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719 2ND AVENUE, SUITE 200 | SEATTLE, WA 98104 | P 206.394.3700

May 26, 2020
Parametrix No. 553-1625-014

Jeff Williamson
Coal Creek Development LLC
PO Box 1743
Bellevue, WA 98009

Re: March 2020 Groundwater Sampling Event, Newcastle Demolition Landfill

Dear Mr. Williamson:

INTRODUCTION

This report summarizes the groundwater monitoring data collected in March 2020 at the Newcastle Demolition Landfill. Sample collection and data analyses were conducted in accordance with the Newcastle Demolition Landfill Post-Closure Plan (Parametrix 1998).

The landfill was formerly owned and operated by Coal Creek Development Corporation and accepted demolition and inert waste until 1992. It was formally closed in June 1993 and has since been developed as a golf course by Newcastle Golf LLC.

The Newcastle Demolition Landfill is located in an area historically mined for coal (Parametrix 1991). The underlying geology of the site consists of a thick sequence of inclined interbedded coal, sandstone, and shale beds of the Eocene Renton Formation. The site is underlain by a complex network of coal mine workings that appear to control much of the groundwater flow beneath the site. Southwesterly regional groundwater flow is substantially intercepted by the mine workings that drain to the west and discharge directly or indirectly into the Richmond Tunnel that flows into Coal Creek. The monitoring wells are installed within bedrock between the workings, and the observed water levels are at elevations expected for groundwater influenced by the draining of the mine workings by the Richmond Tunnel.

MONITORING PROGRAM HISTORY

The downgradient monitoring wells on the golf course (MW-2, MW-3, and MW-4) were disturbed during golf course construction beginning in 1996. Some interim repairs were made during the golf course construction to allow groundwater monitoring to continue, although final completion of the well monuments did not occur until February 2000. At that time the wells were redeveloped and were thought to be suitable for detecting potential impacts to groundwater quality from the former landfill. However, during the golf course construction period there may have been some impacts to groundwater quality in the monitoring wells due to surface water or soil intrusion. The history of activity associated with the wells during golf course construction was summarized in the November 1999 report (Parametrix 2000).

Damage to well MW-4 indicated by high turbidity was first noted in December 2000. Attempts to redevelop the well in February 2001 were unsuccessful. Well MW-4 was decommissioned and replaced in August 2001 with new monitoring well MW-5. MW-5 is located approximately 500 ft northwest of MW-4 (see Figures 1 and 2). The installation of well MW-5 was documented in a letter from Parametrix to Landmarc Technologies (Parametrix 2001).

From 1996 through 2000, a variable groundwater monitoring schedule was established by the Seattle-King County Department of Public Health (Coal Creek Development Corporation 1996). However, the downgradient wells, particularly well MW-3, were frequently dry during much of the year. During the September 2001 sampling event, all the wells were dry except for upgradient well MW-1. Therefore, no samples were collected, and an alternative sampling schedule was proposed to the Health Department (now known as Public Health – Seattle & King County). The proposed sampling schedule consisted of sampling in January and April when water volumes were expected to be adequate for sampling, and measuring depth to groundwater during the fall when groundwater levels were expected to be at their lowest point.

The current groundwater monitoring program for the closed Newcastle Demolition Landfill consists of sampling four groundwater monitoring wells (MW-1, MW-2, MW-3, and MW-5) and two off-site surface water stations (SW-6 and SW-7). Well MW-1 is upgradient of the landfill, and the other wells and stations are downgradient or downstream of the landfill. Surface water station SW-6, located at the Richmond Tunnel mine discharge, is thought to be representative of groundwater intercepted by a network of mine workings beneath the site that discharges into Coal Creek. Surface water station SW-7 is located farther downstream along Coal Creek. The monitoring well locations are shown on Figures 1 and 2, and the surface water station locations are shown on Figure 3. The locations of the downgradient wells with respect to landfill and golf course features are shown on Figure 2.

In September 2006, recommendations were submitted by Landmarc Technologies, Inc. to Public Health for reducing the monitoring frequency and parameters at the Newcastle Demolition Landfill (Parametrix 2006). It was recommended that the frequency of groundwater monitoring be reduced to annual, and analyses for volatile organic compounds, semi-volatile organic compounds, and metals (except for arsenic) be discontinued. These parameters are not required by Chapter 173-304 Washington Administrative Code (WAC), and the historical data since landfill closure have not indicated any detections of these parameters associated with impacts from the landfill. Reduction in monitoring frequency and parameters based on consistent lack of contamination from the landfill is in accordance with the language of the Post-Closure Monitoring Plan. These recommendations were implemented beginning with the February 2007 event.

MARCH 2020 SAMPLING EVENT

Samples were collected on March 17, 2020, by Parametrix personnel. Samples were collected from wells MW-1 and MW-2 using dedicated Hydrostar pumps, and from wells MW-3 and MW-5 using dedicated electrical submersible pumps. Samples were collected using low-flow purging methods. Samples to be analyzed for dissolved metals were field-filtered through 0.45-micron filters. A duplicate sample (designated MW-6) was collected at monitoring well MW-2.

Samples were delivered directly to Analytical Resources, Inc. (ARI) in Seattle, Washington, for analysis. Samples were measured for field parameters (pH, specific conductivity, and temperature), and analyzed for chloride, nitrite, nitrate, ammonia, sulfate, hardness (dissolved calcium and magnesium), dissolved arsenic, dissolved iron, dissolved manganese, dissolved zinc, chemical oxygen demand (COD), total organic carbon (TOC), and total dissolved solids (TDS). Additional field parameters measured included Dissolved oxygen (DO) and oxygen reduction potential (redox).

SAMPLING RESULTS

The analytical results for the monitoring wells and surface water stations are summarized in Table 1. The laboratory report and chain-of-custody forms are presented in Appendix A.

Data Validation

Parametrix conducted a quality assurance (QA) review of the laboratory data, including holding times, field duplicate results, and blank results. The laboratory QA internal standard data were also reviewed, including matrix spikes, matrix spike duplicates, surrogate recoveries, and laboratory control samples. As a result of the review, the MW-2 data for nitrate, nitrite, COD and iron were qualified "J" as estimated due to high relative percent difference between the sample and field duplicate.

Data Analysis

Data analysis consisted of comparing groundwater data (from monitoring wells and surface water station SW-6) and surface water to established state groundwater quality standards (GWQSs; 173-200 WAC) and state maximum contaminant levels (MCLs) for drinking water (246-290 WAC), preparing time-series plots, and conducting Mann-Kendall trend analyses for selected analytes in monitoring wells.

Comparison of Data to Groundwater Quality Standards

The following constituents were present at concentrations above secondary GWQSs and/or MCLs (established based on aesthetic characteristics such as taste, appearance, and/or staining):

- pH in in the sample from well MW-2;
- Specific conductivity in samples from well MW-1 (upgradient) and surface water station SW-6;
- TDS in the sample from well MW-1 (upgradient);
- Dissolved iron in samples from wells MW-2, MW-3, MW-5, and surface water station SW-6;
- Dissolved manganese in samples from wells MW-1 (upgradient), MW-2, MW-5, and surface water stations SW-6 and SW-7.

Dissolved arsenic concentrations in samples from wells MW-1 (upgradient well), MW-2, MW-3, MW-5, and surface water stations SW-6 and SW-7 exceeded the carcinogenic GWQS but not the MCL.

The presence of constituents above their GWQS and/or MCL upgradient from the landfill at MW-1 indicates that the aesthetic characteristics of groundwater in the landfill vicinity are a natural artifact of the local geochemistry.

Time-Series Plots

Groundwater and surface water time-series plots were prepared for dissolved arsenic, ammonia, dissolved calcium, chloride, COD, hardness, dissolved iron, dissolved manganese, specific conductivity, sulfate, and TOC. These constituents were selected for statistical analyses to include parameters that were elevated in leachate with respect to groundwater (Pacific Groundwater Group 1994a).

Dissolved arsenic has been added because it was a constituent of interest discussed in Ecology's Periodic Review (Ecology 2013). These plots are presented in Appendix B and show data collected since 1994. Based on the time-series plots, the following observations can be made:

- Sulfate and hardness (and dissolved calcium) concentrations continued to be highest in upgradient well MW-1.
- In MW-2, concentrations of dissolved iron continued to be lower than the relatively high concentrations measured between 1999 and 2000, although the results for TOC and COD were higher in 2019 and 2020 than typically observed. Specific conductivity and concentrations of chloride and hardness (and dissolved calcium) increased beginning in 2007 but have been declining since then, and the 2019 and 2020 concentrations were lower than typically observed. The elevated concentration of dissolved manganese observed in 2019 was not verified in 2020.
- In MW-3, concentrations of most parameters have remained stable or decreased over the last few years. Specific conductivity, and concentrations of ammonia, chloride, hardness (and dissolved calcium), dissolved iron, dissolved manganese, and TOC continued to be lower compared to the relatively high values observed during 2002.
- In MW-5, stable or decreasing trends have been observed over the history of monitoring.
- At SW-6, concentrations of sulfate, and dissolved manganese have decreased since over the history of monitoring.

Mann-Kendall Tests

The Mann-Kendall test for trends (Gilbert 1987, Gibbons 1994) was used to evaluate the Newcastle Demolition Landfill groundwater data (Pacific Groundwater Group 1994a,b,c). Trends in each well were evaluated separately because the upgradient well continues to show higher concentrations of some constituents than the downgradient wells. The trend analyses used all data collected between April 1988 and March 2020 (except for specific conductivity results for the second 1998 semi-annual monitoring event, which are suspected to be erroneously low due to an error in calibrating the meter). All non-detected values were given a value equal to the reporting limit (Gilbert 1987, Gibbons 1994).

The results of the trend analyses are summarized in Table 2. The Mann-Kendall tests indicate the following:

- MW-1: statistically significant increasing trends in chloride, COD, and TOC; statistically significant decreasing trends in dissolved arsenic and dissolved manganese, upgradient from the landfill;
- MW-2: statistically significant increasing trends in ammonia, dissolved calcium, chloride, COD, hardness, dissolved iron, dissolved manganese, specific conductivity, and TOC; a statistically significant decreasing trend in dissolved arsenic;
- MW-3: statistically significant increasing trends in ammonia, COD, dissolved iron, specific conductivity, and TOC; statistically significant decreasing trends in dissolved calcium, chloride, hardness, and dissolved manganese; and
- MW-5: statistically significant decreasing trends in dissolved arsenic, dissolved calcium, chloride, hardness, specific conductivity, and sulfate.

GROUNDWATER LEVEL MONITORING RESULTS

Groundwater levels were measured at the monitoring wells prior to sampling. Depth to water could not be measured at MW-1 due to wellhead constraints. The measurements are presented in Table 3 with calculated water elevations.

DISCUSSION AND CONCLUSIONS

Analysis of the March 2020 groundwater data from the Newcastle Demolition Landfill indicates the following:

- The differences in groundwater chemistry between monitoring wells suggest that the observed water chemistry is influenced by local geochemical conditions, and therefore do not clearly demonstrate landfill impacts. Concentrations exceeding secondary GWQSs or MCLs (pH, specific conductivity, TDS, dissolved iron, and dissolved manganese) occurred in the upgradient well and in downgradient wells and the surface water stations. Dissolved arsenic concentrations exceeded the carcinogenic GWQS in all wells (including the upgradient well) and surface water stations. All dissolved arsenic concentrations were below the MCL. Statistically significant increasing trends in indicator parameters were also observed in both upgradient and downgradient wells.
- Some of the variations in concentrations may be related to changed geochemical conditions associated with golf course development activities. In recent years data for wells MW-2 and MW-3 have indicated lower concentrations for parameters that were elevated following the golf course construction period during 1996 through 2002 (including dissolved iron, dissolved manganese, and TOC). However, the March 2020 concentrations of TOC and COD in well MW-2 were higher than typically observed.

Please contact me at (206) 394-3667 or lgilbert@parametrix.com if you have questions regarding this report.

Sincerely,

Parametrix

Lisa A. Gilbert, LHG
Project Hydrogeologist

cc:
Richard Morck, P.E. – Landmarc Technologies, Inc.
Darshan S. Dhillon, Public Health – Seattle & King County
Tim O'Connor LG, LHG, Solid Waste Management Program, Washington State Department of Ecology, NWRO
Tamara Welty, LG, LHG, Periodic Reviewer & Site Manager, Toxics Cleanup Program, Washington State Department of Ecology, NWRO

REFERENCES

Coal Creek Development Corporation. 1996. Letter to Parametrix. February 2, 1996.

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Gibbons, R.D. 1994. Statistical Methods for Groundwater Monitoring. John Wiley and Sons, Inc. New York

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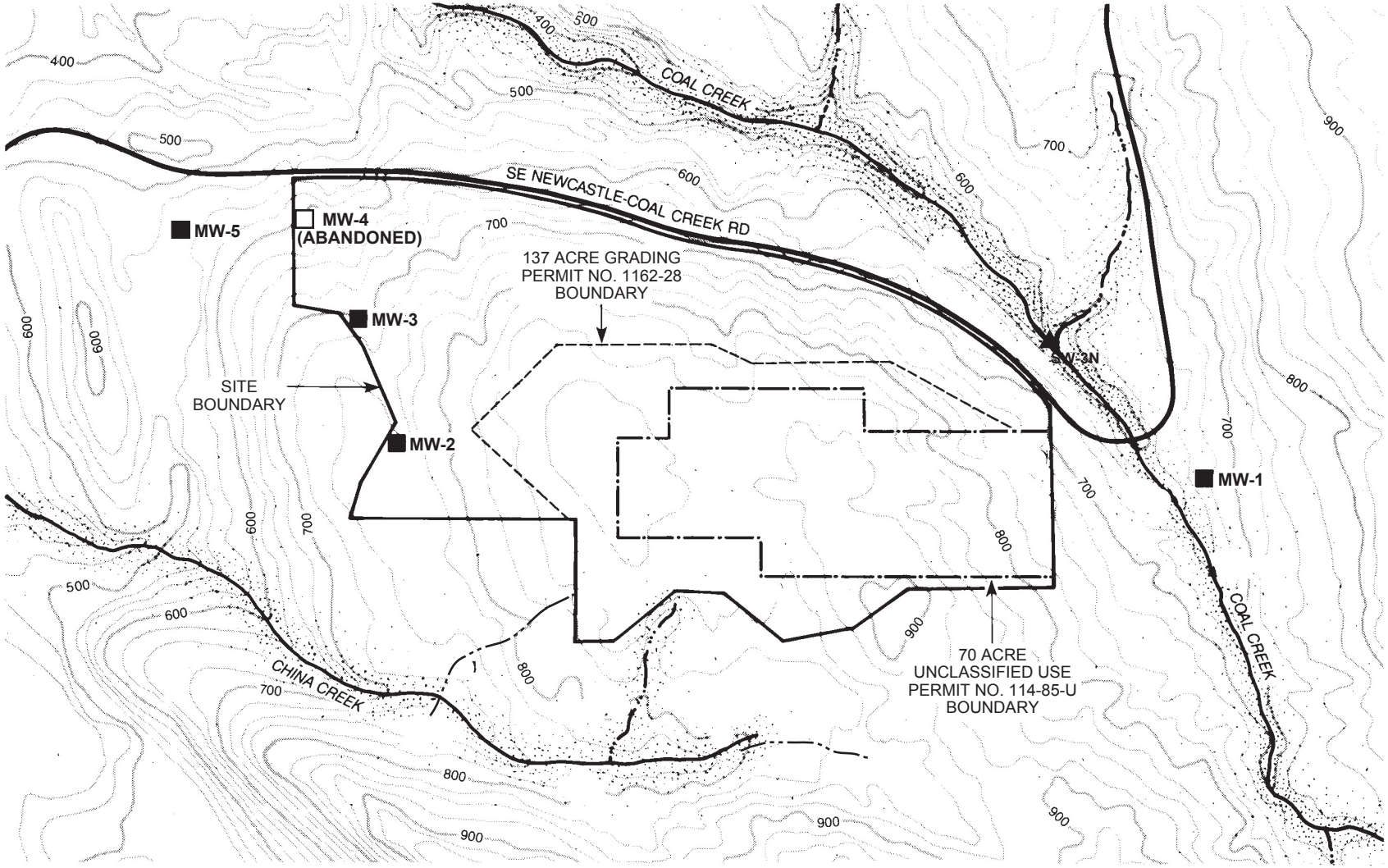
Parametrix, Inc. 2006. Recommendations for Reduction in Groundwater Monitoring, Newcastle Demolition Landfill. Prepared for Landmarc Technologies, Inc. September 7, 2006.

