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July 9, 2018
Parametrix No. 553-1625-014

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

Re: April 2018 Groundwater Sampling Event, Newcastle Demolition Landfill

Dear Mr. Williamson:

INTRODUCTION

This report summarizes the groundwater monitoring data collected in April 2018 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.

APRIL 2018 SAMPLING EVENT

Samples were collected on April 4, 2018, 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, except for wells MW-1 through MW-3, which were filtered at the laboratory. A duplicate sample was collected at monitoring well MW-5 (designated MW-6).

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. No data required qualification, except for TOC in well MW-5 and duplicate MW-6. These data were qualified "J" due to variability between the samples. The variability can likely be attributed to heterogeneity between the sample aliquots.

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):

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

Dissolved arsenic concentrations in samples from wells MW-1 (upgradient), MW-2, MW-3, and surface water stations SW-6 and SW-7 exceeded the carcinogenic GWQS but not the MCL. The dissolved arsenic concentration in well MW-5 also slightly exceeded 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, chemical oxygen demand (COD), hardness, dissolved iron, dissolved manganese, specific conductivity, sulfate, and total organic carbon (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, dissolved manganese, and TOC continued to be lower than the relatively high concentrations measured between 1999 and 2000. Specific conductivity and concentrations of chloride and hardness (and dissolved calcium) increased beginning in 2007, but have been declining since then.
- 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, although ammonia and dissolved iron were slightly higher than observed during the past few years.
- In MW-5, stable or decreasing trends in most parameters have been observed in the last few years. Dissolved manganese and dissolved iron concentrations, however, have remained generally stable. Because this is a low-yield well, continuing development over several years is likely to occur, resulting in improving water quality.
- At SW-6, concentrations of hardness, 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 April 2018 (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, dissolved iron, 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, hardness, dissolved iron, specific conductivity, and TOC; a statistically significant decreasing trend in dissolved arsenic;

- MW-3: statistically significant increasing trends in 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 arsenic, dissolved calcium, chloride, hardness, specific conductivity, and sulfate.

GROUNDWATER LEVEL MONITORING RESULTS

Groundwater levels were measured at three of the four 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 April 2018 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 (specific conductivity, TDS, sulfate, dissolved iron, and dissolved manganese) occurred in the upgradient well and in downgradient wells and the surface water station. Dissolved arsenic concentrations exceeded the carcinogenic GWQS in all wells (including the upgradient well) and the surface water stations. All arsenic concentrations were below the MCL except for well MW-5. 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. The April 2018 data for wells MW-2 and MW-3 indicate continuing lower concentrations for parameters that were elevated following the golf course construction period during 1996 through 2000, including dissolved iron, manganese, and TOC.

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
Eugene Freeman, Cleanup Program, NWRO, Washington State Department of Ecology

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

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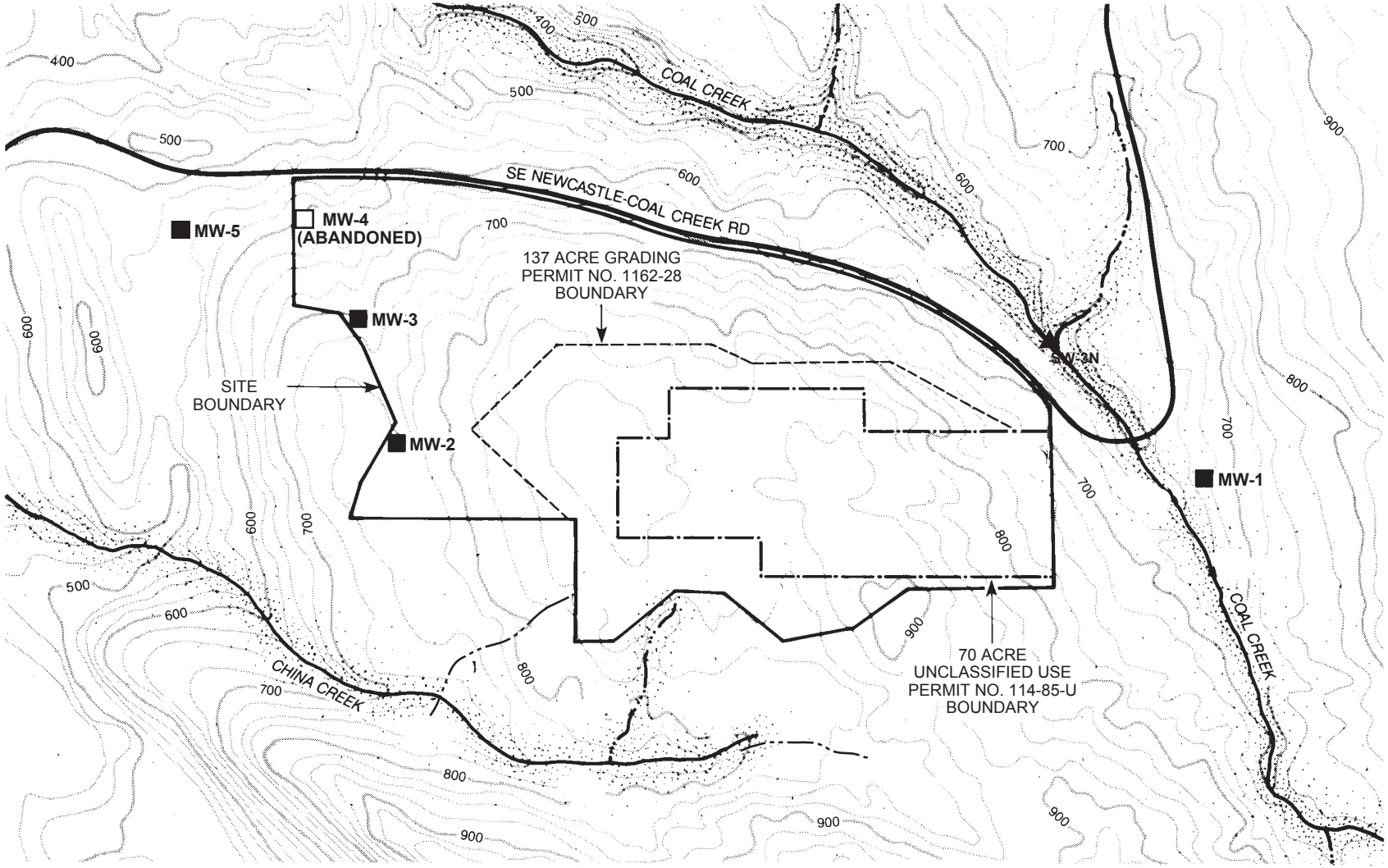
Figures



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

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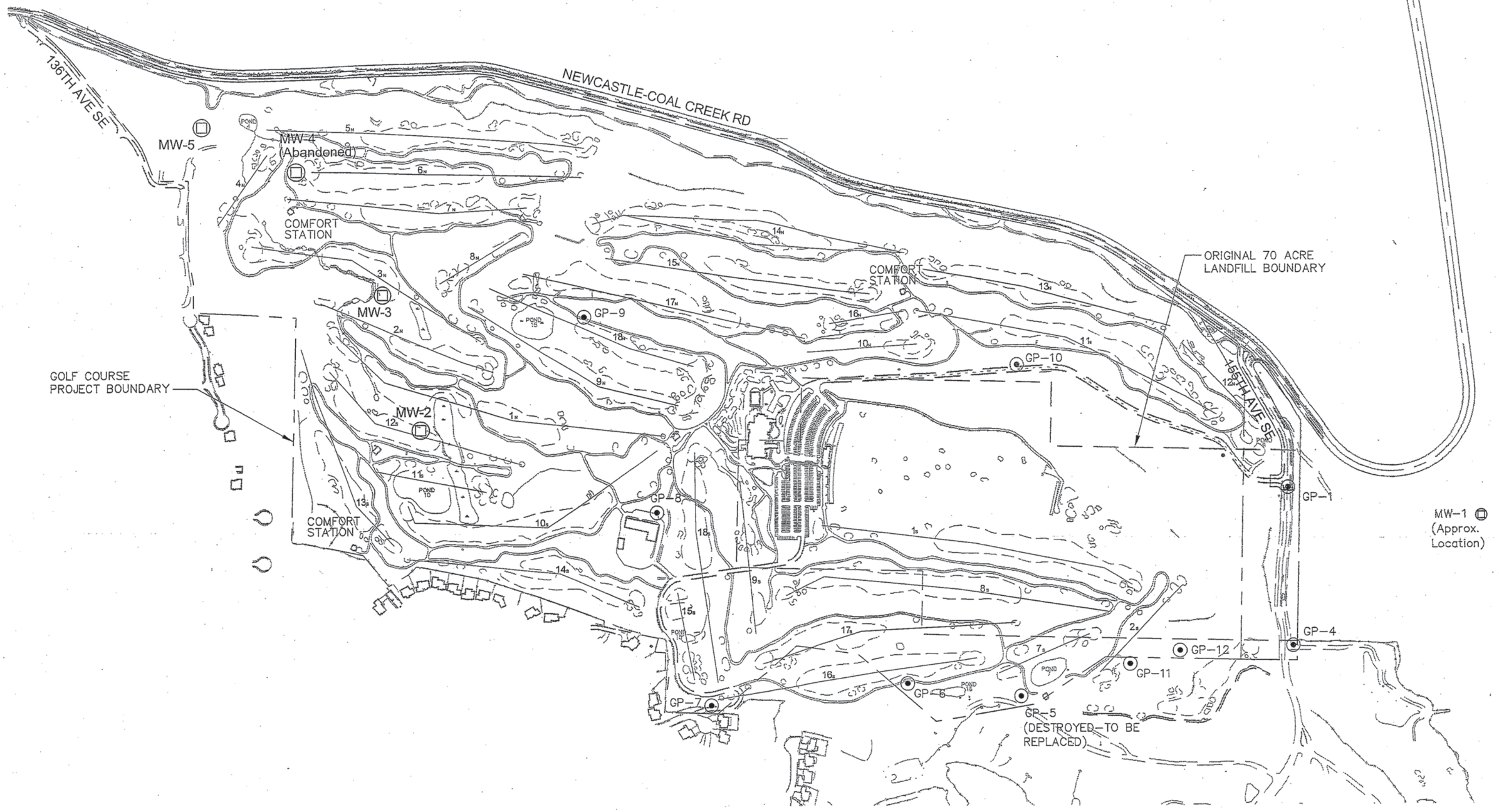
SCALE IN FEET

■ **MW-1** Groundwater Monitoring Well

Figure 1
Groundwater Monitoring Locations in Site Vicinity
Newcastle Demolition Landfill



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

0 250 500
SCALE IN FEET

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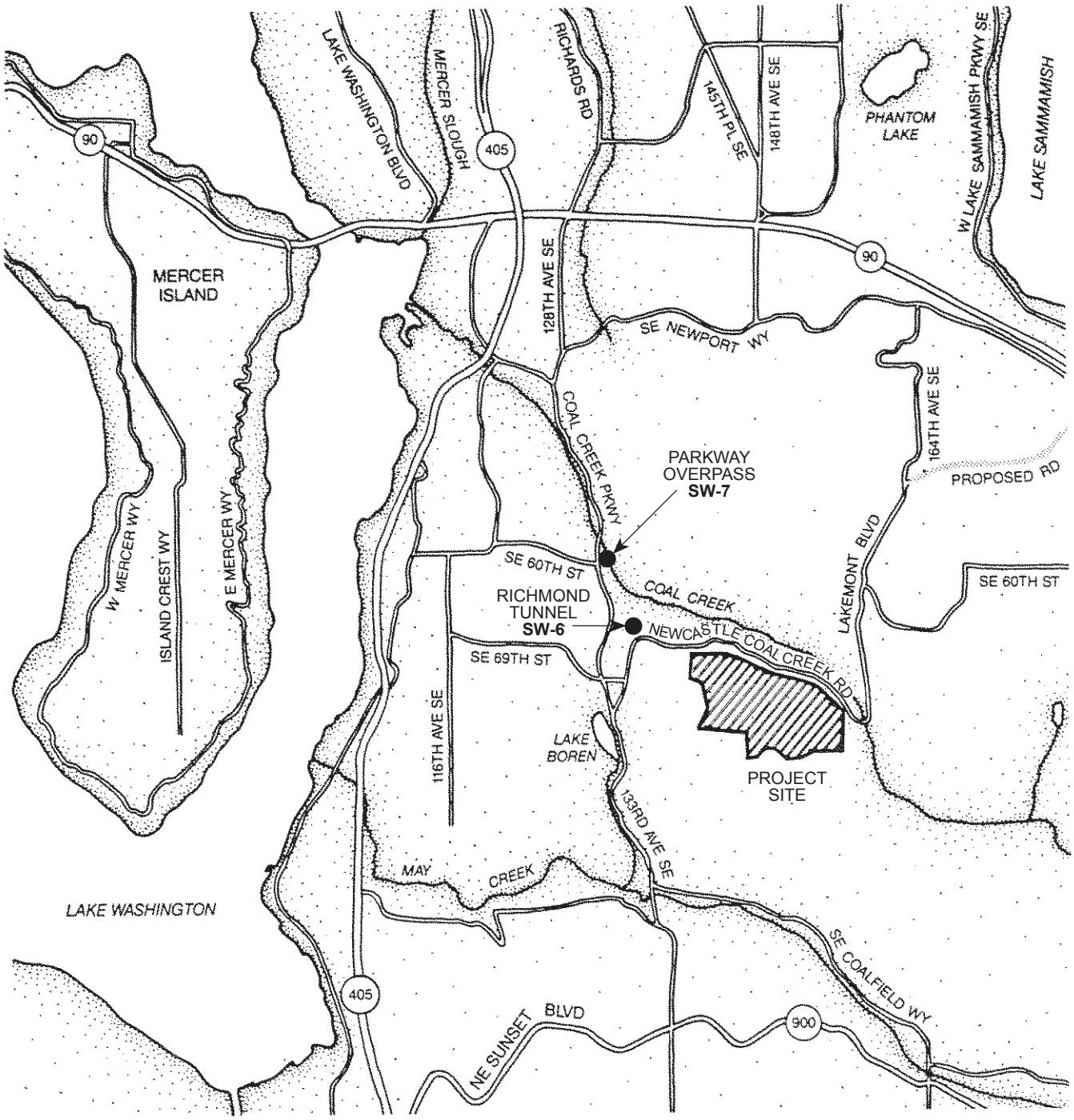
LEGEND

