R. Qualify all samples in batch.	Yes	No	GN65124 (99.3 %R)
Field Duplicate	1/20 Samples; RPD ≤30% for aqueous samples if both results are ≥4XRL, or absolute difference ≤2XRL if either or both results are <4xRL. No qualification required if one result ND and the other ≤2XRL. Qualify all samples in batch.	NA	NA	None with this SDG
Method 7196A Sample Prep	pH 1.5-2.5	Yes	No	
Total vs Dissolved Results	See T vs D tabs	Yes	No	
Calculation Spot Checks	See 7196 calc tab	Yes	No	

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5758
Validation Level: Limited
Number of Samples/Matrix: 1 GW, 1 GWF, 1 FB
Analysis (Include Method #): SW-846 3010A/6020B / SM3500FE B-2011

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/4/2025
Validator: Charlene Flint
Peer Reviewer: Linda Waters 3/13/2025

SOP NO.: 5.A.16/QAPP

SGS SOP: EMA6020B-09 - Metals
SGS SOP: EGN243-13 - Ferrous Iron

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Metals Included	Cr, Ferrous Iron	Yes	No	
Chain-of-Custody		Yes	No	
Sample Preservation	None	Yes	No	
Holding Time	180 days for analysis, 24 hr Ferrous iron	No	Yes	Sampled 2/14/2025, analysis 2/14/2025 and 2/19/2025. Ferrous iron sample analyzed out of 24 hr. HT. Estimate (UJ).
Quantitation Limits	Reporting limits meet GW action limit See dilutions tab	Yes	No	
Method Blanks	With each prep batch, abs value should not exceed MDL ----<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. ---->10 times the blank no qualification.	Yes	No	MP52775 Cr (ND), GN65113 Fe (ND)
Other Laboratory Blanks ^{1,2}	<MDL	NA	NA	
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ----<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. ---->10 times the blank no qualification.	Yes	No	BR-RI-FB-20250214 (JE5758-2) Cr (ND)
Initial Calibration	Daily prior to samples, $r^2 \geq 0.990$	NA	NA	Not included in Limited
Initial Calibration Verification (ICV)	$\pm 10\%$ of true value	NA	NA	Not included in Limited
Continuing Calibration Verification (CCV)	After every 10 samples and at end, $\pm 10\%$ of true value	NA	NA	Not included in Limited
Low-Level Calibration Check (LLCCV) or CRQL Check Standard		NA	NA	Not included in Limited
Matrix Spike	QAPP: 1/20 samples (5% of total) SOP NO.: 5.A.16: 1/20 samples or each batch ($\pm 25\%$ R or lab limits, whichever is smaller, and ≤ 20 RPD	Yes	No	114-MW81D-103.5-20250214 (JE5758-1F), see MS/MSD tab
Matrix Spike Duplicate RPD ²		Yes	No	
Laboratory Duplicate ²	RPD $\leq 35\%$ solids	NA	NA	Lab dup not analyzed for 6020.
Laboratory Control Standards	SOP NO.: 5.A.16: 80-120%R, RPD ≤ 20	Yes	No	MP52775 Cr (91.5 %R), GN65113 Fe (96.7 %R)
Internal Standards ^{2,3}	30-120%RI	NA	NA	Not included in Limited
Serial Dilution	Within $\pm 10\%$ of original for sample conc $> 100\times$ MDL	NA	NA	Not included in Limited
Field Duplicate	QAPP: Either 1/day or 5% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL 1/20 Samples; RPD $\leq 30\%$ for aqueous samples if both results are $\geq 4\times$ RL, or absolute difference $\leq 2\times$ RL if either or both results are $< 4\times$ RL. No qualification required if one result ND and the other $\leq 2\times$ RL. Qualify all samples in batch.	NA	NA	Field duplicates not submitted in this data set.
ICP/MS Tunes ²	Mass calibration ≤ 0.1 amu from the true value; Resolution < 0.9 amu full width at 10% peak height. RSD $\leq 5\%$	NA	NA	Not included in Limited
Interference Check Sample (ICS)	ICS-A: Abs value for non-spiked <MDL, ICS-AB within $\pm 15\%$ of true value	NA	NA	Not included in Limited
Calculation Spot Checks ³		NA	NA	Not included in Limited
Total Vs Dissolved	See TvD Tab	NA	NA	Total only

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only.

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5758
Validation Level: Limited
Number of Samples/Matrix: 1 GW, 1 FB
Analysis (Include Method #): EPA 300.0 Sulfate

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/4/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/13/2025

Method 300.0 is not listed in the QAPP; QC limits are based on the lab SOP.

SGS SOP: EDN318-07

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody		Yes	No	
Sample Preservation	≤6°C but not frozen	Yes	No	1.4°C
Holding Time	28 days	Yes	No	Sampled 2/14/2025, analysis 2/19/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Lab limits: Linear = 5 pt cal, r2 ≥ 0.99 or %RSD ≤10%	NA	NA	Not included in limited
Initial Calibration Verification	ICV ±10%	NA	NA	Not included in limited
Continuing Calibration Verification	1 GW, 1 FB+A10:E24	NA	NA	Not included in limited
Method/Instrument Blanks	No target analyte concentrations ≥ QL. SOP NO.: 5.A.16: abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GP59412/GN65199, ND
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	BR-RI-FB-20250214 (JE5758-2)
Laboratory Control Standards	SOP/Lab limits: 90-110%	Yes	No	GP59412/GN65199 (101.6%R)
Matrix Spike	SOP/Lab limits: 80-120%	NA	NA	Batch QC
Matrix Spike Duplicate	SOP/Lab RPD <20%	NA	NA	Batch QC
Laboratory Duplicate	SOP/Lab: RPD ≤ 20%	NA	NA	
Field Duplicate	QAPP limits: RPD ≤ 30% when sulfate is detected in both samples ≥ 5x QL; Diff ≤ QL if values are < 5x QL	NA	NA	None with this SDG.
Calculation Spot Checks	Full validation only	No	No	Not included in limited

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5758
Validation Level: Limited
Number of Samples/Matrix: 1 GW, 1 FB
Analysis (Include Method #): SM5310B TOC

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/4/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/13/2025

SGS SOP: EGN234-32

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody		Yes	No	
Sample Preservation	HCl to a pH <2. ≤6°C until analysis	Yes	No	1.4°C
Holding Time	28 days	Yes	No	Sampled 2/14/2025, analysis 2/27/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Lab limits: Linear = 5 pt cal, r2 ≥ 0.99 or %RSD ≤20%	NA	NA	Not included in limited
Initial Calibration Verification	ICV ±10%	NA	NA	Not included in limited
Continuing Calibration Verification	CCV ±15%	NA	NA	Not included in limited
Method/Instrument Blanks	No target analyte concentrations ≥ QL. SOP NO.: 5.A.16: abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GP59529/GN65471, ND
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	BR-RI-FB-20250214 (JE5758-2)
Laboratory Control Standards	SOP/Lab limits: 90-110%	Yes	No	GP59529/GN65471 (105.0 %R)
Matrix Spike	SOP/Lab limits: 85-115%	NA	NA	Batch QC
Matrix Spike Duplicate	SOP/Lab RPD <15%	NA	NA	Batch QC
Laboratory Duplicate	SOP/Lab: RPD ≤ 15%	NA	NA	
Field Duplicate	QAPP limits: RPD ≤ 30% when TOC is detected in both samples ≥ 5x QL; Diff ≤ QL if values are < 5x QL	NA	NA	None with this SDG.
Calculation Spot Checks	Full validation only	No	No	Not included in limited

Attachment E

Hexavalent Chromium Calculations

SDG#: JE5758/ Method 7196

GN65124

Cr+6 ICAL 2/15/2025

GW

(p. 329 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.043
0.1	0.085
0.3	0.255
0.5	0.425
0.8	0.681
1	0.849

(p. 329 of data pkg)

AECOM Calculated Intercept	0.00030 OK	Reported intercept	0.0003
AECOM Slope	0.8495 OK	Reported Slope	0.8495
AECOM Calculated r	1.00000 OK	Reported r	1.00000

LCS calculation

GN65124-B1

P. 313, 329

Background absorbance
Sample absorbance
LCS Soluble Instrument Response
Instrument Concentration (mg/L)

0
0.127
0.127
0.149

Sample aliquot
Final volume
Dilution Factor

0.05
0.05
1

AECOM Calculated LCS Result (mg/L)	0.149 OK	Reported Result (mg/L)	0.149

%R = Found/True*100

GN65124-B1

P. 313, 329

True Value (mg/L)

0.150

AECOM Calculated %R

99.4 OK

Reported %R

99.3

MS calculation

GN65124-S1

P. 315, 329

114-MW81D-103.5-20250214

Unfiltered

Background reading
Total absorbance
Total absorbance - background
Instrument Concentration (mg/L)

0
0.125
0.125
0.1468

Sample aliquot
Final volume
Dilution Factor

0.05
0.05
1

AECOM Calculated MS Result (mg/L)	0.147 OK	Reported Result (mg/L)	0.147

%R = Found/True*100

GN65124-S1

P. 315, 329

114-MW81D-103.5-20250214

True Value (mg/L)