Figures



Parametrix 555-3747-001/01(01) 5/09 (B)

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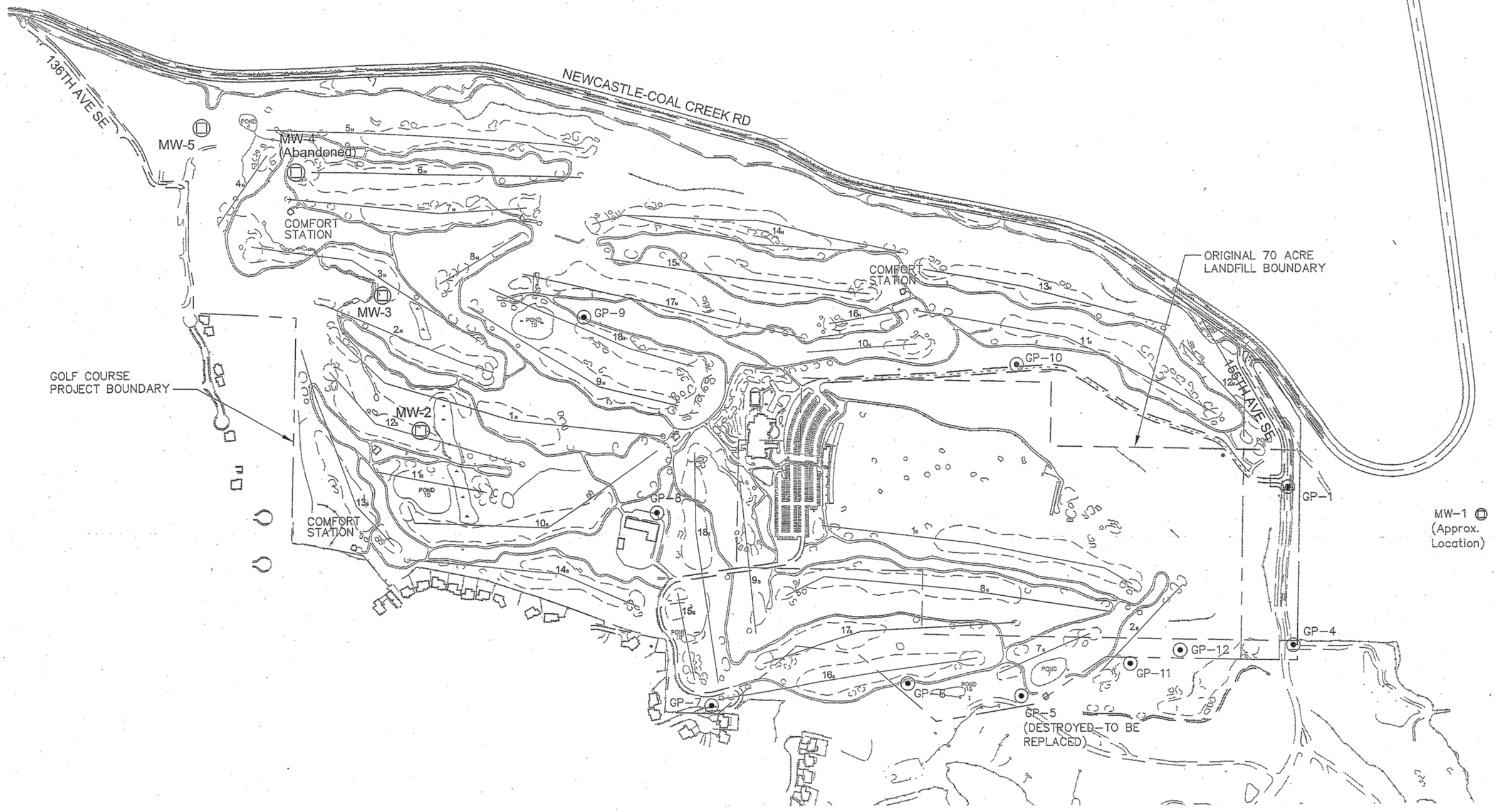
SCALE IN FEET

■ **MW-1** Groundwater Monitoring Well

Figure 1
Groundwater Monitoring Locations in Site Vicinity
Newcastle Demolition Landfill



FILE: K3747001P01T01-F02
DATE: 04/10/03

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SCALE IN FEET

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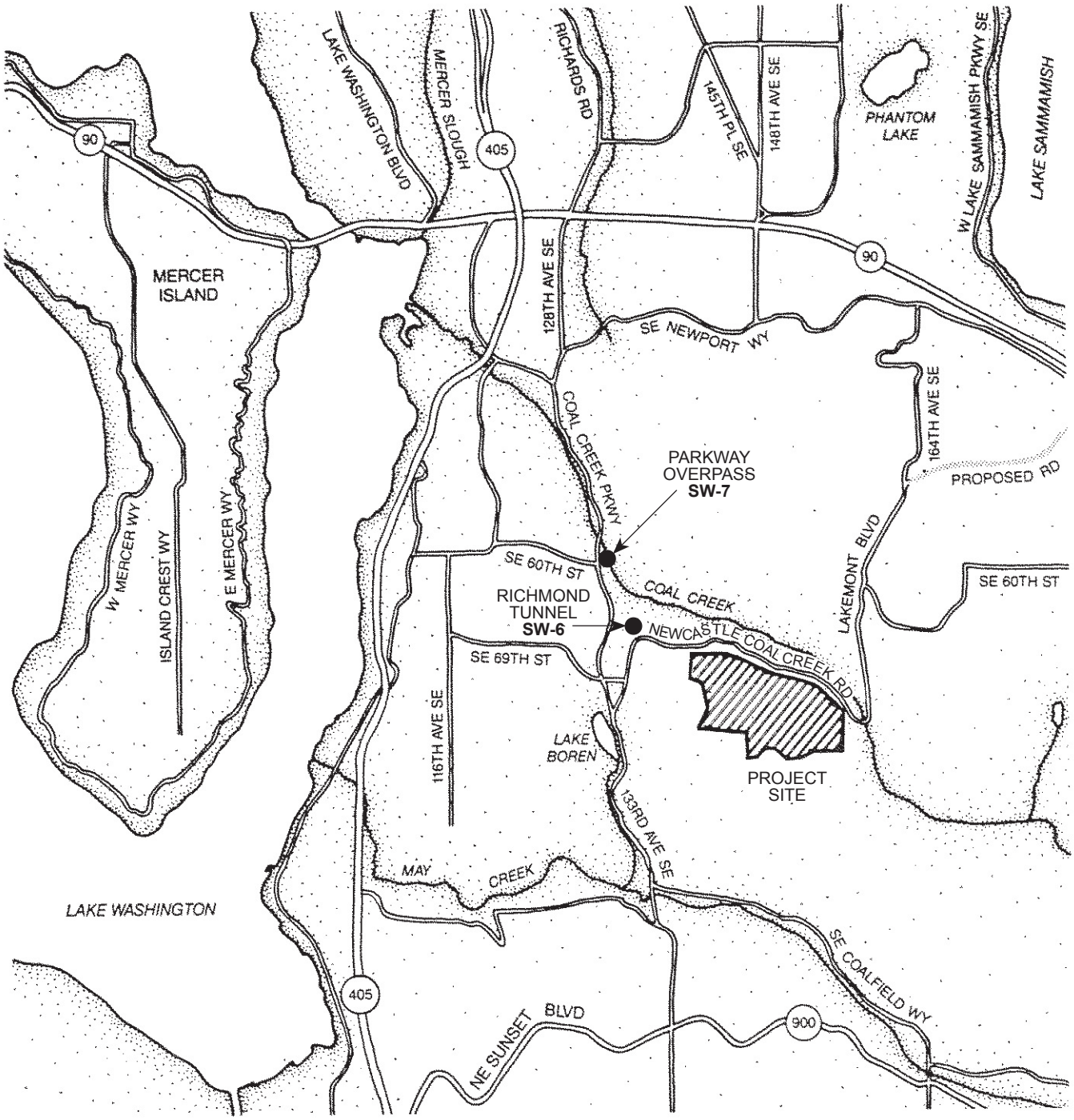
LEGEND

- MW-2 — Groundwater Monitoring Well (Field Located 10/22/01)
- GP-1 — Gas Probe Location (Field Located 10/22/01)
- COMFORT STATION — Comfort Station (Restroom)
- Pond and "Creek" System
- Storm Drainage Control Facility
- Golf Cart Path
- 14s — Golf Course Fairway Alignment and Number

Figure 2
Groundwater Monitoring Well Locations and Golf Course Features, Newcastle Demolition Landfill Area



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N

0 1

SCALE IN MILES

● Surface Water Monitoring Site

Figure 3
Off-site Monitoring Locations
Newcastle Demolition Landfill

Tables

Table 1. Newcastle Groundwater and Surface Water Data

				Groundwater					Surface Water	
Parameter	**Units**	**GWQS**	**MCL**	**MW-1 3/17/2020**	**MW-2 3/17/2020**	**MW-6 (MW-2 Dup) 3/17/2020**	**MW-3 3/17/2020**	**MW-5 3/17/2020**	**SW-6 3/17/2020**	**SW-7 3/17/2020**
Field Data										
Temperature	°C			7.8	10.5	- -	11.7	15.9	12.0	8.4
pH	standard	6.5-8.5 **		7.24	**6.23**	- -	7.64	6.58	7.26	8.42
Specific Conductivity	uS/cm		700 **	**900**	175.5	- -	671	544.1	**973**	421.9
DO	mg/L			0.98	1.64	- -	1.19	0.67	10.80	12.48
Redox	mV			176.0	148.5	- -	-138.5	-5.6	-69.9	67.2
Conventionals										
Total Dissolved Solids	mg/L	500 **	500 **	**621**	130	130	404	323	297	262
Chloride	mg/L	250 **	250 **	2.72	1.06	1.11	6.09	3.29	5.45	8.74
Ammonia	mg-N/L			0.047	0.158	0.184	0.508	0.070	0.185	0.040 U
Nitrate	mg-N/L	10 *	10 *	0.137	0.0826 J	0.0341 J	0.0200 U	0.0200 U	0.0274	0.535
Nitrate + Nitrite	mg-N/L			0.137	0.083 J	0.034 J	0.010 U	0.010 U	0.027	0.535
Nitrite	mg-N/L		1 *	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U
Sulfate	mg/L	250 **	250 **	209	3.01	3.22	21.0	52.2	194	72.4
Chemical Oxygen Demand	mg/L			10.0 U	64.7 J	42.8 J	14.2	10.0 U	10.0 U	10.0 U
Total Organic Carbon	mg/L			0.81	22.20	21.44	3.91	2.31	1.50	2.24
Dissolved Hardness	mg/L			540	83.4	84.2	53.2	276	396	163
Dissolved Metals										
Arsenic	mg/L	0.00005 ***	0.01 *	**0.000167** J	**0.000810**	**0.000805**	**0.00171**	**0.00628**	**0.00455**	**0.000935**
Calcium	mg/L			142	24.6	24.9	11.2	66.3	78.1	35.4
Iron	mg/L	0.3 **	0.3 **	0.0564	**0.584** J	**0.440** J	**0.645**	**4.09**	**3.27**	0.0801
Magnesium	mg/L			45.2	5.30	5.36	6.12	26.8	48.7	18.1
Manganese	mg/L	0.05 **	0.05 **	**0.0844**	**0.593**	**0.698**	0.0399	**0.530**	**0.298**	**0.0589**
Zinc	mg/L	5 **	5 **	0.0100 U	0.0479	0.0432	0.0100 U	0.0062 J	0.0100 U	0.0100 U

Notes:

GWQS = Water Quality Standards for Ground Waters of the State of Washington (173-200 WAC)
MCL = Maximum Contaminant Level, Washington State Drinking Water Regulations (Chapter 246-290 WAC)
* = Primary contaminant criteria
** = Secondary contaminant criteria
*** = Carcinogenic contaminant criteria
= Exceeds GWQS or MCL
U = Compound undetected at the specified reporting limit
J = Estimated concentration below reporting limit, or QC requirements not met

Table 2. Results of Mann-Kendall Tests for Trend, Newcastle Demolition Landfill, March 2020