- 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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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 4/4/2018**	**MW-2 4/4/2018**	**MW-3 4/4/2018**	**MW-5 4/4/2018**	**MW-6 (MW-5 Dup) 4/4/2018**	**SW-6 4/4/2018**	**SW-7 4/4/2018**
Field Data										
Temperature	°C			9.6	10.3	10.0	11.4	- -	11.8	8.7
pH	standard	6.5-8.5 **		7.03	7.24	7.57	6.67	- -	7.40	**8.61**
Specific Conductivity	uS/cm		700 **	**948**	573.7	641.3	438.1	- -	**969**	271.6
DO	mg/L			9.77	0.52	1.05	0.36	- -	14.51	21.78
Redox	mV			0.7	-117.2	-7.8	-120.4	- -	-84.0	231.1
Conventionals										
Total Dissolved Solids	mg/L	500 **	500 **	**719** H	361 H	287	258	235	**543**	140
Chloride	mg/L	250 **	250 **	2.89	13.4	5.88	3.82	3.89	5.01	6.63
Ammonia	mg-N/L			0.120	0.471	0.504	0.050	0.052	0.171	0.040 U
Nitrate	mg-N/L	10 *	10 *	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.0200 U	0.361
Nitrate + Nitrite	mg-N/L			0.010 U	0.018	0.010 U	0.011	0.010	0.019	0.361
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 **	**275**	32.1	41.2	33.6	29.6	159	31.3
Chemical Oxygen Demand	mg/L			10.0 U	18.8	14.9	10.0 U	10.0 U	10.0 U	11.6
Total Organic Carbon	mg/L			1.00	7.66	4.57	2.01 J	3.29 J	1.81	4.05
Dissolved Hardness	mg/L			556	232	60.4	223	237	365	86.5
Dissolved Metals										
Arsenic	mg/L	0.00005 ***	0.01 *	**0.000508**	**0.00090**	**0.00372**	**0.0126**	**0.0110**	**0.00429**	**0.00126**
Calcium	mg/L			147	58.6	13.1	53.3	56.1	73.0	20.2
Iron	mg/L	0.3 **	0.3 **	**0.364**	0.129	**2.06**	**3.74**	**3.37**	**2.64**	0.172
Magnesium	mg/L			45.8	20.8	6.71	21.9	23.5	44.3	8.77
Manganese	mg/L	0.05 **	0.05 **	**0.102**	**0.147**	**0.0665**	**0.468**	**0.394**	**0.232**	0.0318
Zinc	mg/L	5 **	5 **	0.0053 J	0.0297	0.0094 J	0.0022 J	0.0100 U	0.0041 J	0.0042 J

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
H = Estimated concentration, holding time exceeded

Table 2. Results of Mann-Kendall Tests for Trend, Newcastle Demolition Landfill, April 2018

Well ID	Analyte	n	S	Variance	Z	Trend
MW-1	Ammonia-N[1]	58	250	22194.7	1.67	Positive
	Arsenic	**20**	**-131**	**919.0**	**-4.29**	**Negative**
	Calcium, Dissolved	55	-5	18935.0	-0.03	No Trend
	Chloride	**58**	**464**	**22111.3**	**3.11**	**Positive**
	COD	**58**	**313**	**11744.3**	**2.88**	**Positive**
	Hardness	57	-20	21032.7	-0.13	No Trend
	Iron, Dissolved	**58**	**310**	**22201.3**	**2.07**	**Positive**
	Manganese, Dissolved	**58**	**-361**	**22195.7**	**-2.42**	**Negative**
	Specific Conductivity	57	9	21101.7	0.06	No Trend
	Sulfate	58	-7	22193.7	-0.04	No Trend
	TOC	**58**	**437**	**19917.7**	**3.09**	**Positive**
MW-2	**Ammonia-N**	**52**	**299**	**16056.3**	**2.35**	**Positive**
	Arsenic	**20**	**-118**	**854.0**	**-4.00**	**Negative**
	Calcium, Dissolved	**47**	**578**	**11890.0**	**5.29**	**Positive**
	Chloride	**52**	**869**	**16029.7**	**6.86**	**Positive**
	COD[1]	52	228	15878.7	1.80	Positive
	Hardness	**49**	**572**	**13400.0**	**4.93**	**Positive**
	Iron, Dissolved	**52**	**583**	**16051.7**	**4.59**	**Positive**
	Manganese, Dissolved[1]	51	234	15148.7	1.89	Positive
	Specific Conductivity	**49**	**516**	**13458.7**	**4.44**	**Positive**
	Sulfate	51	-39	15149.7	-0.31	No Trend
	TOC	**52**	**511**	**16049.7**	**4.03**	**Positive**
MW-3	Ammonia-N[1]	38	157	6325.0	1.96	Positive
	Arsenic	18	20	691.3	0.72	No Trend
	Calcium, Dissolved	**35**	**-209**	**4956.3**	**-2.95**	**Negative**
	Chloride	**39**	**-295**	**6825.0**	**-3.56**	**Negative**
	COD	**39**	**208**	**6664.0**	**2.54**	**Positive**
	Hardness	**36**	**-253**	**5377.0**	**-3.44**	**Negative**
	Iron, Dissolved	**39**	**168**	**6830.7**	**2.02**	**Positive**
	Manganese, Dissolved	**38**	**-367**	**6320.3**	**-4.60**	**Negative**
	Specific Conductivity	**39**	**208**	**6832.7**	**2.50**	**Positive**
	Sulfate	39	-15	6829.7	-0.17	No Trend
	TOC	**39**	**302**	**6828.7**	**3.64**	**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, April 2018 (continued)

Well ID	Analyte	n	S	Variance	Z	Trend
MW-5	Ammonia-N	20	-32	948.0	-1.01	No Trend
	Arsenic	**14**	**-43**	**333.7**	**-2.30**	**Negative**
	Calcium, Dissolved	**20**	**-128**	**950.0**	**-4.12**	**Negative**
	Chloride	**20**	**-89**	**949.0**	**-2.86**	**Negative**
	COD	20	-18	916.7	-0.56	No Trend
	Hardness	**20**	**-132**	**938.0**	**-4.28**	**Negative**
	Iron, Dissolved[1]	20	54	950.0	1.72	Positive
	Manganese, Dissolved[1]	20	61	949.0	1.95	Positive
	Specific Conductivity	**20**	**-79**	**949.0**	**-2.53**	**Negative**
	Sulfate	**20**	**-141**	**949.0**	**-4.54**	**Negative**
	TOC	20	-19	949.0	-0.58	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, April 2018

Well	Date	Reference Elevation[1]	Depth to Groundwater[2]	Groundwater Elevation[1]
MW-1	4/4/2018	649	NM	NM
MW-2	4/4/2018	753	25.50	728
MW-3	4/4/2018	716	154.86	561
MW-5	4/4/2018	542	60.51	481

Notes:

[1] Reference Elevation and Groundwater Elevation approximate

[2] Depth to groundwater measured from well seal

NM = Not Measured

Appendix A

Laboratory Report and Chain-of-Custody Forms

Analytical Resources, Incorporated
Analytical Chemists and Consultants

29 June 2018

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

RE: Newcastle Landfill 2018

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)
18D0046	N/A

Shelly Fishel

Digitally signed by Shelly Fishel
DN: c=US, st=Washington, l=Tukwila, o=Analytical Resources, Inc., ou=Client Services, cn=Shelly Fishel, email=shelly.fishel@arilabs.com
Date: 2018.06.29 11:11:44 -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: 1870046	Turn-around Requested: 2 weeks
ARI Client Company: Parametrix, Inc.	Phone: 206-394-3700
Client Contact: Lisa Gilbert	
Client Project Name: Newcastle Landfill	
Client Project #: 553-1625-014	Samplers: Trey Parry

Date: 4/4/2018
Page: 1 of 1
No. of Coolers: 1 Cooler Temps:

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,TDS	Ammonia, COD, TOC	D Fe,Mn,Zn, As, hard					Notes/Comments
					Analysis Requested							
MW-1	4/4	9:15	water	3	✔	✔	✔					Dissolved metals samples field filtered Not field filtered
MW-2	4/4	12:00	water	3	✔	✔	✔					" "
MW-3	4/4	10:25	water	3	✔	✔	✔					" "
MW-5	4/4	14:10	water	3	✔	✔	✔					field filtered
MW-6	4/4	14:10	water	3	✔	✔	✔					field filtered
SW-6	4/4	15:25	water	3	✔	✔	✔					field filtered
SW-7	4/4	15:50	water	3	✔	✔	✔					field filtered

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Trey Parry	Printed Name: Brandon Fisk	Printed Name:	Printed Name:
	Company: Parametrix	Company: ARI	Company:	Company:
	Date & Time: 4/4/18 1642	Date & Time: 4/4/18 1642	Date & Time:	Date & Time:

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.

Analytical Report

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	18D0046-01	Water	04-Apr-2018 09:15	04-Apr-2018 16:42
MW-2	18D0046-02	Water	04-Apr-2018 12:00	04-Apr-2018 16:42
MW-3	18D0046-03	Water	04-Apr-2018 10:25	04-Apr-2018 16:42
MW-5	18D0046-04	Water	04-Apr-2018 14:10	04-Apr-2018 16:42
MW-6	18D0046-05	Water	04-Apr-2018 14:10	04-Apr-2018 16:42
SW-6	18D0046-06	Water	04-Apr-2018 15:25	04-Apr-2018 16:42
SW-7	18D0046-07	Water	04-Apr-2018 15:50	04-Apr-2018 16:42

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Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Case Narrative

Revised Report - June 29, 2018

This report was revised to correct reporting error of samples 18D0046-01 (MW-1) and 18D0046-02(MW-2). The data originally report was for the incorrect samples due to laboratory error. Only re-analysis data is reported. The re-analysis of samples occured outside recommended holding time and the data has been flagged with an "H" qualifier. Corrective action has been initiated.

Revised Report- April 27, 2018

This report was revised to report Dissolved Arsenic by 200.8 instead of 6010C. As well as to correct a Total Dissolved Solids calculation error on sample 18D0046-04 (MW-5).

Sample receipt

Samples as listed on the preceding page were received April 4, 2018 under ARI work order 18D0046. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Dissolved Metals and Hardness - EPA Method 6010C and 200.8

The sample(s) were digested and analyzed within the recommended holding times. Samples 18D0046-01, -02 and -03 were not field filtered. An unpreserved portion was filtered through a 0.45 micron filter and chemically preserved upon sample receipt.

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.

The Duplicate RPD were within control limits.

The Matrix Spike percent recoveries were within control limits.

Wet Chemistry (Ammonia, Cl, SO4, NO2, NO3, TDS, COD, TOC)

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

Initial and continuing calibrations were within method requirements.

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

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

The LCS percent recoveries were within control limits.

The Duplicate RPD were within control limits.

