

Table 3
Hexavalent Chromium and CCPW Metals in Groundwater Collected in 2016 and 2017
Site 156
PPG, Jersey City, New Jersey

Location ID	Sample ID	Lab Sample ID	Sample Date	Type	Analyte Units		ANTIMONY (µg/l)		CHROMIUM (µg/l)		(HEXAVALENT) (µg/l)		NICKEL (µg/l)		THALLIUM (µg/l)		VANADIUM (µg/l)		Specific Notes	TEMPERATURE (°C)	PH	SPECIFIC CONDUCTIVITY (mS/cm)	DISSOLVED OXYGEN (mg/L)	OXYGEN REDUCTION POTENTIAL (mV)	TURBIDITY (NTU)
					CAS RN	GWQS	7440-36-0	6	7440-47-3	70	18540-29-9	N/A	7440-02-0	100	7440-28-0	2	7440-62-2	60							
MW-1R	156-MW1R-20160510	JC19972-5	5/10/2016	N	NA		NA		7.2	J	NA		NA		NA		NA			15.9	6.74	3.69	0.55	-54.8	8.78
MW-1R	156-MW1R-20160510	JC19972-5A	5/10/2016	N	< 3.3	U	4.2	J			< 0.76	U	< 1.9	U	7.8	J				15.9	6.74	3.69	0.55	-54.8	8.78
MW-1R	156-MW1R-20160616	JC22339-4	6/16/2016	N	NA		NA		14	RA	NA		NA		NA					17.5	6.00	2.98	1.96	-32.0	4.58
MW-1R	156-MW1R-20160616	JC22339-4A	6/16/2016	N	< 3.3	U	4.7	J			< 0.76	U	< 1.9	U	7.2	J				17.5	6.00	2.98	1.96	-32.0	4.58
MW-1R	156-MW51R-20160616	JC22339-5	6/16/2016	FD	NA		NA		14	RA	NA		NA		NA					17.5	6.00	2.98	1.96	-32.0	4.58
MW-1R	156-MW51R-20160616	JC22339-5A	6/16/2016	FD	< 3.3	U	4.1	J			1.2	J	< 1.9	U	6.7	J				17.5	6.00	2.98	1.96	-32.0	4.58
MW-3	156-MW3-20160511	JC20060-1	5/11/2016	N	NA		NA		20		NA		NA		NA					13.4	6.60	5.62	1.14	-65.5	8.62
MW-3	156-MW3-20160511	JC20060-1A	5/11/2016	N	< 3.3	U	< 0.81	U			0.80	J	< 3.8	U	2.6	J	S1			13.4	6.60	5.62	1.14	-65.5	8.62
MW-3	156-MW3-20160617	JC22453-2	6/17/2016	N	NA		NA		6.9	J	NA		NA		NA					17.3	6.20	6.81	20.8	109	6.10
MW-3	156-MW3-20160617	JC22453-2A	6/17/2016	N	< 3.3	U	2.7	J			1.3	J	1.9	J	3.4	J				17.3	6.20	6.81	20.8	109	6.10
MW-4	MW-04_051716	JC20458-1	5/17/2016	N	< 3.3	U	1.9	J	17	RA	< 0.76	U	< 1.9	U	2.4	J				13.8	6.60	1.78	4.69	-76.0	7.10
MW-4	156-MW4-20160714	JC24082-1	7/14/2016	N	< 3.3	U	1.8	J	44		1.4	J	< 1.9	U	2.0	J				19.5	6.63	18.4	0.29	-99.7	29.9
MW-5R	156-MW5R-20160510	JC19972-2	5/10/2016	N	NA		NA		< 3.9	U	NA		NA		NA					19.0	7.56	0.85	0.44	-54.5	1.85
MW-5R	156-MW5R-20160510	JC19972-2A	5/10/2016	N	< 3.3	U	1.5	J			< 0.76	U	< 1.9	U	< 0.66	U				19.0	7.56	0.85	0.44	-54.5	1.85
MW-5R	156-MW5R-20160616	JC22339-3	6/16/2016	N	NA		NA		< 3.9	RA	NA		NA		NA					20.8	7.33	0.79	15.2	127	10.6
MW-5R	156-MW5R-20160616	JC22339-3A	6/16/2016	N	< 3.3	U	4.8	J			2.0	J	< 1.9	U	2.1	J				20.8	7.33	0.79	15.2	127	10.6
MW-6	156-MW6-20160510	JC19972-3	5/10/2016	N	NA		NA		4.0	J	NA		NA		NA					15.9	7.50	5.76	1.67	-104	2.73
MW-6	156-MW6-20160510	JC19972-3A	5/10/2016	N	< 3.3	U	1.7	J			18.0		< 3.8	U	17.7	J	S1			15.9	7.50	5.76	1.67	-104	2.73
MW-6	156-MW6-20160616	JC22339-1	6/16/2016	N	NA		NA		5.4	RA	NA		NA		NA					18.3	6.13	4.20	1.29	-85.6	4.87
MW-6	156-MW6-20160616	JC22339-1A	6/16/2016	N	< 3.3	U	4.0	J			32.5		< 1.9	U	18.3	J				18.3	6.13	4.20	1.29	-85.6	4.87