Well ID	Analyte	n	S	Variance	Z	Trend
MW-1	Ammonia-N	60	247	24554.3	1.57	No Trend
	Arsenic	**22**	**-154**	**1226.7**	**-4.37**	**Negative**
	Calcium, Dissolved	57	60	21060.0	0.41	No Trend
	Chloride	**60**	**497**	**24471.0**	**3.17**	**Positive**
	COD	**60**	**405**	**14067.0**	**3.41**	**Positive**
	Hardness	59	49	23311.0	0.31	No Trend
	Iron, Dissolved	60	233	24561.0	1.48	No Trend
	Manganese, Dissolved	**60**	**-368**	**24555.3**	**-2.34**	**Negative**
	Specific Conductivity	59	44	23382.7	0.28	No Trend
	Sulfate	60	10	24553.3	0.06	No Trend
	TOC	**60**	**374**	**22274.7**	**2.50**	**Positive**
MW-2	**Ammonia-N**	**54**	**276**	**17964.0**	**2.05**	**Positive**
	Arsenic	**22**	**-107**	**1161.7**	**-3.11**	**Negative**
	Calcium, Dissolved	**49**	**487**	**13457.7**	**4.19**	**Positive**
	Chloride	**54**	**764**	**17937.3**	**5.70**	**Positive**
	COD	**54**	**327**	**17786.3**	**2.44**	**Positive**
	Hardness	**51**	**475**	**15099.7**	**3.86**	**Positive**
	Iron, Dissolved	**54**	**646**	**17959.3**	**4.81**	**Positive**
	Manganese, Dissolved	**53**	**331**	**16985.7**	**2.53**	**Positive**
	Specific Conductivity	**51**	**419**	**15158.3**	**3.40**	**Positive**
	Sulfate	53	-136	16986.7	-1.04	No Trend
	TOC	**54**	**608**	**17957.3**	**4.53**	**Positive**
MW-3	**Ammonia-N**	**40**	**188**	**7364.7**	**2.18**	**Positive**
	Arsenic	20	-1	944.3	0.00	No Trend
	Calcium, Dissolved	**37**	**-278**	**5844.0**	**-3.62**	**Negative**
	Chloride	**41**	**-342**	**7918.0**	**-3.83**	**Negative**
	COD	**41**	**263**	**7757.0**	**2.97**	**Positive**
	Hardness	**38**	**-320**	**6314.0**	**-4.01**	**Negative**
	Iron, Dissolved	**41**	**181**	**7923.7**	**2.02**	**Positive**
	Manganese, Dissolved	**40**	**-404**	**7360.0**	**-4.70**	**Negative**
	Specific Conductivity	**41**	**213**	**7925.7**	**2.38**	**Positive**
	Sulfate	41	-12	7922.7	-0.12	No Trend
	TOC	**41**	**348**	**7920.7**	**3.90**	**Positive**

n = Sample size

S = Mann-Kendall test statistic. Positive number implies an increasing trend; negative number implies a decreasing trend.

Z = Approximate normal test statistic; calculated based on S and the estimated variance when the sample size is greater than 10.

The comparison level (critical value of Z) at 1.0 - (α/2) = (0.05/2) = 97.5% confidence level = 1.97737 for a two-tailed Mann-Kendall test.

If the absolute value of the calculated Z statistic (|Z|) > 1.97737, a significant trend is present in the data. There is no trend in the data when |Z| < 1.97737.

[1] When run as a one-tailed test, there is a trend (i.e., |Z| > 1.65463). The comparison level (critical value of Z) at 1.0 - (α) = (0.05) = 95% confidence level = 1.65463.

Trends significant at a confidence level of 97.5% are shown in **BOLD BLACK FONT.**

Table 2. Results of Mann-Kendall Tests for Trend, Newcastle Demolition Landfill, March 2020 (continued)

Well ID	Analyte	n	S	Variance	Z	Trend
MW-5	Ammonia-N	22	-41	1253.7	-1.13	No Trend
	Arsenic	**16**	**-64**	**493.3**	**-2.84**	**Negative**
	Calcium, Dissolved	**22**	**-163**	**1257.7**	**-4.57**	**Negative**
	Chloride	**22**	**-105**	**1255.7**	**-2.93**	**Negative**
	COD	22	0	1196.7	0.00	No Trend
	Hardness	**22**	**-167**	**1245.7**	**-4.70**	**Negative**
	Iron, Dissolved	22	31	1255.7	0.85	No Trend
	Manganese, Dissolved	22	36	1256.7	0.99	No Trend
	Specific Conductivity	**22**	**-102**	**1256.7**	**-2.85**	**Negative**
	Sulfate	**22**	**-170**	**1256.7**	**-4.77**	**Negative**
	TOC	22	-23	1255.7	-0.62	No Trend

n = Sample size

S = Mann-Kendall test statistic. Positive number implies an increasing trend; negative number implies a decreasing trend.

Z = Approximate normal test statistic; calculated based on S and the estimated variance when the sample size is greater than 10.

The comparison level (critical value of Z) at 1.0 - (α/2) = (0.05/2) = 97.5% confidence level = 1.97737 for a two-tailed Mann-Kendall test.

If the absolute value of the calculated Z statistic (|Z|) > 1.97737, a significant trend is present in the data. There is no trend in the data when |Z| < 1.97737.

[1] When run as a one-tailed test, there is a trend (i.e., |Z| > 1.65463). The comparison level (critical value of Z) at 1.0 - (α) = (0.05) = 95% confidence level = 1.65463.

Trends significant at a confidence level of 97.5% are shown in **BOLD BLACK FONT.**

Table 3. Groundwater Elevations for Newcastle Landfill, March 2020

Well	Date	Reference Elevation[1]	Depth to Groundwater[2]	Groundwater Elevation[1]
MW-1	3/17/2020	649	NM	NM
MW-2	3/17/2020	753	33.14	720
MW-3	3/17/2020	716	>150	<566
MW-5	3/17/2020	542	63.57	478

Notes:

[1] Reference Elevation and Groundwater Elevation approximate

[2] Depth to groundwater in ft measured from well seal

NM = Not Measured

Appendix A

Laboratory Report and Chain-of-Custody Forms

Analytical Resources, Incorporated
Analytical Chemists and Consultants

13 April 2020

Lisa Gilbert
Parametrix, Inc.
719 2nd Avenue, Suite 200
Seattle, WA 98104

RE: Newcastle Landfill

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
20C0219	N/A

Shelly Fishel

Digitally signed by Shelly Fishel
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., cn=Shelly Fishel, email=shelly.fishel@arilabs.com
Date: 2020.04.13 13:50:50 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 20C0219	Turn-around Requested: 2 weeks	Date: 3/17	
ARI Client Company: Parametrix	Phone: (206) 394.3667	Page: 1 of 1	
Client Contact: Lisa Gilbert		No. of Coolers: 1	Cooler Temps: 0.3
Client Project Name: Newcastle Landfill			
Client Project #: 553-1625-014	Samplers:		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Cl, SO4, NO2/NO3	Ammonia, COD, TOC	D Fe,Mn,Zn, Hardness	TDS					Notes/Comments
	Analysis Requested												
MW-1	3/17	10:15	water	4	✔	✔	✔	✔					Dissolved metals samples field-filtered
MW-2	3/17	11:28	water	4	✔	✔	✔	✔					
MW-3	3/17	13:55	water	4	✔	✔	✔	✔					
MW-5	3/17	16:30	water	4	✔	✔	✔	✔					
MW-6	3/17	12:30	water	4	✔	✔	✔	✔					
SW-6	3/17	17:16	water	4	✔	✔	✔	✔					
SW-7	3/17	17:52	water	4	✔	✔	✔	✔					

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Trey Parry	Printed Name: Erin Salle	Printed Name:	Printed Name:
	Company: Parametrix	Company: ARI ~~Delivery Express~~ UPS 3/18/2020	Company:	Company:
	Date & Time: 3/18	Date & Time: 3/18/2020 1120	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	20C0219-01	Water	17-Mar-2020 10:15	18-Mar-2020 11:20
MW-2	20C0219-02	Water	17-Mar-2020 11:28	18-Mar-2020 11:20
MW-3	20C0219-03	Water	17-Mar-2020 13:55	18-Mar-2020 11:20
MW-5	20C0219-04	Water	17-Mar-2020 16:30	18-Mar-2020 11:20
MW-6	20C0219-05	Water	17-Mar-2020 12:30	18-Mar-2020 11:20
SW-6	20C0219-06	Water	17-Mar-2020 17:16	18-Mar-2020 11:20
SW-7	20C0219-07	Water	17-Mar-2020 17:52	18-Mar-2020 11:20

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Work Order Case Narrative

Client: Parametrix, Inc.
Project: Newcastle Landfill
Work Order: 20C0219

Revised Report - April 13, 2020

This report was revised to include Dissolved Arsenic.

Sample receipt

Samples as listed on the preceding page were received 18-Mar-2020 11:20 under ARI work order 20C0219. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Dissolved Metals - EPA Method 6010C

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Dissolved Arsenic - EPA Method 200.8

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Sample specific QC was performed in association with sample 20C0219-01 in batch BID 0112. The duplicate RPD and matrix spike percent recovery were within control limits.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Parametrix | Project Name: Newcastle Landfill

COC No(s): _____ NA | Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 20C0219 | Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1150 | 0.3 | ____ | ____ | ____ | ____ | ____ | ____

If cooler temperature is out of compliance fill out form 00070F | Temp Gun ID#: DOO 5206

Cooler Accepted by: [signature] Date: 3/18/2020 Time: 1120

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ...	Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
How were bottles sealed in plastic bags?	Individually	Grouped	(Not)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		YES	(NO)
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		YES	(NO)
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)		

Were the sample(s) split by ARI? (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: [signature] Date: 3/18/2020 Time: 1213 Labels checked by: GB

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
—	SW-7		

Additional Notes, Discrepancies, & Resolutions:

Client signed COC in Pencil + did not put a year or time when signing. Dissolved metals container in SW-7 has a blank label, but sample ID was on lid. MW-2 containers list sample time as 1210, on COC, it is 1128. Containers missing Sample Times: MW-1 (TDS + Diss. metals), MW-3 (all containers), + SW-7 (all containers). Sample ID illegible (pen bled) on TOC/COD/NH_3 container in MW-1, TDS container in MW-2, + TOC/COD/NH_3 container in SW-7

By: [signature] Date: 3/18/2020

WORK ORDER

20C0219

Client: Parametrix, Inc. **Project Manager:** Shelly Fishel

Project: Newcastle Landfill **Project Number:** 553-1625-014

Preservation Confirmation

Container ID	Container Type	pH	
20C0219-01 A	Large OJ, 1000 mL		
20C0219-01 B	Small OJ, 500 mL		
20C0219-01 C	Glass NM, Amber, 250 mL, 9N H2SO4	<2	pass
20C0219-01 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	pass
20C0219-02 A	Large OJ, 1000 mL		
20C0219-02 B	Small OJ, 500 mL		
20C0219-02 C	Glass NM, Amber, 250 mL, 9N H2SO4	<2	pass
20C0219-02 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	pass
20C0219-03 A	Large OJ, 1000 mL		
20C0219-03 B	Small OJ, 500 mL		
20C0219-03 C	Glass NM, Amber, 250 mL, 9N H2SO4	<2	pass
20C0219-03 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	pass
20C0219-04 A	Large OJ, 1000 mL		
20C0219-04 B	Small OJ, 500 mL		
20C0219-04 C	Glass NM, Amber, 250 mL, 9N H2SO4	<2	pass
20C0219-04 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	pass
20C0219-05 A	Large OJ, 1000 mL		
20C0219-05 B	Small OJ, 500 mL		
20C0219-05 C	Glass NM, Amber, 250 mL, 9N H2SO4	<2	pass
20C0219-05 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	pass
20C0219-06 A	Large OJ, 1000 mL		
20C0219-06 B	Small OJ, 500 mL		
20C0219-06 C	Glass NM, Amber, 250 mL, 9N H2SO4	<2	pass
20C0219-06 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	pass
20C0219-07 A	Large OJ, 1000 mL		
20C0219-07 B	Small OJ, 500 mL		
20C0219-07 C	Glass NM, Amber, 250 mL, 9N H2SO4	<2	pass
20C0219-07 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2	pass

Preservation Confirmed By

3/18/2020
Date

Reviewed By

Date

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/17/2020 10:15
Instrument: ICPMS2 Analyst: MCB — Analyzed: 04/10/2020 17:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 20C0219-01 D 02
Preparation Batch: BID0112 — Sample Size: 25 mL
Prepared: 04/09/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**0.167**	ug/L	J

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 03/17/2020 10:15
Instrument: ICP2 Analyst: SKM — Analyzed: 03/31/2020 14:19

Sample Preparation: Preparation Method: WMN (No Prep) — Extract ID: 20C0219-01 D 01
Preparation Batch: BIC0637 — Sample Size: 25 mL
Prepared: 03/30/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**142**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0564**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**45.2**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0844**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	ND	mg/L	U

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 03/17/2020 10:15

Instrument: BAL2 Analyst: KLE — Analyzed: 03/19/2020 18:13

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-01

Preparation Batch: BIC0413 — Sample Size: 100 mL

Prepared: 03/19/2020 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**621**	mg/L	

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 10:15

Instrument: IC930 Analyst: CDE — Analyzed: 04/03/2020 15:10

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-01 A

Preparation Batch: BIC0423 — Sample Size: 10 mL

Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	**2.72**	mg/L	

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 03/17/2020 10:15
Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/26/2020 11:27

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-01 C
Preparation Batch: BIC0555 — Sample Size: 10 mL
Prepared: 03/25/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.040	**0.047**	mg/L	

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 03/17/2020 10:15
Instrument: [CALC] Analyst: BF — Analyzed: 03/24/2020 15:28

Sample Preparation: Preparation Method: [CALC]; Preparation Batch: [CALC]; Prepared: 03/23/2020; Final Volume: 1 — Extract ID: 20C0219-01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	**0.137**	mg/L	

Instrument: LACHAT1 Analyst: BF — Analyzed: 03/18/2020 17:12

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0366; Prepared: 03/18/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-01 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/24/2020 15:28

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0460; Prepared: 03/23/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-01 C

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.137**	mg/L	

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Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 03/17/2020 10:15

Instrument: UV1800-1 Analyst: JM — Analyzed: 03/31/2020 14:14

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-01 C

Preparation Batch: BIC0639 — Sample Size: 2 mL

Prepared: 03/30/2020 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	ND	mg/L	U

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719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 03/17/2020 10:15
Instrument: TOC-LCSH Analyst: BF — Analyzed: 03/21/2020 01:00

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-01 C
Preparation Batch: BIC0418 — Sample Size: 20 mL
Prepared: 03/20/2020 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**0.81**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/17/2020 10:15
Instrument: [CALC] Analyst: SKM — Analyzed: 03/31/2020 14:19

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/30/2020 Final Volume: 1 — Extract ID: 20C0219-01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**540**	mg/L CaCO3	

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-1

20C0219-01RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 10:15

Instrument: IC930 Analyst: CDE — Analyzed: 04/04/2020 03:29

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-01RE1 A

Preparation Batch: BIC0423 — Sample Size: 10 mL

Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	47	4.70	4.70	**209**	mg/L	D