0.150

Native concentration (mg/L)

0.0000

AECOM Calculated MS Result %R

97.9 OK

Reported %R

98.0

UNFILTERED**Reporting Limit**

JE5758-1

P. 9, 329

114-MW81D-103.5-20250214

Low Standard

0.01

Initial volume (L)
Final volume (L)
Dilution Factor

0.5
0.5
1

AECOM Calculated Reporting Limit	0.010 OK	Reported RL (mg/L)=	0.010

UNFILTERED**Sample Calculations**

JE5758-1

P. 9, 329

114-MW81D-103.5-20250214

Background reading
Total absorbance
Total absorbance - background
Instrument Response (mg/L)

0
0
0
0.000

Sample volume (L)
Final Volume (L)
Dilution Factor

0.5
0.5
1

AECOM Calculated Result (mg/L)	-0.0003 ND	Reported Result (mg/L)	0.0026 U

OK, <MDL report as

Data Validation Report

Project:	PPG 2025 GAG GW Remedial Activities		
Laboratory:	SGS North America Inc., Dayton NJ		
Service Request:	JE5836		
Analyses/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500		
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)		
AECOM Project Number: 60732743 GWM.2024			
Prepared by:	Charlene Flint/AECOM	Completed Date: 3/12/2025	
Reviewed by:	Linda Waters/AECOM	File Name: JE5836 Memo ID	

SUMMARY

The samples listed below were collected by AECOM on February 17, 2025 as part of the PPG 2025 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Sample ID	Laboratory ID	Matrix/Sample Type	Parameter
114-MW81D-107.5-20250217	JE5836-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW81D-107.5-20250217	JE5836-1F	Groundwater	Ferrous Iron (dissolved)
BR-RI-FB-20250217	JE5836-2	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

Data validation activities were conducted in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes, EPA-600/4-79-020, March 1983 And Subsequent Revisions;

- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness (chain-of-custody [COC]/sample integrity)
✗	Holding times and sample preservation
✓	Initial calibration/continuing calibration verification
✓	Laboratory blanks/field blanks
✗	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory duplicate results
✓	Laboratory control sample (LCS) and/or laboratory control sample duplicate (LCSD) results
NA	Field duplicate results
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a quality control (QC) nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Qualified results have been listed in Attachment A.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Hexavalent Chromium (Full Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Initial Calibration/Calibration Check Standard (CCS)

Initial and continuing calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The instrument must be calibrated daily (once every 24 hours) or each time the instrument is set up;
- A calibration blank and at least four (4) standards in graduated amounts and in the appropriate range for Method 7196A;
- The calibration curve must have a correlation coefficient (r) of 0.995 or greater for Method 7196A

All QC acceptance criteria were met.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spikes (MS)

The MS %Rs were reviewed for conformance with the QC acceptance criteria.

Nonconformances are summarized in Attachment B in Table B-2. Sample results were qualified as follows.

Actions: Based on NJDEP SOP 5.A.10

Criteria	Action ¹	
	Detect if reducing	Nondetect if reducing
Matrix spike %R < 30%	J-	RA
Matrix spike %R 30 - 84%	J-	UJ
Matrix spike %R 85 - 115%	None	None
Matrix spike %R > 115%	J+	None
Criteria	Action ¹	
	Detect if oxidizing	Nondetect if oxidizing
Matrix spike %R < 30%	J-	R
Matrix spike %R 30 - 84%	J-	UJ
Matrix spike %R 85 - 115%	None	None
Matrix spike %R > 115%	J+	None
Note: Actions are applied to samples in the batch		
¹ MS/MSD results are not evaluated when the native sample concentration is >4x, based on AECOM professional judgment.		

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of ≤20% for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

All QC acceptance criteria were met.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of ≤30% for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment A for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference ≤ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD ≤30%	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results ≥ 4xRL; RPD >30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Metals (Limited Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

Nonconformances are summarized in Attachment B in Table B-1. Sample results were qualified as follows

Actions: (Based on NJDEP SOP 5.A.16)

Criteria		Actions	
		Detect	Nondetect
Sample temperature > 6°C upon receipt at the laboratory		J	UJ
Aqueous Metals	<180 day	No qualification	No qualification
Aqueous Ferrous iron >24 hours but <48 hours		J	UJ
Aqueous sample analyzed >180 days		R	R

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met or did not require qualification.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no laboratory duplicate samples submitted with this data set. No validation actions were taken on this basis.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Wet Chemistry – Sulfate and TOC (Limited Validation)**Holding Times and Sample Preservation**

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

Nonconformances are summarized in Attachment B in Table B-2. Sample results were qualified as follows.

Actions: : Based on Laboratory Limits

TOC Criteria	Action ¹	
	Detect	Nondetect
%R>115%	J+	No qualification
%R <85%	J-	R
RPD >15	J	No qualification
Sulfate Criteria	Action ¹	
	Detect	Nondetect
%R>120%	J+	No qualification
%R <80%	J-	R
RPD >20	J	No qualification
Note: Actions are applied to samples in the batch		
¹ MS/MSD results are not evaluated when the native sample concentration is >4x, based on AECOM professional judgment.		

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met or did not require qualification.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no laboratory duplicate samples submitted with this data set. No validation actions were taken on this basis.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data in the selected group of validated samples appears to be valid and may be used for decision-making purposes.

Results estimated due to holding time exceedances are useable with a low bias.

Results estimated due to low MS/MSD results are useable with a low bias.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Attachment A. All actions are described above.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Nonconformance Summary Tables

Attachment C: Qualifier Codes and Explanations

Attachment D: Validation Checklists

Attachment E: Hexavalent Chromium Calculations

Attachment A**Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)**

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 14, 2025
Lab Name/ID SGS, Dayton
SDG No JE5758
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250214

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-107.5-20250217	JE5836-1	Total	CHROMIUM (HEXAVALENT)	U	0.012	0.012 J-	0.010	Qualify	1

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

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

NJDEP Validation Footnote

1. MS and/or MSD recovery was below the lower acceptance limit.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE5836
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250217

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-107.5-20250217	JE5836-1	Total	CHROMIUM	U	3.1	3.1	2.0		

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

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

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE5836
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250217

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-107.5-20250217	JE5836-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE5836
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250217

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-107.5-20250217	JE5834-1	SULFATE	U	24.0	24.0	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 17, 2025
Lab Name/ID SGS, Dayton
SDG No JE5836
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID BR-RI-FB-20250217

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-103.5-20250217	JE5836-1	TOC	U	2.8	2.8	1.0		

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

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

Attachment B

Nonconformance Summary Tables

Table B-1 - Hold Time

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW81D-107.5-20250217	JE5836-1F	IRON (FERROUS)	2/17/2025 14:05	2/18/2025 17:40	>24 hr. <48 hr., Estimate (UJ)

Table B-2 - Matrix Spikes

114-MW81D-107.5-20250217 (JE5836-1, -1F)

Analyte	Fraction	Units	Spike added (ug/l)	SR (ug/l)	SSR MS (ug/l)	SDR (ug/l)	MS % R	MSD % R	Upper Limit	Lower Limit	RPD (%)	RPD Upper Limit	Action
CHROMIUM (HEXAVALENT)	Total	mg/l	0.15	0.012	0.15	NA	62	NA	115	85	NA		Estimate (J-)
TOC	Total	mg/l	10	2	10.4	10.6	84	86	115	85	1.9	15	Estimate (J-)

SR – sample result

SSR – spiked sample result

SDR – sample duplicate result

NA – not applicable

RPD – relative percent difference

Attachment C**Qualifier Codes and Explanations**

Qualifier	Explanation
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.
U	Indicates the analyte was not detected in the sample above the sample reporting limit.
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.

Attachment D
Validation Checklists

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5836
Validation Level: Full
Number of Samples/Matrix: 1 GW, 1 FB
Analysis (Include Method #): Hexavalent Chromium / 7196A

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/6/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/13/2025

NJDEP SOP 5.A.10, Rev 3 (Sept 2009)
USEPA SW-846 Methods 3060A, 7196A and 7199

SGS SOP: EGN214-18 Method 7198A

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Sample IDs on COC match data package and EDD, COCs signed	Yes	No	
Data Completeness	Results for each sample on COC, case narrative included, method reference included	Yes	No	
Sample Preservation	Sample receipt temperature 2-6°C	Yes	No	1.5°C
Holding Time	Holding time criteria met (<24h from collection). Sample collection dates, analysis dates included in lab report NJDEP SOP 5.A.10 ---HT >24 hours but <48 hours flag J or UJ ---HT >48 hours flag R	Yes	No	sampled 2/17/2025, analyzed 2/18/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Method 7196A-Daily, blank +4 standards, $r \geq 0.995$ Method 7199-Daily, blank +3 standards, $r \geq 0.999$ NJDEP SOP 5.A.10 ---not performed or calibrated daily, then all associated data are rejected "R" ---r for the calibration curve outside QC rejected "R" ---correct number of standards was not analyzed then qualify "J"	Yes	No	
Calibration Check Standard (CCS)	CCS every 10 samples, %R 90-110% NJDEP SOP 5.A.10 ---not performed or calibrated daily, then all associated data are rejected "R" ---r for the calibration curve outside QC rejected "R" ---correct number of standards was not analyzed then qualify "J"	Yes	No	
Method Blanks	With each prep batch, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	MB GN65174, ND
Calibration Blanks	Prior to ICAL, after each CCV, abs value should not exceed MDL	Yes	No	

