



SNOHOMISH COUNTY

Public Works

M E M O R A N D U M

DATE: 11/17/25

TO: Sunny Becker, Washington State Department of Ecology

FROM: Snohomish County Public Works Dept., Solid Waste Division

SUBJECT: Environmental Monitoring Summary Report, First Semiannual 2025

Snohomish County Solid Waste (County) has prepared this letter report to document the ongoing environmental monitoring activities performed at the former Emarder Landfill/McCollum Park (Site) during the first half (January-June) of 2025.

The following activities were performed during the current monitoring period:

Landfill Gas System Operation and Monitoring

- The County operates a passive sparker/blower driven landfill gas flare system at the Site. Weekly flare system inspections were performed throughout the monitoring period. Up to 35% methane was measured in the flare manifold during weekly monitoring during the first half of 2025, and the flare was operating as designed during the first half of 2025. See attached field inspection forms (Attachment 1) for details.
- Quarterly monitoring of five gas probes (designated GP-14 through GP-16 and GP-18 and GP-19) and the flare manifold was performed during the first half of 2025 on February 14 and May 21, 2025. During the first half of 2025, none of the gas probes contained detectable concentrations of methane. During the two quarterly landfill gas monitoring events performed during February and April 2025, the methane concentrations measured at the flare manifold were 0% and 12%, respectively. See the quarterly monitoring forms in Attachment 2 for details.

Groundwater Monitoring

- Quarterly groundwater monitoring was performed at five shallow zone monitoring wells (BH-03A, BH-05, BH-06, BH-07, and BH-08) and eight deep zone monitoring wells (MW-12, MW-14, MW-15, MW-16, MW-17, MW-18, MW-19, and MW-20) during the first and second quarter 2025 monitoring events on March 18 and 19 and June 3 and 4, 2025. The groundwater sampling field sheets are included as Attachment 3.

- Groundwater flow conditions in the shallow and deep zones beneath the site during the first and second quarter 2025 groundwater monitoring events are shown on figures 3A through 3D. In general, the groundwater flow direction during the first and second quarter events (south-southwest) and gradient (0.0052 to 0.0054 foot per foot [ft/ft] in the shallow zone and 0.0017 to 0.0018 ft/ft in the deep zone) were consistent with historical data for the site. The groundwater gradient, velocity, and flow direction calculations for the first and second quarters of 2025 are included in Attachment 4.
- Groundwater results were compared to the concentration limits in Chapter 173-200 WAC, “Water Quality Standards for Groundwaters”.
 - As shown on the attached Tables, exceedances to the groundwater standards in shallow zone wells during the first semiannual monitoring period were limited to five inorganic constituents – conductivity, pH, dissolved arsenic, dissolved iron, and dissolved manganese (in one or more wells). Organic constituents that exceeded their respective water quality standards in shallow zone wells during the first semiannual monitoring period included acrylonitrile and vinyl chloride during the first and second quarters of 2025.
 - Other VOCs detected in shallow groundwater samples during the first semiannual 2025 groundwater monitoring events include benzene, chlorobenzene, chloromethane, and cis-1,2-dichloroethene (cis-1,2-DCE), and toluene. None of these constituent concentrations exceeded any applicable groundwater standards.
 - In addition, acetone was detected in all five shallow groundwater samples collected during the second quarter and in the trip blank associated with those samples. Therefore, the acetone concentrations detected during the second quarter sampling event appear to be the result of cross contamination during sampling or analysis and are not representative of actual acetone impacts to groundwater.
 - As shown on the attached Tables, exceedances to the groundwater standards in deep zone wells during the first semiannual monitoring period were limited to seven inorganic constituents – conductivity, pH, sodium, TDS, dissolved arsenic, dissolved iron, and dissolved manganese (in one or more wells). Organic constituents that exceeded their respective water quality standards in shallow zone wells during the second semiannual monitoring period included vinyl chloride during the first and second quarter 2025 sampling events.
 - Other VOCs detected in deep groundwater samples during the first semiannual 2025 groundwater monitoring events include 1,2-dichloroethane and cis-1,2-DCE during the first quarter and 1,2-dichloropropane and cis-1,2-DCE during the second quarter. None of these constituent concentrations exceeded any applicable groundwater standards.

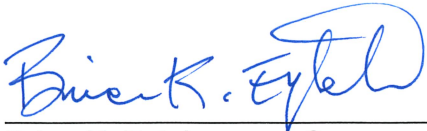
- In addition, acetone was detected in all eight deep groundwater samples collected during the second quarter and in the trip blank associated with those samples. Therefore, the acetone concentrations detected during the second quarter sampling event appear to be the result of cross contamination during sampling or analysis and are not representative of actual acetone impacts to groundwater.
- Statistical analysis is performed using DUMPStat Statistical Software (Version 3.0 by Robert D. Gibbons Ltd., 2018) to determine statistical exceedances and identify statistically significant concentration trends based on historical concentration data. Per Ecology and Snohomish Health District request on similar projects, the statistical prediction limits for each groundwater zone are updated in the first quarter of the year and subsequent data sets are compared against that prediction limit for the remainder of that year.
 - Statistically significant concentration trends were noted in all sampled shallow zone wells during the first semiannual 2025 monitoring events. Decreasing trends in the shallow zone outnumbered increasing trends 19 to 9 and 19 to 10 during the first and second quarters, respectively. Prediction limit exceedances were noted in all five sampled shallow zone wells during the first half of 2025 and were most frequently noted for alkalinity, bicarbonate, chloride, conductivity, magnesium, arsenic, iron, and manganese. Organic constituents that exceeded their respective prediction limits in at least one shallow zone groundwater sample during the first semiannual sampling events included chlorobenzene, cis-1,2-DCE, methylene chloride, toluene, and vinyl chloride.
 - Three VOCs (o-xylene, styrene, and toluene) had laboratory detection limits that exceeded their respective statistical prediction limits. These results were shown in the data summary tables as exceeding the prediction limit but are flagged as non-detectable.
 - Statistically significant concentration trends were noted in all sampled deep zone wells during the first semiannual 2025 monitoring events. Decreasing trends in the deep zone outnumbered increasing trends 34 to 24 during the first quarter and 33 to 29 during the second quarter. Prediction limit exceedances were noted in all eight sampled deep zone wells during the first half of 2025, although most of the exceedances occurred in downgradient wells MW-12, MW-16, MW-17, and MW-18. Inorganic constituent prediction limit exceedances in the deep zone were most frequently noted for alkalinity, bicarbonate, calcium, conductivity, magnesium, nitrite, sodium, arsenic, barium, iron, and manganese. Organic constituents that exceeded their respective prediction limits in the deep zone were limited to vinyl chloride.

Deviations from Scope

- During both monitoring events, upgradient shallow zone well MW-11 did not contain sufficient water for sampling.
- Acetone was detected in all of the shallow and deep zone wells during the second quarter 2025 monitoring event, but since acetone is a common laboratory contaminant and was detected in the trip blanks associated with the second quarter monitoring event, the acetone detections appear to be the result of cross-contamination imparted during analysis. They have been flagged "B" on the attached Tables.

If you have any questions regarding this report, please don't hesitate to contact us.

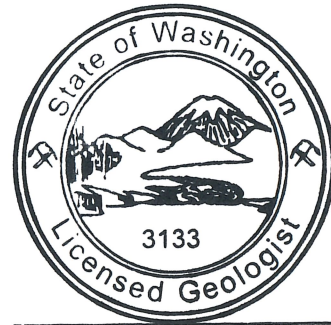
Sincerely,



Brian K. Eytcheson, LG
Snohomish County Solid Waste

Attachments:

- Groundwater Analytical Summary Tables
- Figures
- Attachment 1 – Flare Field Inspection Forms
- Attachment 2 – Gas Probe Monitoring Field Sheets
- Attachment 3 – Groundwater Sampling Field Sheets
- Attachment 4 – Groundwater Flow Calculations
- Attachment 5 – Statistical Time Series Plots



BRIAN K. EYTCHESON

Groundwater Analytical Summary Tables

Groundwater Analytical Summary - Shallow Wells: First Quarter 2025
McCullum Park, Snohomish County, WA

	Statistical Method	Prediction Limit (a)	GW Stds 173-200	Downgradient Wells																				Upgradient Wells												
				BH-03A				BH-05				BH-06				BH-07				BH-08				MW-10				MW-11								
				3/18/25	D	V	Tr	Ch	3/18/25	D	V	Tr	Ch	3/18/25	D	V	Tr	Ch	3/19/25	D	V	Tr	Ch	3/18/25	D	V	Tr	Ch	D	V	Tr	Ch	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																				
Alkalinity (as CaCO3)	lognor	35.8048	--	84.0		V	I	N	39.8		V			67.8		V			391		V	D	N	32.2		P	D	N	Well not accessible				Insufficient water for sampling			
Ammonia Nitrogen	nonpar	0.023	--	0.02	U				0.25		V			2.02		V	I	N	37.6		E	D	N	0.02	U											
Bicarbonate	lognor	35.8048	--	84.0		V	I	N	39.8		V			67.8		V			391		V	D	N	32.2		P	D	N								
Calcium, Dissolved	normal	14.9503	--	12.4					14.6		P			16.2		V			56.5		V	D	N	12.2				Y								
Chemical Oxygen Demand	nonpar	49	--	10	U				10	U				10	U				22.2					10	U											
Chloride	normal	11.2896	250	7.01					25.9		E	I	N	5.74					14.6		V	D	N	24.0		E	I	N								
Conductivity (umhos/cm)	normal	179.0531	700	196		V			186		V			198		V			834		V	D	N	166												
Magnesium, Dissolved	normal	6.9761	--	12.3		V			6.37		P			7.83		V			15.8		V	D	N	6.46												
Nitrate Nitrogen (mg-N/L)	lognor	6.8489	10	0.02	U		D	N	0.034					0.02	U				0.077					0.813				Y								
Nitrite Nitrogen (mg-N/L)	normal	0.015	1	0.002	U				0.002	U				0.004					0.002					0.002	U											
pH (std units)	normal	4.55-6.79	6.5-8.5	6.38			D	Y	5.73					5.99					6.55					5.29			D	N								
Potassium, Dissolved	lognor	2.4973	--	1.34					2.27		P			6.04		V		Y	33.9		V	D	N	0.832												
Sodium, Dissolved	normal	8.8627	20	10.8		V	I	N	8.59		P	I	N	5.19					16.6		V	D	N	8.23			I	Y								
Sulfate	lognor	46.6996	250	6.64			D	N	8.77					17.5				Y	2.30				Y	6.43			D	N								
Total Dissolved Solids	normal	139.4063	500	129					116					126		P			332		V	D	N	89.0												
Total Organic Carbon	nonpar	3.0141	--	0.5					3.3		V			8.6		V			7.2		V			0.8		P										
DISSOLVED METALS EPA Methods 200.7/200.8 (mg/L)																																				
Antimony	nonpar	0.0004	0.006	0.000104					0.0001	U				0.0001	U				0.0001	U				0.0001	U				Well not accessible				Insufficient water for sampling			
Arsenic	normal	0.0003	0.00005	0.000548		V			0.004239		V			0.005416		V			0.01393		V			0.0001												
Barium	normal	0.0588	1	0.01	U				0.017					0.027					0.59		V	D	N	0.01	U											
Beryllium	nonpar	0.0005	0.004	0.0002	U				0.0002	U				0.0002	U				0.0002	U				0.0002	U											
Cadmium	nonpar	0.0002	0.005	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U											
Chromium	nonpar	0.005	0.05	0.02	U				0.02	U	P			0.02	U				0.025		E			0.02	U											
Cobalt	nonpar	0.005	--	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U											
Copper	nonpar	0.015	1	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U											
Iron	normal	0.284	0.3	0.03	U				4.46		V			2.12		V			8.2		V			0.207												
Lead	normal	0.0002	0.05	0.0002	U				0.0002	U				0.0002	U				0.0002	U				0.0002	U											
Manganese	lognor	0.5258	0.05	0.066				Y	0.658		V			0.747		V			4.23		V	D	N	0.01	U											
Nickel	nonpar	0.005	0.1	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U											
Selenium	nonpar	0.0007	0.01	0.0005	U				0.0005	U				0.0005	U				0.003461		V			0.0005	U											
Silver	nonpar	0.0002	0.05	0.0002	U				0.0002	U				0.0002	U				0.0002	U				0.0002	U											
Thallium	nonpar	0.0001	0.002	0.00005	U				0.00005	U				0.00005	U				0.00005	U				0.00005	U											
Vanadium	nonpar	0.01	--	0.02	U				0.02	U				0.029	B	E			0.02	U				0.02	U											
Zinc	nonpar	0.011	5	0.02	U				0.02	U				0.02	U				0.02	U				0.02	U											
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																				
1,1,1-Trichloroethane	NA	--	200	1	U				1	U				1	U				1	U				1	U				Well not accessible				Insufficient water for sampling			
1,1,2,2-Tetrachloroethane	NA	--	--	1	U				1	U				1	U				1	U				1	U											
1,1,2-Trichloroethane	NA	--	--	2	U				2	U				2	U				2	U				2	U											
1,1-Dichloroethane	nonpar	1.0	1	1	U				1	U				1	U				1	U				1	U											
1,1-Dichloroethylene	NA	--	--	1	U				1	U				1	U				1	U				1	U											
1,2,3-Trichloropropane	NA	--	--	1	U				1	U				1	U				1	U				1	U											
1,2-Dibromo-3-chloropropane	NA	--	0.2	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U											
1,2-Dibromoethane	NA	--	0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U											