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719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-2

20C0219-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/17/2020 11:28
Instrument: ICPMS2 Analyst: MCB — Analyzed: 04/10/2020 16:38

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 20C0219-02 D 02
Preparation Batch: BID0112 — Sample Size: 25 mL
Prepared: 04/09/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**0.810**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-2

20C0219-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 03/17/2020 11:28
Instrument: ICP2 Analyst: SKM — Analyzed: 04/01/2020 14:35

Sample Preparation: Preparation Method: WMN (No Prep) — Extract ID: 20C0219-02 D 01
Preparation Batch: BIC0637 — Sample Size: 25 mL
Prepared: 03/30/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**24.6**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.584**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**5.30**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.593**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0479**	mg/L	

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Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-2

20C0219-02 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 03/17/2020 11:28

Instrument: BAL2 Analyst: KLE — Analyzed: 03/19/2020 18:13

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-02

Preparation Batch: BIC0413 — Sample Size: 200 mL

Prepared: 03/19/2020 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**130**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-2

20C0219-02 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 11:28
Instrument: IC930 Analyst: CDE — Analyzed: 04/03/2020 15:30

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-02 A
Preparation Batch: BIC0423 — Sample Size: 10 mL
Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	**1.06**	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	**3.01**	mg/L	

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Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-2

20C0219-02 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 03/17/2020 11:28
Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/26/2020 11:29

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-02 C
Preparation Batch: BIC0555 — Sample Size: 10 mL
Prepared: 03/25/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.040	**0.158**	mg/L	

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Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-2

20C0219-02 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 03/17/2020 11:28
Instrument: [CALC] Analyst: BF — Analyzed: 03/24/2020 15:30

Sample Preparation: Preparation Method: [CALC]; Preparation Batch: [CALC]; Prepared: 03/23/2020; Final Volume: 1 — Extract ID: 20C0219-02

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	**0.0826**	mg/L	

Instrument: LACHAT1 Analyst: BF — Analyzed: 03/18/2020 17:18

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0366; Prepared: 03/18/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-02 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/24/2020 15:30

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0460; Prepared: 03/23/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-02 C

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.083**	mg/L	

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MW-2

20C0219-02 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 03/17/2020 11:28
Instrument: UV1800-1 Analyst: JM — Analyzed: 03/31/2020 14:14

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-02 C
Preparation Batch: BIC0639 — Sample Size: 2 mL
Prepared: 03/30/2020 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	**64.7**	mg/L	

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-2

20C0219-02 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 03/17/2020 11:28

Instrument: TOC-LCSH Analyst: BF — Analyzed: 03/21/2020 02:06

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-02 C

Preparation Batch: BIC0418 — Sample Size: 20 mL

Prepared: 03/20/2020 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		10	5.00	5.00	**22.20**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-2

20C0219-02 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/17/2020 11:28
Instrument: [CALC] Analyst: SKM — Analyzed: 04/01/2020 14:35

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/30/2020 Final Volume: 1 — Extract ID: 20C0219-02

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**83.4**	mg/L CaCO3	

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-3

20C0219-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/17/2020 13:55
Instrument: ICPMS2 Analyst: MCB — Analyzed: 04/10/2020 16:43

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 20C0219-03 D 02
Preparation Batch: BID0112 — Sample Size: 25 mL
Prepared: 04/09/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**1.71**	ug/L	

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MW-3

20C0219-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 03/17/2020 13:55
Instrument: ICP2 Analyst: SKM — Analyzed: 03/31/2020 14:24

Sample Preparation: Preparation Method: WMN (No Prep) — Extract ID: 20C0219-03 D 01
Preparation Batch: BIC0637 — Sample Size: 25 mL
Prepared: 03/30/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**11.2**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.645**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**6.12**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0399**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	ND	mg/L	U

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MW-3

20C0219-03 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 03/17/2020 13:55
Instrument: BAL2 Analyst: KLE — Analyzed: 03/19/2020 18:13

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-03
Preparation Batch: BIC0413 — Sample Size: 100 mL
Prepared: 03/19/2020 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**404**	mg/L	

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MW-3

20C0219-03 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 13:55

Instrument: IC930 Analyst: CDE — Analyzed: 04/03/2020 15:50

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-03 A

Preparation Batch: BIC0423 — Sample Size: 10 mL

Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	**6.09**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-3

20C0219-03 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 03/17/2020 13:55

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/26/2020 11:30

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-03 C

Preparation Batch: BIC0555 — Sample Size: 10 mL

Prepared: 03/25/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.040	**0.508**	mg/L	

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MW-3

20C0219-03 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 03/17/2020 13:55
Instrument: [CALC] Analyst: BF — Analyzed: 03/24/2020 15:31

Sample Preparation: Preparation Method: [CALC]; Preparation Batch: [CALC]; Prepared: 03/23/2020; Final Volume: 1 — Extract ID: 20C0219-03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LACHAT1 Analyst: BF — Analyzed: 03/18/2020 17:19

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0366; Prepared: 03/18/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-03 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/24/2020 15:31

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0460; Prepared: 03/23/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-03 C

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	ND	mg/L	U

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-3

20C0219-03 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 03/17/2020 13:55
Instrument: UV1800-1 Analyst: JM — Analyzed: 03/31/2020 14:15

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-03 C
Preparation Batch: BIC0639 — Sample Size: 2 mL
Prepared: 03/30/2020 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	**14.2**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-3

20C0219-03 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 03/17/2020 13:55

Instrument: TOC-LCSH Analyst: BF — Analyzed: 03/21/2020 02:27

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-03 C

Preparation Batch: BIC0418 — Sample Size: 20 mL

Prepared: 03/20/2020 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**3.91**	mg/L	

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MW-3

20C0219-03 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/17/2020 13:55
Instrument: [CALC] Analyst: SKM — Analyzed: 03/31/2020 14:24

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/30/2020 Final Volume: 1 — Extract ID: 20C0219-03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**53.2**	mg/L CaCO3	

Parametrix, Inc.	Project: Newcastle Landfill	
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MW-3

20C0219-03RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 13:55

Instrument: IC930 Analyst: CDE — Analyzed: 04/04/2020 03:49

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-03RE1 A

Preparation Batch: BIC0423 — Sample Size: 10 mL

Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	4	0.400	0.400	**21.0**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-5

20C0219-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/17/2020 16:30
Instrument: ICPMS2 Analyst: MCB — Analyzed: 04/10/2020 16:48

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 20C0219-04 D 02
Preparation Batch: BID0112 — Sample Size: 25 mL
Prepared: 04/09/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**6.28**	ug/L	

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Parametrix, Inc.	Project: Newcastle Landfill	
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MW-5

20C0219-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 03/17/2020 16:30
Instrument: ICP2 Analyst: SKM — Analyzed: 03/31/2020 14:28

Sample Preparation: Preparation Method: WMN (No Prep) — Extract ID: 20C0219-04 D 01
Preparation Batch: BIC0637 — Sample Size: 25 mL
Prepared: 03/30/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**66.3**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**4.09**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**26.8**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.530**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0062**	mg/L	J

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MW-5

20C0219-04 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 03/17/2020 16:30
Instrument: BAL2 Analyst: KLE — Analyzed: 03/19/2020 18:13

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-04
Preparation Batch: BIC0413 — Sample Size: 100 mL
Prepared: 03/19/2020 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**323**	mg/L	

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MW-5

20C0219-04 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 16:30
Instrument: IC930 Analyst: CDE — Analyzed: 04/03/2020 16:10

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-04 A
Preparation Batch: BIC0423 — Sample Size: 10 mL
Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	**3.29**	mg/L	

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MW-5

20C0219-04 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 03/17/2020 16:30
Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/26/2020 11:31

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-04 C
Preparation Batch: BIC0555 — Sample Size: 10 mL
Prepared: 03/25/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.040	**0.070**	mg/L	

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MW-5

20C0219-04 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 03/17/2020 16:30
Instrument: [CALC] Analyst: BF — Analyzed: 03/24/2020 15:32

Sample Preparation: Preparation Method: [CALC]; Preparation Batch: [CALC]; Prepared: 03/23/2020; Final Volume: 1 — Extract ID: 20C0219-04

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	ND	mg/L	U

Instrument: LACHAT1 Analyst: BF — Analyzed: 03/18/2020 17:20

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0366; Prepared: 03/18/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-04 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/24/2020 15:32

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0460; Prepared: 03/23/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-04 C

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	ND	mg/L	U

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-5

20C0219-04 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 03/17/2020 16:30
Instrument: UV1800-1 Analyst: JM — Analyzed: 03/31/2020 14:15

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-04 C
Preparation Batch: BIC0639 — Sample Size: 2 mL
Prepared: 03/30/2020 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	ND	mg/L	U

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MW-5

20C0219-04 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 03/17/2020 16:30
Instrument: TOC-LCSH Analyst: BF — Analyzed: 03/21/2020 02:50

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-04 C
Preparation Batch: BIC0418 — Sample Size: 20 mL
Prepared: 03/20/2020 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**2.31**	mg/L	

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MW-5

20C0219-04 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/17/2020 16:30
Instrument: [CALC] Analyst: SKM — Analyzed: 03/31/2020 14:28

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/30/2020 Final Volume: 1 — Extract ID: 20C0219-04

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**276**	mg/L CaCO3	

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MW-5

20C0219-04RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 16:30
Instrument: IC930 Analyst: CDE — Analyzed: 04/04/2020 04:09

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-04RE1 A
Preparation Batch: BIC0423 — Sample Size: 10 mL
Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	12	1.20	1.20	**52.2**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-6

20C0219-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/17/2020 12:30
Instrument: ICPMS2 Analyst: MCB — Analyzed: 04/10/2020 16:52

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 20C0219-05 D 02
Preparation Batch: BID0112 — Sample Size: 25 mL
Prepared: 04/09/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**0.805**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-6

20C0219-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 03/17/2020 12:30
Instrument: ICP2 Analyst: SKM — Analyzed: 04/01/2020 14:41

Sample Preparation: Preparation Method: WMN (No Prep) — Extract ID: 20C0219-05 D 01
Preparation Batch: BIC0637 — Sample Size: 25 mL
Prepared: 03/30/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**24.9**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.440**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**5.36**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.698**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0432**	mg/L	

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MW-6

20C0219-05 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 03/17/2020 12:30
Instrument: BAL2 Analyst: KLE — Analyzed: 03/19/2020 18:13

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-05
Preparation Batch: BIC0413 — Sample Size: 200 mL
Prepared: 03/19/2020 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**130**	mg/L	

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-6

20C0219-05 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 12:30
Instrument: IC930 Analyst: CDE — Analyzed: 04/03/2020 17:10

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-05 A
Preparation Batch: BIC0423 — Sample Size: 10 mL
Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	**1.11**	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	**3.22**	mg/L	

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719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-6

20C0219-05 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 03/17/2020 12:30
Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/26/2020 11:32

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-05 C
Preparation Batch: BIC0555 — Sample Size: 10 mL
Prepared: 03/25/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.040	**0.184**	mg/L	

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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

MW-6

20C0219-05 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 03/17/2020 12:30
Instrument: [CALC] Analyst: BF — Analyzed: 03/24/2020 15:33

Sample Preparation: Preparation Method: [CALC]; Preparation Batch: [CALC]; Prepared: 03/23/2020; Final Volume: 1 — Extract ID: 20C0219-05

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	**0.0341**	mg/L	

Instrument: LACHAT1 Analyst: BF — Analyzed: 03/18/2020 17:22

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0366; Prepared: 03/18/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-05 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/24/2020 15:33

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0460; Prepared: 03/23/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-05 C

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.034**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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MW-6

20C0219-05 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 03/17/2020 12:30
Instrument: UV1800-1 Analyst: JM — Analyzed: 03/31/2020 14:15

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-05 C
Preparation Batch: BIC0639 — Sample Size: 2 mL
Prepared: 03/30/2020 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	**42.8**	mg/L	

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MW-6

20C0219-05 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 03/17/2020 12:30
Instrument: TOC-LCSH Analyst: BF — Analyzed: 03/21/2020 03:16

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-05 C
Preparation Batch: BIC0418 — Sample Size: 20 mL
Prepared: 03/20/2020 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		10	5.00	5.00	**21.44**	mg/L	D

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MW-6

20C0219-05 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/17/2020 12:30
Instrument: [CALC] Analyst: SKM — Analyzed: 04/01/2020 14:41

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/30/2020 Final Volume: 1 — Extract ID: 20C0219-05

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**84.2**	mg/L CaCO3	

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719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-6

20C0219-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/17/2020 17:16

Instrument: ICPMS2 Analyst: MCB — Analyzed: 04/10/2020 16:57

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 20C0219-06 D 02

Preparation Batch: BID0112 — Sample Size: 25 mL

Prepared: 04/09/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**4.55**	ug/L	

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SW-6

20C0219-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 03/17/2020 17:16

Instrument: ICP2 Analyst: SKM — Analyzed: 03/31/2020 14:33

Sample Preparation: Preparation Method: WMN (No Prep) — Extract ID: 20C0219-06 D 01

Preparation Batch: BIC0637 — Sample Size: 25 mL

Prepared: 03/30/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**78.1**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**3.27**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**48.7**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.298**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	ND	mg/L	U

Parametrix, Inc.	Project: Newcastle Landfill	
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SW-6

20C0219-06 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 03/17/2020 17:16

Instrument: BAL2 Analyst: KLE — Analyzed: 03/19/2020 18:13

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-06

Preparation Batch: BIC0413 — Sample Size: 200 mL

Prepared: 03/19/2020 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**297**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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SW-6

20C0219-06 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 17:16

Instrument: IC930 Analyst: CDE — Analyzed: 04/03/2020 17:30

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-06 A

Preparation Batch: BIC0423 — Sample Size: 10 mL

Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	**5.45**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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SW-6

20C0219-06 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 03/17/2020 17:16

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/26/2020 11:33

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-06 C

Preparation Batch: BIC0555 — Sample Size: 10 mL

Prepared: 03/25/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.040	**0.185**	mg/L	

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SW-6

20C0219-06 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 03/17/2020 17:16
Instrument: [CALC] Analyst: BF — Analyzed: 03/24/2020 15:34

Sample Preparation: Preparation Method: [CALC] — Extract ID: 20C0219-06
Preparation Batch: [CALC]
Prepared: 03/23/2020 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	**0.0274**	mg/L	

Instrument: LACHAT1 Analyst: BF — Analyzed: 03/18/2020 17:23

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-06 B
Preparation Batch: BIC0366 Sample Size: 10 mL
Prepared: 03/18/2020 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/24/2020 15:34