	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.10: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.			
Field Blanks		Yes	No	BR-RI-FB-20250217 (JE5836-2), ND
Eh/pH	Included for each sample	Yes	No	
Matrix Spike	One per 20 samples (total and dissolved), soluble MS 85-115%R. Qualify all samples in batch. (see MS Requirement tab)	No	Yes	114-MW81D-107.5-20250217 (JE5836-1), {58.7%R}
Laboratory Duplicate	One per 20 samples, RPD ≤20% if both results are ≥4x RL, or absolute difference ±RL if either or both results are <4xRL. Qualify all samples in batch.	Yes	No	114-MW81D-107.5-20250217 (JE5836-1), see tab
Laboratory Control Standards	One per 20 samples or one per batch, 80-120%R. Qualify all samples in batch.	Yes	No	GN65174 (101.3 %R)
Field Duplicate	1/20 Samples; RPD ≤30% for aqueous samples if both results are ≥4XRL, or absolute difference ≤2XRL if either or both results are <4xRL. No qualification required if one result ND and the other ≤2XRL. Qualify all samples in batch.	NA	NA	None with this SDG
Method 7196A Sample Prep	pH 1.5-2.5	Yes	No	
Total vs Dissolved Results	See T vs D tabs	Yes	No	
Calculation Spot Checks	See 7196 calc tab	Yes	No	

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5836
Validation Level: Limited
Number of Samples/Matrix: 1 GW, 1 GWF, 1 FB
Analysis (Include Method #): SW-846 3010A/6020B / SM3500FE B-2011

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/6/2025
Validator: Charlene Flint
Peer Reviewer: Linda Waters 3/13/2025

SOP NO.: 5.A.16/QAPP

SGS SOP: EMA6020B-09 - Metals
SGS SOP: EGN243-13 - Ferrous Iron

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Metals Included	Cr, Ferrous Iron	Yes	No	
Chain-of-Custody		Yes	No	
Sample Preservation	None	Yes	No	1.5°C
Holding Time	180 days for analysis, 24 hr Ferrous iron	No	Yes	Sampled 2/17/2025, Fe analyzed 2/18/2025, Cr analyzed 2/19/2025 and 3/4/2025. Ferrous iron sample analyzed out of 24 hr. HT. Estimate (UJ).
Quantitation Limits	Reporting limits meet GW action limit See dilutions tab	Yes	No	
Method Blanks	With each prep batch, abs value should not exceed MDL ----<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ----and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. ---->10 times the blank no qualification.	Yes	No	MP52775 Cr (ND), MP52810 Cr (ND), GN65196 Fe (ND)
Other Laboratory Blanks ^{1,2}	<MDL	NA	NA	
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ----<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ----and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. ---->10 times the blank no qualification.	Yes	No	BR-RI-FB-20250217 (JE5836-2) Cr (ND)
Initial Calibration	Daily prior to samples, $r^2 \geq 0.990$	NA	NA	Not included in Limited
Initial Calibration Verification (ICV)	$\pm 10\%$ of true value	NA	NA	Not included in Limited
Continuing Calibration Verification (CCV)	After every 10 samples and at end, $\pm 10\%$ of true value	NA	NA	Not included in Limited
Low-Level Calibration Check (LLCCV) or CRQL Check Standard		NA	NA	Not included in Limited
Matrix Spike	QAPP: 1/20 samples (5% of total) SOP NO.: 5.A.16: 1/20 samples or each batch	Yes	No	114-MW81D-107.5-20250217 (JE5758-1, -1F), see MS/MSD tab
Matrix Spike Duplicate RPD ²	($\pm 25\%$ R or lab limits, whichever is smaller, and ≤ 20 RPD	Yes	No	
Laboratory Duplicate ²	RPD $\leq 35\%$ solids	NA	NA	Lab dup not analyzed for 6020.
Laboratory Control Standards	SOP NO.: 5.A.16: 80-120%R, RPD ≤ 20	Yes	No	MP52775 Cr (91.5 %R), MP52810 Cr (96.0 %R), GN65196 Fe (96.7 %R)
Internal Standards ^{2,3}	30-120%RI	NA	NA	Not included in Limited
Serial Dilution	Within $\pm 10\%$ of original for sample conc >100x MDL	NA	NA	Not included in Limited
Field Duplicate	QAPP: Either 1/day or 5% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL 1/20 Samples; RPD $\leq 30\%$ for aqueous samples if both results are ≥ 4 XRL, or absolute difference ≤ 2 XRL if either or both results are < 4 XRL. No qualification required if one result ND and the other ≤ 2 XRL. Qualify all samples in batch.	NA	NA	Field duplicates not submitted in this data set.
ICP/MS Tunes ²	Mass calibration ≤ 0.1 amu from the true value; Resolution < 0.9 amu full width at 10% peak height. RSD $\leq 5\%$	NA	NA	Not included in Limited
Interference Check Sample (ICS)	ICS-A: Abs value for non-spiked <MDL, ICS-AB within $\pm 15\%$ of true value	NA	NA	Not included in Limited
Calculation Spot Checks ³		NA	NA	Not included in Limited
Total Vs Dissolved	See TvD Tab	NA	NA	Total only

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only.

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5836
Validation Level: Limited
Number of Samples/Matrix: 1 GW, 1 FB
Analysis (Include Method #): EPA 300.0

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/6/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/13/2025

Method 300.0 is not listed in the QAPP; QC limits are based on the lab SOP.

SGS SOP: EDN318-07

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody		Yes	No	
Sample Preservation	≤6°C but not frozen	Yes	No	1.5°C
Holding Time	28 days	Yes	No	Sampled 2/17/2025, analyzed 2/19/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Lab limits: Linear = 5 pt cal, r2 ≥ 0.99 or %RSD ≤10%	NA	NA	Not included in limited
Initial Calibration Verification	ICV ±10%	NA	NA	Not included in limited
Continuing Calibration Verification	1 GW, 1 FB+A10:E24	NA	NA	Not included in limited
Method/Instrument Blanks	No target analyte concentrations ≥ QL. SOP NO.: 5.A.16: abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GP59412/GN65199, ND
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	BR-RI-FB-20250217 (JE5836-2)
Laboratory Control Standards	SOP/Lab limits: 90-110%	Yes	No	GP59412/GN65199 (101.6%R)
Matrix Spike	SOP/Lab limits: 80-120%	NA	NA	Batch QC
Matrix Spike Duplicate	SOP/Lab RPD <20%	NA	NA	Batch QC
Laboratory Duplicate	SOP/Lab: RPD ≤ 20%	NA	NA	
Field Duplicate	QAPP limits: RPD ≤ 30% when sulfate is detected in both samples ≥ 5x QL; Diff ≤ QL if values are < 5x QL	NA	NA	None with this SDG.
Calculation Spot Checks	Full validation only	No	No	Not included in limited

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5836
Validation Level: Limited
Number of Samples/Matrix: 1 GW, 1 FB
Analysis (Include Method #): SM5310B

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/6/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/13/2025

SGS SOP: EGN234-32

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody		Yes	No	
Sample Preservation	HCl to a pH <2. ≤6°C until analysis	Yes	No	1.5°C
Holding Time	28 days	Yes	No	Sampled 2/17/2025, analyzed 2/27/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Lab limits: Linear = 5 pt cal, r2 ≥ 0.99 or %RSD ≤20%	NA	NA	Not included in limited
Initial Calibration Verification	ICV ±10%	NA	NA	Not included in limited
Continuing Calibration Verification	CCV ±15%	NA	NA	Not included in limited
Method/Instrument Blanks	No target analyte concentrations ≥ QL. SOP NO.: 5.A.16: abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GP59534/GN65503, ND
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	BR-RI-FB-20250217 (JE5836-2)
Laboratory Control Standards	SOP/Lab limits: 90-110%	Yes	No	GP59534/GN65503 (93.9 %R)
Matrix Spike	SOP/Lab limits: 85-115%	No	Yes	114-MW81D-107.5-20250217 (JE5836-1)
Matrix Spike Duplicate	SOP RPD <15%	Yes	No	114-MW81D-107.5-20250217 (JE5836-1)
Laboratory Duplicate	SOP/Lab: RPD ≤ 15%	NA	NA	
Field Duplicate	QAPP limits: RPD ≤ 30% when TOC is detected in both samples ≥ 5x QL; Diff ≤ QL if values are < 5x QL	NA	NA	None with this SDG.
Calculation Spot Checks	Full validation only	No	No	Not included in limited

Attachment E

Hexavalent Chromium Calculations

SDG#: JE5836/ Method 7196

GN65174

Cr+6 ICAL 2/18/2025

GW

(p. 1086 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.088
0.3	0.255
0.5	0.422
0.8	0.661
1	0.865