Groundwater Analytical Summary - Deep Wells: First Quarter 2025
McCullum Park, Snohomish County, WA

	Statistical Method	Prediction Limit (a)	GW Stds 173-200	Downgradient Wells																				Upgradient Wells																												
				MW-12					MW-14					MW-16					MW-17					MW-18					MW-19					MW-20					MW-13				MW-15									
				3/18/25	D	V	Tr	Ch	3/18/25	D	V	Tr	Ch	3/18/25	D	V	Tr	Ch	3/18/25	D	V	Tr	Ch	3/19/25	D	V	Tr	Ch	3/19/25	D	V	Tr	Ch	3/19/25	D	V	Tr	Ch	3/19/25	D	V	Tr	Ch	3/19/25	D	V	Tr	Ch				
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																																				
4-Methyl-2-Pentanone (MIBK)	NA	--	--	3	U					3	U					3	U					3	U					3	U					3	U					3	U					Well not accessible	3	U				
Acetone	NA	--	--	5	U					5	U					5	U					5	U					5	U					5	U					5	U					5	U					
Acrylonitrile	NA	--	0.07	0.05	U					0.05	U					0.05	U					0.05	U					0.05	U					0.05	U					0.05	U											
Benzene	nonpar	1.0	1	0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U											
Bromodichloromethane	nonpar	0.3	0.3	0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U											
Bromoform	NA	--	5	2	U					2	U					2	U					2	U					2	U					2	U					2	U											
Bromomethane	NA	--	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U											
Carbon Disulfide	NA	--	--	3	U					3	U					3	U					3	U					3	U					3	U					3	U											
Carbon Tetrachloride	NA	--	0.3	0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U											
Chlorobenzene	nonpar	0.2	--	0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U											
Chlorodibromomethane	NA	--	0.5	0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U											
Chloroethane	NA	--	--	0.02	U					0.02	U					0	U					0.02	U					0.02	U					0.02	U					0.02	U											
Chloroform	nonpar	1.0	7	1	U					1	U					1	U					1	U					1	U					1	U					1	U											
Chloromethane	NA	--	--	0.1	U					0.1	U					0	U					0.1	U					0.1	U					0.1	U					0.1	U											
cis-1,2-Dichloroethene	NA	--	--	0.03	U					0.03	U					1.36						0.03	U					0.61						0.03	U					0.03	U											
cis-1,3-Dichloropropene	NA	--	0.2	0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U											
Dibromomethane	NA	--	--	0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U											
Ethylbenzene	nonpar	1.0	--	1	U					1	U					1	U					1	U					1	U					1	U					1	U											
m,p-Xylene	NA	--	--	5	U					5	U					5	U					5	U					5	U					5	U					5	U											
Methyl Iodide	NA	--	--	3	U					3	U					3	U					3	U					3	U					3	U					3	U											
Methylene Chloride	nonpar	7.4	5	3	U					3	U					3	U					3	U					3	U					3	U					3	U											
o-Xylene	nonpar	1.0	--	1.5	U					1.5	U					1.5	U					1.5	U					1.5	U					1.5	U					1.5	U											
Styrene	nonpar	1.0	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U											
Tetrachloroethylene	NA	--	0.8	0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U											
Toluene	nonpar	1.0	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U											
trans-1,2-Dichloroethene	NA	--	--	1	U					1	U					1	U					1	U					1	U					1	U					1	U											
trans-1,3-Dichloropropene	NA	--	0.2	0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U											
trans-1,4-Dichloro-2-butene	NA	--	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U											
Trichlorethene (1,1,2-Trichloroethylene)	NA	--	3	2	U					2	U					2	U					2	U					2	U					2	U					2	U											
Trichlorofluoromethane	NA	--	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U											
Vinyl Acetate	NA	--	--	3	U					3	U					3	U					3	U					3	U					3	U					3	U											
Vinyl Chloride	nonpar	0.01	0.02	0.01	U					0.01	U					0.23		V				0.01	U					1.06		V	D	Y	0.02		E				0.01	U					0.01	U						

D: U = Indicates compound was not detected at the given reporting limit; B = the analyte was found in the associated method blank at a level that is significant relative to the sample result
V: E = Exceedance, waiting verification based on subsequent lab data; V = Exceedance verified based on previous lab data; P = Passed, previous exceedance not verified based on current lab data
Tr: I = increasing Trend, D = Decreasing Trend;
The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards - the most restrictive of the two is used.
Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards
NA: Not applicable - too few data points to evaluate statistically

Groundwater Analytical Summary - Shallow Wells: Second Quarter 2025
McCullum Park, Snohomish County, WA

	Statistical Method	Prediction Limit (a)	GW Stds 173-200	Downgradient Wells																				Upgradient Wells												
				BH-03A				BH-05				BH-06				BH-07				BH-08				MW-10				MW-11								
				6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	D	V	Tr	Ch	D	V	Tr	Ch
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																				
Alkalinity (as CaCO3)	lognor	35.8048	--	81.4		V	I	N	60.0		V			73.0		V			380		V	D	N	35.0			D	N	Well not accessible				Insufficient water for sampling			
Ammonia Nitrogen	nonpar	0.023	--	0.02	U				0.363		V			3.61	D	V	I	N	41.5	D	V	D	N	0.02	U				Well not accessible				Insufficient water for sampling			
Bicarbonate	lognor	35.8048	--	81.4		V	I	N	60.0		V			73.0		V			380		V	D	N	35.0			D	N	Well not accessible				Insufficient water for sampling			
Calcium, Dissolved	normal	14.9503	--	11.2					18.2		E			17.8		V			54.2		V	D	N	10.4					Well not accessible				Insufficient water for sampling			
Chemical Oxygen Demand	nonpar	49	--	10	U				10	U				18.7					11.3					10	U				Well not accessible				Insufficient water for sampling			
Chloride	normal	11.2896	250	6.73					29.5	D	V	I	N	8.58	D				13.5	D	V	D	N	15.7	D	V	I	N	Well not accessible				Insufficient water for sampling			
Conductivity (umhos/cm)	normal	179.0531	700	192		V			228		V			203		V			809		V	D	N	142					Well not accessible				Insufficient water for sampling			
Magnesium, Dissolved	normal	6.9761	--	10.3		V			7.54		E			7.48		V			14.3		V	D	N	5.18					Well not accessible				Insufficient water for sampling			
Nitrate Nitrogen (mg-N/L)	lognor	6.8489	10	0.02	U			Y	0.02	U				0.02	U				0.108					0.681					Well not accessible				Insufficient water for sampling			
Nitrite Nitrogen (mg-N/L)	normal	0.015	1	0.002	U				0.004					0.005					0.006					0.002	U				Well not accessible				Insufficient water for sampling			
pH (std units)	normal	4.55-6.79	6.5-8.5	6.49			D	N	5.83			D	Y	6.08					6.52				5.34			D	N	Well not accessible				Insufficient water for sampling				
Potassium, Dissolved	lognor	2.4973	--	1.30			I	Y	2.65		E			7.70		V			32.5		V	D	N	0.748					Well not accessible				Insufficient water for sampling			
Sodium, Dissolved	normal	8.8627	20	9.27		V	I	N	9.10		E	I	N	5.39					15.3		V	D	N	7.01			I	N	Well not accessible				Insufficient water for sampling			
Sulfate	lognor	46.6996	250	7.41			D	N	9.54					4.05					0.93					7.23			D	N	Well not accessible				Insufficient water for sampling			
Total Dissolved Solids	normal	139.4063	500	128					151		E			154		E			307		V	D	N	88.0					Well not accessible				Insufficient water for sampling			
Total Organic Carbon	nonpar	3.0141	--	0.68					3.88		V			8.45		V			7.92		V			0.9					Well not accessible				Insufficient water for sampling			
DISSOLVED METALS EPA Methods 200.7/200.8 (µg/L)																																				
Antimony	nonpar	0.4	6	0.103					0.1	U				0.1	U				0.1	U				0.1	U				Well not accessible				Insufficient water for sampling			
Arsenic	normal	0.3	0.05	0.533		V			3.794		V			10.52		V			11.21	B	V			0.19					Well not accessible				Insufficient water for sampling			
Barium	normal	58.8	1000	10	U				20					35					535		V	D	N	10	U				Well not accessible				Insufficient water for sampling			
Beryllium	nonpar	0.5	4	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				Well not accessible				Insufficient water for sampling			
Cadmium	nonpar	0.2	5	0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				Well not accessible				Insufficient water for sampling			
Chromium	nonpar	5	50	20	U				20	U				20	U				20	U	P			20	U				Well not accessible				Insufficient water for sampling			
Cobalt	nonpar	5	--	10	U				10	U				10	U				10	U				10	U				Well not accessible				Insufficient water for sampling			
Copper	nonpar	15	1000	20	U				20	U				20	U				20	U				20	U				Well not accessible				Insufficient water for sampling			
Iron	normal	284	300	30	U				3670		V			2880		V			5700		V			30	U	P			Well not accessible				Insufficient water for sampling			
Lead	normal	0.2	50	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				Well not accessible				Insufficient water for sampling			
Manganese	lognor	525.8	50	81		V			902		V			851		V			3830		V	D	N	10	U				Well not accessible				Insufficient water for sampling			
Nickel	nonpar	5	100	10	U				10	U				10	U				10	U				10	U				Well not accessible				Insufficient water for sampling			
Selenium	nonpar	0.7	10	0.5	U				0.665					0.5	U				4.359		V			0.5	U				Well not accessible				Insufficient water for sampling			
Silver	nonpar	0.2	50	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				Well not accessible				Insufficient water for sampling			
Thallium	nonpar	0.1	2	0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				Well not accessible				Insufficient water for sampling			
Vanadium	nonpar	10	--	20	U				20	U				20	U	P			20	U				20	U				Well not accessible				Insufficient water for sampling			
Zinc	nonpar	11	5000	20	U				20	U				20	U				20	U				20	U				Well not accessible				Insufficient water for sampling			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																				
1,1,1-Trichloroethane	NA	--	200	1	U				1	U				1	U				1	U				1	U				Well not accessible				Insufficient water for sampling			
1,1,2,2-Tetrachloroethane	NA	--	--	1	U				1	U				1	U				1	U				1	U				Well not accessible				Insufficient water for sampling			
1,1,2-Trichloroethane	NA	--	--	2	U				2	U				2	U				2	U				2	U				Well not accessible				Insufficient water for sampling			
1,1-Dichloroethane	nonpar	1.0	1	1	U				1	U				1	U				1	U				1	U				Well not accessible				Insufficient water for sampling			
1,1-Dichloroethylene	NA	--	--	1	U				1	U				1	U				1	U				1	U				Well not accessible				Insufficient water for sampling			
1,2,3-Trichloropropane	NA	--	--	1	U				1	U				1	U				1	U				1	U				Well not accessible				Insufficient water for sampling			
1,2-Dibromo-3-chloropropane	NA	--	0.2	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				Well not accessible				Insufficient water for sampling			
1,2-Dibromoethane	NA	--	0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				Well not accessible				Insufficient water for sampling			