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-06 C
Preparation Batch: BIC0460 Sample Size: 10 mL
Prepared: 03/23/2020 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.027**	mg/L	

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SW-6

20C0219-06 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 03/17/2020 17:16

Instrument: UV1800-1 Analyst: JM — Analyzed: 03/31/2020 14:16

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-06 C

Preparation Batch: BIC0639 — Sample Size: 2 mL

Prepared: 03/30/2020 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	ND	mg/L	U

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SW-6

20C0219-06 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 03/17/2020 17:16

Instrument: TOC-LCSH Analyst: BF — Analyzed: 03/21/2020 03:40

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-06 C

Preparation Batch: BIC0418 — Sample Size: 20 mL

Prepared: 03/20/2020 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**1.50**	mg/L	

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SW-6

20C0219-06 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/17/2020 17:16

Instrument: [CALC] Analyst: SKM — Analyzed: 03/31/2020 14:33

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 03/30/2020 Final Volume: 1 — Extract ID: 20C0219-06

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**396**	mg/L CaCO3	

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-6

20C0219-06RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 17:16

Instrument: IC930 Analyst: CDE — Analyzed: 04/04/2020 04:28

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-06RE1 A

Preparation Batch: BIC0423 — Sample Size: 10 mL

Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	44	4.40	4.40	**194**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-7

20C0219-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 03/17/2020 17:52

Instrument: ICPMS2 Analyst: MCB — Analyzed: 04/10/2020 17:02

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix — Extract ID: 20C0219-07 D 02

Preparation Batch: BID0112 — Sample Size: 25 mL

Prepared: 04/09/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0220	0.200	**0.935**	ug/L	

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SW-7

20C0219-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 03/17/2020 17:52

Instrument: ICP2 Analyst: SKM — Analyzed: 04/01/2020 14:26

Sample Preparation: Preparation Method: WMN (No Prep) — Extract ID: 20C0219-07 D 01

Preparation Batch: BIC0637 — Sample Size: 25 mL

Prepared: 03/30/2020 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**35.4**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.0801**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**18.1**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0589**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	ND	mg/L	U

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-7

20C0219-07 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 03/17/2020 17:52

Instrument: BAL2 Analyst: KLE — Analyzed: 03/19/2020 18:13

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-07

Preparation Batch: BIC0413 — Sample Size: 200 mL

Prepared: 03/19/2020 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**262**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-7

20C0219-07 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 17:52

Instrument: IC930 Analyst: CDE — Analyzed: 04/03/2020 17:50

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-07 A

Preparation Batch: BIC0423 — Sample Size: 10 mL

Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	0.100	0.100	**8.74**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-7

20C0219-07 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 03/17/2020 17:52

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/26/2020 11:35

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-07 C

Preparation Batch: BIC0555 — Sample Size: 10 mL

Prepared: 03/25/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Ammonia-N	7664-41-7	1	0.040	0.040	ND	mg/L	U

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-7

20C0219-07 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 03/17/2020 17:52
Instrument: [CALC] Analyst: BF — Analyzed: 03/24/2020 15:36

Sample Preparation: Preparation Method: [CALC]; Preparation Batch: [CALC]; Prepared: 03/23/2020; Final Volume: 1 — Extract ID: 20C0219-07

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	**0.535**	mg/L	

Instrument: LACHAT1 Analyst: BF — Analyzed: 03/18/2020 17:24

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0366; Prepared: 03/18/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-07 B

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.010	0.010	ND	mg/L	U

Instrument: LACHAT2 Analyst: WCW — Analyzed: 03/24/2020 15:36

Sample Preparation: Preparation Method: No Prep Wet Chem; Preparation Batch: BIC0460; Prepared: 03/23/2020; Sample Size: 10 mL; Final Volume: 10 mL — Extract ID: 20C0219-07 C

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.535**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-7

20C0219-07 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 03/17/2020 17:52

Instrument: UV1800-1 Analyst: JM — Analyzed: 03/31/2020 14:21

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-07 C

Preparation Batch: BIC0639 — Sample Size: 2 mL

Prepared: 03/30/2020 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	ND	mg/L	U

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

SW-7

20C0219-07 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 03/17/2020 17:52

Instrument: TOC-LCSH Analyst: BF — Analyzed: 03/21/2020 04:02

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-07 C

Preparation Batch: BIC0418 — Sample Size: 20 mL

Prepared: 03/20/2020 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**2.24**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill	
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SW-7

20C0219-07 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 03/17/2020 17:52

Instrument: [CALC] Analyst: SKM — Analyzed: 04/01/2020 14:26

Sample Preparation: Preparation Method: [CALC] — Extract ID: 20C0219-07

Preparation Batch: [CALC]

Prepared: 03/30/2020 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**163**	mg/L CaCO3	

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SW-7

20C0219-07RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 03/17/2020 17:52

Instrument: IC930 Analyst: CDE — Analyzed: 04/04/2020 05:28

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20C0219-07RE1 A

Preparation Batch: BIC0423 — Sample Size: 10 mL

Prepared: 04/02/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	16	1.60	1.60	**72.4**	mg/L	D

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Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BIC0637 - WMN (No Prep)

Instrument: ICP2 Analyst: SKM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0637-BLK1)					Prepared: 30-Mar-2020 Analyzed: 31-Mar-2020 12:29						
Calcium, Dissolved	ND	0.0051	0.0500	mg/L							U
Iron, Dissolved	ND	0.0013	0.0500	mg/L							U
Magnesium, Dissolved	ND	0.0160	0.0500	mg/L							U
Manganese, Dissolved	ND	0.0003	0.0010	mg/L							U
Zinc, Dissolved	ND	0.0021	0.0100	mg/L							U
LCS (BIC0637-BS1)					Prepared: 30-Mar-2020 Analyzed: 31-Mar-2020 13:01						
Calcium, Dissolved	9.81	0.0051	0.0500	mg/L	10.0		98.1	80-120			
Iron, Dissolved	2.00	0.0013	0.0500	mg/L	2.00		100	80-120			
Magnesium, Dissolved	10.3	0.0160	0.0500	mg/L	10.0		103	80-120			
Manganese, Dissolved	0.507	0.0003	0.0010	mg/L	0.500		101	80-120			
Zinc, Dissolved	0.508	0.0021	0.0100	mg/L	0.500		102	80-120			

Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BID0112 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BID0112-BLK1)						Prepared: 09-Apr-2020 Analyzed: 10-Apr-2020 16:29						
Arsenic, Dissolved	75a	ND	0.0220	0.200	ug/L							U
LCS (BID0112-BS1)						Prepared: 09-Apr-2020 Analyzed: 10-Apr-2020 16:34						
Arsenic, Dissolved	75a	24.7	0.0220	0.200	ug/L	25.0		98.9	80-120			
Duplicate (BID0112-DUP1)			**Source: 20C0219-01**			Prepared: 09-Apr-2020 Analyzed: 10-Apr-2020 17:34						
Arsenic, Dissolved	75a	0.231	0.0220	0.200	ug/L		0.167			32.20	20	L
Matrix Spike (BID0112-MS1)			**Source: 20C0219-01**			Prepared: 09-Apr-2020 Analyzed: 10-Apr-2020 17:39						
Arsenic, Dissolved	75a	25.8	0.0220	0.200	ug/L	25.0	0.167	103	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Parametrix, Inc.	Project: Newcastle Landfill	
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Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Wet Chemistry - Quality Control

Batch BIC0366 - No Prep Wet Chem

Instrument: LACHAT1 Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0366-BLK1)				Prepared: 18-Mar-2020 Analyzed: 18-Mar-2020 16:47							
Nitrite-N	ND	0.010	0.010	mg/L							U
LCS (BIC0366-BS1)				Prepared: 18-Mar-2020 Analyzed: 18-Mar-2020 16:48							
Nitrite-N	0.503	0.010	0.010	mg/L	0.500		101	75-125			

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Wet Chemistry - Quality Control

Batch BIC0413 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0413-BLK1)				Prepared: 19-Mar-2020 Analyzed: 19-Mar-2020 18:13							
Dissolved Solids	ND	5	5	mg/L							U
LCS (BIC0413-BS1)				Prepared: 19-Mar-2020 Analyzed: 19-Mar-2020 18:13							
Dissolved Solids	475	10	10	mg/L	500		95.0	90-110			

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Wet Chemistry - Quality Control

Batch BIC0418 - No Prep Wet Chem

Instrument: TOC-LCSH Analyst: BF

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0418-BLK1)				Prepared: 20-Mar-2020 Analyzed: 21-Mar-2020 00:11							
Total Organic Carbon	ND	0.50	0.50	mg/L							U
LCS (BIC0418-BS1)				Prepared: 20-Mar-2020 Analyzed: 21-Mar-2020 00:37							
Total Organic Carbon	20.52	0.50	0.50	mg/L	20.00		103	90-110			

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Wet Chemistry - Quality Control

Batch BIC0423 - No Prep Wet Chem

Instrument: IC930 Analyst: CDE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0423-BLK1)					Prepared: 02-Apr-2020 Analyzed: 03-Apr-2020 23:31						
Chloride	ND	0.100	0.100	mg/L							U
Sulfate	ND	0.100	0.100	mg/L							U
LCS (BIC0423-BS1)					Prepared: 02-Apr-2020 Analyzed: 03-Apr-2020 23:51						
Chloride	5.00	0.100	0.100	mg/L	5.00		100	90-110			
Sulfate	4.93	0.100	0.100	mg/L	5.00		98.7	90-110			

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Wet Chemistry - Quality Control

Batch BIC0460 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: WCW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0460-BLK1)				Prepared: 23-Mar-2020 Analyzed: 24-Mar-2020 14:56							
Nitrate + Nitrite as N	ND	0.010	0.010	mg/L							U
LCS (BIC0460-BS1)				Prepared: 23-Mar-2020 Analyzed: 24-Mar-2020 14:57							
Nitrate + Nitrite as N	0.481	0.010	0.010	mg/L	0.500		96.2	90-110			

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Wet Chemistry - Quality Control

Batch BIC0555 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: WCW

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0555-BLK2)				Prepared: 25-Mar-2020 Analyzed: 26-Mar-2020 12:28							
Ammonia-N	ND	0.040	0.040	mg/L							U
LCS (BIC0555-BS1)				Prepared: 25-Mar-2020 Analyzed: 26-Mar-2020 11:08							
Ammonia-N	0.502	0.040	0.040	mg/L	0.500		100	90-110			

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Wet Chemistry - Quality Control

Batch BIC0639 - No Prep Wet Chem

Instrument: UV1800-1 Analyst: JM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0639-BLK1)				Prepared: 30-Mar-2020 Analyzed: 31-Mar-2020 13:54							
COD	ND	10.0	10.0	mg/L							U
LCS (BIC0639-BS1)				Prepared: 30-Mar-2020 Analyzed: 31-Mar-2020 13:55							
COD	105	10.0	10.0	mg/L	100		105	90-110			

Parametrix, Inc.	Project: Newcastle Landfill	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	13-Apr-2020 13:48

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 300.0 in Water	
Chloride	DoD-ELAP,WADOE,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW,NELAP
EPA 353.2 in Water	
Nitrate + Nitrite as N	NELAP,DoD-ELAP,WADOE
Nitrite-N	WADOE,NELAP,DoD-ELAP
EPA 410.4 in Water	
COD	DoD-ELAP,NELAP,WADOE
EPA 6010C in Water	
Calcium	WADOE,NELAP,DoD-ELAP
Iron	WADOE,NELAP,DoD-ELAP
Magnesium	WADOE,NELAP,DoD-ELAP
Manganese	WADOE,NELAP,DoD-ELAP
Zinc	WADOE,NELAP,DoD-ELAP
EPA 9060A in Water	
Total Organic Carbon	DoD-ELAP,WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2020
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019

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Notes and Definitions

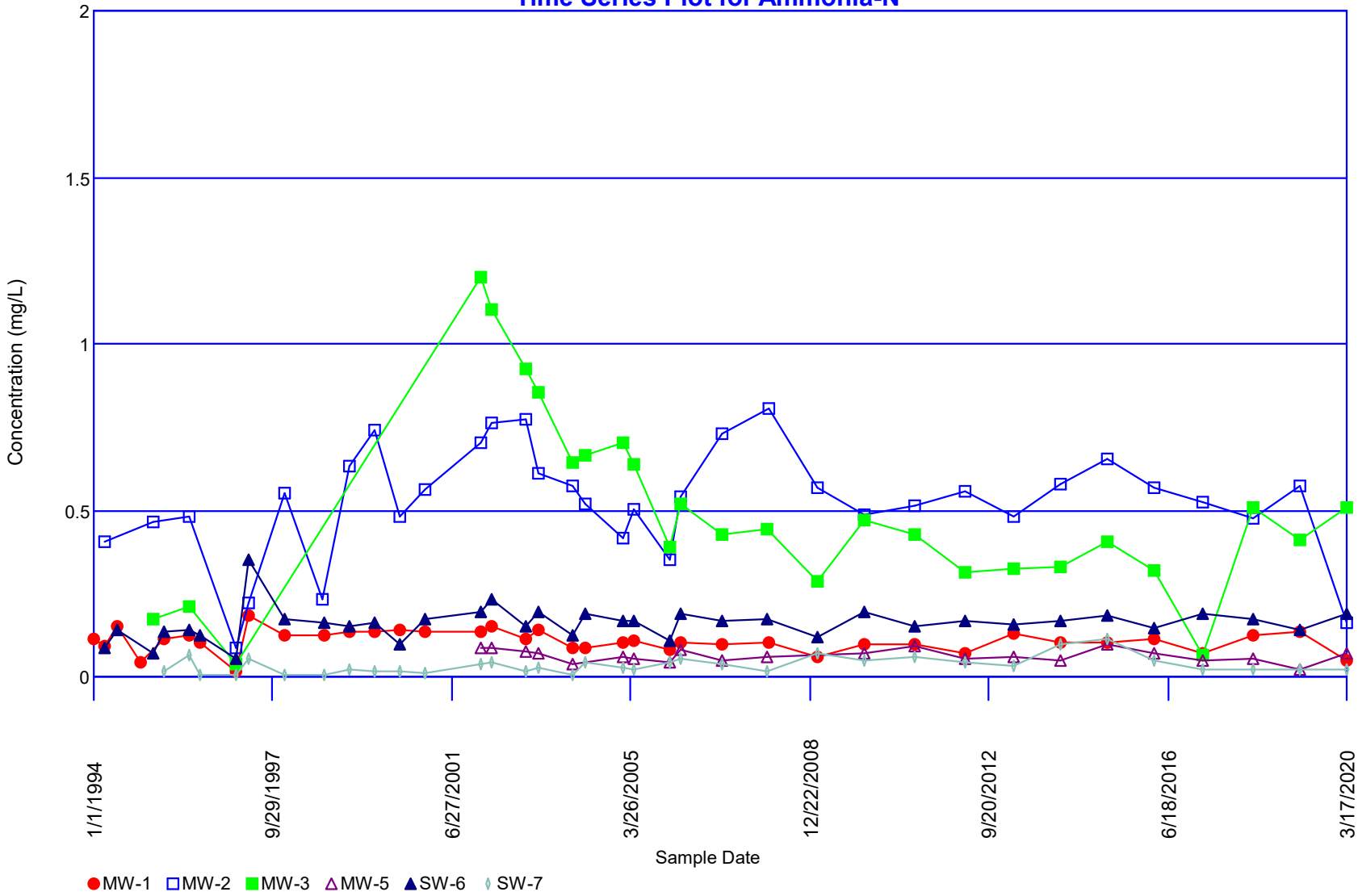
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Appendix B