(p. 1086 of data pkg)

AECOM Calculated Intercept	0.00018 OK	Reported intercept	0.0002
AECOM Slope	0.8491 OK	Reported Slope	0.8491
AECOM Calculated r	0.99959 OK	Reported r	0.99959

LCS calculation

GN65174-B1

P. 1074, 1086

Background absorbance	0
Sample absorbance	0.129
LCS Soluble Instrument Response	0.129
Instrument Concentration (mg/L)	0.152

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated LCS Result (mg/L)	0.152 OK	Reported Result (mg/L)	0.152

%R = Found/True*100

GN65174-B1

P. 1074, 1086

True Value (mg/L)	0.150

AECOM Calculated %R	101.1 OK	Reported %R	101.3

MS calculation

GN65174-S1

P. 1076, 1086, 1087

114-MW81D-107.5-20250217

Unfiltered

Background reading	0.002
Total absorbance	0.091
Total absorbance - background	0.089
Instrument Concentration (mg/L)	0.1046

Sample aliquot	0.05
Final volume	0.05
Dilution Factor	1

AECOM Calculated MS Result (mg/L)	0.105 OK	Reported Result (mg/L)	0.105

%R = Found/True*100

GN65174-S1

P. 1076, 1086, 1087

114-MW81D-107.5-20250217

True Value (mg/L)	0.150

Native concentration (mg/L)	0.0120

AECOM Calculated MS Result %R	61.7 OK	Reported %R	62.0

UNFILTERED**Reporting Limit**

JE5836-1

P. 9, 1086

114-MW81D-107.5-20250217

Low Standard	0.01

Initial volume (L)	0.5
Final volume (L)	0.5
Dilution Factor	1

AECOM Calculated Reporting Limit	0.010 OK	Reported RL (mg/L)=	0.010

UNFILTERED**Sample Calculations**

JE5836-1

P. 9, 1086

114-MW81D-107.5-20250217

Background reading	0.001
Total absorbance	0.011
Total absorbance - background	0.01
Instrument Response (mg/L)	0.012
Sample volume (L)	0.5
Final Volume (L)	0.5
Dilution Factor	1

AECOM Calculated Result (mg/L)	0.012 OK	Reported Result (mg/L)	0.012

Data Validation Report

Project:	PPG 2025 GAG GW Remedial Activities	
Laboratory:	SGS North America Inc., Dayton NJ	
Service Request:	JE5874	
Analyses/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500	
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)	
AECOM Project Number: 60732743 GWM.2024		
Prepared by:	Charlene Flint/AECOM	Completed Date: 03/05/2025
Reviewed by:	Linda Waters/AECOM	File Name: JE5874 Memo ID

SUMMARY

The samples listed below were collected by AECOM on February 18, 2025 as part of the PPG 2025 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Sample ID	Laboratory ID	Matrix/Sample Type	Parameter
114-MW81D-115.0-20250218	JE5874-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW81D-115.0-20250218	JE5874-1F	Groundwater	Ferrous Iron (dissolved)
114-MW81D-115.0-20250218-X (Field Duplicate of 114-MW81D-115.0-20250218)	JE5874-2	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW81D-115.0-20250218-X (Field Duplicate of 114-MW81D-115.0-20250218)	JE5874-2F	Groundwater	Ferrous Iron (dissolved)
GW-RI-FB-20250218	JE5874-3	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

Data validation activities were conducted in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

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

- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);
- Method 300.0, Methods For Chemical Analysis Of Water And Wastes, EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness (chain-of-custody [COC]/sample integrity)
X	Holding times and sample preservation
✓	Initial calibration/continuing calibration verification
✓	Laboratory blanks/field blanks
✓	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory duplicate results
✓	Laboratory control sample (LCS) and/or laboratory control sample duplicate (LCSD) results
✓	Field duplicate results
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (X) indicates that a quality control (QC) nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.

- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Hexavalent Chromium (Full Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Initial Calibration/Calibration Check Standard (CCS)

Initial and continuing calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The instrument must be calibrated daily (once every 24 hours) or each time the instrument is set up;
- A calibration blank and at least four (4) standards in graduated amounts and in the appropriate range for Method 7196A;
- The calibration curve must have a correlation coefficient (r) of 0.995 or greater for Method 7196A

All QC acceptance criteria were met.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spikes (MS)

The MS %Rs were reviewed for conformance with the QC acceptance criteria.

MS analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no laboratory duplicate samples submitted with this data set. No validation actions were taken on this basis.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

No qualifications were made.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is >RL	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference $\leq$ RL	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results < 4xRL; Absolute Difference > RL	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq$ 4xRL; RPD $\leq 30\%$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq$ 4xRL; RPD > 30%	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Sample Results/Reporting Issues

All analytes detected at concentrations less than the reporting limit (RL) but greater than the method detection limit (MDL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

Metals (Limited Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

Nonconformances are summarized in Attachment B in Table B-1. Sample results were qualified as follows

Actions: (Based on NJDEP SOP 5.A.16)

Criteria		Actions	
		Detect	Nondetect
Sample temperature > 6°C upon receipt at the laboratory		J	UJ
Aqueous Metals	<180 day	No qualification	No qualification
Aqueous Ferrous iron >24 hours but <48 hours		J	UJ
Aqueous sample analyzed >180 days		R	R

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of ≤20% for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no laboratory duplicate samples submitted with this data set. No validation actions were taken on this basis.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

All QC acceptance criteria were met.

Wet Chemistry – Sulfate and TOC (Limited Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met or did not require qualification.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no laboratory duplicate samples submitted with this data set. No validation actions were taken on this basis.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

All QC acceptance criteria were met.

Data Quality and Usability

In general, the data in the selected group of validated samples appears to be valid and may be used for decision-making purposes. Qualified results are discussed in attachments A and B below.

Results estimated due to holding time issues are useable with a low bias.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Attachment A. All actions are described above.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Nonconformance Summary Tables

Attachment C: Qualifier Codes and Explanations

Attachment D: Validation Checklists

Attachment E: Hexavalent Chromium Calculations

Attachment A**Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)**

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 18, 2025
Lab Name/ID SGS, Dayton
SDG No JE5874
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250218

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-115.0-20250218	JE5874-1	Total	CHROMIUM (HEXAVALENT)	U	0.0036B	0.0036J	0.010	Qualify	1
114-MW81D-115.0-20250218-X	JE5874-2	Total	CHROMIUM (HEXAVALENT)	U	0.0072B	0.0072J	0.010	Qualify	1

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

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

NJDEP Validation Footnote

1. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 18, 2025
Lab Name/ID SGS, Dayton
SDG No JE5874
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250218

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			CHROMIUM						

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

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 18, 2025
Lab Name/ID SGS, Dayton
SDG No JE5874
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250218

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-115.0-20250218	JE5874-1F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1
114-MW81D-115.0-20250218-X	JE5874-2F	Dissolved	IRON (FERROUS)	U	U	UJ	0.20	Qualify	1

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

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

NJDEP Validation Footnote

1. Technical holding time was exceeded.

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 18, 2025
Lab Name/ID SGS, Dayton
SDG No JE5874
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250218

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-115.0-20250218	JE5874-1	SULFATE	U	22.4	22.4	2.0		
114-MW81D-115.0-20250218-X	JE5874-2	SULFATE	U	22.5	22.5	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 18, 2025
Lab Name/ID SGS, Dayton
SDG No JE5874
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250218

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-115.0-20250218	JE5874-1	TOC	U	2.0	2.0	1.0		
114-MW81D-115.0-20250218-X	JE5874-2	TOC	U	1.9	1.9	1.0		

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

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

Attachment B**Nonconformance Summary Tables****Table B-1 - Hold Time**

Sample ID	Lab ID	Analyte	Sampled Date	Analysis Date	Action
114-MW81D-115.0-20250218	JE5874-1F	IRON (FERROUS)	2/18/2025 13:10	2/19/2025 23:12	Estimate (UJ)
114-MW81D-115.0-20250218-X	JE5874-2F	IRON (FERROUS)	2/18/2025 13:15	2/19/2025 23:12	Estimate (UJ)

Attachment C**Qualifier Codes and Explanations**

Qualifier	Explanation
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.
U	Indicates the analyte was not detected in the sample above the sample reporting limit.
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.