Groundwater Analytical Summary - Shallow Wells: Second Quarter 2025
McCollum Park, Snohomish County, WA

	Statistical Method	Prediction Limit (a)	GW Stds 173-200	Downgradient Wells																				Upgradient Wells														
				BH-03A				BH-05				BH-06				BH-07				BH-08				MW-10				MW-11										
				6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	D	V	Tr	Ch	D	V	Tr	Ch		
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																						
1,2-Dichlorobenzene	nonpar	1.0	--	1	U					1	U				1	U				1	U				1	U											Well not accessible	Insufficient water for sampling
1,2-Dichloroethane	nonpar	0.5	0.5	0.03	U					0.03	U				0.03	U				0.03	U				0.03	U												
1,2-Dichloropropane	NA	--	0.6	0.02	U					0.02	U				0.02	U				0.02	U				0.02	U												
1,4-Dichlorobenzene	nonpar	--	4	1	U					1	U				1	U				1	U				1	U												
2-Butanone	NA	--	--	5	U					5	U				5	U				5	U				5	U												
2-Hexanone	NA	--	--	2	U					2	U				2	U				2	U				2	U												
4-Methyl-2-Pentanone (MIBK)	NA	--	--	3	U					3	U				3	U				3	U				3	U												
Acetone	NA	--	--	47.8	B					29.5	B				31.6	B				18.7	B				18.8	B												
Acrylonitrile	NA	--	0.07	0.05	U					0.05	U				0.05	U				0.38	B				0.05	U												
Benzene	nonpar	1.0	1	0.1	U					0.1	U				0.1	U				0.4	B				0.1	U												
Bromodichloromethane	nonpar	0.3	0.3	0.02	U					0.02	U				0.02	U				0.02	U				0.02	U												
Bromoform	NA	--	5	2	U					2	U				2	U				2	U				2	U												
Bromomethane	NA	--	--	2	U					2	U				2	U				2	U				2	U												
Carbon Disulfide	NA	--	--	3	U					3	U				3	U				3	U				3	U												
Carbon Tetrachloride	NA	--	0.3	0.02	U					0.02	U				0.02	U				0.02	U				0.02	U												
Chlorobenzene	nonpar	0.2	--	0.03	U					0.14		P			0.34		E	I	N	2.76		V			0.03	U												
Chlorodibromomethane	NA	--	0.5	0.1	U					0.1	U				0.1	U				0.1	U				0.1	U												
Chloroethane	NA	--	--	0.02	U					0.02	U				0.02	U				0	U				0.02	U												
Chloroform	nonpar	1.0	7	1	U					1	U				1	U				1	U				1	U												
Chloromethane	NA	--	--	0.1	U					0.1	U				0.1	U				0.1	U				0.1	U												
cis-1,2-Dichloroethene	nonpar	0.2	--	0.03	U	P				0.03	U				0.03	U	P			0.35		V			0.03	U												
cis-1,3-Dichloropropene	nonpar	0.2	0.2	0.03	U					0.03	U				0.03	U				0.03	U				0.03	U												
Dibromomethane	NA	--	--	0.02	U					0.02	U				0.02	U				0.02	U				0.02	U												
Ethylbenzene	nonpar	1.0	--	1	U					1	U				1	U				1	U				1	U												
m,p-Xylene	NA	--	--	5	U					5	U				5	U				5	U				5	U												
Methyl Iodide	NA	--	--	3	U					3	U				3	U				3	U				3	U												
Methylene Chloride	nonpar	4.4	5	9.58		E				3	U				7.06		E			3	U				3	U												
o-Xylene	nonpar	1.0	--	1.5	U					1.5	U				1.5	U				1.5	U				1.5	U												
Styrene	nonpar	1.0	--	2	U					2	U				2	U				2	U				2	U												
Tetrachloroethylene	NA	--	0.8	0.03	U					0.03	U				0.03	U				0.03	U				0.03	U												
Toluene	nonpar	1.0	--	2	U					2	U				2	U				2	U	P			2	U												
trans-1,2-Dichloroethene	NA	--	--	1	U					1	U				1	U				1	U				1	U												
trans-1,3-Dichloropropene	NA	--	0.2	0.03	U					0.03	U				0.03	U				0.03	U				0.03	U												
trans-1,4-Dichloro-2-butene	nonpar	5.0	--	2	U					2	U				2	U				2	U				2	U												
Trichlorethene (1,1,2-Trichloroethylene)	NA	--	3	2	U					2	U				2	U				2	U				2	U												
Trichlorofluoromethane	NA	--	--	2	U					2	U				2	U				2	U				2	U												
Vinyl Acetate	NA	--	--	3	U					3	U				3	U				3	U				3	U												
Vinyl Chloride	nonpar	0.01	0.02	0.01	U	P				0.01	U	P			0.01	U	P			2.78		V			0.01	U												

D: U = Indicates compound was not detected at the given reporting limit; B = the analyte was found in the associated method blank at a level that is significant relative to the sample result
V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data
Tr: I=increasing Trend, D=Decreasing Trend;
Ch: Y indicates a change in trend from previous quarter; N means no change in trend.
The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards - the most restrictive of the two is used.
Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards
NA: Not applicable - too few data points to evaluate statistically

Groundwater Analytical Summary - Deep Wells: Second Quarter 2025
McCullum Park, Snohomish County, WA

	Statistical Method	Prediction Limit (a)	GW Stds 173-200	Downgradient Wells																				Upgradient Wells																				
				MW-12				MW-14				MW-16				MW-17				MW-18				MW-19				MW-20				MW-13				MW-15								
				6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/4/25
CONVENTIONAL CHEMISTRY PARAMETERS (mg/L)																																												
Alkalinity (as CaCO3)	nonpar	123	--	170		V	I	N	56.8					288		V			127		E			523		V	D	N	79.6			D	N	82.6			D	N	Well not accessible	120			I	N
Ammonia Nitrogen	nonpar	0.094	--	0.02	U				0.02	U				0.041					8.87	D	V	D	N	0.067					0.035					0.02	U					0.02	U			
Bicarbonate	nonpar	123	--	170		V	I	N	56.8					288		V			127		E			523		V	D	N	79.6			D	N	82.6			D	N		120			I	N
Calcium, Dissolved	normal	24.269	--	27.0		V	I	N	11.5					42.8		V	D	N	20.6		I	N		60.1		V	D	N	14.5			D	N	16.0			D	N		22.7			I	Y
Chemical Oxygen Demand	nonpar	55	--	10	U				10	U				10	U				10	U				10	U		D	Y	10	U				10	U					10	U			
Chloride	normal	12.4	250	9.71			D	N	9.61					8.62					15.0	D	V	I	N	6.1			D	N	14.4	D	E			17.8	D		I	N		10.3	D			
Conductivity (umhos/cm)	nonpar	320	700	390		V	I	N	163					542		V			349		V			835		V	D	N	218					244						322			I	N
Magnesium, Dissolved	normal	23.0115	--	24.9		V	I	N	5.95					39.6		V			15.5		I	N		63.2		V	D	N	13.2			D	N	13.6			D	N		20.9			I	N
Nitrate Nitrogen (mg-N/L)	normal	4.0952	10	3.5			I	N	0.359					0.02	U				0.02	U				0.02	U				0.539					0.701						3.19			I	Y
Nitrite Nitrogen (mg-N/L)	nonpar	0.002	1	0.003		V			0.003		V			0.004		V			0.002	U				0.004		V			0.004		V			0.003		V				0.002	U			
pH (std units)	normal	5.96-8.26	6.5-8.5	6.90					5.79		V	D	Y	6.69			D	N	6.65			D	N	7.21					7.26					7.20						7.37				
Potassium, Dissolved	nonpar	3.38	--	3.82		V	I	N	1.05					2.33					7.24		V			3.81		V		Y	1.63					1.52						3.30			I	Y
Sodium, Dissolved	normal	8.4651	20	7.92		P	I	N	8.17		P	I	N	8.8		V	I	N	7.84					19.7		V	D	N	6.73					7.06						7.87			I	Y
Sulfate	normal	18.3953	250	15.3			I	Y	8.29					2.39			D	N	27.5		V		Y	0.86					7.53			D	N	7.02			D	N		15.7				
Total Dissolved Solids	normal	236.8897	500	246		V	I	N	119					316		V	D	N	198					498		V	D	N	121			D	Y	151						187				
Total Organic Carbon	nonpar	16.1	--	0.5	U				0.5	U				1.78					3.92					5.36			D	N	0.55					0.5	U					0.5	U			
DISSOLVED METALS EPA Methods 200.7/200.8 (µg/L)																																												
Antimony	nonpar	0.7	6	0.1	U				0.1	U				0.1	U				0.1	U				0.1	U				0.1	U				0.1	U				Well not accessible	0.1	U			
Arsenic	nonpar	2.6	0.05	1.954					0.326					20.87		V			9.186		V	I	N	15.28	B	V			0.77	B				0.302	B					2.397	B			
Barium	nonpar	20.6	1000	17			I	N	10	U				19		P			31		V			37		V	D	N	10			D	N	10						10				Y
Beryllium	nonpar	0.5	4	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U					0.2	U			
Cadmium	nonpar	0.1	5	0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U					0.05	U			
Chromium	nonpar	25	50	20	U				20	U				20	U				20	U				20	U				20	U				20	U					20	U			
Cobalt	nonpar	5	--	10	U				10	U				10	U				10	U				10	U				10	U				10	U					10	U			
Copper	nonpar	10	1000	20	U				20	U				20	U				20	U				20	U				20	U				20	U					20	U			
Iron	nonpar	20	300	30	U	P			30	U				30	U	V			30	U		I	N	62		E	D	N	30	U	P			30	U					30	U			
Lead	nonpar	0.4	50	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U					0.617				
Manganese	nonpar	7	50	10	U				52		V			2210		V			2120		V	I	N	1780		V	D	N	10	U	P			10	U		I	Y		10	U			
Nickel	nonpar	14	100	10	U				10	U				10	U				10	U				10	U				10	U				10	U					10	U			
Selenium	lognor	1.5	10	0.605					0.5	U				0.782					0.5	U				0.892					0.5	U				0.5	U					1.299				
Silver	nonpar	0.3	50	0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U				0.2	U					0.2	U			
Thallium	nonpar	0.1	2	0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U				0.05	U					0.05	U			
Vanadium	nonpar	24	--	20	U				20	U				20	U		P		20	U		P		20	U	P			20	U				20	U					20	U			
Zinc	nonpar	22	5000	20	U				20	U				20	U				20	U				20	U				20	U				20	U					20	U			
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L)																																												
1,1,1-Trichloroethane	NA	--	200	1	U				1	U				1	U				1	U				1	U				1	U				1	U				Well not accessible	1	U			
1,1,2,2-Tetrachloroethane	NA	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U					1	U			
1,1,2-Trichloroethane	NA	--	--	2	U				2	U				2	U				2	U				2	U				2	U				2	U					2	U			
1,1-Dichloroethane	nonpar	1.0	1	1	U				1	U				1	U				1	U				1	U				1	U				1	U					1	U			
1,1-Dichloroethylene	NA	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U					1	U			
1,2,3-Trichloropropane	NA	--	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U					1	U			
1,2-Dibromo-3-chloropropane	NA	--	0.2	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U					0.03	U			
1,2-Dibromoethane	NA	--	0.001	0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U				0.01	U					0.01	U			
1,2-Dichlorobenzene	nonpar	1.0	--	1	U				1	U				1	U				1	U				1	U				1	U				1	U					1	U			
1,2-Dichloroethane	NA	--	0.5	0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U				0.03	U					0.03	U			
1,2-Dichloropropane	nonpar</																																											