The Matrix Spike percent recoveries were within control limits.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Parametrix | Project Name: _____

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

Assigned ARI Job No: 180046 | Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to 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: 1642 — 0.9

If cooler temperature is out of compliance fill out form 00070F — Temp Gun ID#: D00256S

Cooler Accepted by: BF Date: 4/4/18 Time: 1642

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
Were all bottles sealed in individual plastic bags?		YES	NO
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		

Was Sample Split by ARI : NA YES Date/Time: 4/4/18 1707 Equipment: pour Split by: BF

Samples Logged by: BF Date: 4/4/18 Time: 1707

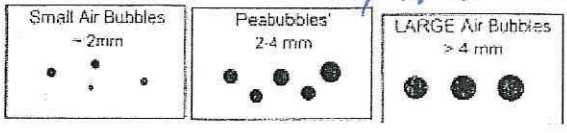
*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

Diss Metals-MW-1, 2, +3 did not get FF before preservation volume was split from conventionals analysis, pres metals archived

By: BF Date: 4/4/18



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

WORK ORDER

18D0046

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

Project: Newcastle Landfill 2018 **Project Number:** Newcastle Landfill

Analysis	Due	TAT	Expires	Comments
Ammonia-N, Dist/Colr, 350.1 M	04/19/2018	10	5/2/2018	
Met Diss 6010C - Fe	04/19/2018	10	10/1/2018	

Analysis groups included in this work order

Hardness, Calculated Diss (6010C)

Met Diss 6010C - Mg Met Diss 6010C - Ca

Nitrate-N Calc EPA 353.2

Nitrite-N, EPA 353.2 Nitrate + Nitrite-N, EPA 353.2

Preservation Confirmation

Container ID	Container Type	pH
18D0046-01 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-01 B	HDPE NM, 1000 mL	
18D0046-01 C	HDPE NM, 500 mL	>2 f
18D0046-01 D	HDPE NM, 500 mL, 1:1 HNO3	<2 p
18D0046-02 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-02 B	HDPE NM, 1000 mL	
18D0046-02 C	HDPE NM, 500 mL	>2 f
18D0046-02 D	HDPE NM, 500 mL, 1:1 HNO3	<2 p
18D0046-03 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-03 B	HDPE NM, 1000 mL	
18D0046-03 C	HDPE NM, 500 mL	>2 f
18D0046-03 D	HDPE NM, 500 mL, 1:1 HNO3	<2 p
18D0046-04 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-04 B	HDPE NM, 1000 mL	
18D0046-04 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 p
18D0046-05 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-05 B	HDPE NM, 1000 mL	
18D0046-05 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 p
18D0046-06 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-06 B	HDPE NM, 1000 mL	
18D0046-06 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 p
18D0046-07 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-07 B	HDPE NM, 1000 mL	
18D0046-07 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 p

BT
Preservation Confirmed By

4/4/18
Date

P = pass
f = fail

Reviewed By

Date

WORK ORDER

18D0046

Client: Parametrix, Inc.	**Project Manager:** Shelly Fishel
Project: Newcastle Landfill 2018	**Project Number:** Newcastle Landfill

Analysis	Due	TAT	Expires	Comments
Ammonia-N, Dist/Colr, 350.1 M	04/19/2018	10	5/2/2018	
Met Diss 6010C - Fe	04/19/2018	10	10/1/2018	

Analysis groups included in this work order

Hardness, Calculated Diss (6010C)

Met Diss 6010C - Mg Met Diss 6010C - Ca

Nitrate-N Calc EPA 353.2

Nitrite-N, EPA 353.2 Nitrate + Nitrite-N, EPA 353.2

Preservation Confirmation

Container ID	Container Type	pH
18D0046-01 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-01 B	HDPE NM, 1000 mL	
18D0046-01 C	HDPE NM, 500 mL	>2 f
18D0046-01 D	HDPE NM, 500 mL, 1:1 HNO3	<2 p
18D0046-02 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-02 B	HDPE NM, 1000 mL	
18D0046-02 C	HDPE NM, 500 mL	>2 f
18D0046-02 D	HDPE NM, 500 mL, 1:1 HNO3	<2 p
18D0046-03 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-03 B	HDPE NM, 1000 mL	
18D0046-03 C	HDPE NM, 500 mL	>2 f
18D0046-03 D	HDPE NM, 500 mL, 1:1 HNO3	<2 p
18D0046-04 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-04 B	HDPE NM, 1000 mL	
18D0046-04 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 p
18D0046-05 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-05 B	HDPE NM, 1000 mL	
18D0046-05 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 p
18D0046-06 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-06 B	HDPE NM, 1000 mL	
18D0046-06 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 p
18D0046-07 A	Glass NM, Amber, 250 mL, 9N H2SO4	<2 p
18D0046-07 B	HDPE NM, 1000 mL	
18D0046-07 D	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 p

RJF
Preservation Confirmed By

4/4/18
Date

P = pass
f = fail

4/5/18 DP
filtered + preserved

Reviewed By

Date

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/04/2018 09:15

Instrument: ICPMS2 — Analyzed: 25-Apr-2018 13:05

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0557 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — 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	**0.508**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 04/04/2018 09:15

Instrument: ICP2 — Analyzed: 13-Apr-2018 14:51

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGD0221 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0047	0.0500	**0.0157**	mg/L	J
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**147**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.364**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**45.8**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.102**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0053**	mg/L	J

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Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01 (Water)

Wet Chemistry

Method: EPA 325.2 — Sampled: 04/04/2018 09:15

Instrument: LACHAT1 — Analyzed: 12-Apr-2018 10:54

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.00	**2.89**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 04/04/2018 09:15

Instrument: LACHAT2 — Analyzed: 19-Apr-2018 14:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0304 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — 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	**0.120**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 04/04/2018 09:15

Instrument: [CALC] — Analyzed: 05-Apr-2018 17:25

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 05-Apr-2018 Final Volume: 1

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

Instrument: LACHAT2 — Analyzed: 05-Apr-2018 17:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0103 Sample Size: 10 mL
Prepared: 05-Apr-2018 Final Volume: 10 mL

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

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 04/04/2018 09:15

Instrument: UV1800-1 — Analyzed: 10-Apr-2018 10:23

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0094 — Sample Size: 2 mL
Prepared: 05-Apr-2018 — 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

Analytical Report

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 04/04/2018 09:15

Instrument: TOC-LCSH — Analyzed: 11-Apr-2018 02:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0209 — Sample Size: 20 mL
Prepared: 10-Apr-2018 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**1.00**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/04/2018 09:15

Instrument: [CALC] — Analyzed: 13-Apr-2018 14:51

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**556**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01RE1 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 04/04/2018 09:15

Instrument: BAL2 — Analyzed: 15-Jun-2018 08:56

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0378 — Sample Size: 100 mL
Prepared: 15-Jun-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**719**	mg/L	H

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-1

18D0046-01RE1 (Water)

Wet Chemistry

Method: EPA 375.2 — Sampled: 04/04/2018 09:15

Instrument: LACHAT1 — Analyzed: 18-Apr-2018 16:47

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	20.0	20.0	**275**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/04/2018 12:00

Instrument: ICPMS2 — Analyzed: 25-Apr-2018 15:24

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0557 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — 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	**0.897**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 04/04/2018 12:00

Instrument: ICP2 — Analyzed: 13-Apr-2018 14:55

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGD0221 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0047	0.0500	**0.0127**	mg/L	J
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**58.6**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.129**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**20.8**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.147**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0297**	mg/L	

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Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 04/04/2018 12:00

Instrument: LACHAT2 — Analyzed: 19-Apr-2018 14:05

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0304 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — 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	**0.471**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 04/04/2018 12:00

Instrument: [CALC] — Analyzed: 05-Apr-2018 17:30

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 05-Apr-2018 Final Volume: 1

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

Instrument: LACHAT2 — Analyzed: 05-Apr-2018 17:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0103 Sample Size: 10 mL
Prepared: 05-Apr-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.018**	mg/L	

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02 (Water)

Wet Chemistry

Method: EPA 375.2 — Sampled: 04/04/2018 12:00

Instrument: LACHAT1 — Analyzed: 18-Apr-2018 16:33

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	10.0	10.0	**32.1**	mg/L	D

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Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 04/04/2018 12:00

Instrument: UV1800-1 — Analyzed: 10-Apr-2018 10:24

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0094 — Sample Size: 2 mL
Prepared: 05-Apr-2018 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	**18.8**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 04/04/2018 12:00

Instrument: TOC-LCSH — Analyzed: 11-Apr-2018 02:51

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0209 — Sample Size: 20 mL
Prepared: 10-Apr-2018 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**7.66**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/04/2018 12:00

Instrument: [CALC] — Analyzed: 13-Apr-2018 14:55

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**232**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02RE1 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 04/04/2018 12:00

Instrument: BAL2 — Analyzed: 15-Jun-2018 08:56

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGF0378 — Sample Size: 100 mL
Prepared: 15-Jun-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**361**	mg/L	H

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-2

18D0046-02RE1 (Water)

Wet Chemistry

Method: EPA 325.2 — Sampled: 04/04/2018 12:00

Instrument: LACHAT1 — Analyzed: 12-Apr-2018 11:18

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	2	2.00	2.00	**13.4**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/04/2018 10:25

Instrument: ICPMS2 — Analyzed: 25-Apr-2018 15:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0557 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — 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	**3.72**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 04/04/2018 10:25

Instrument: ICP2 — Analyzed: 13-Apr-2018 14:59

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGD0221 — Sample Size: 25 mL
Prepared: 11-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0047	0.0500	**0.0078**	mg/L	J
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**13.1**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**2.06**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**6.71**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0665**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0094**	mg/L	J

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Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 04/04/2018 10:25

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0136 — Sample Size: 100 mL
Prepared: 09-Apr-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**287**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Wet Chemistry

Method: EPA 325.2 — Sampled: 04/04/2018 10:25

Instrument: LACHAT1 — Analyzed: 12-Apr-2018 10:59

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.00	**5.88**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 04/04/2018 10:25

Instrument: LACHAT2 — Analyzed: 19-Apr-2018 14:06

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0304 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — 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	**0.504**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 04/04/2018 10:25

Instrument: [CALC] — Analyzed: 05-Apr-2018 17:34

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 05-Apr-2018 Final Volume: 1

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

Instrument: LACHAT2 — Analyzed: 05-Apr-2018 17:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0103 Sample Size: 10 mL
Prepared: 05-Apr-2018 Final Volume: 10 mL

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

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Wet Chemistry

Method: EPA 375.2 — Sampled: 04/04/2018 10:25

Instrument: LACHAT1 — Analyzed: 18-Apr-2018 16:36

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	10.0	10.0	**41.2**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 04/04/2018 10:25

Instrument: UV1800-1 — Analyzed: 10-Apr-2018 10:25

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0094 — Sample Size: 2 mL
Prepared: 05-Apr-2018 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	**14.9**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 04/04/2018 10:25

Instrument: TOC-LCSH — Analyzed: 11-Apr-2018 03:15

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0209 — Sample Size: 20 mL
Prepared: 10-Apr-2018 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**4.57**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-3

18D0046-03 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/04/2018 10:25

Instrument: [CALC] — Analyzed: 13-Apr-2018 14:59

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 11-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**60.4**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/04/2018 14:10

Instrument: ICPMS2 — Analyzed: 25-Apr-2018 14:29

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0558 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — 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	**12.6**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 04/04/2018 14:10

Instrument: ICP2 — Analyzed: 17-Apr-2018 16:19

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGD0367 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0047	0.0500	**0.0262**	mg/L	J
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**53.3**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**3.74**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**21.9**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.468**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0022**	mg/L	J

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Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 04/04/2018 14:10

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0136 — Sample Size: 200 mL
Prepared: 09-Apr-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**258**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Wet Chemistry

Method: EPA 325.2 — Sampled: 04/04/2018 14:10

Instrument: LACHAT1 — Analyzed: 12-Apr-2018 11:00

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.00	**3.82**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 04/04/2018 14:10

Instrument: LACHAT2 — Analyzed: 19-Apr-2018 14:07

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0304 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — 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	**0.050**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 04/04/2018 14:10

Instrument: [CALC] — Analyzed: 05-Apr-2018 17:36

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 05-Apr-2018 Final Volume: 1

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

Instrument: LACHAT2 — Analyzed: 05-Apr-2018 17:36

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0103 Sample Size: 10 mL
Prepared: 05-Apr-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.011**	mg/L	

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Wet Chemistry

Method: EPA 375.2 — Sampled: 04/04/2018 14:10

Instrument: LACHAT1 — Analyzed: 18-Apr-2018 16:38

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	10.0	10.0	**33.6**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 04/04/2018 14:10

Instrument: UV1800-1 — Analyzed: 10-Apr-2018 10:26

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0094 — Sample Size: 2 mL
Prepared: 05-Apr-2018 — 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 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 04/04/2018 14:10

Instrument: TOC-LCSH — Analyzed: 11-Apr-2018 03:34

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0209 — Sample Size: 20 mL
Prepared: 10-Apr-2018 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**2.01**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-5

18D0046-04 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/04/2018 14:10

Instrument: [CALC] — Analyzed: 17-Apr-2018 16:19

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 17-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**223**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/04/2018 14:10

Instrument: ICPMS2 — Analyzed: 25-Apr-2018 15:15

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0558 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — 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	**11.0**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 04/04/2018 14:10

Instrument: ICP2 — Analyzed: 17-Apr-2018 16:02

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGD0367 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0047	0.0500	**0.0227**	mg/L	J
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**56.1**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**3.37**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**23.5**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.394**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	ND	mg/L	U

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 04/04/2018 14:10

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0136 — Sample Size: 200 mL
Prepared: 09-Apr-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**235**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Wet Chemistry

Method: EPA 325.2 — Sampled: 04/04/2018 14:10

Instrument: LACHAT1 — Analyzed: 12-Apr-2018 11:01

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.00	**3.89**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 04/04/2018 14:10

Instrument: LACHAT2 — Analyzed: 19-Apr-2018 14:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0304 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — 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	**0.052**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 04/04/2018 14:10

Instrument: [CALC] — Analyzed: 05-Apr-2018 17:37

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 05-Apr-2018 Final Volume: 1

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

Instrument: LACHAT2 — Analyzed: 05-Apr-2018 17:37

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0103 Sample Size: 10 mL
Prepared: 05-Apr-2018 Final Volume: 10 mL

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

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Wet Chemistry

Method: EPA 375.2 — Sampled: 04/04/2018 14:10

Instrument: LACHAT1 — Analyzed: 18-Apr-2018 16:39

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	10.0	10.0	**29.6**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 04/04/2018 14:10

Instrument: UV1800-1 — Analyzed: 10-Apr-2018 10:27

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0094 — Sample Size: 2 mL
Prepared: 05-Apr-2018 — 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 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 04/04/2018 14:10

Instrument: TOC-LCSH — Analyzed: 11-Apr-2018 04:51

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0209 — Sample Size: 20 mL
Prepared: 10-Apr-2018 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**3.29**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