Attachment D
Validation Checklists

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5874
Validation Level: Full
Number of Samples/Matrix: 2 GW, 1 FB
Analysis (Include Method #): Hexavalent Chromium / 7196A

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/5/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/17/2025

NJDEP SOP 5.A.10, Rev 3 (Sept 2009)
USEPA SW-846 Methods 3060A, 7196A and 7199

SGS SOP: EGN214-18 Method 7198A

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Sample IDs on COC match data package and EDD, COCs signed	Yes	No	
Data Completeness	Results for each sample on COC, case narrative included, method reference included	Yes	No	
Sample Preservation	Sample receipt temperature 2-6°C	Yes	No	1.5°C
Holding Time	Holding time criteria met (<24h from collection). Sample collection dates, analysis dates included in lab report NJDEP SOP 5.A.10 ---HT >24 hours but <48 hours flag J or UJ ---HT >48 hours flag R	Yes	No	sampled 2/18/2025, analyzed 2/19/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Method 7196A-Daily, blank +4 standards, $r \geq 0.995$ Method 7199-Daily, blank +3 standards, $r \geq 0.999$ NJDEP SOP 5.A.10 ---not performed or calibrated daily, then all associated data are rejected "R" ---r for the calibration curve outside QC rejected "R" ---correct number of standards was not analyzed then qualify "J"	Yes	No	
Calibration Check Standard (CCS)	CCS every 10 samples, %R 90-110% NJDEP SOP 5.A.10 ---not performed or calibrated daily, then all associated data are rejected "R" ---r for the calibration curve outside QC rejected "R" ---correct number of standards was not analyzed then qualify "J"	Yes	No	
Method Blanks	With each prep batch, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	MB GN65125, ND
Calibration Blanks	Prior to ICAL, after each CCV, abs value should not exceed MDL	Yes	No	

	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.10: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.			
Field Blanks		Yes	No	GW-RI-FB-20250218 (JE5874-3), ND
Eh/pH	Included for each sample	Yes	No	
Matrix Spike	One per 20 samples (total and dissolved), soluble MS 85-115%R. Qualify all samples in batch. (see MS Requirement tab)	NA	NA	Batch QC
Laboratory Duplicate	One per 20 samples, RPD ≤20% if both results are ≥4x RL, or absolute difference ±RL if either or both results are <4xRL. Qualify all samples in batch.	NA	NA	Batch QC
Laboratory Control Standards	One per 20 samples or one per batch, 80-120%R. Qualify all samples in batch.	Yes	No	GN65125 (100.7 %R)
Field Duplicate	1/20 Samples; RPD ≤30% for aqueous samples if both results are ≥4XRL, or absolute difference ≤2XRL if either or both results are <4xRL. No qualification required if one result ND and the other ≤2XRL. Qualify all samples in batch.	No	No	114-MW81D-115.0-20250218 (JE5874-1) & 114-MW81D-115.0-20250218-X (JE5874-2)
Method 7196A Sample Prep	pH 1.5-2.5	Yes	No	
Total vs Dissolved Results	See T vs D tabs	Yes	No	Total only
Calculation Spot Checks	See 7196 calc tab	Yes	No	

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5874
Validation Level: Limited
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB
Analysis (Include Method #): SW-846 3010A/6020B / SM3500FE B-2011

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/5/2025
Validator: Charlene Flint
Peer Reviewer: Linda Waters 3/17/2025

SOP NO.: 5.A.16/QAPP

SGS SOP: EMA6020B-09 - Metals
SGS SOP: EGN243-13 - Ferrous Iron

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Metals Included	Cr, Ferrous Iron	Yes	No	
Chain-of-Custody		Yes	No	
Sample Preservation	None	Yes	No	1.5 °C
Holding Time	180 days for analysis, 24 hr Ferrous iron	No	Yes	Sampled 2/14/2025, analyzed 2/19/2025 and 2/21/2025. Ferrous iron sample analyzed out of 24 hr. HT. Estimate (UJ).
Quantitation Limits	Reporting limits meet GW action limit See dilutions tab	Yes	No	
Method Blanks	With each prep batch, abs value should not exceed MDL ----<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ----and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. ---->10 times the blank no qualification.	Yes	No	MP52810 Cr (ND), GN65250 Fe (ND)
Other Laboratory Blanks ^{1,2}	<MDL	NA	NA	
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ----<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ----and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. ---->10 times the blank no qualification.	Yes	No	GW-RI-FB-20250218 (JE5874-3) Cr (ND)
Initial Calibration	Daily prior to samples, $r^2 \geq 0.990$	NA	NA	Not included in Limited
Initial Calibration Verification (ICV)	$\pm 10\%$ of true value	NA	NA	Not included in Limited
Continuing Calibration Verification (CCV)	After every 10 samples and at end, $\pm 10\%$ of true value	NA	NA	Not included in Limited
Low-Level Calibration Check (LLCCV) or CRQL Check Standard		NA	NA	Not included in Limited
Matrix Spike	QAPP: 1/20 samples (5% of total) SOP NO.: 5.A.16: 1/20 samples or each batch	Yes	No	114-MW81D-115.0-20250218 (JE5874-1F), see MS/MSD tab
Matrix Spike Duplicate RPD ²	($\pm 25\%$ R or lab limits, whichever is smaller, and ≤ 20 RPD	Yes	No	
Laboratory Duplicate ²	RPD $\leq 35\%$ solids	NA	NA	Lab dup not analyzed for 6020.
Laboratory Control Standards	SOP NO.: 5.A.16: 80-120%R, RPD ≤ 20	Yes	No	MP52810 Cr (96.0 %R), GN65250 Fe (96.7 %R)
Internal Standards ^{2,3}	30-120%RI	NA	NA	Not included in Limited
Serial Dilution	Within $\pm 10\%$ of original for sample conc >100x MDL	NA	NA	Not included in Limited
Field Duplicate	QAPP: Either 1/day or 5% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL 1/20 Samples; RPD $\leq 30\%$ for aqueous samples if both results are ≥ 4 XRL, or absolute difference ≤ 2 XRL if either or both results are < 4 XRL. No qualification required if one result ND and the other ≤ 2 XRL. Qualify all samples in batch.	Yes	No	114-MW81D-115.0-20250218 (JE5874-1, -1F) & 114-MW81D-115.0-20250218-X (JE5874-2, -2F), All ND
ICP/MS Tunes ²	Mass calibration ≤ 0.1 amu from the true value; Resolution < 0.9 amu full width at 10% peak height. RSD $\leq 5\%$	NA	NA	Not included in Limited
Interference Check Sample (ICS)	ICS-A: Abs value for non-spiked <MDL, ICS-AB within $\pm 15\%$ of true value	NA	NA	Not included in Limited
Calculation Spot Checks ³		NA	NA	Not included in Limited
Total Vs Dissolved	See TvD Tab	NA	NA	Total only

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only.

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5874
Validation Level: Limited
Number of Samples/Matrix: 2 GW, 1 FB
Analysis (Include Method #): EPA 300.0

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/5/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/17/2025

Method 300.0 is not listed in the QAPP; QC limits are based on the lab SOP.

SGS SOP: EDN318-07

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody		Yes	No	
Sample Preservation	≤6°C but not frozen	Yes	No	1.5°C
Holding Time	28 days	Yes	No	Sampled 2/18/2025, analysis 2/19/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Lab limits: Linear = 5 pt cal, r2 ≥ 0.99 or %RSD ≤10%	NA	NA	Not included in limited
Initial Calibration Verification	ICV ±10%	NA	NA	Not included in limited
Continuing Calibration Verification	1 GW, 1 FB+A10:E24	NA	NA	Not included in limited
Method/Instrument Blanks	No target analyte concentrations ≥ QL. SOP NO.: 5.A.16: abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GP59431/GN65239, ND
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GW-RI-FB-20250218 (JE5874-3)
Laboratory Control Standards	SOP/Lab limits: 90-110%	Yes	No	GP59431/GN65239 (102.5%R)
Matrix Spike	SOP/Lab limits: 80-120%	NA	NA	Batch QC
Matrix Spike Duplicate	SOP/Lab RPD <20%	NA	NA	Batch QC
Laboratory Duplicate	SOP/Lab: RPD ≤ 20%	NA	NA	
Field Duplicate	QAPP limits: RPD ≤ 30% when sulfate is detected in both samples ≥ 5x QL; Diff ≤ QL if values are < 5x QL	Yes	No	114-MW81D-115.0-20250218 (JE5874-1) & 114-MW81D-115.0-20250218-X (JE5874-2), see tab
Calculation Spot Checks	Full validation only	No	No	Not included in limited

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5874
Validation Level: Limited
Number of Samples/Matrix: 2 GW, 1 FB
Analysis (Include Method #): SM5310B

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/5/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/17/2025

SGS SOP: EGN234-32

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody		Yes	No	
Sample Preservation	HCl to a pH <2. ≤6°C until analysis	Yes	No	1.5°C
Holding Time	28 days	Yes	No	Sampled 2/18/2025, analysis 2/28/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Lab limits: Linear = 5 pt cal, r2 ≥ 0.99 or %RSD ≤20%	NA	NA	Not included in limited
Initial Calibration Verification	ICV ±10%	NA	NA	Not included in limited
Continuing Calibration Verification	CCV ±15%	NA	NA	Not included in limited
Method/Instrument Blanks	No target analyte concentrations ≥ QL. SOP NO.: 5.A.16: abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GP59535/GN65503, ND
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GW-RI-FB-20250218 (JE5874-3)
Laboratory Control Standards	SOP/Lab limits: 90-110%	Yes	No	GP59535/GN65503 (97.2 %R)
Matrix Spike	SOP limits: 85-115%	NA	NA	Batch QC
Matrix Spike Duplicate	SOP RPD <15%	NA	NA	Batch QC
Laboratory Duplicate	SOP/Lab: RPD ≤ 15%	NA	NA	
Field Duplicate	QAPP limits: RPD ≤ 30% when TOC is detected in both samples ≥ 5x QL; Diff ≤ QL if values are < 5x QL	Yes	No	114-MW81D-115.0-20250218 (JE5874-1) & 114-MW81D-115.0-20250218-X (JE5874-2), see tab
Calculation Spot Checks	Full validation only	No	No	Not included in limited