Groundwater Analytical Summary - Deep Wells: Second Quarter 2025
McCullum Park, Snohomish County, WA

	Statistical Method	Prediction Limit (a)	GW Stds 173-200	Downgradient Wells																				Upgradient Wells																																													
				MW-12					MW-14					MW-16					MW-17					MW-18					MW-19					MW-20					MW-13				MW-15																										
				6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/3/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch	6/4/25	D	V	Tr	Ch																					
VOLATILE ORGANIC COMPOUNDS (VOCs) EPA Method 8260 (µg/L) (cont.)																																																																					
4-Methyl-2-Pentanone (MIBK)	NA	--	--	3	U					3	U					3	U					3	U					3	U					3	U					3	U					Well not accessible	3	U																					
Acetone	NA	--	--	11.9	B					16.5	B					21.8	B					24	B					19.2	B					19.3	B					14.8	B											20	B																
Acrylonitrile	NA	--	0.07	0.05	U					0.05	U					0.05	U					0.05	U					0.05	U					0.05	U					0.05	U					0.05	U											0.05	U										
Benzene	nonpar	1.0	1	0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U											0.1	U				
Bromodichloromethane	nonpar	0.3	0.3	0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U				
Bromoform	NA	--	5	2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U										
Bromomethane	NA	--	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U																
Carbon Disulfide	NA	--	--	3	U					3	U					3	U					3	U					3	U					3	U					3	U					3	U					3	U																
Carbon Tetrachloride	NA	--	0.3	0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U																
Chlorobenzene	nonpar	0.2	--	0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U																
Chlorodibromomethane	NA	--	0.5	0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U																
Chloroethane	NA	--	--	0.02	U					0.02	U					0.02	U					0	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U																
Chloroform	nonpar	1.0	7	1	U					1	U					1	U					1	U					1	U					1	U					1	U					1	U					1	U																
Chloromethane	NA	--	--	0.1	U					0.1	U					0.1	U					0	U					0.1	U					0.1	U					0.1	U					0.1	U					0.1	U																
cis-1,2-Dichloroethene	NA	--	--	0.03	U					0.03	U					0.59						0.03	U					0.7						0.03	U					0.03	U					0.03	U					0.03	U																
cis-1,3-Dichloropropene	NA	--	0.2	0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U																						
Dibromomethane	NA	--	--	0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U					0.02	U																						
Ethylbenzene	nonpar	1.0	--	1	U					1	U					1	U					1	U					1	U					1	U					1	U					1	U					1	U																
m,p-Xylene	NA	--	--	5	U					5	U					5	U					5	U					5	U					5	U					5	U					5	U																						
Methyl Iodide	NA	--	--	3	U					3	U					3	U					3	U					3	U					3	U					3	U					3	U																						
Methylene Chloride	nonpar	7.4	5	3	U					3	U					3	U					3	U					3	U					3	U					3	U					3	U																						
o-Xylene	nonpar	1.0	--	1.5	U					1.5	U					1.5	U					1.5	U					1.5	U					1.5	U					1.5	U					1.5	U																						
Styrene	nonpar	1.0	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U																						
Tetrachloroethylene	NA	--	0.8	0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U																						
Toluene	nonpar	1.0	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U																						
trans-1,2-Dichloroethene	NA	--	--	1	U					1	U					1	U					1	U					1	U					1	U					1	U					1	U																						
trans-1,3-Dichloropropene	NA	--	0.2	0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U					0.03	U																						
trans-1,4-Dichloro-2-butene	NA	--	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U																						
Trichlorethene (1,1,2-Trichloroethylene)	NA	--	3	2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U																						
Trichlorofluoromethane	NA	--	--	2	U					2	U					2	U					2	U					2	U					2	U					2	U					2	U																						
Vinyl Acetate	NA	--	--	3	U					3	U					3	U					3	U					3	U					3	U					3	U					3	U																						
Vinyl Chloride	nonpar	0.01	0.02	0.01	U					0.01	U					0.01	U	P				0.01	U					6.97	V	D	Y	0.01	U	P				0.01	U					0.01	U																								


D: U = Indicates compound was not detected at the given reporting limit; B = the analyte was found in the associated method blank at a level that is significant relative to the sample result
V: E= Exceedance, waiting verification based on subsequent lab data; V= Exceedance verified based on previous lab data; P=Passed, previous exceedance not verified based on current lab data
Tr: I=increasing Trend, D=Decreasing Trend;
The groundwater standards listed are based on the Washington Administrative Code (WAC) 173-200 groundwater limits as modified by the TMS 91-11 standards - the most restrictive of the two is used.
Values in purple exceed the prediction limit; indicates that a value exceeded the Groundwater Standards
NA: Not applicable - too few data points to evaluate statistically

Figures

Figure 1

McCollum Park (Emander Landfill)

Site Location

 Subject Property
Boundary



Snohomish County
Public Works
Solid Waste Division
Jan 2025

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Figure 2

McCullum Park (Emander Landfill)

Groundwater Monitoring Well Locations

- Parcel Boundaries
- Subject Property Boundary

- Aquifer Unit
- Shallow Aquifer
 - Deep Aquifer



Snohomish County
Public Works
Solid Waste Division
Jan 2025

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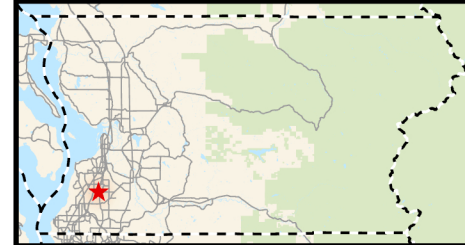



Figure 3a

McCollum Park Landfill

Shallow Aquifer Groundwater Contour Map First Quarter 2025

 GROUNDWATER FLOW
0.0276 ft / day
10.07 ft / year
-120.33 degrees to the positive x-axis

 PARCEL BOUNDARY

 WELL LOCATION

 CONTOURS

WELL ID	DATE	GW ELEVATION
BH-03	3/18/2025	377.66
BH-05	3/18/2025	378.02
BH-06	3/18/2025	377.59
BH-07	3/18/2025	378.06
BH-08	3/18/2025	382.90
MW-10	3/18/2025	NM
MW-11	3/18/2024	DRY

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Date Created: 11/13/2025
File Location:
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Groundwater Contours\
2025Q1

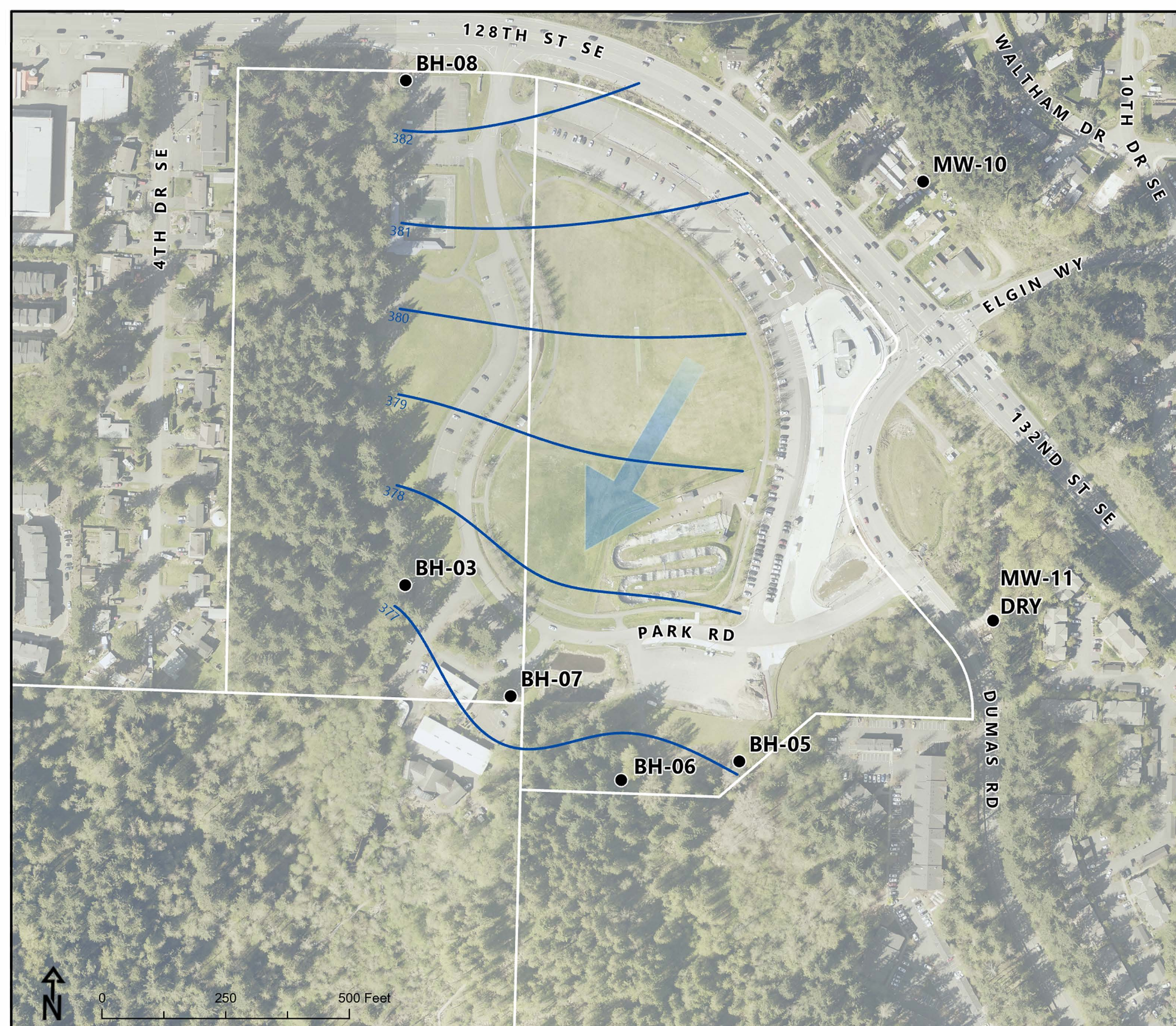
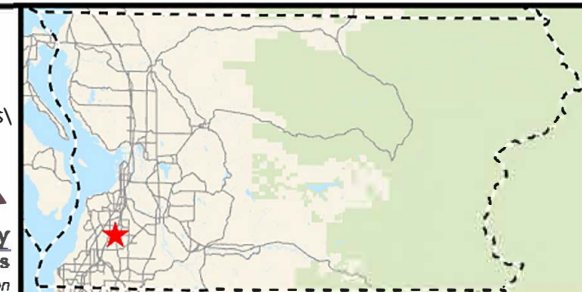