Time-Series Plots

Newcastle Landfill

Time Series Plot for Ammonia-N

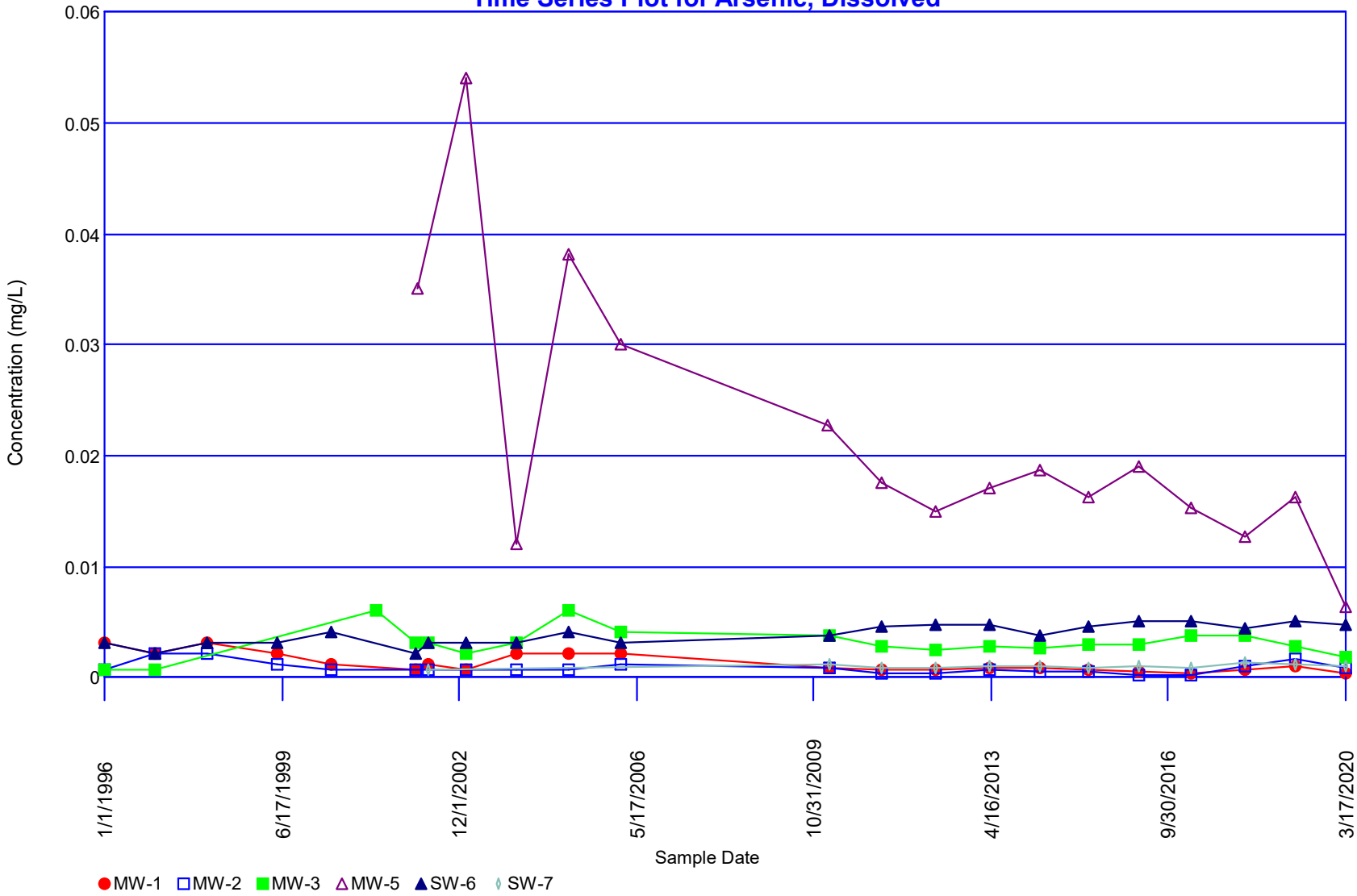


Ammonia-N

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Arsenic, Dissolved

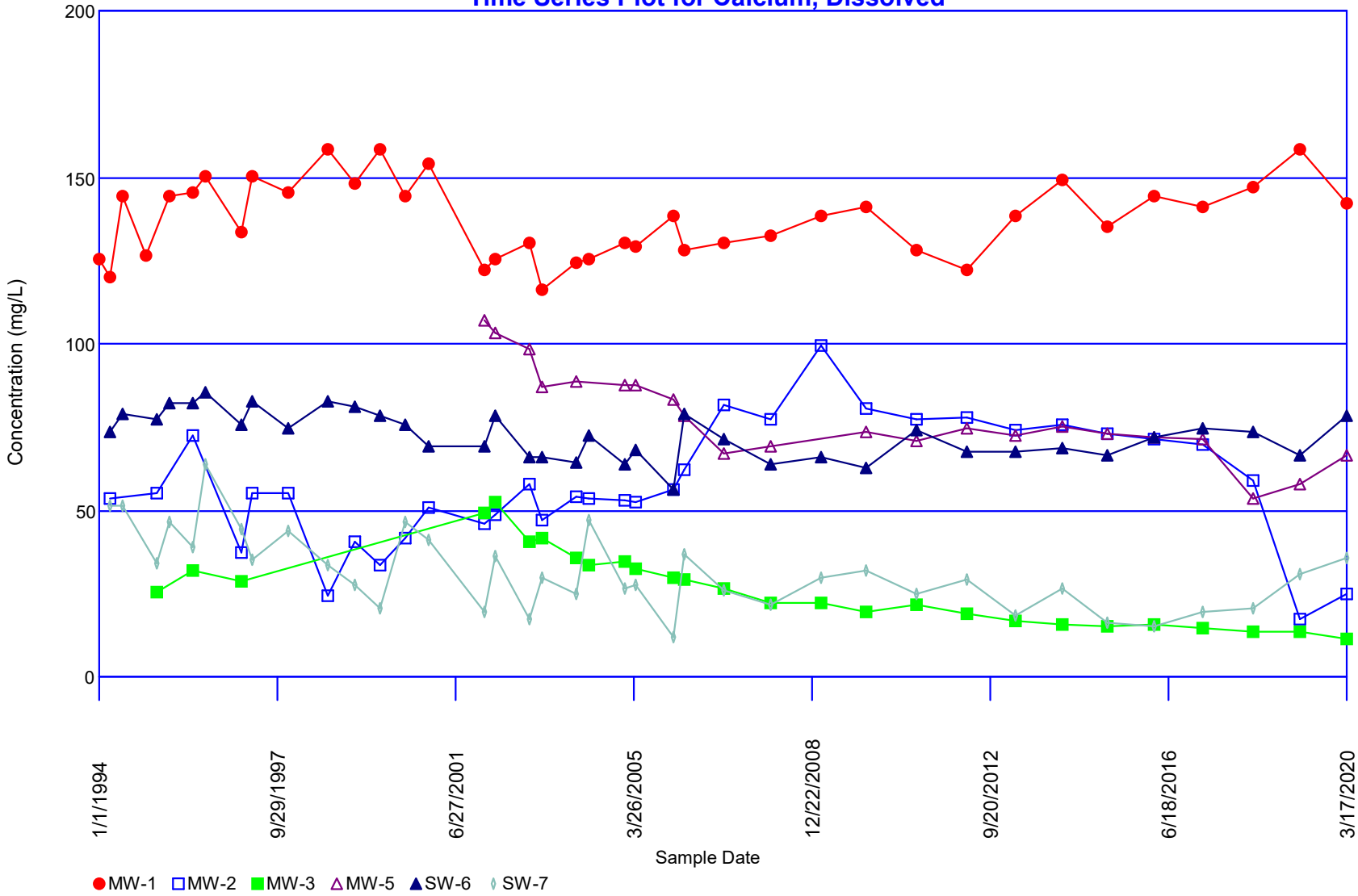


Arsenic, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Calcium, Dissolved

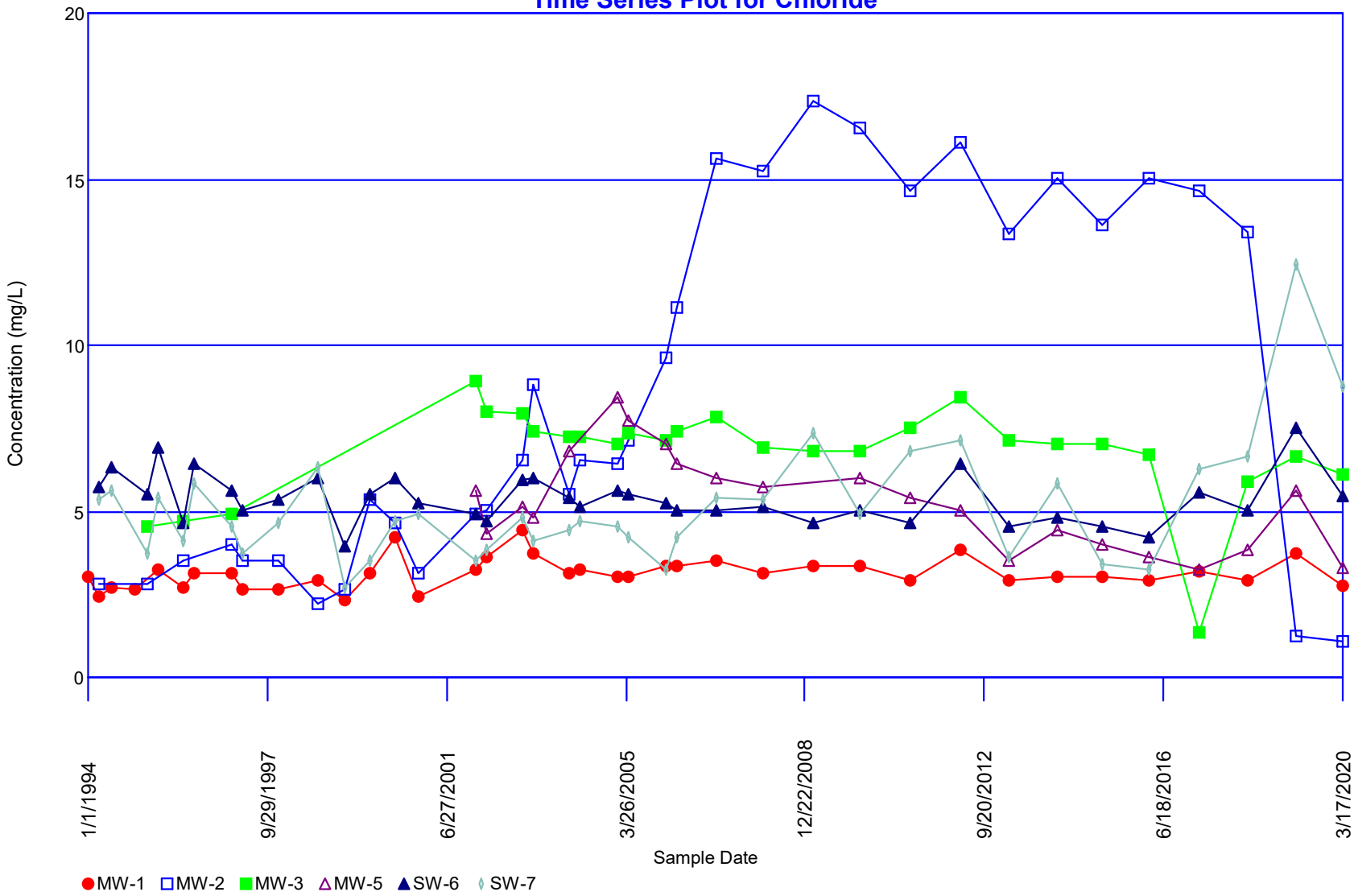


Calcium, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Chloride

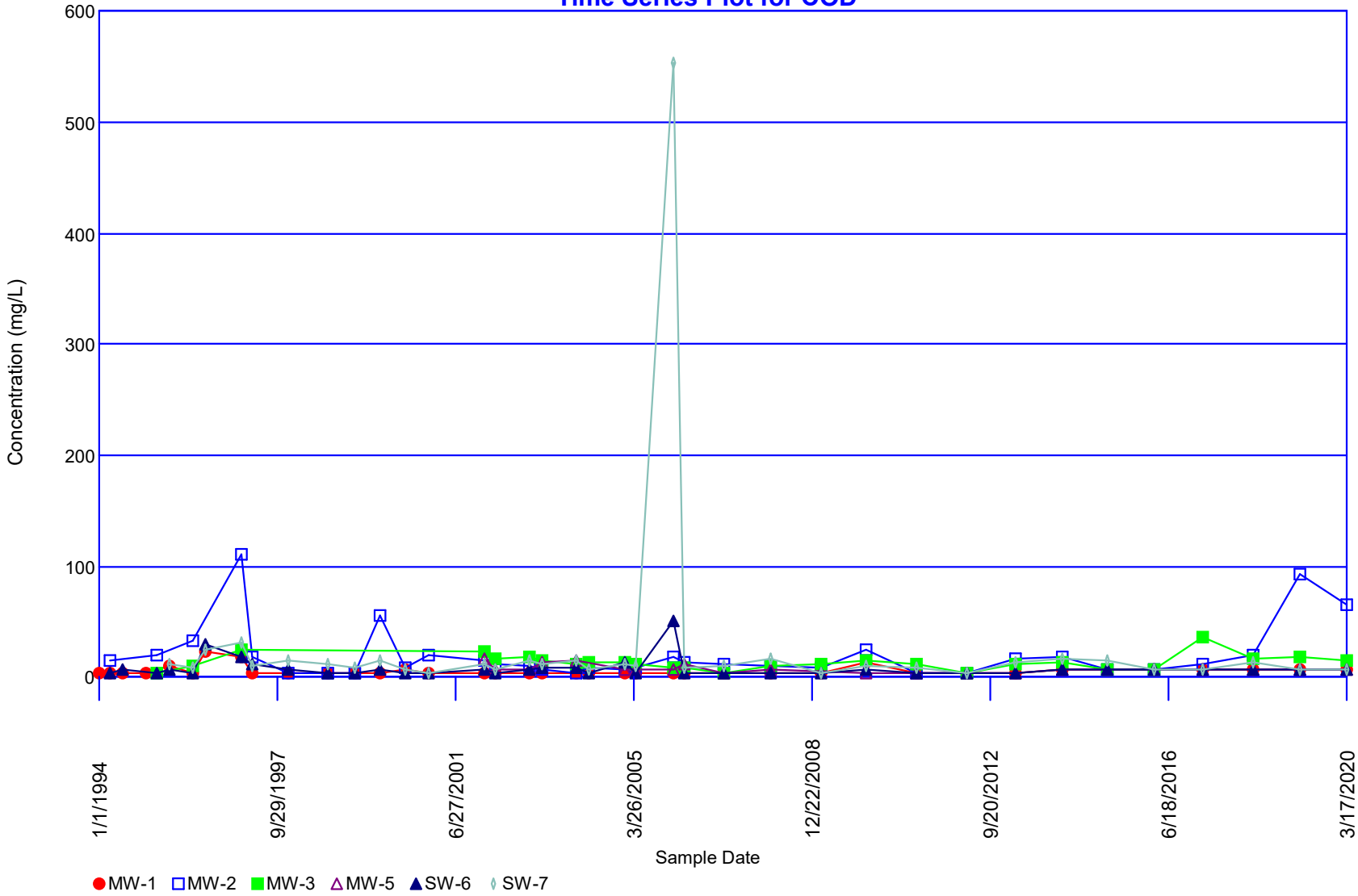


Chloride

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for COD

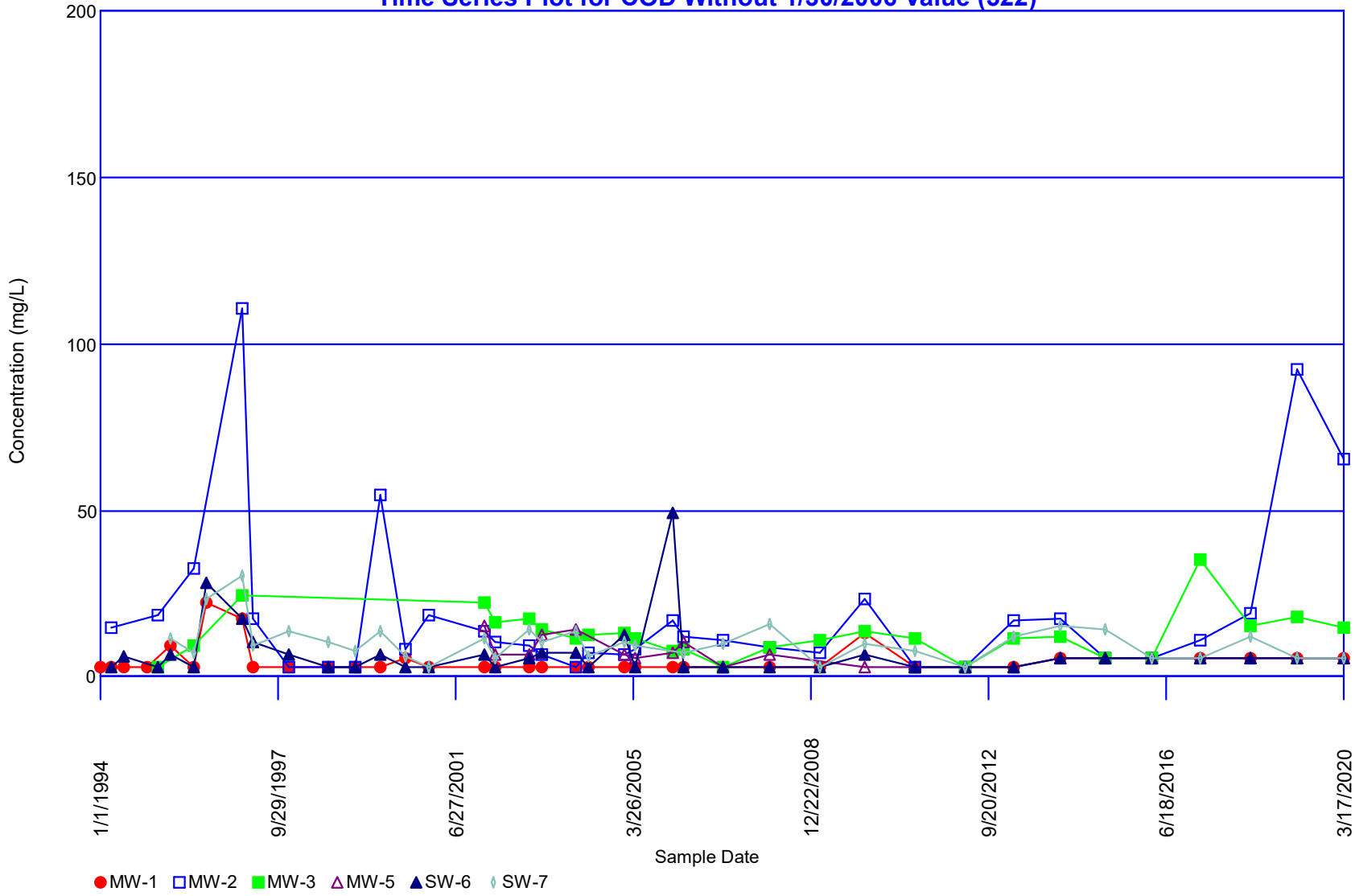


COD

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for COD Without 1/30/2006 Value (522)