Attachment E

Hexavalent Chromium Calculations

SDG#: JE5874/ Method 7196

GN65215

Cr+6 ICAL 2/19/2025

GW

(p. 399 of data pkg)

x - concentration	y - response
0	0
0.01	0.009
0.05	0.045
0.1	0.089
0.3	0.26
0.5	0.435
0.8	0.681
1	0.850

(p. 399 of data pkg)

AECOM Calculated Intercept	0.00291 OK	Reported intercept	0.0029
AECOM Slope	0.8499 OK	Reported Slope	0.8499
AECOM Calculated r	0.99995 OK	Reported r	0.99995

LCS calculation

GN65215-B1

P. 384, 399

Background absorbance	0		
Sample absorbance	0.131		
LCS Soluble Instrument Response	0.131		
Instrument Concentration (mg/L)	0.151		
Sample aliquot	0.05		
Final volume	0.05		
Dilution Factor	1		
AECOM Calculated LCS Result (mg/L)	0.151 OK	Reported Result (mg/L)	0.151

%R = Found/True*100

GN65215-B1

P. 384, 399

True Value (mg/L)	0.150		
AECOM Calculated %R	100.5 OK	Reported %R	100.7

MS calculation

GN65215-S1

P. 386, 399

Batch QC (JE5875-3)

Unfiltered

Background reading	0.805		
Total absorbance	0.809		
Total absorbance - background	0.004		
Instrument Concentration (mg/L)	0.0013		
Sample aliquot	0.05		
Final volume	0.05		
Dilution Factor	1		
AECOM Calculated MS Result (mg/L)	0.001 OK	Reported Result (mg/L)	0.000

%R = Found/True*100

GN65215-S1

P. 386, 399

Batch QC (JE5875-3)

True Value (mg/L)	0.150		
Native concentration (mg/L)	0.0060		
AECOM Calculated MS Result %R	-3.1 OK	Reported %R	-4.0

UNFILTERED

Reporting Limit

JE5874-1

P. 9, 399

114-MW81D-115.0-20250218

Low Standard	0.01		
Initial volume (L)	0.5		
Final volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Reporting Limit	0.010 OK	Reported RL (mg/L)=	0.010

UNFILTERED

Sample Calculations

JE5874-1

P. 9, 399

114-MW81D-115.0-20250218

Background reading	0.002		
Total absorbance	0.008		
Total absorbance - background	0.006		
Instrument Response (mg/L)	0.004		
Sample volume (L)	0.5		
Final Volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Result (mg/L)	0.0036 OK	Reported Result (mg/L)	0.0036 J

Data Validation Report

Project:	PPG 2025 GAG GW Remedial Activities		
Laboratory:	SGS North America Inc., Dayton NJ		
Service Request:	JE5940		
Analyses/Method:	Hexavalent Chromium SW846 3060A/7196A Metals SW-846 3010A/6020B Total Organic Carbon (TOC) by SM5310B Sulfate by EPA 300.0 Ferrous Iron by SM3500		
Validation Level:	Full (Hexavalent Chromium) Limited (Metals, TOC, Sulfate, Ferrous iron)		
AECOM Project Number: 60732743 GWM.2024			
Prepared by:	Charlene Flint/AECOM	Completed Date: 3/12/2025	
Reviewed by:	Linda Waters/AECOM	File Name: JE5940 Memo ID	

SUMMARY

The samples listed below were collected by AECOM on February 19, 2025 as part of the PPG 2025 GAG GW Remedial Activities at 70 Carteret Avenue, Jersey City, New Jersey. Only the samples and parameters listed below were validated.

Sample ID	Laboratory ID	Matrix/Sample Type	Parameter
114-MW81D-123.0-20250219	JE5940-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW81D-123.0-20250219	JE5940-1F	Groundwater	Ferrous Iron (dissolved)
114-MW81D-127.0-20250219	JE5940-1	Groundwater	Hexavalent Chromium, Chromium, *Wet Chemistry
114-MW81D-127.0-20250219	JE5940-1F	Groundwater	Ferrous Iron (dissolved)
GW-RI-FB-20250219	JE5940-2	Field Blank	Hexavalent Chromium, Chromium, *Wet Chemistry
*Wet Chemistry – Total Organic Carbon (TOC), Sulfate			

Data validation activities were conducted in accordance with the FSP-QAPP and the following NJDEP and / or Region 2 validation Standard Operating Procedure(s) (SOP):

- NJDEP Office of Data Quality SOP 5.A.10, Rev 3 (September 2009), SOP for Analytical Data Validation of Hexavalent Chromium - for USEPA SW-846 Method 3060A, USEPA SW-846 Method 7196A;
- NJDEP Office of Data Quality SOP 5.A.16, Rev 1 (May 2002), Quality Assurance Data Validation of Analytical Deliverables for Inorganics (based on USEPA SW-846 Methods);
- ICP-MS Data Validation, SOP No. HW-3b Revision 1 (September 2016);

- Method 300.0, Methods For Chemical Analysis Of Water And Wastes, EPA-600/4-79-020, March 1983 And Subsequent Revisions;
- SM 5310B Total Organic Carbon by High-Temperature Combustion Method, Standards Methods for the Examination of Water and Wastewater;
- SM 3500-FE Iron, Standard Methods for the Examination of Water and Wastewater, Revision 24

The wet chemistry analyses were evaluated using the inorganic data validation SOP noted above in the absence of specific data validation guidance.

REVIEW ELEMENTS

The data were evaluated based on the following parameters (where applicable to the method):

✓	Data completeness (chain-of-custody [COC]/sample integrity)
✓	Holding times and sample preservation
✓	Initial calibration/continuing calibration verification
X	Laboratory blanks/field blanks
✓	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Laboratory duplicate results
✓	Laboratory control sample (LCS) and/or laboratory control sample duplicate (LCSD) results
NA	Field duplicate results
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An NA indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (X) indicates that a quality control (QC) nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Qualified results are discussed in Table 1.

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Hexavalent Chromium (Full Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Initial Calibration/Calibration Check Standard (CCS)

Initial and continuing calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- The instrument must be calibrated daily (once every 24 hours) or each time the instrument is set up;
- A calibration blank and at least four (4) standards in graduated amounts and in the appropriate range for Method 7196A;
- The calibration curve must have a correlation coefficient (r) of 0.995 or greater for Method 7196A

All QC acceptance criteria were met.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spikes (MS)

The MS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

All QC acceptance criteria were met.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

All QC acceptance criteria were met.

Sample Results

The results for total chromium were compared to the results for total hexavalent chromium to verify that the chromium concentration was greater than the hexavalent chromium concentration in each sample. Refer to the tables in Attachment B for results and actions. Sample results were evaluated as follows:

Actions: No guidance exists for comparison of total chromium and hexavalent results therefore the following is based on professional judgement and the duplicate criteria in the FSP QAPP.

Total Hexavalent Chromium vs. Dissolved Hexavalent Chromium Chromium vs. Hexavalent Chromium Comparison	Action
Total Chromium Concentration Greater than Hexavalent Chromium Concentration	No Qualification
Total Chromium Concentration Nondetect and Hexavalent Chromium Positive; Absolute difference between the positive value and the RL of the ND result is $>RL$	Qualify Positive and Nondetect J/UJ
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $< 4 \times RL$; Absolute Difference $\leq RL$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $< 4 \times RL$; Absolute Difference $> RL$	Qualify J
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times RL$; RPD $\leq 30\%$	No Qualification
Total Chromium Concentration Less than Hexavalent Chromium Concentration, Both Sample Results $\geq 4 \times RL$; RPD $> 30\%$	Qualify J
Total Chromium Concentration Equal to Hexavalent Chromium	No Qualification

All QC acceptance criteria were met.

Metals (Limited Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Detected compounds are summarized in Attachment B in Table B-1. Sample results were qualified as follows.

Actions: Based on NJDEP SOP 5.A.16

Blank Actions		
Method/Field Blank	Actions	
	Sample Detect	Sample Nondetect
Nondetect	No qualification	No qualification
Detect	<3X the blank concentration qualified as nondetect (UB) at the reported concentration.	No qualification
Detect	>3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high	No qualification
Detect	>10 times the blank no qualification.	No qualification

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no laboratory duplicate samples submitted with this data set. No validation actions were taken on this basis.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Sample Results/Reporting Issues

All analytes detected at concentrations less than the reporting limit (RL) but greater than the method detection limit (MDL) are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

Wet Chemistry – Sulfate and TOC (Limited Validation)

Holding Times and Sample Preservation

Sample chain of custody documents, laboratory sample receipt logs, and analytical reports were used to determine sample preservation and holding times.

All samples were properly preserved and analyzed within the required holding time.

Laboratory Blanks/Calibration Blanks/Field Blanks

Laboratory method blanks, calibration blanks and field blanks are evaluated as to whether there are contaminants detected above the method detection limit (MDL).