Figure 3b

McCollum Park Landfill

Deep Aquifer Groundwater Contour Map First Quarter 2025

GROUNDWATER FLOW
 0.08656 ft / day
 31.6 ft / year
 -41.76 degrees to the positive x - axis



 PARCEL BOUNDARY
 WELL LOCATION
 CONTOURS

WELL ID	DATE	GW ELEVATION
MW-12	3/18/2025	377.63
MW-14	3/18/2025	379.71
MW-15	3/18/2025	375.96
MW-16	3/18/2025	378.57
MW-17	3/18/2025	377.96
MW-18	3/18/2025	377.88
MW-19	3/18/2025	377.86
MW-20	3/18/2025	378.34

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 2025Q1

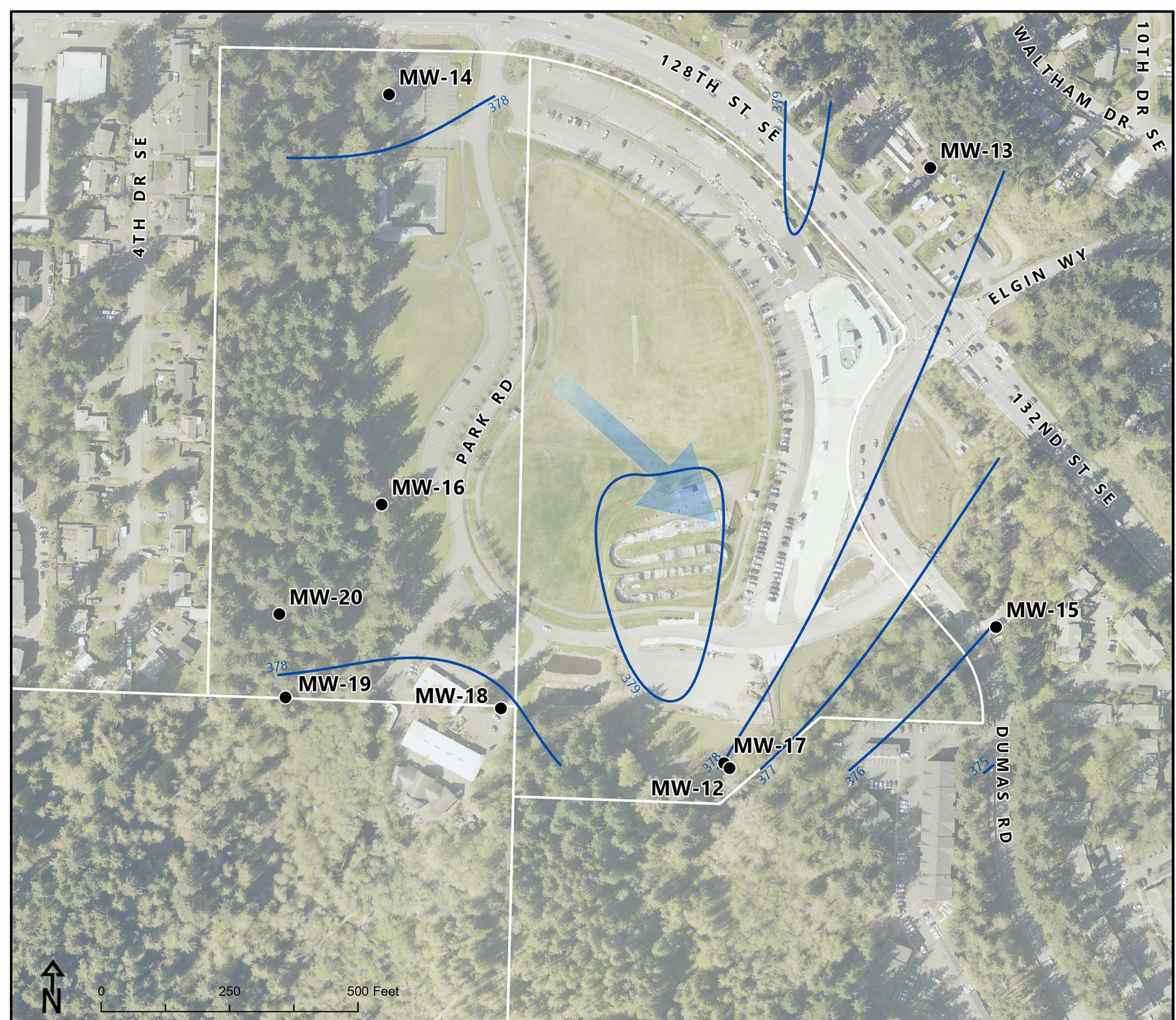



Figure 3c

McCollum Park Landfill

Shallow Aquifer Groundwater Contour Map Second Quarter 2025

 GROUNDWATER FLOW
0.02694 ft / day
9.83 ft / year
-114.39 degrees to the positive x - axis

 PARCEL BOUNDARY

 WELL LOCATION

 CONTOURS

WELL ID	DATE	GW ELEVATION
BH-03A	6/3/2025	377.15
BH-05	6/3/2025	377.08
BH-06	6/3/2025	376.69
BH-07	6/3/2025	377.32
BH-08	6/3/2025	382.47

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Date Created: 8/19/2025
File Location:
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2025Q2