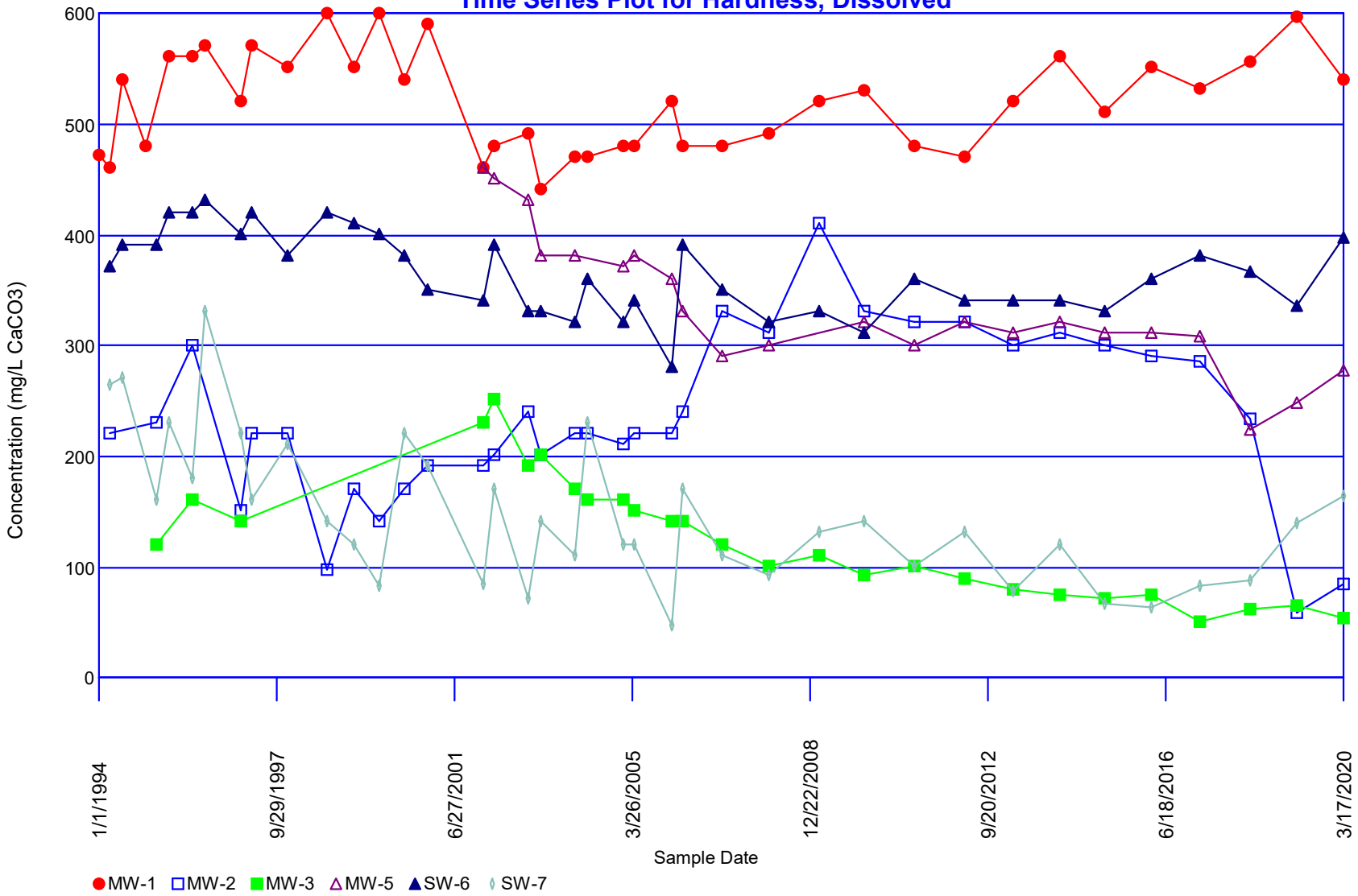


COD

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Hardness, Dissolved

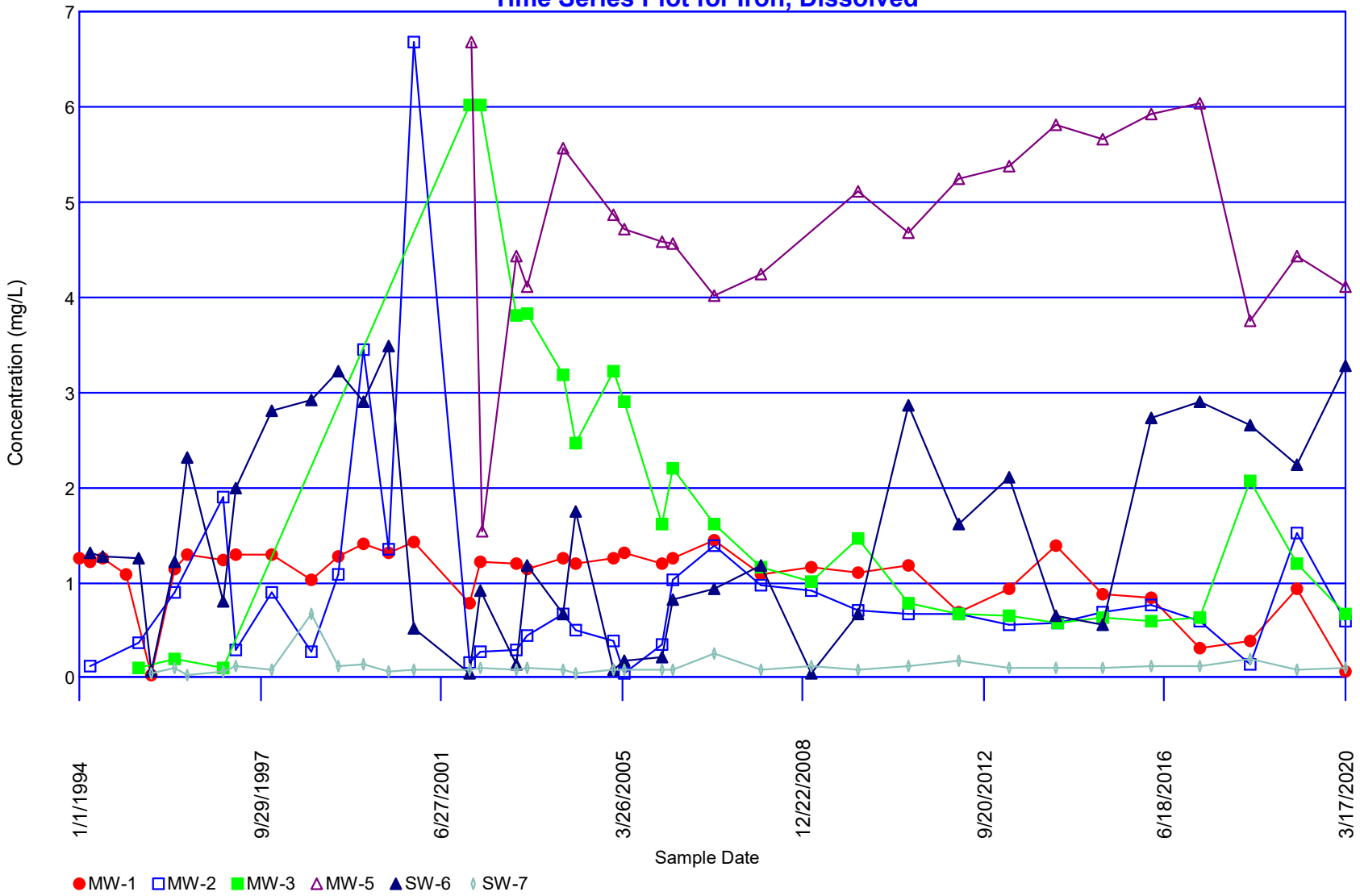


Hardness, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Iron, Dissolved

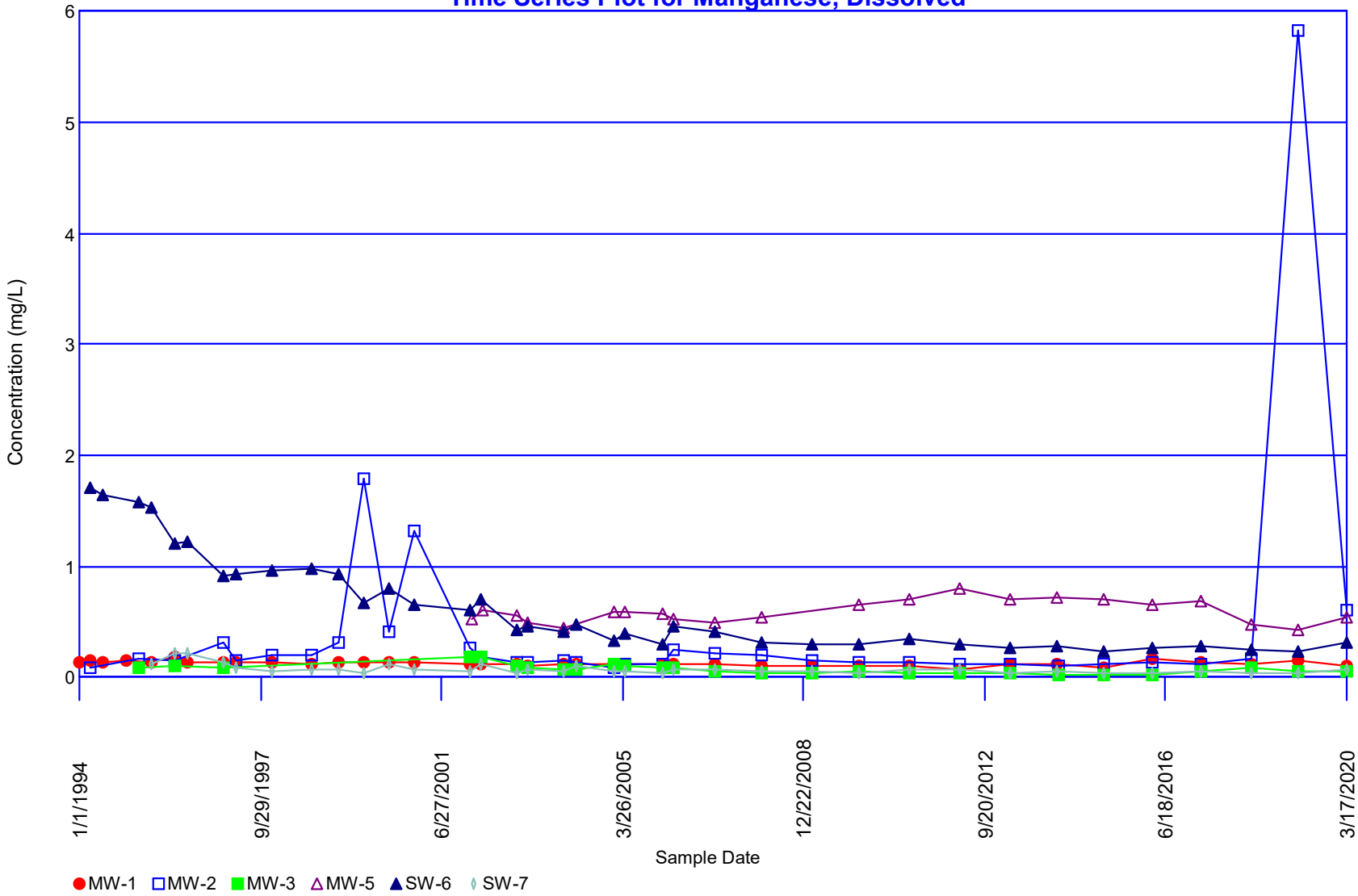


Iron, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Manganese, Dissolved