MW-6

18D0046-05 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/04/2018 14:10

Instrument: [CALC] — Analyzed: 17-Apr-2018 16:02

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 17-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**237**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/04/2018 15:25

Instrument: ICPMS2 — Analyzed: 25-Apr-2018 15:20

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0558 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — 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	**4.29**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 04/04/2018 15:25

Instrument: ICP2 — Analyzed: 17-Apr-2018 16:06

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGD0367 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0047	0.0500	**0.0176**	mg/L	J
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**73.0**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**2.64**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**44.3**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.232**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0041**	mg/L	J

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 04/04/2018 15:25

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0136 — Sample Size: 100 mL
Prepared: 09-Apr-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	10	10	**543**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Wet Chemistry

Method: EPA 325.2 — Sampled: 04/04/2018 15:25

Instrument: LACHAT1 — Analyzed: 12-Apr-2018 11:02

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.00	**5.01**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 04/04/2018 15:25

Instrument: LACHAT2 — Analyzed: 19-Apr-2018 14:16

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0304 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — 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	**0.171**	mg/L	

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Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 04/04/2018 15:25

Instrument: [CALC] — Analyzed: 05-Apr-2018 17:38

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 05-Apr-2018 Final Volume: 1

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

Instrument: LACHAT2 — Analyzed: 05-Apr-2018 17:38

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0103 Sample Size: 10 mL
Prepared: 05-Apr-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.019**	mg/L	

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 04/04/2018 15:25

Instrument: UV1800-1 — Analyzed: 10-Apr-2018 10:30

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0094 — Sample Size: 2 mL
Prepared: 05-Apr-2018 — 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 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 04/04/2018 15:25

Instrument: TOC-LCSH — Analyzed: 11-Apr-2018 05:14

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0209 — Sample Size: 20 mL
Prepared: 10-Apr-2018 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**1.81**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/04/2018 15:25

Instrument: [CALC] — Analyzed: 17-Apr-2018 16:06

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 17-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**365**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-6

18D0046-06RE1 (Water)

Wet Chemistry

Method: EPA 375.2 — Sampled: 04/04/2018 15:25

Instrument: LACHAT1 — Analyzed: 18-Apr-2018 16:53

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	10	20.0	20.0	**159**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/04/2018 15:50

Instrument: ICPMS1 — Analyzed: 25-Apr-2018 13:06

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGD0389 — Sample Size: 25 mL
Prepared: 24-Apr-2018 — 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	**1.26**	ug/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 6010C — Sampled: 04/04/2018 15:50

Instrument: ICP2 — Analyzed: 17-Apr-2018 16:10

Sample Preparation: Preparation Method: WMN (No Prep)
Preparation Batch: BGD0367 — Sample Size: 25 mL
Prepared: 17-Apr-2018 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.0047	0.0500	**0.0068**	mg/L	J
Calcium, Dissolved	7440-70-2	1	0.0051	0.0500	**20.2**	mg/L	
Iron, Dissolved	7439-89-6	1	0.0013	0.0500	**0.172**	mg/L	
Magnesium, Dissolved	7439-95-4	1	0.0160	0.0500	**8.77**	mg/L	
Manganese, Dissolved	7439-96-5	1	0.0003	0.0010	**0.0318**	mg/L	
Zinc, Dissolved	7440-66-6	1	0.0021	0.0100	**0.0042**	mg/L	J

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Wet Chemistry

Method: EPA 160.1 — Sampled: 04/04/2018 15:50

Instrument: BAL2 — Analyzed: 09-Apr-2018 10:08

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0136 — Sample Size: 200 mL
Prepared: 09-Apr-2018 — Final Volume: 200 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Dissolved Solids		1	5	5	**140**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Wet Chemistry

Method: EPA 325.2 — Sampled: 04/04/2018 15:50

Instrument: LACHAT1 — Analyzed: 12-Apr-2018 11:04

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloride	16887-00-6	1	1.00	1.00	**6.63**	mg/L	

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Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Wet Chemistry

Method: EPA 350.1 M — Sampled: 04/04/2018 15:50

Instrument: LACHAT2 — Analyzed: 19-Apr-2018 14:18

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0304 — Sample Size: 10 mL
Prepared: 13-Apr-2018 — 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 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Wet Chemistry

Method: EPA 353.2 — Sampled: 04/04/2018 15:50

Instrument: [CALC] — Analyzed: 05-Apr-2018 17:39

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 05-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.0200	**0.361**	mg/L	

Instrument: LACHAT2 — Analyzed: 05-Apr-2018 17:39

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0103 Sample Size: 10 mL
Prepared: 05-Apr-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate + Nitrite as N		1	0.010	0.010	**0.361**	mg/L	

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Wet Chemistry

Method: EPA 375.2 — Sampled: 04/04/2018 15:50

Instrument: LACHAT1 — Analyzed: 18-Apr-2018 16:41

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0104 — Sample Size: 10 mL
Prepared: 05-Apr-2018 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	5	10.0	10.0	**31.3**	mg/L	D

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Wet Chemistry

Method: EPA 410.4 — Sampled: 04/04/2018 15:50

Instrument: UV1800-1 — Analyzed: 10-Apr-2018 10:31

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0094 — Sample Size: 2 mL
Prepared: 05-Apr-2018 — Final Volume: 2 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
COD		1	10.0	10.0	**11.6**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Wet Chemistry

Method: EPA 9060A — Sampled: 04/04/2018 15:50

Instrument: TOC-LCSH — Analyzed: 11-Apr-2018 05:44

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGD0209 — Sample Size: 20 mL
Prepared: 10-Apr-2018 — Final Volume: 20 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.50	0.50	**4.05**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

SW-7

18D0046-07 (Water)

Calculation

Method: SM 2340 B-97 — Sampled: 04/04/2018 15:50

Instrument: [CALC] — Analyzed: 17-Apr-2018 16:10

Sample Preparation: Preparation Method: [CALC]
Preparation Batch: [CALC]
Prepared: 17-Apr-2018 Final Volume: 1

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Hardness, Dissolved		1	0.331	**86.5**	mg/L	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGD0221 - WMN (No Prep)

Instrument: ICP2 Analyst: MCB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0221-BLK1)					Prepared: 11-Apr-2018 Analyzed: 11-Apr-2018 11:15						
Arsenic, Dissolved	ND	0.0047	0.0500	mg/L							U
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 (BGD0221-BS1)					Prepared: 11-Apr-2018 Analyzed: 11-Apr-2018 11:53						
Arsenic, Dissolved	2.16	0.0047	0.0500	mg/L	2.00		108	80-120			
Calcium, Dissolved	9.96	0.0051	0.0500	mg/L	10.0		99.6	80-120			
Iron, Dissolved	1.99	0.0013	0.0500	mg/L	2.00		99.5	80-120			
Magnesium, Dissolved	10.5	0.0160	0.0500	mg/L	10.0		105	80-120			
Manganese, Dissolved	0.477	0.0003	0.0010	mg/L	0.500		95.5	80-120			
Zinc, Dissolved	0.512	0.0021	0.0100	mg/L	0.500		102	80-120			

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGD0367 - WMN (No Prep)

Instrument: ICP2 Analyst: MCB

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0367-BLK1)				Prepared: 17-Apr-2018 Analyzed: 17-Apr-2018 15:58							
Arsenic, Dissolved	ND	0.0047	0.0500	mg/L							U
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 (BGD0367-BS1)				Prepared: 17-Apr-2018 Analyzed: 17-Apr-2018 16:27							
Arsenic, Dissolved	2.11	0.0047	0.0500	mg/L	2.00		105	80-120			
Calcium, Dissolved	9.91	0.0051	0.0500	mg/L	10.0		99.1	80-120			
Iron, Dissolved	1.93	0.0013	0.0500	mg/L	2.00		96.7	80-120			
Magnesium, Dissolved	10.4	0.0160	0.0500	mg/L	10.0		104	80-120			
Manganese, Dissolved	0.490	0.0003	0.0010	mg/L	0.500		98.1	80-120			
Zinc, Dissolved	0.510	0.0021	0.0100	mg/L	0.500		102	80-120			
Duplicate (BGD0367-DUP1)		**Source: 18D0046-04**		Prepared: 17-Apr-2018 Analyzed: 17-Apr-2018 16:15							
Arsenic, Dissolved	0.0283	0.0047	0.0500	mg/L		0.0262			7.99	20	J
Calcium, Dissolved	54.8	0.0051	0.0500	mg/L		53.3			2.86	20	
Iron, Dissolved	3.87	0.0013	0.0500	mg/L		3.74			3.47	20	
Magnesium, Dissolved	22.8	0.0160	0.0500	mg/L		21.9			3.85	20	
Manganese, Dissolved	0.486	0.0003	0.0010	mg/L		0.468			3.70	20	
Zinc, Dissolved	ND	0.0021	0.0100	mg/L		0.0022					U
Matrix Spike (BGD0367-MS1)		**Source: 18D0046-04**		Prepared: 17-Apr-2018 Analyzed: 17-Apr-2018 16:23							
Arsenic, Dissolved	2.18	0.0047	0.0500	mg/L	2.00	0.0262	108	75-125			
Calcium, Dissolved	62.2	0.0051	0.0500	mg/L	10.0	53.3	89.0	75-125			
Iron, Dissolved	5.77	0.0013	0.0500	mg/L	2.00	3.74	102	75-125			
Magnesium, Dissolved	31.1	0.0160	0.0500	mg/L	10.0	21.9	92.1	75-125			
Manganese, Dissolved	0.948	0.0003	0.0010	mg/L	0.500	0.468	96.0	75-125			
Zinc, Dissolved	0.506	0.0021	0.0100	mg/L	0.500	0.0022	101	75-125			

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGD0389 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0389-BLK1)						Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 11:47						
Arsenic, Dissolved	75a	ND	0.0220	0.200	ug/L							U
LCS (BGD0389-BS1)						Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 12:23						
Arsenic, Dissolved	75a	25.5	0.0220	0.200	ug/L	25.0		102	80-120			
Duplicate (BGD0389-DUP1)			**Source: 18D0046-07**			Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 14:51						
Arsenic, Dissolved	75a	1.28	0.0220	0.200	ug/L		1.26			1.89	20	
Matrix Spike (BGD0389-MS1)			**Source: 18D0046-07**			Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 13:10						
Arsenic, Dissolved	75a	26.3	0.0220	0.200	ug/L	25.0	1.26	100	75-125			

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGD0557 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0557-BLK1)						Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 14:01						
Arsenic, Dissolved	75a	ND	0.0220	0.200	ug/L							U
LCS (BGD0557-BS1)						Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 14:43						
Arsenic, Dissolved	75a	26.3	0.0220	0.200	ug/L	25.0		105	80-120			

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGD0558 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0558-BLK1)						Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 14:05						
Arsenic, Dissolved	75a	ND	0.0220	0.200	ug/L							U
LCS (BGD0558-BS1)						Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 14:38						
Arsenic, Dissolved	75a	26.0	0.0220	0.200	ug/L	25.0		104	80-120			
Duplicate (BGD0558-DUP1)			**Source: 18D0046-04**			Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 14:24						
Arsenic, Dissolved	75a	12.7	0.0220	0.200	ug/L		12.6			0.58	20	
Matrix Spike (BGD0558-MS1)			**Source: 18D0046-04**			Prepared: 24-Apr-2018 Analyzed: 25-Apr-2018 14:34						
Arsenic, Dissolved	75a	39.3	0.0220	0.200	ug/L	25.0	12.6	107	75-125			

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Wet Chemistry - Quality Control

Batch BGD0094 - No Prep Wet Chem

Instrument: UV1800-1 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0094-BLK1)				Prepared: 05-Apr-2018 Analyzed: 10-Apr-2018 10:17							
COD	ND	10.0	10.0	mg/L							U
DL (BGD0094-BLK2)				Prepared: 05-Apr-2018 Analyzed: 10-Apr-2018 10:27							
COD	ND	10.0	10.0	mg/L							U
Calibration Blank (BGD0094-BLK3)				Prepared: 05-Apr-2018 Analyzed: 10-Apr-2018 10:37							
COD	ND	10.0	10.0	mg/L							U
LCS (BGD0094-BS1)				Prepared: 05-Apr-2018 Analyzed: 10-Apr-2018 10:18							
COD	101	10.0	10.0	mg/L	100		101	90-110			
DL (BGD0094-BS2)				Prepared: 05-Apr-2018 Analyzed: 10-Apr-2018 10:27							
COD	101	10.0	10.0	mg/L	100		101	90-110			
Calibration Check (BGD0094-BS3)				Prepared: 05-Apr-2018 Analyzed: 10-Apr-2018 10:37							
COD	101	10.0	10.0	mg/L	100		101	90-110			

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Wet Chemistry - Quality Control

Batch BGD0103 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0103-BLK1)				Prepared: 05-Apr-2018 Analyzed: 05-Apr-2018 17:21							
Nitrate + Nitrite as N	ND	0.010	0.010	mg/L							U
Nitrite-N	ND	0.010	0.010	mg/L							U
LCS (BGD0103-BS1)				Prepared: 05-Apr-2018 Analyzed: 05-Apr-2018 17:23							
Nitrate + Nitrite as N	0.485	0.010	0.010	mg/L	0.500		97.1	90-110			
LCS (BGD0103-BS2)				Prepared: 05-Apr-2018 Analyzed: 05-Apr-2018 17:24							
Nitrite-N	0.486	0.010	0.010	mg/L	0.500		97.1	75-125			
Duplicate (BGD0103-DUP1)		**Source: 18D0046-01**		Prepared: 05-Apr-2018 Analyzed: 05-Apr-2018 17:26							
Nitrate + Nitrite as N	ND	0.010	0.010	mg/L		ND					U
Nitrite-N	ND	0.010	0.010	mg/L		ND					U
Matrix Spike (BGD0103-MS1)		**Source: 18D0046-01**		Prepared: 05-Apr-2018 Analyzed: 05-Apr-2018 17:27							
Nitrate + Nitrite as N	0.496	0.010	0.010	mg/L	0.500	ND	99.2	75-125			