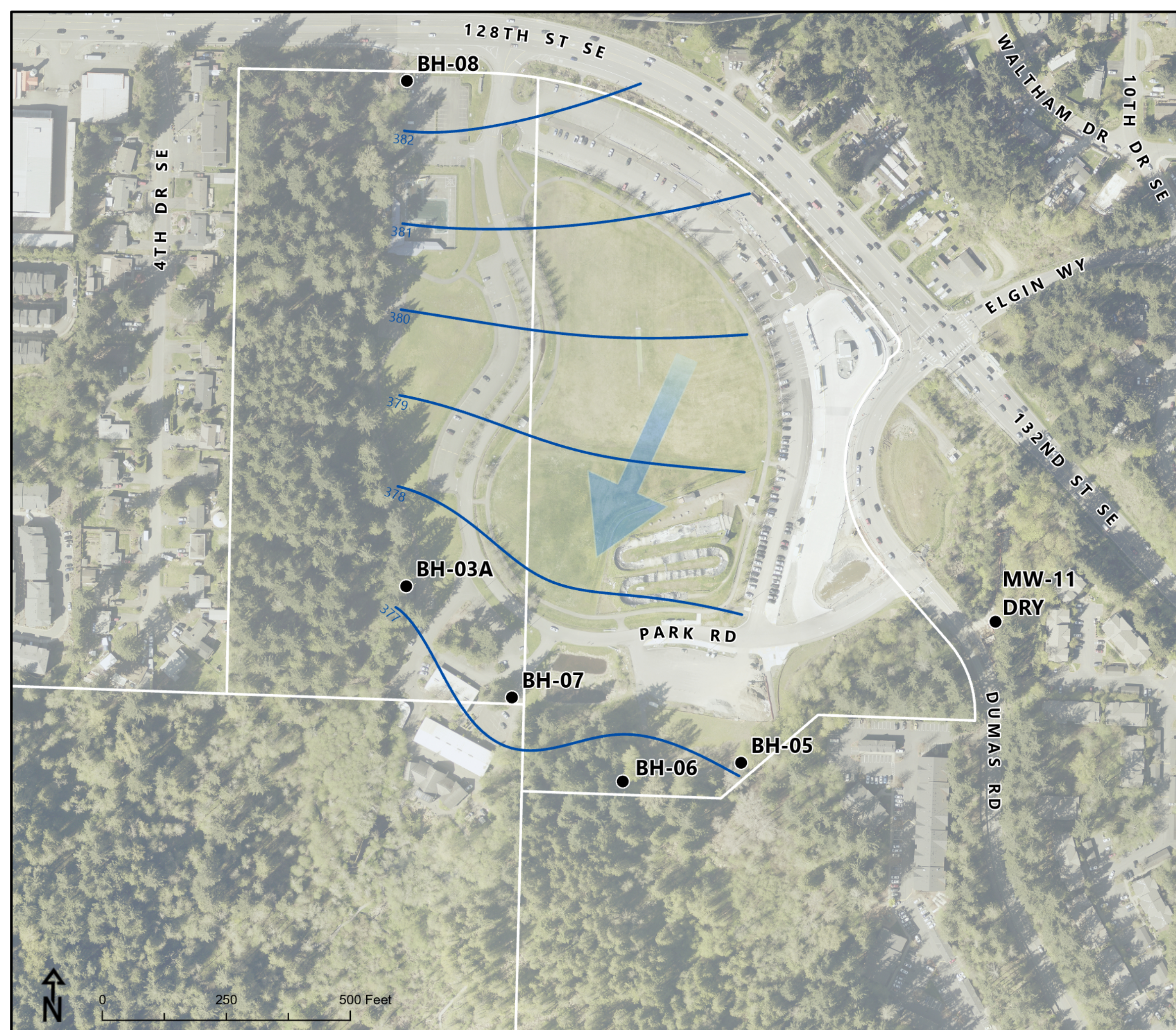






Figure 3d

McCollum Park Landfill

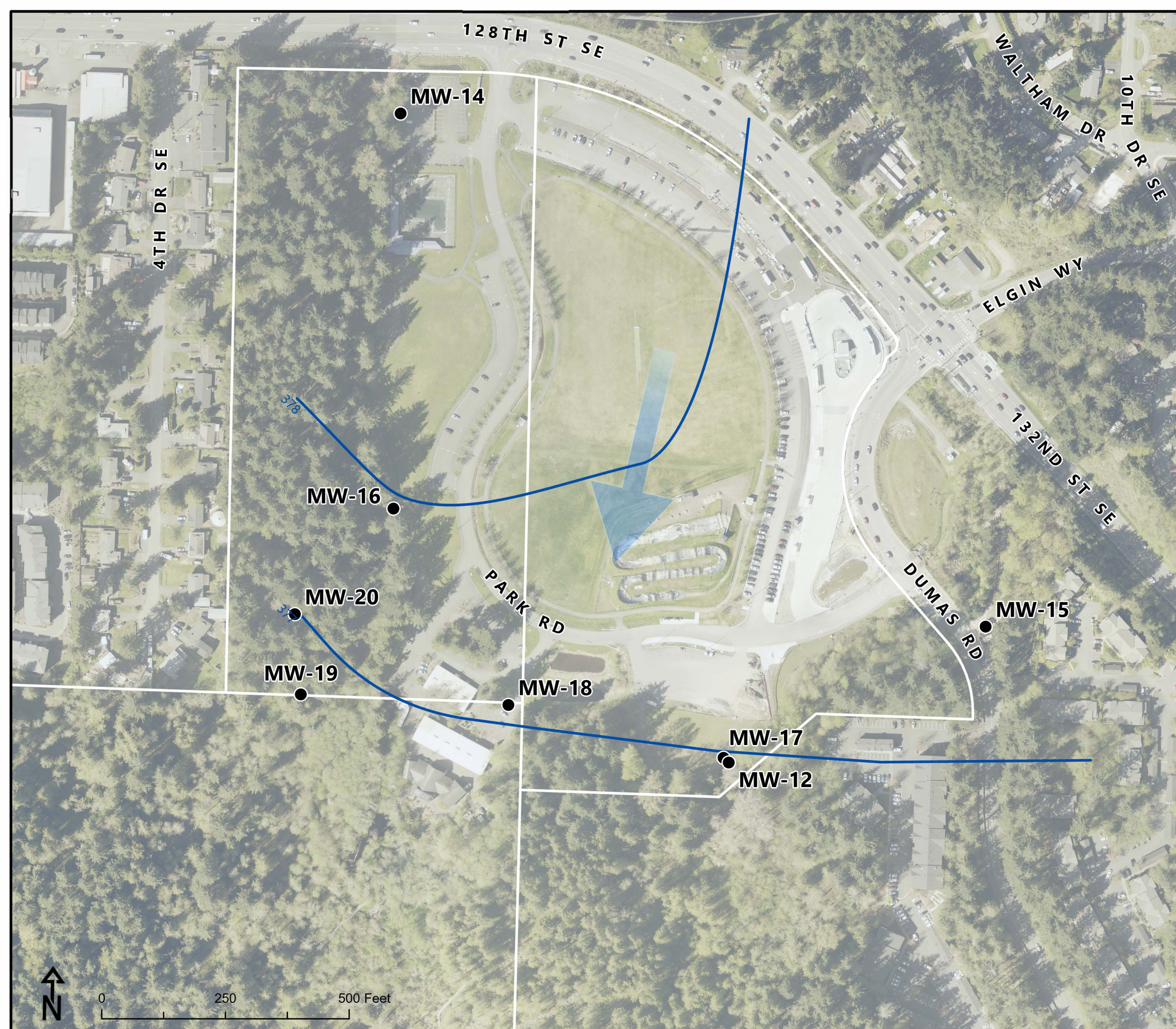
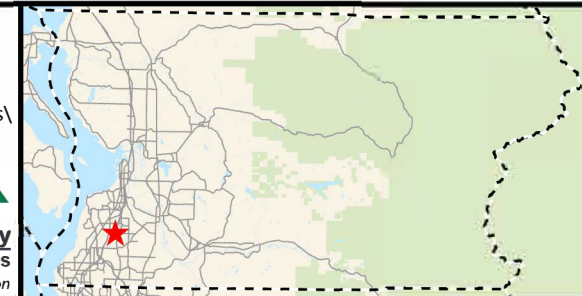
Deep Aquifer Groundwater Contour Map Second Quarter 2025

-  GROUNDWATER FLOW
0.09176 ft / day
33.49 ft / year
-103.13 degrees to the positive x - axis
-  PARCEL BOUNDARY
-  WELL LOCATION
-  CONTOURS

WELL ID	DATE	GW ELEVATION
MW-12	6/3/2025	376.97
MW-14	6/3/2025	378.88
MW-15	6/3/2025	377.64
MW-16	6/3/2025	377.93
MW-17	6/3/2025	376.95
MW-18	6/3/2025	377.07
MW-19	6/3/2025	376.79
MW-20	6/3/2025	376.98

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Date Created: 11/7/2025
File Location:
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Groundwater Contours\
2025Q2



Attachment 1

Flare Field Inspection Forms

McCOLLUM PARK LANDFILL - WEEKLY GAS PROBE MONITORING DATA

DATE	MILITARY TIME	METHANE %	OXYGEN %	CO2 %	VELOCITY (Ft/Min)	LEL SENSORS	BL-1	BL-2	FLARE	Comments	READERS INITIALS	
							Check if system is on					
12-27-24	0930	13	9	10	—	MAN- 0 BLR- 0	ON	OFF	OUT	GP 14 - 0 BAR- 29.13	NO GAS TURNED OFF BL #1 NO SPARKER	TA
1-3-25	1400	35	0	17	—	MAN- 0 BLR- 0	OFF	OFF		GP 14 - 0 BAR- 29.30		ML AW
1-10-25	10:30	13	9	10	—	MAN- 0 BLR- 0	ON	OFF	OUT	GP 14 - 0 BAR- 29.76	NO GAS - TURNED OFF BL #1 NO SPARK	TA
1-17-25	1023	0	21	0	—	MAN- 0 BLR- 0	OFF	OFF	OUT	GP 14 - 0 BAR- 30.0	NO GAS NO SPARKS	AW/ML
1-24-25	0915	0	21	0	—	MAN- 0 BLR- 44.4	OFF	OFF	OUT	GP 14 - 0 BAR- 29.99	NO GAS SPARKER GOOD	TA
1-31-25	1110	35	1	16	—	MAN- 0 BLR- 26.5	OFF	OFF	OUT	GP 14 - 0 BAR- 29.24	STARTED FLARE W/BL #1 SPARK GOOD	TA
2-7-25	10:00	11	10	9	—	MAN- 0 BLR- 0	ON	OFF	OUT	GP 14 - 0 BAR- 29.66	NO GAS, SPARK GOOD BYPASS VALVE FROZEN	TA
2-14-25	1115	0	22	0	—	MAN- 0 BLR- 0	OFF	OFF	OUT	GP 14 - 29.56 BAR- 0	NO GAS SPARK NOT WORKING	ML/TA
2-21-25	0850	0	21	0	—	MAN- 0 BLR- 0	OFF	OFF	OUT	GP 14 - 0 BAR- 29.70	NO GAS NO SPARK	TA
2-28-25	0930	0	21	0	—	MAN- 0 BLR- 0	OFF	OFF	OUT	GP 14 - 0 BAR- 29.72	NO GAS NO SPARK	TA
3-7-25	13:30	0	19	2	—	MAN- 0 BLR- 0	OFF	OFF	OUT	GP 14 - 0 BAR- 29.77	NO GAS NO SPARK	AW/TA
3-14-25	0925	27	0	15	—	MAN- 0 BLR- 0	OFF	OFF	OUT	GP 14 - 0 BAR- 29.13	NO SPARKS blowers not working	TA/ML
3-21-25	0900	0	21	0	—	MAN- 0 BLR- 0	OFF	OFF	OUT	GP 14 - 0 BAR- 29.46	SPARKER GOOD NO GAS	TA
3-29-25	1330	0	22	1	—	MAN- 0 BLR- 0	OFF	OFF	OUT	GP 14 - 0 BAR- 29.46	Sparker good, NO GAS	AW/ML
4-4-25	1415	10	7	10	—	MAN- 0 BLR- 0	ON	OFF	OUT	GP 14 - 0 BAR- 29.91	Sparker good No gas	AW/ML
4-11-25	1325	10	7	11	—	MAN- 0 BLR- 0	ON	OFF	OUT	GP 14 - 0 BAR- 29.87	SPARKER GOOD NO GAS	TA/ML
4-18-25	1330	15	6	12	—	MAN- 0 BLR- 0	ON	OFF	OUT	GP 14 - 0 BAR- 29.68	Sparker good, Flare start w/blower	AW

McCOLLUM PARK LANDFILL - WEEKLY GAS PROBE MONITORING DATA

DATE	MILITARY TIME	METHANE %	OXYGEN %	CO2 %	VELOCITY (Ft/Min)	LEL SENSORS	BL-1	BL-2	FLARE	Comments	READERS INITIALS
							Check if system is on				
4/29/25	1406	7	9	8	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.87	Spark good, no gas AW
5-2-25	1410	17	4	13	-	MAN- BLR- Ø	ON	OFF	ON	GP 14 - Ø BAR- 29.46	SPARKER GOOD LEFT BL#1 ON AW/TA
5-9-25	1325	12	9	10	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.70	Spark good, turn BL#1 off AW/ML
5-16-25	1115	18	5	12	-	MAN- BLR- Ø	ON	OFF	ON	GP 14 - Ø BAR- 29.65	SPARKER GOOD LEFT BL#1 ON TA
5-21-25	1038	12	10	10	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.82	NO GAS, TURN OFF BL#1 - SPARKER GOOD ML/TA/AW
5-30-25	1035	12	6	12	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.80	SPARK GOOD NOT ENOUGH GAS ML/AW
6-6-25	1430	18	4	14	-	MAN- BLR- Ø	ON	OFF	ON	GP 14 - Ø BAR- 29.59	Spark good, LEFT BL#1 ON AW/ML
6-13-25	1400	11	10	10	905	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.65	SPARKER GOOD SHUT OFF BL#1 ML
6-20-25	1400	17	5	14	-	MAN- BLR- Ø	ON	OFF	ON	GP 14 - Ø BAR- 29.42	Spark good, LEFT BL#1 ON AW/ML
6-27-25	1355	10	10	10	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.68	Spark good, TURN BL#1 OFF AW/TA
7-3-25	1400	13	9	11	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.63	SPARKER GOOD NO GAS, TURN BL OFF AW/TA
7-11-25	1435	12	7	12	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.75	Spark good, NO GAS, turn BL#1 OFF AW/TA
7-18-25	1335	9	10	9	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.57	Spark good no gas, turn BL#1 off AW
7-25-25	1000	15	5	13	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.62	SPARK GOOD - NO GAS TURNED OFF BL#1 TA
8-1-25	1020	12	7	12	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.75	Spark good - no gas Turned off BL#1 AW
8-8-25	1335	17	5	14	-	MAN- BLR- Ø	ON	OFF	ON	GP 14 - Ø BAR- 29.75	Spark good. FI on. LEFT BL#1 ON AW/TA
8-15-25	1340	12	9	12	-	MAN- BLR- Ø	ON	OFF	OUT	GP 14 - Ø BAR- 29.41	Turn BL#1 OFF, NO gas. Spark good. AW