MW-6	156-MW6D-20160510	JC19972-4	5/10/2016	FD	NA		NA		< 3.9	U	NA		NA		NA					15.9	7.50	5.76	1.67	-104	2.73
MW-6	156-MW6D-20160510	JC19972-4A	5/10/2016	FD	< 3.3	U	1.7	J			16.6	J	< 1.9	U	16.3	J				15.9	7.50	5.76	1.67	-104	2.73
MW-7	156-MW7-20160510	JC19972-1	5/10/2016	N	NA		NA		< 3.9	U	NA		NA		NA					16.3	7.80	0.93	0.37	31.3	1.47
MW-7	156-MW7-20160510	JC19972-1A	5/10/2016	N	< 3.3	U	3.1	J			< 0.76	U	< 1.9	U	7.5	J				16.3	7.80	0.93	0.37	31.3	1.47
MW-7	156-MW7-20160617	JC22453-4	6/17/2016	N	NA		NA		< 3.9	U	NA		NA		NA					18.5	7.41	0.97	1.66	384	4.71
MW-7	156-MW7-20160617	JC22453-4A	6/17/2016	N	< 3.3	U	2.0	J			2.9	J	< 1.9	U	2.1	J				18.5	7.41	0.97	1.66	384	4.71
MW-8	156-MW8-20160511	JC20060-2	5/11/2016	N	NA		NA		< 3.9	U	NA		NA		NA					16.1	7.24	1.66	1.51	-68.1	0.40
MW-8	156-MW8-20160511	JC20060-2A	5/11/2016	N	< 3.3	U	472				4.1	J	< 1.9	U	6.8	J	S2			16.1	7.24	1.66	1.51	-68.1	0.40
MW-8	156-MW8-20160617	JC22453-1	6/17/2016	N	NA		NA		5.8	J	NA		NA		NA					18.4	6.79	2.53	3.75	-30.2	4.84
MW-8	156-MW8-20160617	JC22453-1A	6/17/2016	N	< 3.3	U	730				3.7	J	< 1.9	U	13.2	J	S2			18.4	6.79	2.53	3.75	-30.2	4.84
MW-9	156-MW9-20160511	JC20060-3	5/11/2016	N	NA		NA		31		NA		NA		NA					15.7	6.65	1.20	0.43	-56.0	-0.42
MW-9	156-MW9-20160511	JC20060-3A	5/11/2016	N	< 3.3	U	1.3	J			< 0.76	U	< 1.9	U	1.5	J				15.7	6.65	1.20	0.43	-56.0	-0.42
MW-9	156-MW9-20160616	JC22339-2	6/16/2016	N	NA		NA		50	RA	NA		NA		NA					16.7	6.23	1.19	40.4	65.5	4.49
MW-9	156-MW9-20160616	JC22339-2A	6/16/2016	N	< 3.3	U	1.9	J			< 0.76	U	< 1.9	U	1.7	J				16.7	6.23	1.19	40.4	65.5	4.49
MW-10	156-MW10-20160511	JC20060-5	5/11/2016	N	NA		NA		< 3.9	U	NA		NA		NA					26.0	7.40	0.28	1.76	17.6	1.50
MW-10	156-MW10-20160511	JC20060-5A	5/11/2016	N	5.1	J	42.2				17.4		< 1.9	U	10.9	J				26.0	7.40	0.28	1.76	17.6	1.50
MW-10	156-MW10-20160617	JC22453-3	6/17/2016	N	NA		NA		< 3.9	U	NA		NA		NA					26.0	7.48	1.83	5.36	115	4.05
MW-10	156-MW10-20160617	JC22453-3A	6/17/2016	N	< 3.3	U	5.3	J			62.7		< 1.9	U	5.2	J				26.0	7.48	1.83	5.36	115	4.05
156-MW8A	156-MW8A-20171121	JC55900-1	11/21/2017	N	NA		NA		< 8.1	U	NA		NA		NA		S2			18.7	7.35	2.85	0.83	201	3.41
156-MW8A	156-MW8A-20171121	JC55900-1A	11/21/2017	N	< 22	U	0.90	J			10.6	J	< 8.2	U	1.7	J	S1, S2			18.7	7.35	2.85	0.83	201	3.41
156-MW8A	156-MW8A-20171121X	JC55900-2	11/21/2017	FD	NA		NA		< 8.1	U	NA		NA		NA		S2			18.7	7.35	2.85	0.83	201	3.41
156-MW8A	156-MW8A-20171121X	JC55900-2A	11/21/2017	FD	< 4.3	U	1.4	J			10.9	J	< 8.2	U	2.5	J	S1, S2			18.7	7.35	2.85	0.83	201	3.41
156-MW8A	156-MW8A-20171221	JC57819-1	12/21/2017	N	NA		NA		< 8.1	U	NA		NA		NA		S2			15.0	7.31	2.90	0.33	46.5	6.30
156-MW8A	156-MW8A-20171221	JC57819-1A	12/21/2017	N	< 4.3	U	2.2	J			< 1.3	UJ	< 8.2	U	2.6	J	S1, S2			15.0	7.31	2.90	0.33	46.5	6.30