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

Matrix Spike (BGD0103-MS2)		**Source: 18D0046-01**		Prepared: 05-Apr-2018 Analyzed: 05-Apr-2018 17:29							
Nitrite-N	0.492	0.010	0.010	mg/L	0.500	ND	98.3	75-125			

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Wet Chemistry - Quality Control

Batch BGD0104 - No Prep Wet Chem

Instrument: LACHAT1 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0104-BLK1)				Prepared: 05-Apr-2018 Analyzed: 12-Apr-2018 10:38							
Chloride	ND	1.00	1.00	mg/L							U
Blank (BGD0104-BLK2)				Prepared: 05-Apr-2018 Analyzed: 18-Apr-2018 16:27							
Sulfate	ND	2.00	2.00	mg/L							U
LCS (BGD0104-BS1)				Prepared: 05-Apr-2018 Analyzed: 12-Apr-2018 10:41							
Chloride	5.03	1.00	1.00	mg/L	5.00		101	90-110			
LCS (BGD0104-BS2)				Prepared: 05-Apr-2018 Analyzed: 18-Apr-2018 16:28							
Sulfate	15.3	2.00	2.00	mg/L	15.0		102	90-110			
Duplicate (BGD0104-DUP1)		**Source: 18D0046-01**		Prepared: 05-Apr-2018 Analyzed: 12-Apr-2018 10:55							
Chloride	2.96	1.00	1.00	mg/L		2.89			2.69	20	
Duplicate (BGD0104-DUP3)		**Source: 18D0046-01RE1**		Prepared: 05-Apr-2018 Analyzed: 18-Apr-2018 16:51							
Sulfate	285	20.0	20.0	mg/L		275			3.39	20	D
Matrix Spike (BGD0104-MS1)		**Source: 18D0046-01**		Prepared: 05-Apr-2018 Analyzed: 12-Apr-2018 10:56							
Chloride	8.07	1.00	1.00	mg/L	5.00	2.89	104	75-125			

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

Matrix Spike (BGD0104-MS3)		**Source: 18D0046-01RE1**		Prepared: 05-Apr-2018 Analyzed: 18-Apr-2018 16:52							
Sulfate	487	40.0	40.0	mg/L	200	275	106	75-125			D

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Wet Chemistry - Quality Control

Batch BGD0136 - 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 (BGD0136-BLK1)				Prepared: 09-Apr-2018 Analyzed: 09-Apr-2018 10:08							
Dissolved Solids	ND	5	5	mg/L							U
LCS (BGD0136-BS1)				Prepared: 09-Apr-2018 Analyzed: 09-Apr-2018 10:08							
Dissolved Solids	494	5	5	mg/L	500		98.8	90-110			
Duplicate (BGD0136-DUP1)		**Source: 18D0046-01**		Prepared: 09-Apr-2018 Analyzed: 09-Apr-2018 10:08							
Dissolved Solids	325	10	10	mg/L		332			2.13	20	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Wet Chemistry - Quality Control

Batch BGD0209 - No Prep Wet Chem

Instrument: TOC-LCSH Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0209-BLK1)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 01:43							
Total Organic Carbon	ND	0.50	0.50	mg/L							U
LCS (BGD0209-BS1)				Prepared: 10-Apr-2018 Analyzed: 11-Apr-2018 02:06							
Total Organic Carbon	20.50	0.50	0.50	mg/L	20.00		103	90-110			

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Wet Chemistry - Quality Control

Batch BGD0304 - No Prep Wet Chem

Instrument: LACHAT2 Analyst: RLM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGD0304-BLK1)				Prepared: 13-Apr-2018 Analyzed: 19-Apr-2018 13:57							
Ammonia-N	ND	0.040	0.040	mg/L							U
LCS (BGD0304-BS1)				Prepared: 13-Apr-2018 Analyzed: 19-Apr-2018 14:00							
Ammonia-N	0.534	0.040	0.040	mg/L	0.500		107	90-110			
Duplicate (BGD0304-DUP1)		**Source: 18D0046-01**		Prepared: 13-Apr-2018 Analyzed: 19-Apr-2018 14:02							
Ammonia-N	0.118	0.040	0.040	mg/L		0.120			1.76	20	
Matrix Spike (BGD0304-MS1)		**Source: 18D0046-01**		Prepared: 13-Apr-2018 Analyzed: 19-Apr-2018 14:03							
Ammonia-N	0.608	0.040	0.040	mg/L	0.500	0.120	97.5	75-125			

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

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Wet Chemistry - Quality Control

Batch BGF0378 - 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 (BGF0378-BLK1)					Prepared: 15-Jun-2018 Analyzed: 15-Jun-2018 08:56						
Dissolved Solids	ND	5	5	mg/L							U
LCS (BGF0378-BS1)					Prepared: 15-Jun-2018 Analyzed: 15-Jun-2018 08:56						
Dissolved Solids	499	5	5	mg/L	500		99.8	90-110			
Duplicate (BGF0378-DUP1)		**Source: 18D0046-01RE1**			Prepared: 15-Jun-2018 Analyzed: 15-Jun-2018 08:56						
Dissolved Solids	733	10	10	mg/L		719			1.93	20	

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
EPA 353.2 in Water	
Nitrate + Nitrite as N	NELAP,DoD-ELAP,WADOE
Nitrite-N	WADOE,NELAP,DoD-ELAP
EPA 375.2 in Water	
Sulfate	WADOE,NELAP
EPA 410.4 in Water	
COD	DoD-ELAP,NELAP,WADOE
EPA 6010C in Water	
Arsenic	WADOE,NELAP
Calcium	WADOE,NELAP
Iron	WADOE,NELAP
Magnesium	WADOE,NELAP
Manganese	WADOE,NELAP
Zinc	WADOE,NELAP
EPA 9060A in Water	
Total Organic Carbon	DoD-ELAP,WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Report

Parametrix, Inc.	Project: Newcastle Landfill 2018	
719 2nd Avenue, Suite 200	Project Number: 553-1625-014	**Reported:**
Seattle WA, 98104	Project Manager: Lisa Gilbert	29-Jun-2018 10:39

Notes and Definitions

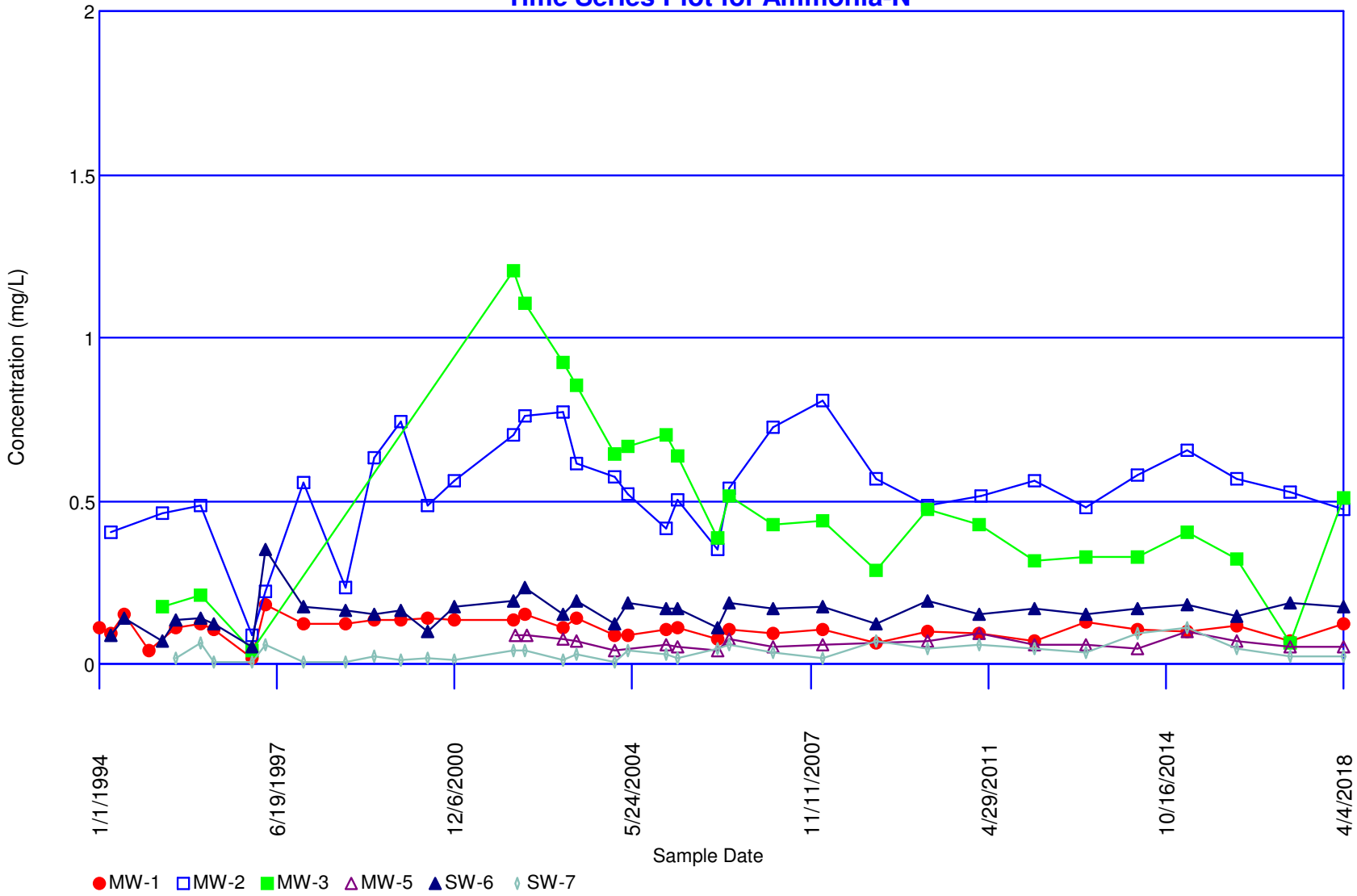
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
H	Hold time violation - Hold time was exceeded.
J	Estimated concentration value detected below the reporting limit.
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
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