Attachment 2

Gas Probe Monitoring Field Sheets

QUARTERLY GAS ROUND	
DATE:	02/14/25

Site	Location	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Barometric Pressure	Comments
LK STEVENS	GP-1	0855	0%	21%	0%		29.62	
	GP-5	0905	0%	21%	1%		"	
	GP-4	0907	0%	13%	7%		"	
	GP-3	0910	0%	21%	0%		"	
	GP-2	0914	0%	21%	0%		"	
	Flare	0918	0%	22%	0%	12	"	
Site	Location	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Barometric Pressure	Comments
BRYANT	GP-1(S)	1008	0%	22%	0%		29.68	
	GP-1(M)	1009	0%	22%	0%		"	
	GP-1(D)	1010	0%	22%	0%		"	
	GP-5	1005	0%	21%	1%		"	
	GP-6	1015	0%	22%	0%		"	
	Flare	1020	9%	11%	1%	10	"	
Site	Location	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Barometric Pressure	Comments
McCOLLUM PARK	GP-18	1110	0%	21%	0%		29.56	
	GP-19	1114	0%	21%	0%		"	
	GP-14	1117	0%	21%	1%		"	
	GP-15	1120	0%	20%	1%		"	
	GP-16	1122	0%	22%	1%		"	
	Flare	1127	0%	22%	0%	20	"	

Methane/Oxygen Meter Used =

Technician Name =

Page =

GEM 5000
ML/TA
1 of 2

QUARTERLY GAS ROUND	
DATE:	05/21/25

Site	Location	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Barometric Pressure	Comments
LK STEVENS	GP-1	0842	0%	21%	0%	-	30.02	
	GP-5	0846	0%	19%	3%	-	30.02	
	GP-4	0848	0%	11%	10%	-	30.02	
	GP-3	0851	0%	18%	2%	-	30.02	
	GP-2	0857	0%	20%	2%	-	30.02	
	Flare	0900	63%	2%	24%	10	30.02	
Site	Location	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Barometric Pressure	Comments
BRYANT	GP-1(S)	0940	0%	21%	0%	-	30.03	
	GP-1(M)	0940	0%	21%	0%	-	30.03	
	GP-1(D)	0940	0%	21%	0%	-	30.03	
	GP-5	0940	0%	21%	0%	-	30.03	
	GP-6	0945	0%	21%	0%	-	30.03	
	Flare	0950	34%	0%	8%	--	30.03	Velocity meter not working.
Site	Location	Time (Military)	Methane (% VOL)	Oxygen (% VOL, % LEL, PPM)	Carbon Diox. (% VOL)	Velocity	Barometric Pressure	Comments
McCOLLUM PARK	GP-18	1030	0%	18%	4%	--	29.82	
	GP-19	1035	0%	19%	2%	--	29.82	
	GP-14	1038	0%	17%	5%	--	29.82	
	GP-15	1042	0%	20%	1%	--	29.82	
	GP-16	1047	0%	21%	1%	--	29.82	
	Flare	1050	12%	10%	10%	--	29.82	Velocity meter not working.

Methane/Oxygen Meter Used =

Technician Name =

Page =

GEM 5000
ML/AW/TA
1 of 2

Attachment 3

Groundwater Sampling Field Sheets



Sample Number: 22807 **Conditions:** Overcast
Date: 3/19/2025 **Site:** McCollum Park
Time: 10:43 AM **Location:** BH-07

Well Information:

Well Depth: 15.3 ft **Water Depth:** 5.89 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.51 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.54	892 µS	10.9	Clear	Very Fine				
Test 2	Grab	6.53	877 µS	10.9	Clear	Very Fine				
Test 3	Grab	6.55	870 µS	10.9	Clear	Very Fine				

Sampling:

Sample Depth: 6.01 ft **Sample Type:** Standard Ground - Water

Sample Time: 11:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22806 **Conditions:** Overcast
Date: 3/19/2025 **Site:** McCollum Park
Time: 10:42 AM **Location:** MMW-18

Well Information:

Well Depth: 100.3 ft **Water Depth:** 6 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 15.09 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.95	846 µS	11.8	Clear	Fine				
Test 2	Grab	7.12	844 µS	11.6	Clear	Very Fine				
Test 3	Grab	7.11	842 µS	11.8	Clear	Very Fine				

Sampling:

Sample Depth: 6.71 ft **Sample Type:** Standard Ground - Water

Sample Time: 11:00

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22805 **Conditions:** Overcast
Date: 3/19/2025 **Site:** McCollum Park
Time: 10:18 AM **Location:** MMW-19

Well Information:

Well Depth: 94.7 ft **Water Depth:** 1.51 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 14.91 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.91	212 µS	9.9	Clear	Fine				
Test 2	Grab	7.11	211 µS	10.4	Clear	Fine				
Test 3	Grab	7.15	210 µS	10.4	Clear	Fine				

Sampling:

Sample Depth: 2.01 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:40

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22804 **Conditions:** Overcast
Date: 3/19/2025 **Site:** McCollum Park
Time: 9:53 AM **Location:** MMW-20

Well Information:

Well Depth: **Water Depth:**

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume:

Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
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Sampling:

Sample Depth: 5.18 ft **Sample Type:** Standard Ground - Water
Sample Time: 10:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split sample with 22803. See 22803 for field measurements.

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22803 **Conditions:** Overcast
Date: 3/19/2025 **Site:** McCollum Park
Time: 9:52 AM **Location:** MMW-20

Well Information:

Well Depth: 96.2 ft **Water Depth:** 5.16 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 14.57 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.85	243 µS	9.8	Clear	Fine				
Test 2	Grab	7.02	232 µS	10	Clear	Fine				
Test 3	Grab	7.11	234 µS	9.9	Clear	Fine				

Sampling:

Sample Depth: 5.18 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split sample with 22804.

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22802 **Conditions:** Overcast
Date: 3/19/2025 **Site:** McCollum Park
Time: 9:14 AM **Location:** MMW-15

Well Information:

Well Depth: 125.5 ft **Water Depth:** 25.9 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 15.94 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.99	332 µS	10.4	Clear	Very Fine				
Test 2	Grab	7.28	317 µS	10.4	Clear	Very Fine				
Test 3	Grab	7.35	319 µS	10.5	Clear	Very Fine				

Sampling:

Sample Depth: 25.95 ft **Sample Type:** Standard Ground - Water

Sample Time: 09:30

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22801 **Conditions:** Overcast
Date: 3/19/2025 **Site:** McCollum Park
Time: 9:12 AM **Location:** MMW-11

Well Information:

Well Depth: **Water Depth:**

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume:

Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
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Sampling:

Sample Depth: **Sample Type:**

Sample Time:

Sample Type	Sample Method	Volume	Bottle Type	Preservative
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Notes: No sample, no water

Number of Bottles:

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22800 **Conditions:** Sunny
Date: 3/18/2025 **Site:** McCollum Park
Time: 10:14 AM **Location:** MMW-17

Well Information:

Well Depth: 47.6 ft **Water Depth:** 8.95 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 6.18 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.4	358 µS	9.9	Clear	Very Fine				
Test 2	Grab	6.6	350 µS	10.3	Clear	Very Fine				
Test 3	Grab	6.63	347 µS	10.4	Clear	Very Fine				

Sampling:

Sample Depth: 9.01 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:40

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22799 **Conditions:** Sunny
Date: 3/18/2025 **Site:** McCollum Park
Time: 9:17 AM **Location:** BH-05

Well Information:

Well Depth: 16.85 ft **Water Depth:** 7.31 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.53 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	5.77	199 µS	7.8	Clear	Fine				
Test 2	Grab	5.74	198 µS	7.8	Clear	Fine				
Test 3	Grab	5.73	198 µS	7.7	Clear	Fine				

Sampling:

Sample Depth: 7.31 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:10

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22798 **Conditions:** Sunny
Date: 3/18/2025 **Site:** McCollum Park
Time: 9:17 AM **Location:** MMW-12

Well Information:

Well Depth: 101.2 ft **Water Depth:** 8.68 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 14.8 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.38	392 µS	10.8	Clear	Fine				
Test 2	Grab	6.77	399 µS	10.6	Clear	Very Fine				
Test 3	Grab	6.85	397 µS	10.7	Clear	Very Fine				

Sampling:

Sample Depth: 8.61 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:30

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Matt Lawless



Sample Number: 22797 **Conditions:** Sunny
Date: 3/18/2025 **Site:** McCollum Park
Time: 9:17 AM **Location:** BH-06

Well Information:

Well Depth: 14.4 ft **Water Depth:** 4.21 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.63 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6	213 µS	8.1	Clear	Fine				
Test 2	Grab	6	202 µS	8.1	Clear	Very Fine				
Test 3	Grab	5.99	202 µS	8.2	Clear	Fine				

Sampling:

Sample Depth: 4.31 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:00

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22796 **Conditions:** Sunny
Date: 3/18/2025 **Site:** McCollum Park
Time: 9:07 AM **Location:** BH-03A

Well Information:

Well Depth: 40.5 ft **Water Depth:** 5.89 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 5.54 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.28	200.2 µS	11.9	Clear	Very Fine				
Test 2	Grab	6.29	199.7 µS	13.2	Clear	Fine				
Test 3	Comp	6.38	198.3 µS	13.2	Clear	Fine				

Sampling:

Sample Depth: 5.95 ft **Sample Type:** Standard Ground - Water

Sample Time: 09:45

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22795 **Conditions:** Sunny
Date: 3/18/2025 **Site:** McCollum Park
Time: 8:51 AM **Location:** MMW-16

Well Information:

Well Depth: 100.3 ft **Water Depth:** 5.11 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 15.23 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.08	541 µS	10.9	Clear	Very Fine				
Test 2	Grab	6.51	559 µS	10.7	Clear	Very Fine				
Test 3	Grab	6.65	568 µS	10.2	Clear	Very Fine				

Sampling:

Sample Depth: 5.38 ft **Sample Type:** Standard Ground - Water

Sample Time: 09:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22794 **Conditions:** Sunny
Date: 3/18/2025 **Site:** McCollum Park
Time: 8:38 AM **Location:** MMW-14

Well Information:

Well Depth: 108.96 ft **Water Depth:** 13.94 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 15.2 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	5.58	165.6 µS	11.6	Clear	Fine				
Test 2	Grab	5.55	166 µS	11.2	Clear	Fine				
Test 3	Grab	5.7	168.5 µS	11.1	Clear	Very Fine				

Sampling:

Sample Depth: 14 ft **Sample Type:** Standard Ground - Water
Sample Time: 08:55

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Matt Lawless



Sample Number: 22793 **Conditions:** Sunny
Date: 3/18/2025 **Site:** McCollum Park
Time: 8:29 AM **Location:** BH-08

Well Information:

Well Depth: 23 ft **Water Depth:** 12.81 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.63 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	5.41	166 µS	10.5	Clear	Medium				
Test 2	Grab	5.27	163.4 µS	10.1	Clear	Fine				
Test 3	Grab	5.29	161.8 µS	10.2	Clear	Fine				

Sampling:

Sample Depth: 15.33 ft **Sample Type:** Standard Ground - Water
Sample Time: 08:40

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Matt Lawless



Sample Number: 22888 **Conditions:** Overcast
Date: 6/4/2025 **Site:** McCollum Park
Time: 11:00 AM **Location:** BH-07

Well Information:

Well Depth: **Water Depth:**

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume:

Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
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Sampling:

Sample Depth: 6.79 ft **Sample Type:** Priority Pollutants - Water

Sample Time: 11:05

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	ISCO	100	Clpl	NaOH
Bottle 2	Grab	ISCO	1000	Ambgl	None
Bottle 3	Grab	ISCO	1000	Ambgl	None
Bottle 4	Grab	ISCO	1000	Ambgl	None
Bottle 5	Grab	ISCO	40	Ambgl	H2SO4

Notes: Added bottle set. See field measurements on 22887.