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Location ID	Sample ID	Lab Sample ID	Sample Date	Type	Analyte	ANTIMONY	CHROMIUM	(HEXAVALENT	NICKEL	THALLIUM	VANADIUM	Specific Notes	TEMPERATURE	PH	SPECIFIC CONDUCTIVITY	DISSOLVED OXYGEN	OXYGEN REDUCTION POTENTIAL	TURBIDITY			
					Units	(µg/l)	(µg/l)) (µg/l)	(µg/l)	(µg/l)	(µg/l)		(°C)		(mS/cm)	(mg/L)	(mV)	(NTU)			
					CAS RN	7440-36-0	7440-47-3	18540-29-9	7440-02-0	7440-28-0	7440-62-2		N/A	N/A	N/A	N/A	N/A	N/A			
					GWQS	6	70	N/A	100	2	60										
156-MW8A	156-MW8A-20171221X	JC57819-2	12/21/2017	FD	NA	NA	NA	< 8.1	U	NA	NA	S2	15.0	7.31	2.90	0.33	46.5	6.30			
156-MW8A	156-MW8A-20171221X	JC57819-2A	12/21/2017	FD	< 4.3	U	2.4	J	< 1.3	UJ	< 8.2	U	2.3	J	S1, S2	15.0	7.31	2.90	0.33	46.5	6.30
156-MW8B	156-MW8B-20171121	JC55900-3	11/21/2017	N	NA	NA	NA	< 8.1	U	NA	NA		19.0	8.39	13.3	0.06	-199	5.97			
156-MW8B	156-MW8B-20171121	JC55900-3A	11/21/2017	N	< 4.3	U	1.9	J	< 6.7	U	< 8.2	U	22.8	J	S1	19.0	8.39	13.3	0.06	-199	5.97
156-MW8B	156-MW8B-20171221	JC57819-3	12/21/2017	N	NA	NA	NA	< 8.1	U	NA	NA		16.0	8.10	10.1	0.11	-149	5.01			
156-MW8B	156-MW8B-20171221	JC57819-3A	12/21/2017	N	< 4.3	U	4.5	J	< 6.7	U	9.7	J	41.8	J	S3	16.0	8.10	10.1	0.11	-149	5.01

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Abbreviations:

µg/l - micrograms per liter

°C - degrees Celsius

CAS RN - Chemical Abstracts Service Registry Number

CCPW - Chromate Chemical Production Waste

Cr - total chromium

Cr⁺⁶ - hexavalent chromium

EB - equipment blank sample type

FD - field duplicate sample type

GWQS - Ground Water Quality Standard

IRIS - Integrated Risk Information System

mg/L - milligrams per liter

mS/cm - millisiemens per centimeter

mV - millivolts

N - normal sample type

N/A - not applicable

NA - not analyzed

N.J.A.C. - New Jersey Administrative Code

NTU - nephelometric unit

USEPA - United States Environmental Protection Agency

Data Qualifiers:

J - The result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.

RA - The result was rejected due to deficiencies but is considered usable for decision-making purposes.

U - The analyte was not detected above the sample reporting limit shown.

UJ - The analyte was not detected above the sample reporting limit shown and the reporting limit was approximate.

General Notes:

1. GWQS exceedances are bolded.

2. The GWQS for vanadium pentoxide is shown. A GWQS has not been established for total vanadium. The USEPA IRIS database, which is incorporated into N.J.A.C. 7:9D by reference, has not assigned a Carcinogenic Slope Factor or Reference Dose for vanadium and a GWQS cannot be calculated.

3. Temperature, pH, specific conductivity, dissolved oxygen, oxygen reduction potential, and turbidity are field-measured parameters.

Specific Notes:

S1. The elevated detection limits for antimony and thallium are not considered CCPW related but are due to dilution required for matrix interference.

S2. Well MW-8 was removed during remediation of Supplemental Layout Area 3 in 2017. The sample results from well 156-MW8A are representative of groundwater in the vicinity of MW-8 post-remediation.

S3. The thallium exceedance in well 156-MW8B is not CCPW related because: 1) the intermediate well is screened below the meadow mat, which acts as a confining layer; 2) the Cr concentrations are compliant with the GWQS in all shallow wells and this intermediate well, there were no detections exceeding the current GWQS in the source area well (MW-2) which was sampled in 1993; 3) the Cr⁺⁶ concentrations are not detected in both samples collected from the intermediate well; and 4) there are no remaining soil samples with thallium exceedances.