Target compounds were not detected in the laboratory method blanks, calibration blanks, or field blanks associated with the samples in this data set.

Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The MS/MSD %Rs and relative percent differences (RPDs) were reviewed for conformance with the QC acceptance criteria.

MS/MSD analyses were not performed on samples reported in this SDG. There were no validation actions taken on this basis.

Laboratory Control Sample (LCS) Analysis

The LCS %Rs were reviewed for conformance with the QC acceptance criteria.

All QC acceptance criteria were met or did not require qualification.

Laboratory Duplicate Analysis

Laboratory duplicate RPDs were reviewed for conformance with the QAPP QC criteria of $\leq 20\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

All QC acceptance criteria were met.

Field Duplicate

Field duplicate RPDs were reviewed for conformance with the AECOM QC criteria of $\leq 30\%$ for aqueous matrices. This criterion applies if both results were greater than four times the reporting limit (RL).

There were no field duplicate samples submitted with this data set. No validation actions were taken on this basis.

Data Quality and Usability

In general, the data in the selected group of validated samples appears to be valid and may be used for decision-making purposes. Qualified results are discussed in Attachments A and B below.

Results negated due to field blank issues are useable at the reporting limit.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Attachment A. All actions are described above.

ATTACHMENTS

Attachment A: Target Analyte Summary Hit List(s)

Attachment B: Nonconformance Summary Tables

Attachment C: Qualifier Codes and Explanations

Attachment D: Validation Checklists

Attachment E: Hexavalent Chromium Calculations

Attachment A**Aqueous Target Analyte Summary Hit List (Hexavalent Chromium)**

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 19, 2025
Lab Name/ID SGS, Dayton
SDG No JE5940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250219

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			CHROMIUM (HEXAVALENT)						

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

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

Aqueous Target Analyte Summary Hit List (Chromium)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 19, 2025
Lab Name/ID SGS, Dayton
SDG No JE5940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250219

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (ug/l)	Laboratory Sample Result (ug/l)	Validation Sample Result (ug/l)	RL (ug/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-123.0-20250219	JE5940-1	Total	CHROMIUM	U	3.8B	UB	10	Negate	1
GW-RI-FB-20250219	JE5940-3	Total	CHROMIUM	U	1.3B	1.3J	2.0	Qualify	2

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

NJDEP Validation Footnote

1. Sample result was <RL and <3X the associated blank result. Sample result was negated at the RL.
2. The reported result was greater than the MDL but less than the RL and qualified as estimated (B) by the laboratory. This qualifier was changed to J during validation.

Aqueous Target Analyte Summary Hit List (Iron, Ferrous)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 19, 2025
Lab Name/ID SGS, Dayton
SDG No JE5940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250219

Field Sample ID	Lab Sample ID	Fraction	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
No positive results reported			IRON (FERROUS)						

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

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

Aqueous Target Analyte Summary Hit List (Sulfate)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 19, 2025
Lab Name/ID SGS, Dayton
SDG No JE5940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250219

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-123.0-20250219	JE5940-1	SULFATE	U	22.6	22.6	2.0		
114-MW81D-127.0-20250219	JE5940-2	SULFATE	U	23.2	23.2	2.0		

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

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

Aqueous Target Analyte Summary Hit List (TOC)

Site Name PPG 2025 GAG GW Remedial Activities
Sampling Date February 19, 2025
Lab Name/ID SGS, Dayton
SDG No JE5940
Sample Matrix Aqueous
Trip Blank ID NA
Field Blank ID GW-RI-FB-20250219

Field Sample ID	Lab Sample ID	Analyte	Method Blank (mg/l)	Laboratory Sample Result (mg/l)	Validation Sample Result (mg/l)	RL (mg/l)	Quality Assurance Decision	NJDEP Validation Footnote
114-MW81D-123.0-20250219	JE5940-1	TOC	U	2.3	2.3	1.0		
114-MW81D-127.0-20250219	JE5940-2	TOC	U	1.8	1.8	1.0		

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

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

Attachment B**Nonconformance Summary Tables****Table A-1 - Field Blank**

GW-RI-FB-20250219 (JE5940-3)

Analyte	Fraction	SR (ug/l)	Qual	RL	Associated Samples	Action
CHROMIUM	Total	1.3	J	2	All	Sample 114-MW81D-123.0-20250219 (JE5940-1) reported chromium at a concentration <3x the FB. Chromium result was qualified as nondetect at the RL (UB). Sample 114-MW81D-127.0-20250219 (JE5940-2) was ND. Accept

SR – sample result**RL – reporting limit**

Attachment C**Qualifier Codes and Explanations**

Qualifier	Explanation
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.
U	Indicates the analyte was not detected in the sample above the sample reporting limit.
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.

Attachment D
Validation Checklists

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5940
Validation Level: Full
Number of Samples/Matrix: 2 GW, 1 FB
Analysis (Include Method #): Hexavalent Chromium / 7196A

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/12/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/17/2025

NJDEP SOP 5.A.10, Rev 3 (Sept 2009)
USEPA SW-846 Methods 3060A, 7196A and 7199

SGS SOP: EGN214-18 Method 7198A

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody	Sample IDs on COC match data package and EDD, COCs signed	Yes	No	
Data Completeness	Results for each sample on COC, case narrative included, method reference included	Yes	No	
Sample Preservation	Sample receipt temperature 2-6°C	Yes	No	2.1°C
Holding Time	Holding time criteria met (<24h from collection). Sample collection dates, analysis dates included in lab report NJDEP SOP 5.A.10 ---HT >24 hours but <48 hours flag J or UJ ---HT >48 hours flag R	Yes	No	sampled 2/19/2025, analyzed 2/20/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Method 7196A-Daily, blank +4 standards, $r \geq 0.995$ Method 7199-Daily, blank +3 standards, $r \geq 0.999$ NJDEP SOP 5.A.10 ---not performed or calibrated daily, then all associated data are rejected "R" ---r for the calibration curve outside QC rejected "R" ---correct number of standards was not analyzed then qualify "J"	Yes	No	
Calibration Check Standard (CCS)	CCS every 10 samples, %R 90-110% NJDEP SOP 5.A.10 ---not performed or calibrated daily, then all associated data are rejected "R" ---r for the calibration curve outside QC rejected "R" ---correct number of standards was not analyzed then qualify "J"	Yes	No	
Method Blanks	With each prep batch, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	MB GN65257, ND
Calibration Blanks	Prior to ICAL, after each CCV, abs value should not exceed MDL	Yes	No	

	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.10: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.			
Field Blanks		Yes	No	GW-RI-FB-20250219 (JE5940-3), ND
Eh/pH	Included for each sample	Yes	No	
Matrix Spike	One per 20 samples (total and dissolved), soluble MS 85-115%R. Qualify all samples in batch. (see MS Requirement tab)	Yes	No	114-MW81D-123.0-20250219 (JE5940-1), {100.0 %R}
Laboratory Duplicate	One per 20 samples, RPD ≤20% if both results are ≥4x RL, or absolute difference ±RL if either or both results are <4xRL. Qualify all samples in batch.	Yes	No	114-MW81D-123.0-20250219 (JE5940-1), {0 RPD }
Laboratory Control Standards	One per 20 samples or one per batch, 80-120%R. Qualify all samples in batch.	Yes	No	GN65257 (101.3 %R)
Field Duplicate	1/20 Samples; RPD ≤30% for aqueous samples if both results are ≥4XRL, or absolute difference ≤2XRL if either or both results are <4xRL. No qualification required if one result ND and the other ≤2XRL. Qualify all samples in batch.	NA	NA	None with this SDG.
Method 7196A Sample Prep	pH 1.5-2.5	Yes	No	
Total vs Dissolved Results	See T vs D tabs	Yes	No	Total only
Calculation Spot Checks	See 7196 calc tab	Yes	No	

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5940
Validation Level: Limited
Number of Samples/Matrix: 2 GW, 2 GWF, 1 FB
Analysis (Include Method #): SW-846 3010A/6020B / SM3500FE B-2011

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/12/2025
Validator: Charlene Flint
Peer Reviewer: Linda Waters 3/17/2025