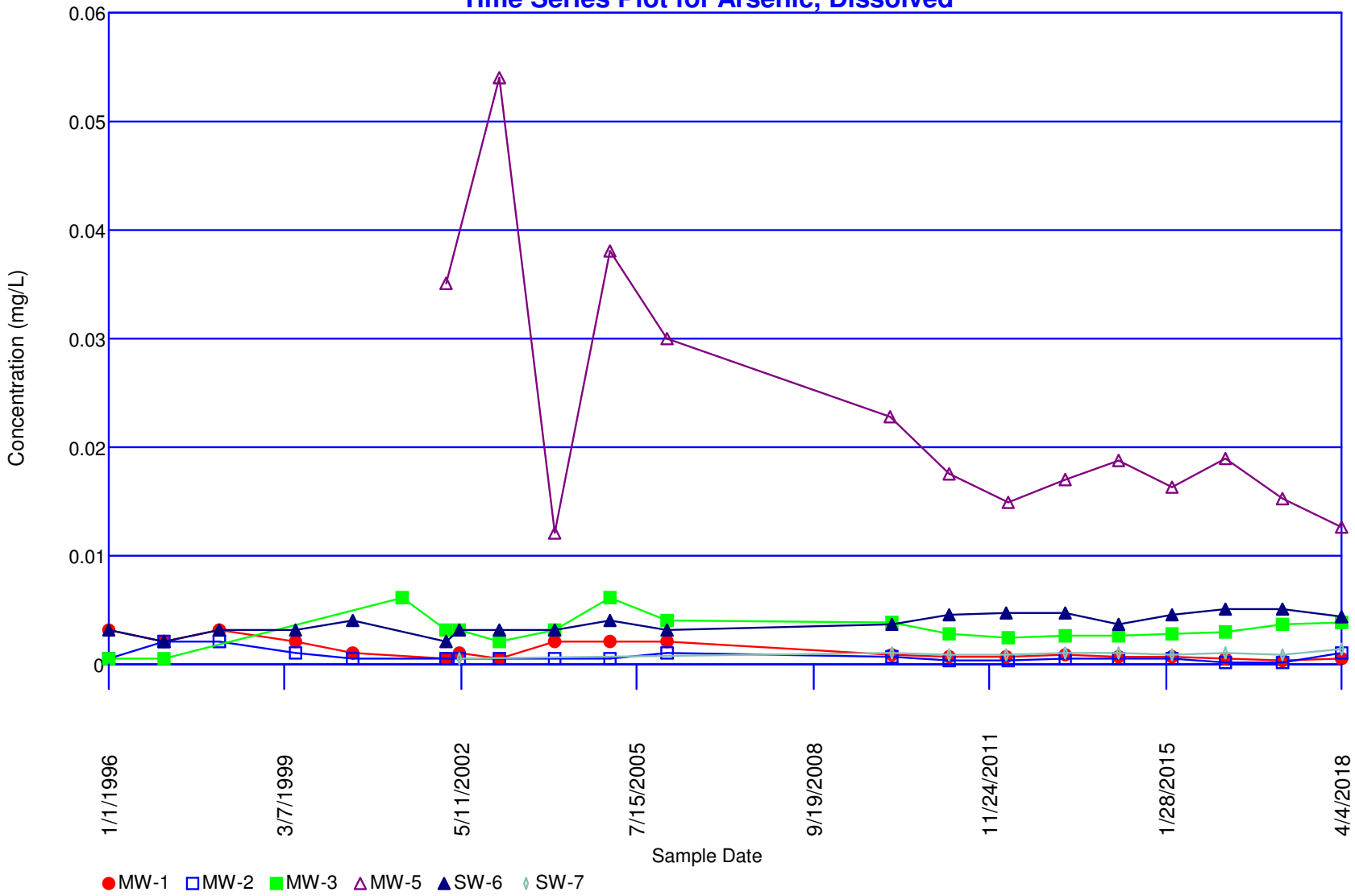


Ammonia-N

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Arsenic, Dissolved

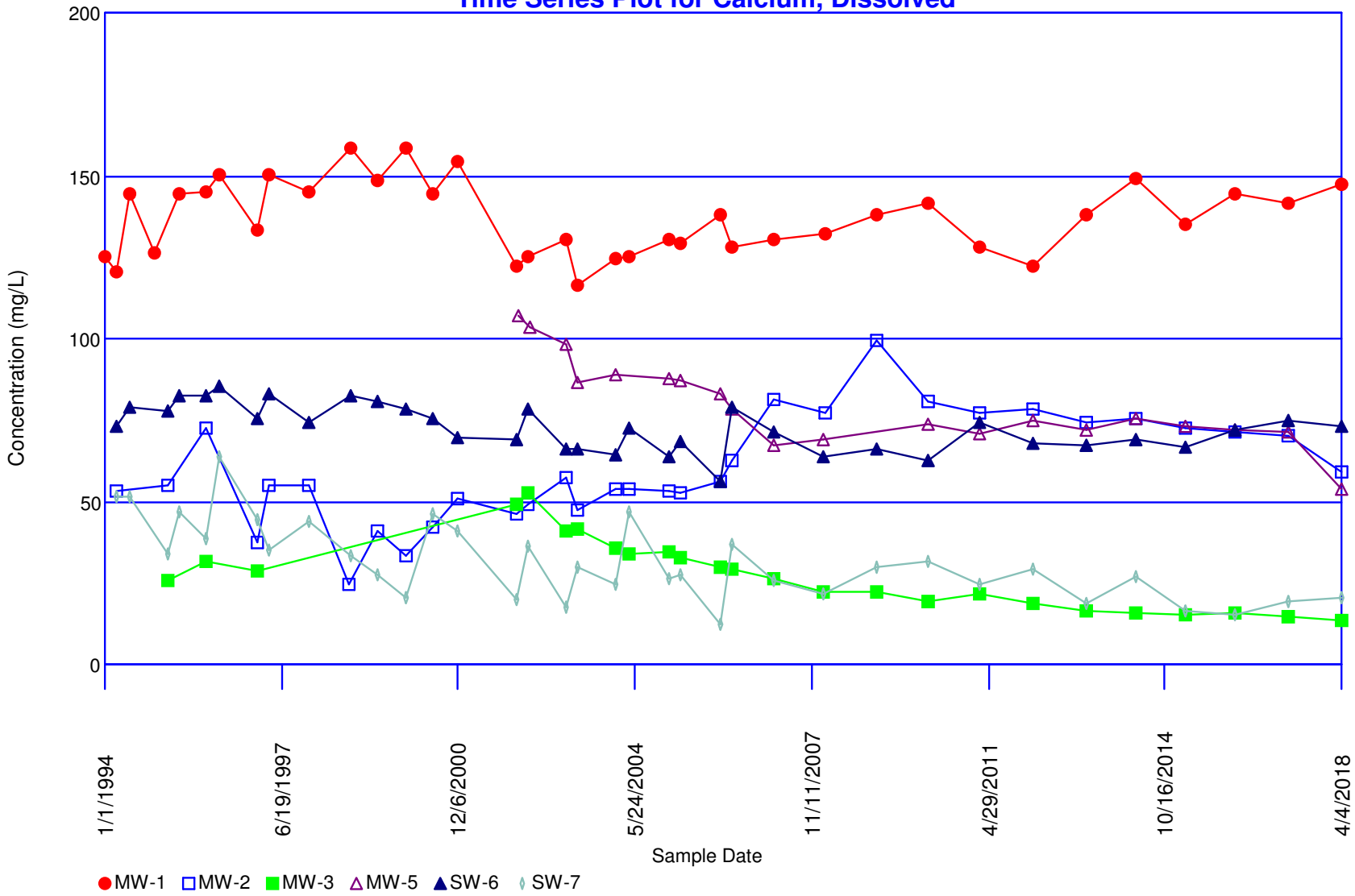


Arsenic, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Calcium, Dissolved

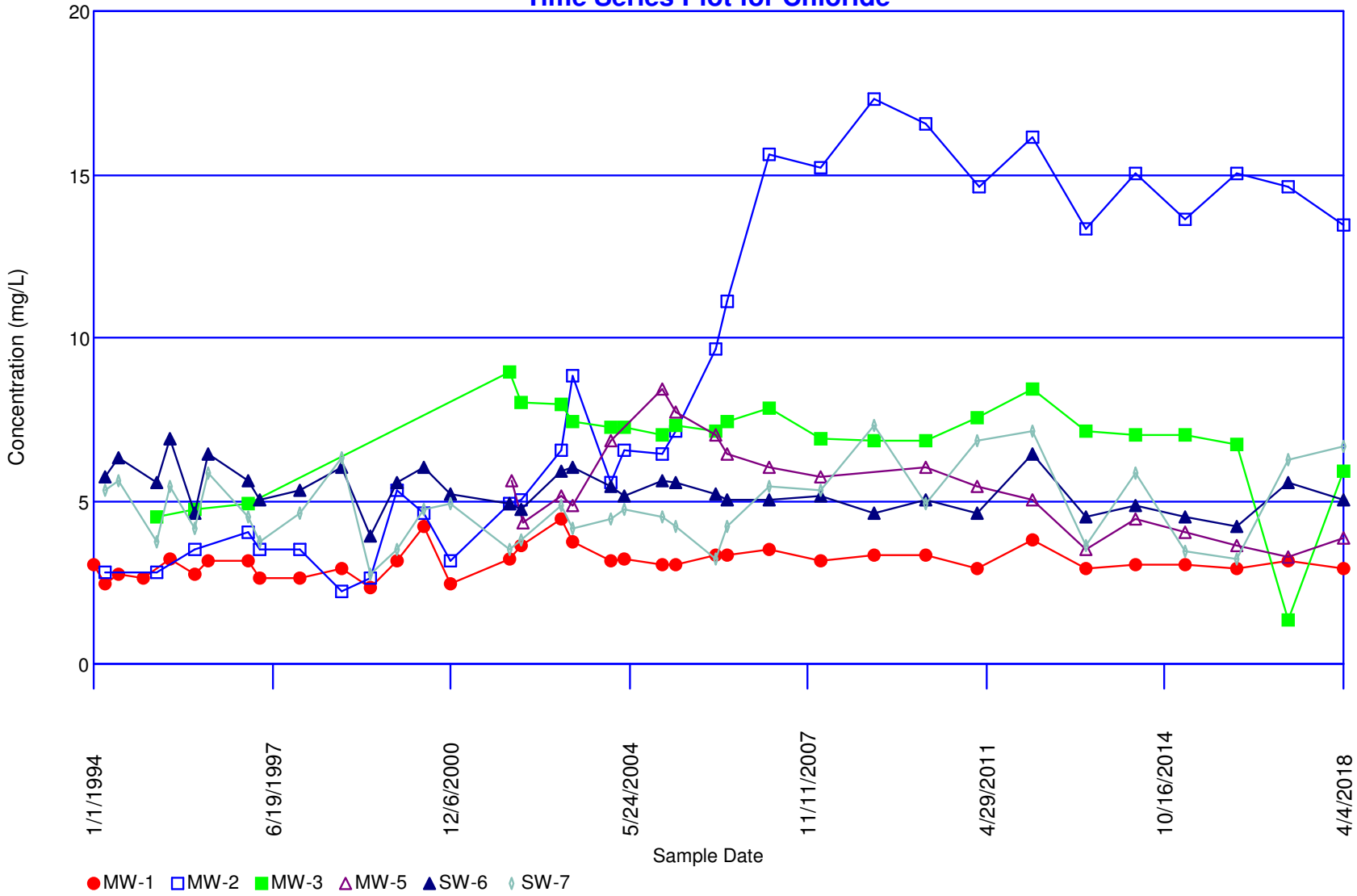


Calcium, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Chloride

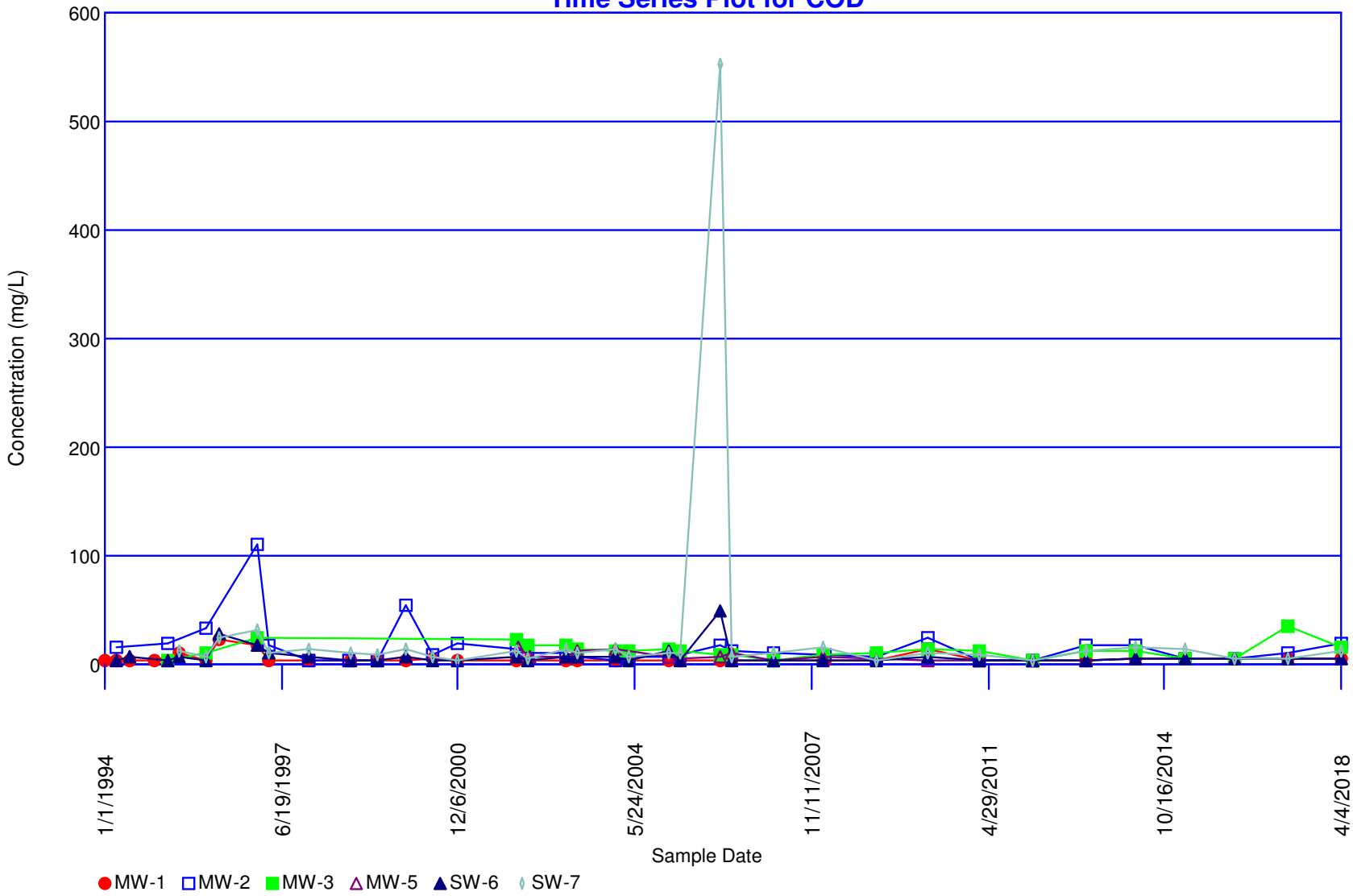


Chloride

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for COD

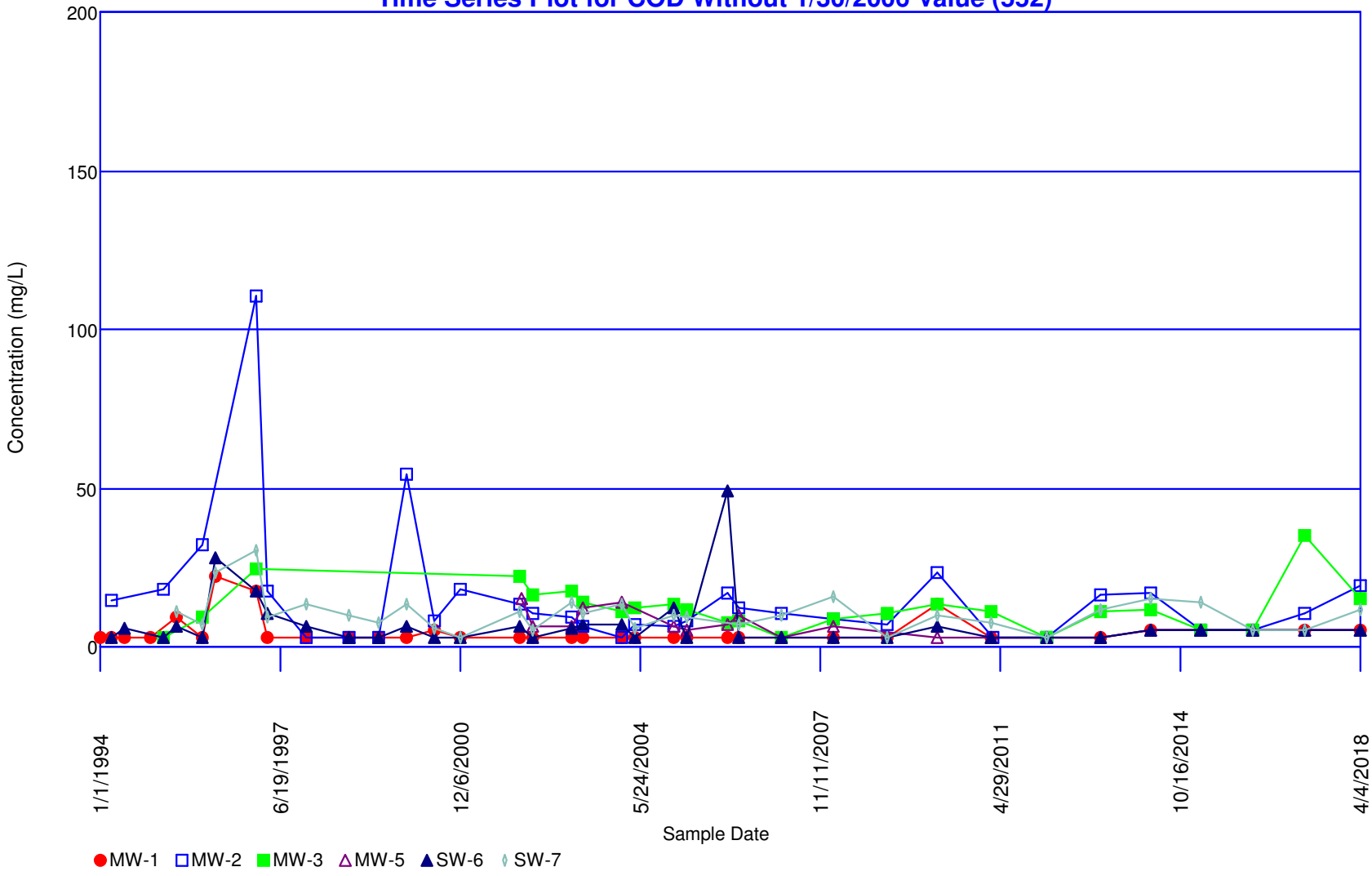


COD

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for COD Without 1/30/2006 Value (552)