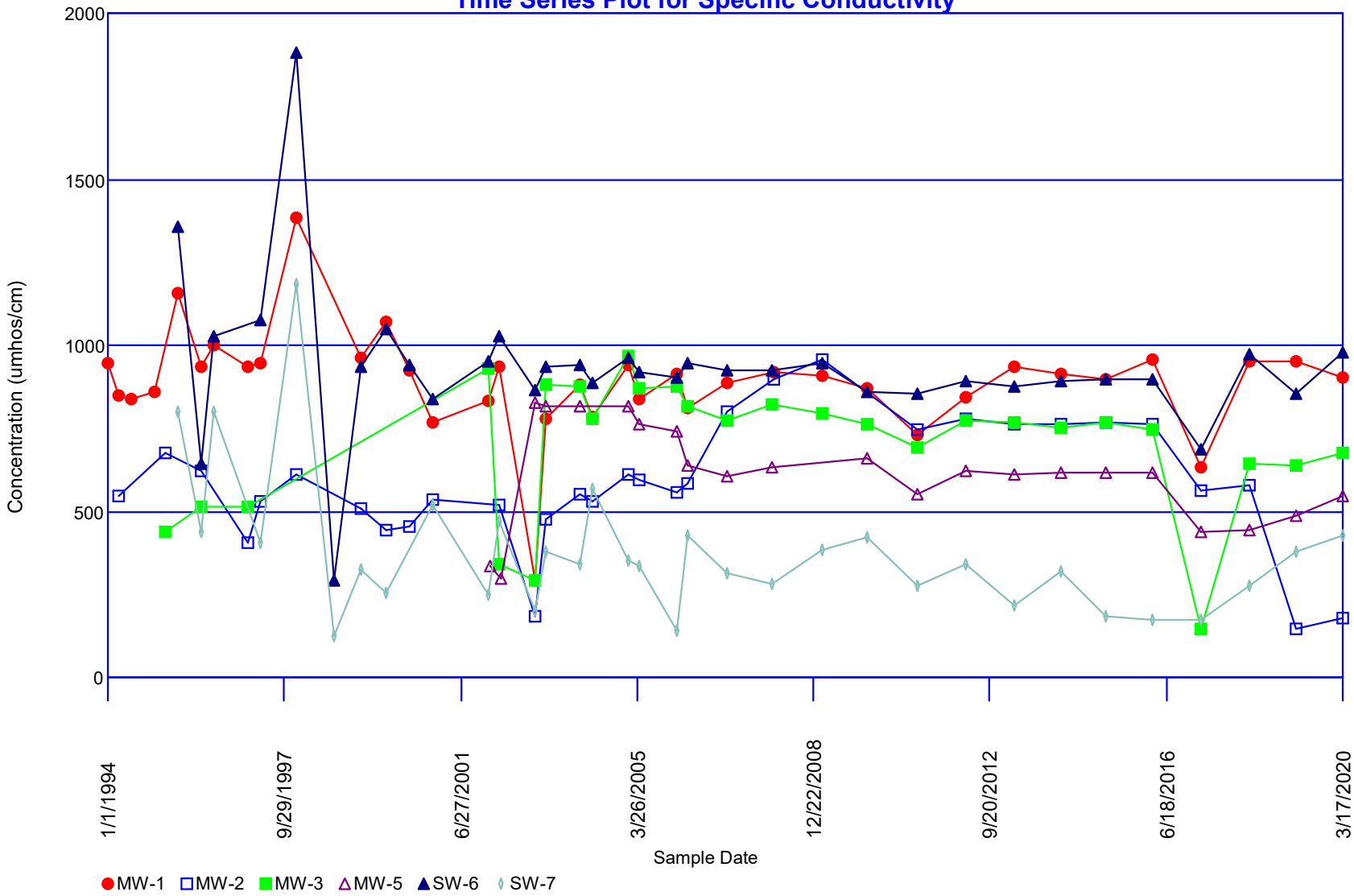


Manganese, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Specific Conductivity

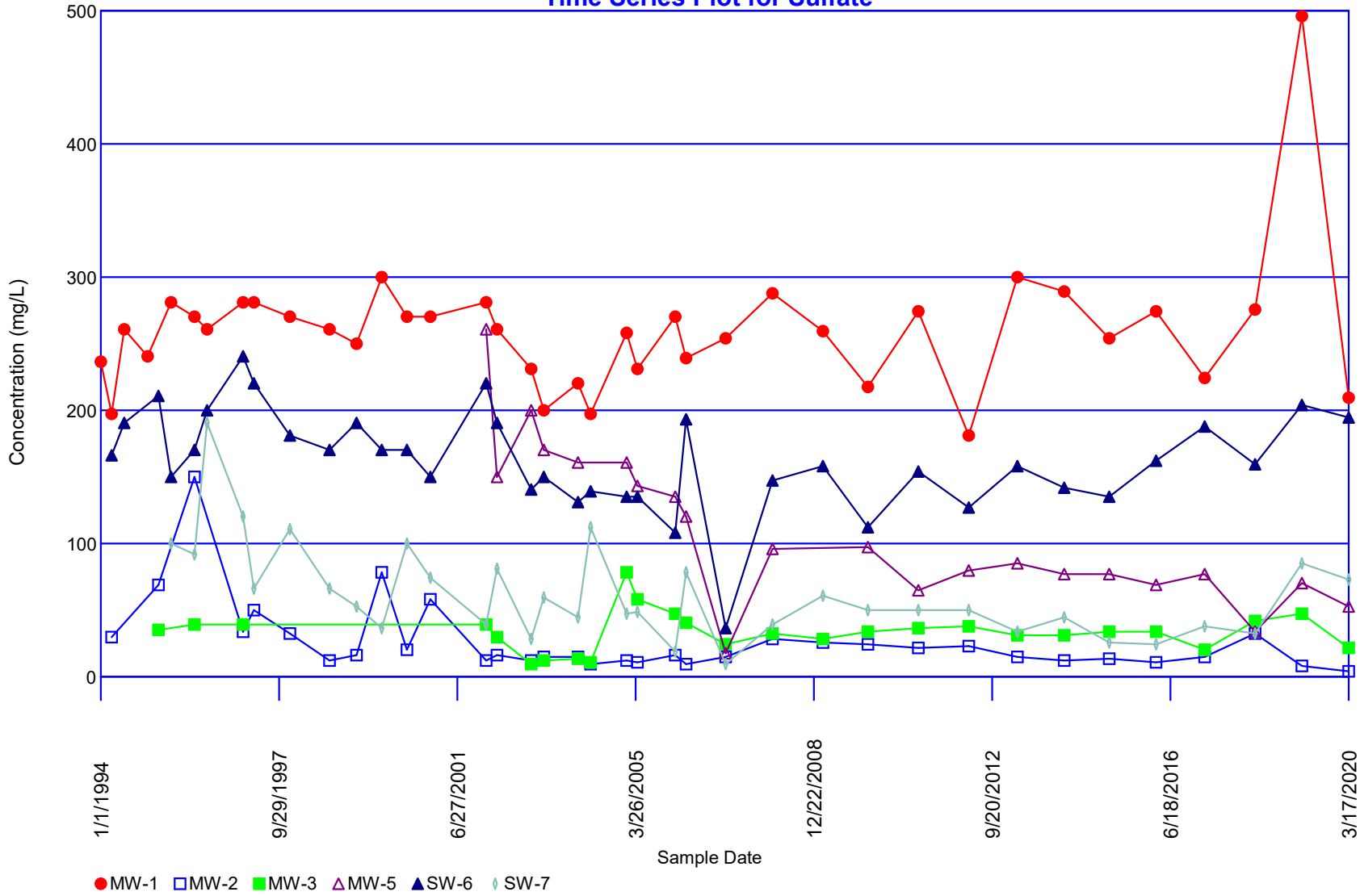


Specific Conductivity

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Sulfate

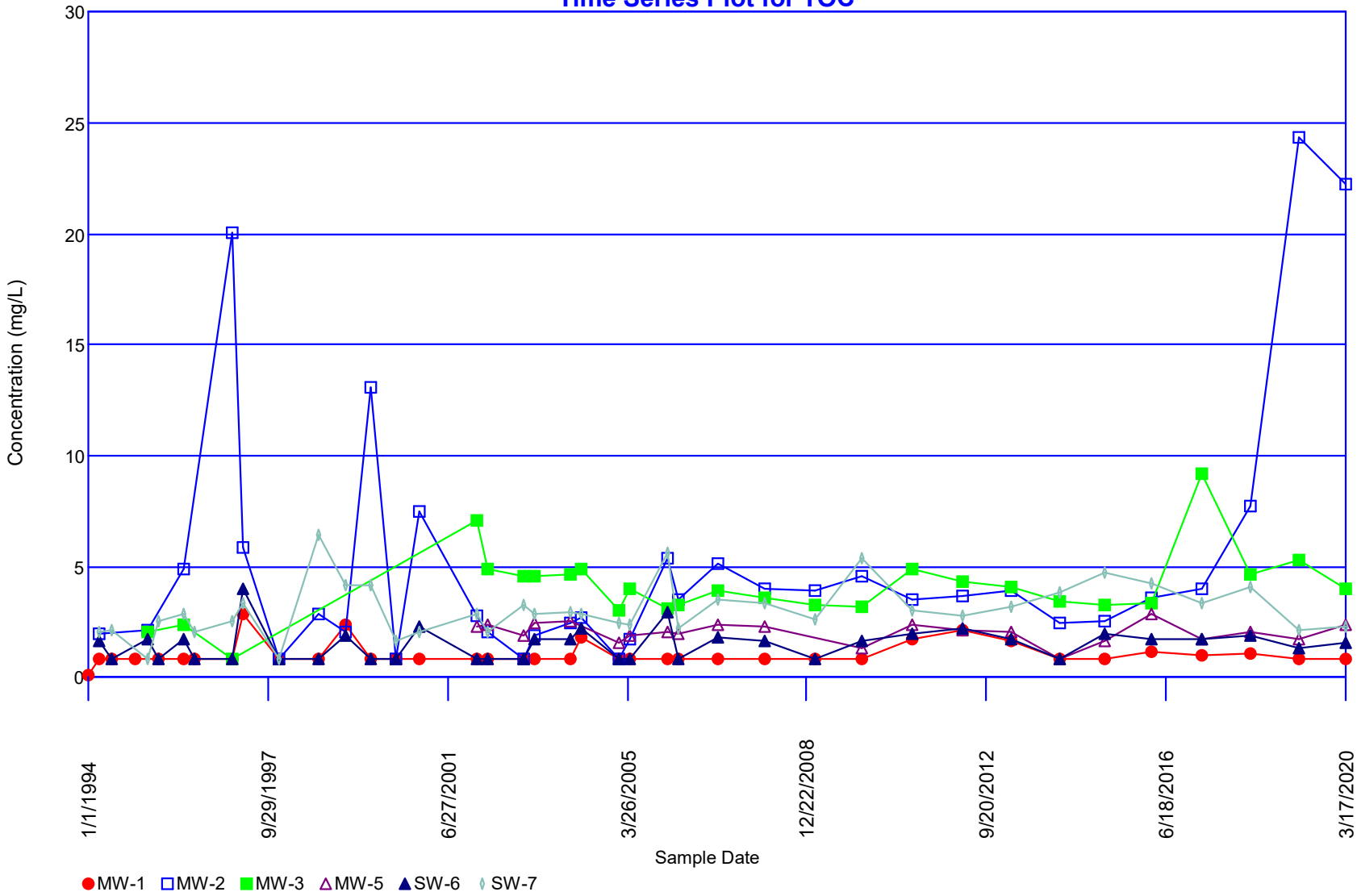


Sulfate

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for TOC



TOC

Non-Detects Replaced with 1/2 DL