SOP NO.: 5.A.16/QAPP

SGS SOP: EMA6020B-09 - Metals
SGS SOP: EGN243-13 - Ferrous Iron

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Metals Included	Cr, Ferrous Iron	Yes	No	
Chain-of-Custody		Yes	No	
Sample Preservation	None	Yes	No	2.1 °C
Holding Time	180 days for analysis, 24 hr Ferrous iron	Yes	No	Sampled 2/19/2025, analyzed 2/19/2025 and 2/21/2025.
Quantitation Limits	Reporting limits meet GW action limit See dilutions tab	Yes	No	
Method Blanks	With each prep batch, abs value should not exceed MDL ----<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. ---->10 times the blank no qualification.	Yes	No	MP52810 Cr (ND), GN65250 Fe (ND)
Other Laboratory Blanks ^{1,2}	<MDL	NA	NA	
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ----<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. ---->10 times the blank no qualification.	No	Yes	GW-RI-FB-20250219 (JE5940-3) Cr (1.3 ug/l), see tab
Initial Calibration	Daily prior to samples, $r^2 \geq 0.990$	NA	NA	Not included in Limited
Initial Calibration Verification (ICV)	$\pm 10\%$ of true value	NA	NA	Not included in Limited
Continuing Calibration Verification (CCV)	After every 10 samples and at end, $\pm 10\%$ of true value	NA	NA	Not included in Limited
Low-Level Calibration Check (LLCCV) or CRQL Check Standard		NA	NA	Not included in Limited
Matrix Spike	QAPP: 1/20 samples (5% of total) SOP NO.: 5.A.16: 1/20 samples or each batch	NA	NA	Batch QC
Matrix Spike Duplicate RPD ²	($\pm 25\%$ R or lab limits, whichever is smaller, and ≤ 20 RPD	NA	NA	
Laboratory Duplicate ²	RPD $\leq 35\%$ solids	NA	NA	Lab dup not analyzed for 6020.
Laboratory Control Standards	SOP NO.: 5.A.16: 80-120%R, RPD ≤ 20	Yes	No	MP52810 Cr (96.0 %R), GN65250 Fe (96.7 %R)
Internal Standards ^{2,3}	30-120%RI	NA	NA	Not included in Limited
Serial Dilution	Within $\pm 10\%$ of original for sample conc >100x MDL	NA	NA	Not included in Limited
Field Duplicate	QAPP: Either 1/day or 5% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL/1/20 Samples; RPD $\leq 30\%$ for aqueous samples if both results are ≥ 4 XRL, or absolute difference ≤ 2 XRL if either or both results are <4xRL. No qualification required if one result ND and the other ≤ 2 XRL. Qualify all samples in batch.	NA	NA	Batch QC
ICP/MS Tunes ²	Mass calibration ≤ 0.1 amu from the true value; Resolution < 0.9 amu full width at 10% peak height. RSD $\leq 5\%$	NA	NA	Not included in Limited
Interference Check Sample (ICS)	ICS-A: Abs value for non-spiked <MDL, ICS-AB within +/-15% of true value	NA	NA	Not included in Limited
Calculation Spot Checks ³		NA	NA	Not included in Limited
Total Vs Dissolved	See TvD Tab	NA	NA	Total only

¹May include reagent blanks, calibration blanks, etc.

²May not be applicable to all analyses.

³Level IV validation only.

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5940
Validation Level: Limited
Number of Samples/Matrix: 2 GW, 1 FB
Analysis (Include Method #): EPA 300.0

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/12/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/17/2025

Method 300.0 is not listed in the QAPP; QC limits are based on the lab SOP.

SGS SOP: EDN318-07

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody		Yes	No	
Sample Preservation	≤6°C but not frozen	Yes	No	2.1°C
Holding Time	28 days	Yes	No	Sampled 2/19/2025, analyzed 2/20/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Lab limits: Linear = 5 pt cal, r2 ≥ 0.99 or %RSD ≤10%	NA	NA	Not included in limited
Initial Calibration Verification	ICV ±10%	NA	NA	Not included in limited
Continuing Calibration Verification	1 GW, 1 FB+A10:E24	NA	NA	Not included in limited
Method/Instrument Blanks	No target analyte concentrations ≥ QL. SOP NO.: 5.A.16: abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GP59441/GN65280, ND
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GW-RI-FB-20250219 (JE5940-3)
Laboratory Control Standards	SOP/Lab limits: 90-110%	Yes	No	GP59441/GN65280 (103.8%R)
Matrix Spike	SOP/Lab limits: 80-120%	NA	NA	Batch QC
Matrix Spike Duplicate	SOP/Lab RPD <20%	NA	NA	Batch QC
Laboratory Duplicate	SOP/Lab: RPD ≤ 20%	NA	NA	
Field Duplicate	QAPP limits: RPD ≤ 30% when sulfate is detected in both samples ≥ 5x QL; Diff ≤ QL if values are < 5x QL	NA	NA	None with this SDG
Calculation Spot Checks	Full validation only	No	No	Not included in limited

Laboratory: SGS Dayton
Laboratory SDG/Job No: JE5940
Validation Level: Limited
Number of Samples/Matrix: 2 GW, 1 FB
Analysis (Include Method #): SM5310B

Client/Site Name: PPG 2025 GAG GW Remedial Activities
Project Number: 60732743 GWM.2024
Date: 3/12/2025
Validator: Charlene Flint
Reviewer and Date: Linda Waters 3/17/2025

SGS SOP: EGN234-32

Review Item	Criteria	Criteria Met? (Yes/No)	Qualification? (Yes/No)	Comments
Chain of Custody		Yes	No	
Sample Preservation	HCl to a pH <2. ≤6°C until analysis	Yes	No	2.1°C
Holding Time	28 days	Yes	No	Sampled 2/19/2025, analyzed 2/28/2025, 3/1/2025
Quantitation Limits	Reporting limits meet GW Action action goal. See dilutions tab	Yes	No	No dilutions
Initial Calibration	Lab limits: Linear = 5 pt cal, r2 ≥ 0.99 or %RSD ≤20%	NA	NA	Not included in limited
Initial Calibration Verification	ICV ±10%	NA	NA	Not included in limited
Continuing Calibration Verification	CCV ±15%	NA	NA	Not included in limited
Method/Instrument Blanks	No target analyte concentrations ≥ QL. SOP NO.: 5.A.16: abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GP59563/GN65554, ND
Field Blanks	QAPP: Either 1/day or 10% of the total number of samples collected SOP NO.: 5.A.16: 1/20 samples, abs value should not exceed MDL ---<3X the blank concentration were qualified as nondetect (UB) at the reported concentration, ---and results >3X blank, but <10 times the blank concentration qualify as estimated (JB) and may be biased high. --->10 times the blank no qualification.	Yes	No	GW-RI-FB-20250219 (JE5940-3)
Laboratory Control Standards	SOP/Lab limits: 90-110%	Yes	No	GP59563/GN65554 (96.0 %R)
Matrix Spike	SOP limits: 85-115%	NA	NA	None with this SDG
Matrix Spike Duplicate	SOP RPD <15%	NA	NA	None with this SDG
Laboratory Duplicate	SOP/Lab: RPD ≤ 15%	NA	NA	
Field Duplicate	QAPP limits: RPD ≤ 30% when TOC is detected in both samples ≥ 5x QL; Diff ≤ QL if values are < 5x QL	NA	NA	None with this SDG
Calculation Spot Checks	Full validation only	No	No	Not included in limited

Attachment E

Hexavalent Chromium Calculations

SDG#: JE5940/ Method 7196

GN65257

Cr+6 ICAL 2/20/2025

GW

(p. 400 of data pkg)

x - concentration	y - response
0	0
0.01	0.01
0.05	0.047
0.1	0.09
0.3	0.264
0.5	0.442
0.8	0.694
1	0.865

(p. 400 of data pkg)

AECOM Calculated Intercept	0.00315 OK	Reported intercept	0.0032
AECOM Slope	0.8648 OK	Reported Slope	0.8648
AECOM Calculated r	0.99996 OK	Reported r	0.99996

LCS calculation

GN65257-B1

P. 384, 400

Background absorbance	0		
Sample absorbance	0.135		
LCS Soluble Instrument Response	0.135		
Instrument Concentration (mg/L)	0.152		
Sample aliquot	0.05		
Final volume	0.05		
Dilution Factor	1		
AECOM Calculated LCS Result (mg/L)	0.152 OK	Reported Result (mg/L)	0.152

%R = Found/True*100

GN65257-B1

P. 384, 400

True Value (mg/L)	0.150		
AECOM Calculated %R	101.6 OK	Reported %R	101.3

MS calculation

GN65257-S1

P. 386, 400, 402

114-MW81D-123.0-20250219

Unfiltered

Background reading	0		
Total absorbance	0.131		
Total absorbance - background	0.131		
Instrument Concentration (mg/L)	0.1478		
Sample aliquot	0.05		
Final volume	0.05		
Dilution Factor	1		
AECOM Calculated MS Result (mg/L)	0.148 OK	Reported Result (mg/L)	0.148

%R = Found/True*100

GN65257-S1

P. 386, 400, 402

114-MW81D-123.0-20250219

True Value (mg/L)	0.150		
Native concentration (mg/L)	0.0000		
AECOM Calculated MS Result %R	98.6 OK	Reported %R	98.7

UNFILTERED

Reporting Limit

JE5940-1

P. 9, 400

114-MW81D-123.0-20250219

Low Standard	0.01		
Initial volume (L)	0.5		
Final volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Reporting Limit	0.010 OK	Reported RL (mg/L)=	0.010

UNFILTERED

Sample Calculations

JE5940-1

P. 9, 400

114-MW81D-123.0-20250219

Background reading	0		
Total absorbance	0.002		
Total absorbance - background	0.002		
Instrument Response (mg/L)	-0.001		
Sample volume (L)	0.5		
Final Volume (L)	0.5		
Dilution Factor	1		
AECOM Calculated Result (mg/L)	OK, <MDL report as -0.0013 ND	Reported Result (mg/L)	0.0026 U