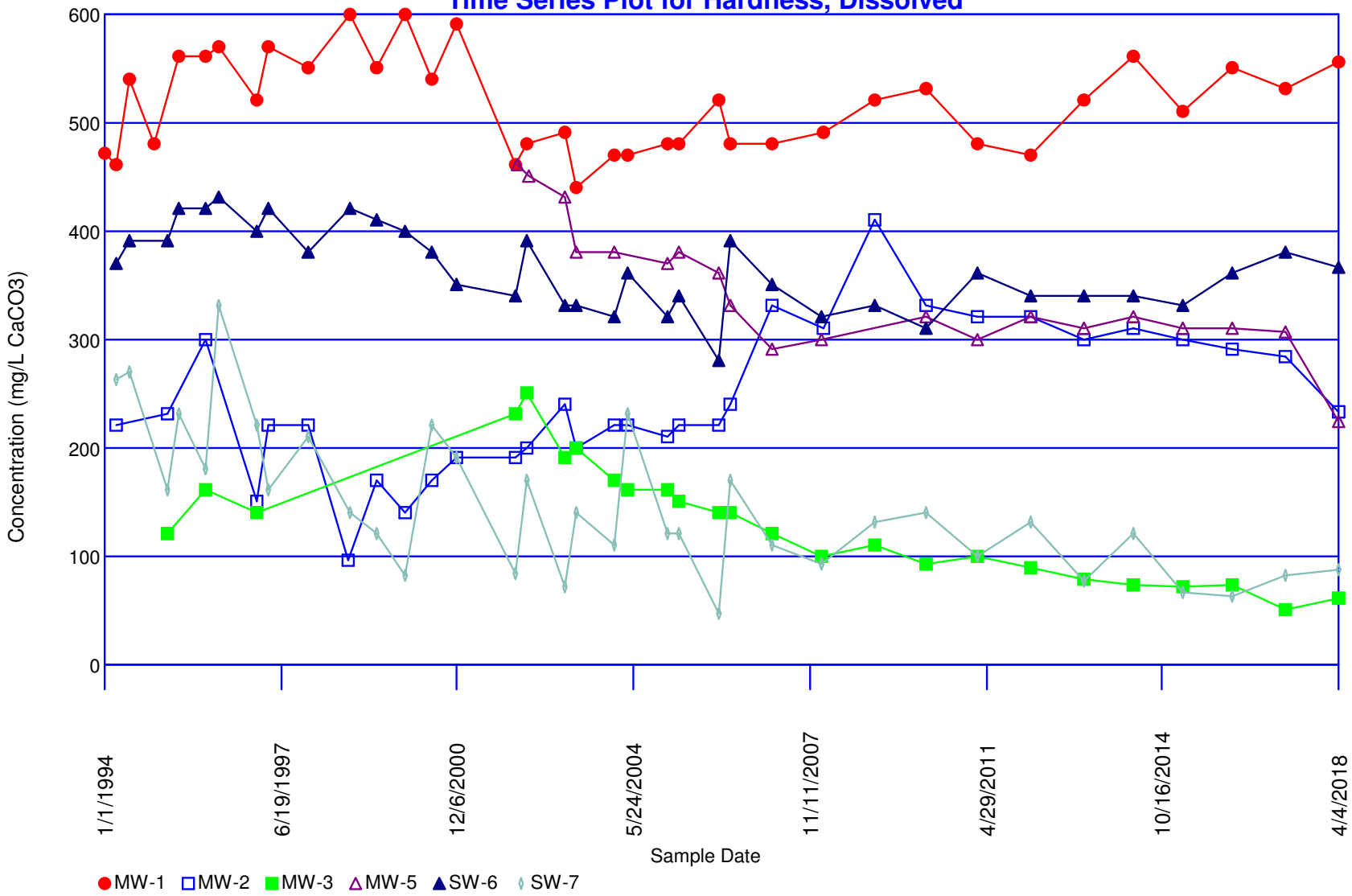


COD

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Hardness, Dissolved

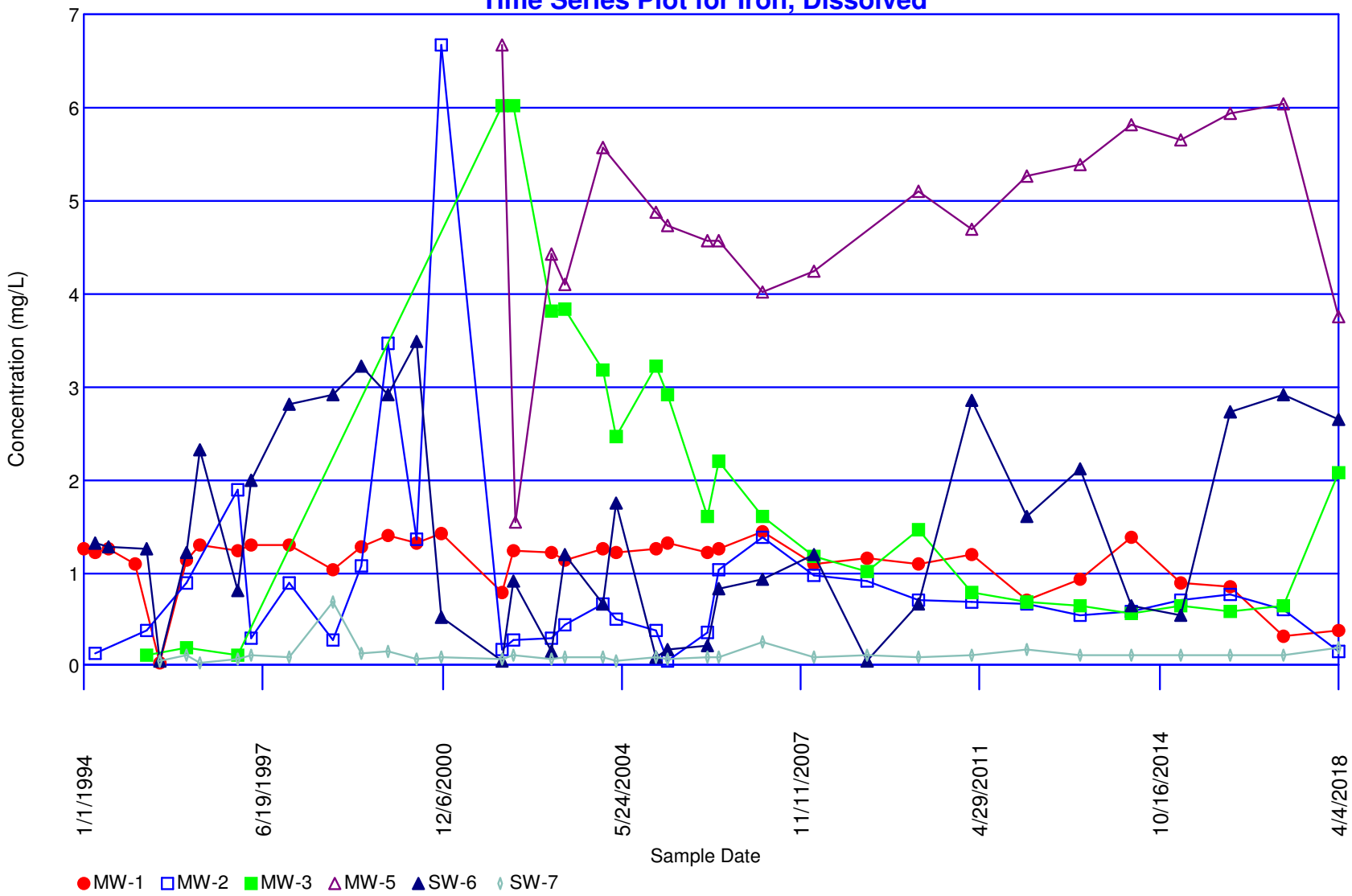


Hardness, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Iron, Dissolved

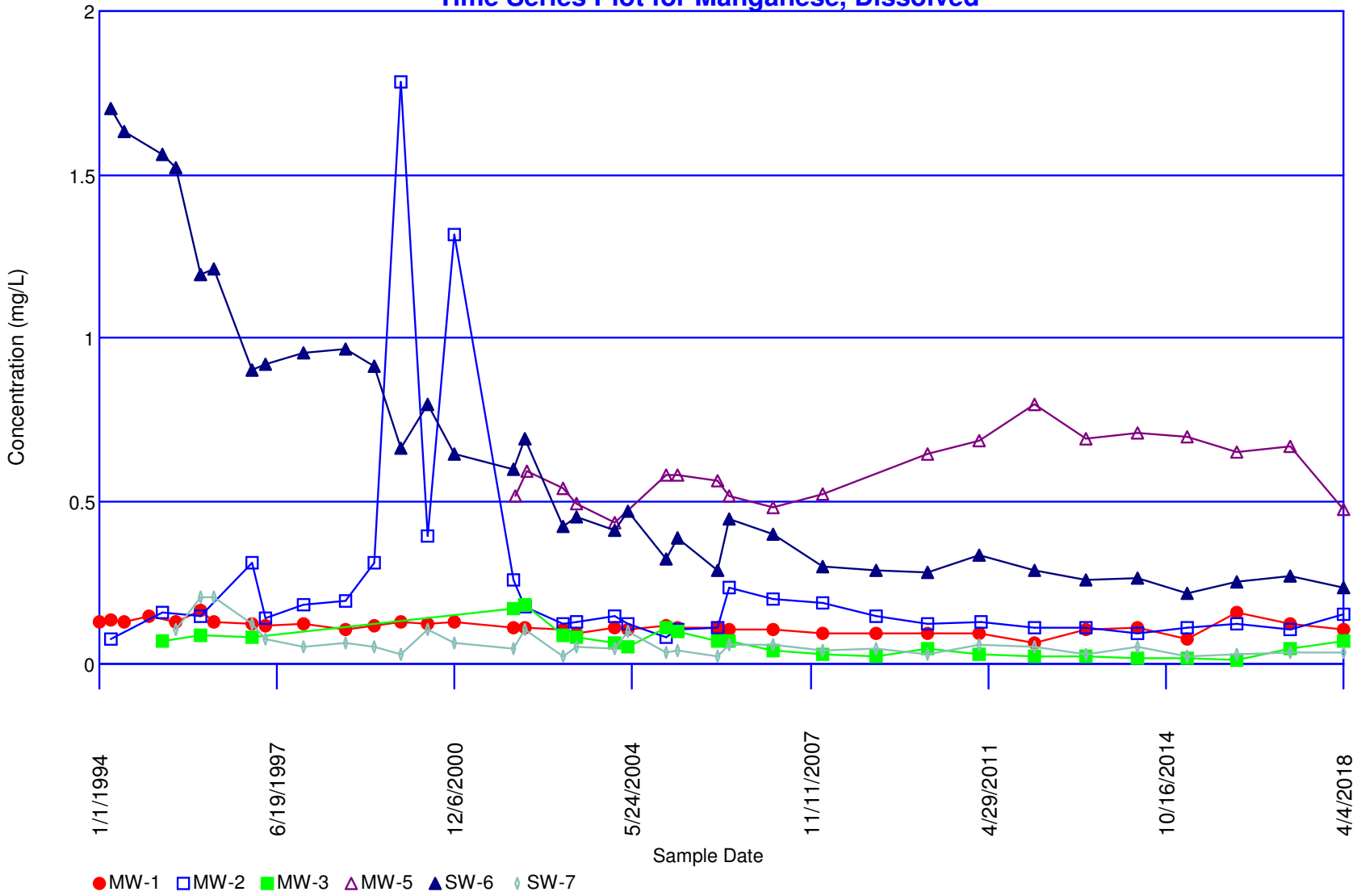


Iron, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Manganese, Dissolved

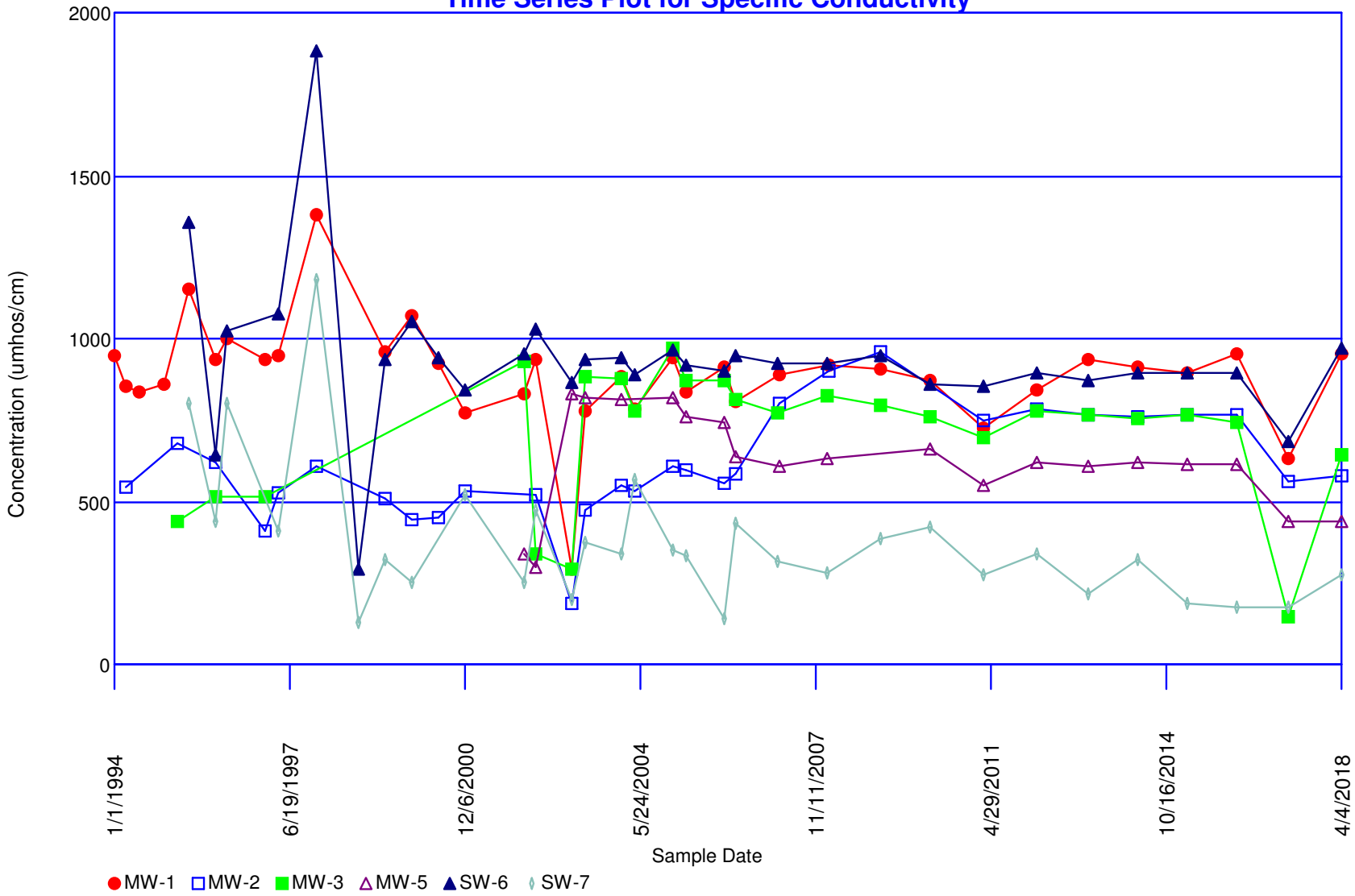


Manganese, Dissolved

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Specific Conductivity

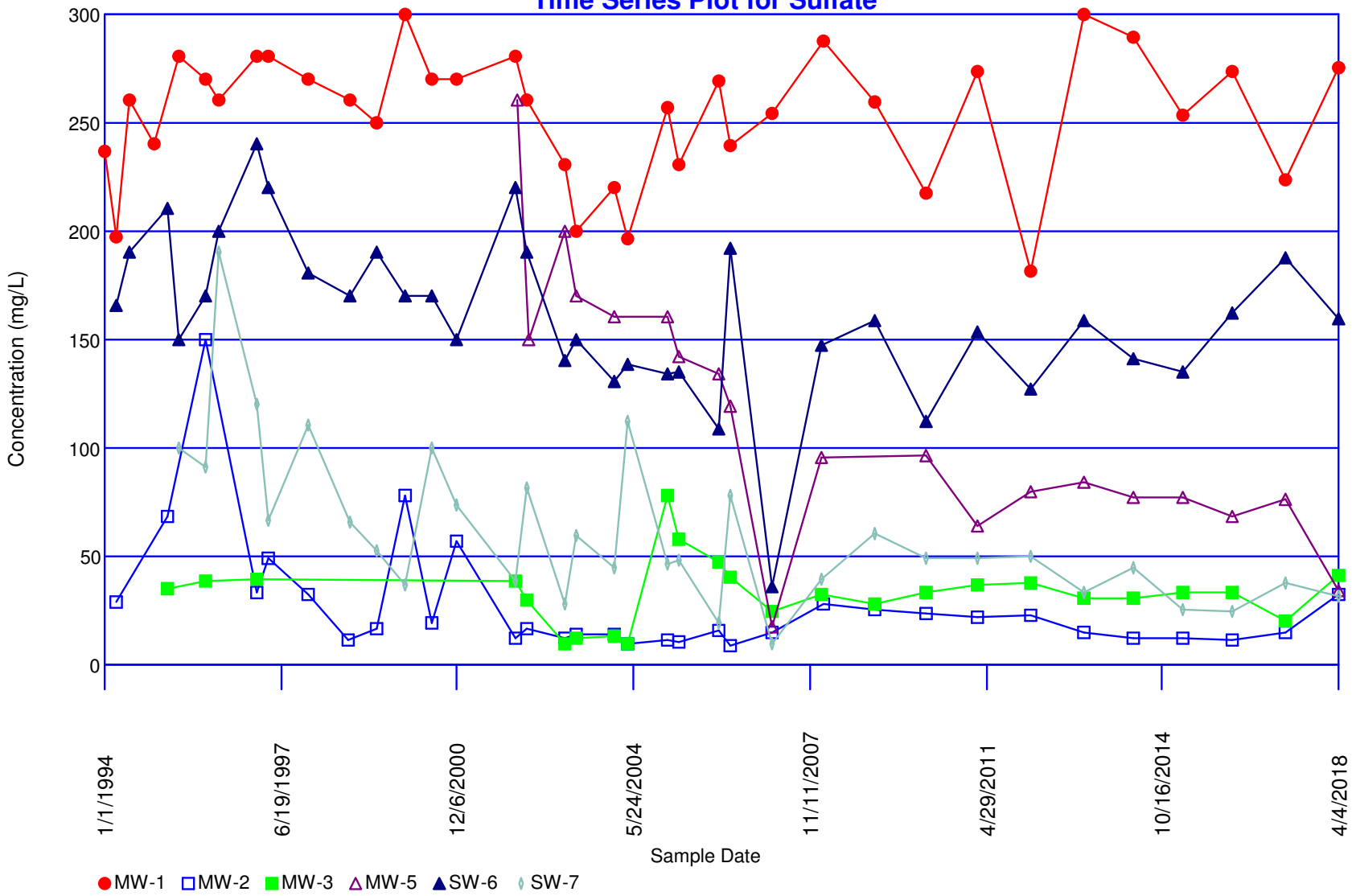


Specific Conductivity

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for Sulfate

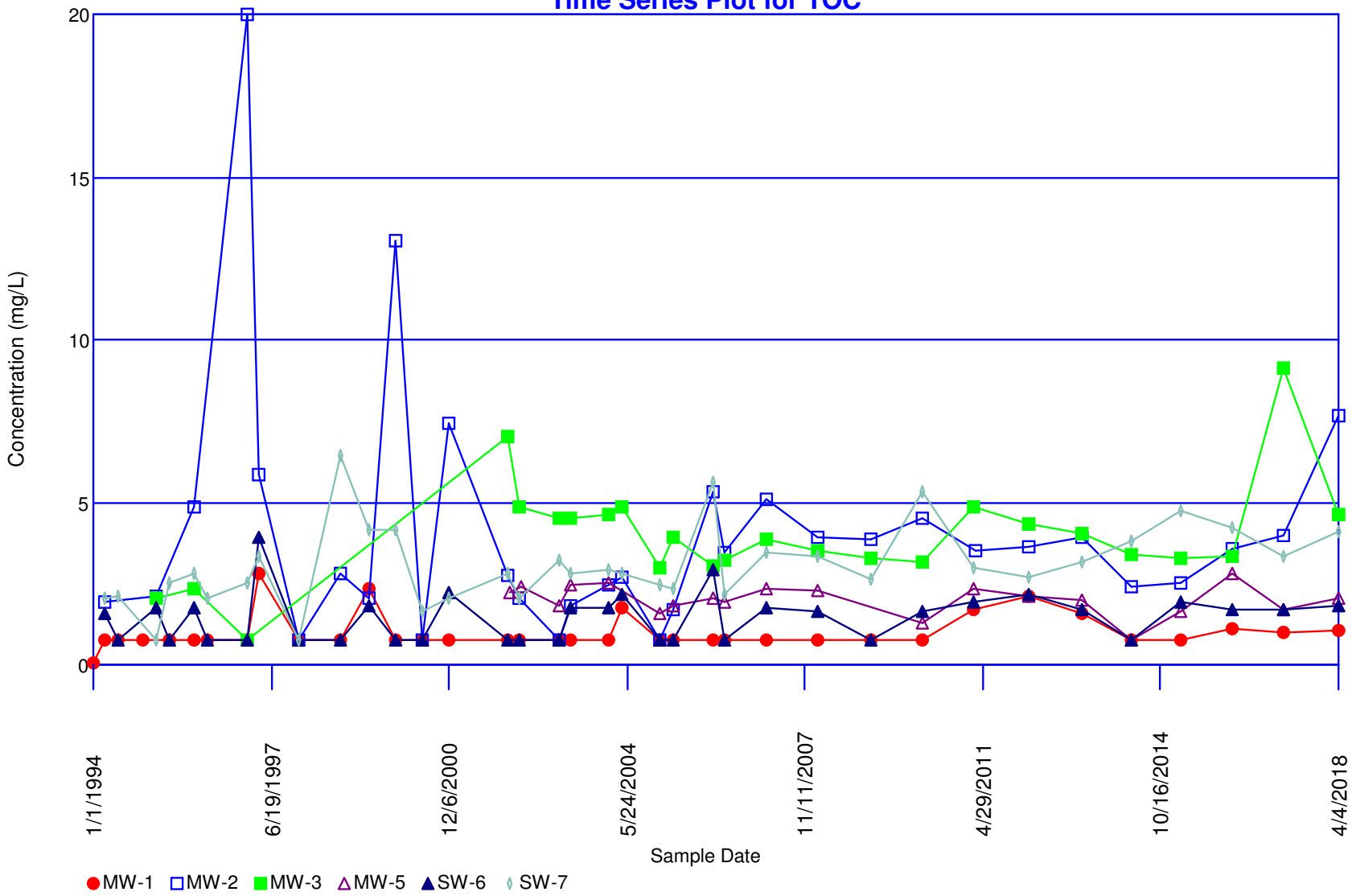


Sulfate

Non-Detects Replaced with 1/2 DL

Newcastle Landfill

Time Series Plot for TOC



TOC

Non-Detects Replaced with 1/2 DL