Number of Bottles: 5

Operator/Witness: Trina Arnold

Sampler: Matt Lawless



Sample Number: 22887 **Conditions:** Overcast
Date: 6/4/2025 **Site:** McCollum Park
Time: 11:00 AM **Location:** BH-07

Well Information:

Well Depth: 15.3 ft **Water Depth:** 6.63 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.39 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.57	901 µS	13.6	Clear	Very Fine				
Test 2	Grab	6.54	873 µS	13.1	Clear	Very Fine				
Test 3	Grab	6.52	874 µS	12.9	Clear	Very Fine				

Sampling:

Sample Depth: 6.79 ft **Sample Type:** Standard Ground - Water
Sample Time: 11:05

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold

Sampler: Matt Lawless



Sample Number: 22886 **Conditions:** Overcast
Date: 6/4/2025 **Site:** McCollum Park
Time: 10:36 AM **Location:** MMW-18

Well Information:

Well Depth: 100.3 ft **Water Depth:** 6.81 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 14.96 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.03	834 µS	13.5	Clear	Very Fine				
Test 2	Grab	7.09	837 µS	13.1	Clear	Very Fine				
Test 3	Grab	7.21	839 µS	13.3	Clear	Very Fine				

Sampling:

Sample Depth: 7.75 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:55

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold

Sampler: Matt Lawless



Sample Number: 22885 **Conditions:** Overcast
Date: 6/4/2025 **Site:** McCollum Park
Time: 10:10 AM **Location:** MMW-19

Well Information:

Well Depth: 94.7 ft **Water Depth:** 2.58 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 14.74 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.22	207 µS	11.8	Clear	Very Fine				
Test 2	Grab	7.26	215 µS	11.3	Clear	Very Fine				
Test 3	Grab	7.26	215 µS	11.3	Clear	Very Fine				

Sampling:

Sample Depth: 2.39 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:25

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold

Sampler: Matt Lawless



Sample Number: 22884 **Conditions:** Overcast
Date: 6/4/2025 **Site:** McCollum Park
Time: 9:46 AM **Location:** MMW-20

Well Information:

Well Depth: 96.2 ft **Water Depth:** 6.52 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 14.35 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.06	227 µS	11.4	Clear	Very Fine				
Test 2	Grab	7.2	235 µS	11.2	Clear	Very Fine				
Test 3	Grab	7.2	236 µS	11.5	Clear	Very Fine				

Sampling:

Sample Depth: 6.15 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:05

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold

Sampler: Matt Lawless



Sample Number: 22883 **Conditions:** Overcast
Date: 6/4/2025 **Site:** McCollum Park
Time: 9:15 AM **Location:** MMW-15

Well Information:

Well Depth: 125.5 ft **Water Depth:** 24.22 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 16.2 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	7.2	304 µS	12.2	Clear	Very Fine				
Test 2	Grab	7.43	311 µS	11.8	Clear	Very Fine				
Test 3	Grab	7.37	310 µS	11.5	Clear	Very Fine				

Sampling:

Sample Depth: 25.43 ft **Sample Type:** Standard Ground - Water

Sample Time: 09:35

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Trina Arnold

Sampler: Matt Lawless



Sample Number: 22882 **Conditions:** Overcast
Date: 6/4/2025 **Site:** McCollum Park
Time: 9:12 AM **Location:** MMW-11

Well Information:

Well Depth: **Water Depth:**

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume:

Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
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Sampling:

Sample Depth: **Sample Type:**

Sample Time:	Sample Type	Sample Method	Volume	Bottle Type	Preservative
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Notes: Not enough water to sample.

Number of Bottles:

Operator/Witness: Trina Arnold

Sampler: Matt Lawless



Sample Number: 22881 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 10:25 AM **Location:** MMW-17

Well Information:

Well Depth: 47.6 ft **Water Depth:** 9.96 ft

Surface Measurements:

Flow Rate: 0 **Measure Method:**

Field Chemistry Tests:

Purge Volume: 6.02 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.48	374 µS	12.2	Clear	Very Fine				
Test 2	Grab	6.58	378 µS	11.3	Clear	Very Fine				
Test 3	Grab	6.65	380 µS	11.1	Clear	Very Fine				

Sampling:

Sample Depth: 9.79 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:45

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22880 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 10:15 AM **Location:** MMW-12

Well Information:

Well Depth: 101.2 ft **Water Depth:** 9.34 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 14.7 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.49	393 µS	13.1	Clear	Fine				
Test 2	Grab	6.82	400 µS	12	Clear	Fine				
Test 3	Grab	6.9	401 µS	11.9	Clear	Fine				

Sampling:

Sample Depth: 9.23 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:30

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Matt Lawless



Sample Number: 22879 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 10:09 AM **Location:** BH-05

Well Information:

Well Depth: 16.85 ft **Water Depth:** 8.25 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.38 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	5.8	244 µS	10.5	Clear	Fine				
Test 2	Grab	5.82	247 µS	9.5	Clear	Fine				
Test 3	Grab	5.83	250 µS	9	Clear	Very Fine				

Sampling:

Sample Depth: 8.44 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:15

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22878 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 9:54 AM **Location:** BH-06

Well Information:

Well Depth: 14.4 ft **Water Depth:** 5.11 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.49 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.03	231 µS	11.7	Clear	Very Fine				
Test 2	Grab	6.05	232 µS	10.9	Clear	Fine				
Test 3	Grab	6.08	235 µS	10.5	Clear	Very Fine				

Sampling:

Sample Depth: 5.28 ft **Sample Type:** Standard Ground - Water

Sample Time: 10:10

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Matt Lawless



Sample Number: 22877 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 9:39 AM **Location:** BH-03A

Well Information:

Well Depth: 40.5 ft **Water Depth:** 6.4 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 5.46 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.2	191.3 µS	14.8	Clear	Fine				
Test 2	Grab	6.41	194 µS	13.7	Clear	Fine				
Test 3	Grab	6.49	196 µS	13.7	Clear	Fine				

Sampling:

Sample Depth: 6.51 ft **Sample Type:** Standard Ground - Water
Sample Time: 09:50

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Matt Lawless



Sample Number: 22876 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 9:06 AM **Location:** MMW-16

Well Information:

Well Depth: **Water Depth:**

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume:

Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
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Sampling:

Sample Depth: 6.38 ft **Sample Type:** Standard Ground - Water

Sample Time: 09:30

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split sample, see 22875 for field measurements.

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22875 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 9:05 AM **Location:** MMW-16

Well Information:

Well Depth: 100.3 ft **Water Depth:** 5.75 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 15.13 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	6.23	531 µS	13.8	Clear	Fine				
Test 2	Grab	6.59	545 µS	13.1	Clear	Fine				
Test 3	Grab	6.69	562 µS	12.9	Clear	Fine				

Sampling:

Sample Depth: 6.38 ft **Sample Type:** Standard Ground - Water

Sample Time: 09:30

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes: Split sample with 22876.

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22874 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 8:49 AM **Location:** MMW-14

Well Information:

Well Depth: 108.96 ft **Water Depth:** 14.77 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 15.07 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	5.6	163 µS	13.5	Clear	Fine				
Test 2	Grab	5.68	164 µS	12.9	Clear	Very Fine				
Test 3	Grab	5.79	164 µS	12.9	Clear	Very Fine				

Sampling:

Sample Depth: 14.73 ft **Sample Type:** Standard Ground - Water

Sample Time: 09:05

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold



Sample Number: 22873 **Conditions:** Sunny
Date: 6/3/2025 **Site:** McCollum Park
Time: 8:39 AM **Location:** BH-08

Well Information:

Well Depth: 23 ft **Water Depth:** 13.24 ft

Surface Measurements:

Flow Rate: **Measure Method:**

Field Chemistry Tests:

Purge Volume: 1.56 gallons

	Type	pH	Cond	Temp	Color	Turbidity	Purge Vol	Water Depth	ORP	Time
Test 1	Grab	5.26	137 µS	13.1	Clear	Medium				
Test 2	Grab	5.34	141 µS	11.7	Clear	Fine				
Test 3	Grab	5.34	143 µS	11	Clear	Fine				

Sampling:

Sample Depth: 16.01 ft **Sample Type:** Standard Ground - Water

Sample Time: 08:50

	Sample Type	Sample Method	Volume	Bottle Type	Preservative
Bottle 1	Grab	Dedicator	1000	Clpl	None
Bottle 2	Grab	Dedicator	250	Clpl	HNO3R
Bottle 3	Grab	Dedicator	250	Clpl	H2SO4
Bottle 4	Grab	Dedicator	250	Clpl	HNO3
Bottle 5	Grab	Dedicator	40	Glass	HCL
Bottle 6	Grab	Dedicator	40	Glass	HCL
Bottle 7	Grab	Dedicator	40	Glass	HCL
Bottle 8	Grab	Dedicator	40	Glass	HCL

Notes:

Number of Bottles: 8

Operator/Witness: Arianna Wald

Sampler: Trina Arnold

Attachment 4

Groundwater Flow Calculations

Site: **McCullum Park/Former Emander Landfill - Shallow Aquifer, 1st Quarter 2025**

Measurement Date: **3/18/2025**

Well ID	[X] matrix		GW Elev.	[D] matrix	Pt									
	X-axis	Y-axis		D										
BH-03A	222.89	1076.77	377.66	1										
BH-05	899.19	716.67	378.02	1		222.89	899.19	658.91	436.3	223.9	0	0	0	
BH-06	658.91	680.07	377.59	1		1076.77	716.67	680.07	849.7	2097.01	0	0	0	
BH-07	436.29	849.69	378.06	1		377.66	378.02	377.59	378.1	382.9	0	0	0	
BH-08	223.90	2097.01	382.90	1										
6	0	0	0	1	{[P]t{P}}									
7	0	0	0	1		1532865.17	2172760.475	923561.4						
8	0	0	0	1		2172760.475	7254968.763	2058535						
9	0	0	0	1		923561.3755	2058535.113	717642.2						
10	0	0	0	1										
11	0	0	0	1	{[P]t{P}'									
12	0	0	0	1		5.67654E-06	2.00321E-06	-1.3E-05						
13	0	0	0	1		2.00321E-06	1.44759E-06	-6.7E-06						
14	0	0	0	1		-1.30515E-05	-6.7304E-06	3.75E-05						
15	0	0	0	1										
16	0	0	0	1	{[P]t{P}]{P]t									
17	0	0	0	1		-0.00150679	0.001606198	0.000175	-8E-04	0.000474304	0	0	0	
18	0	0	0	1		-0.000536576	0.000294492	-0.00024	-4E-04	0.000907069	0	0	0	
19	0	0	0	1		0.00400455	-0.00238507	0.000981	0.003	-0.002678746	0	0	0	
20	0	0	0	1										

{[P]t{P}]{P]t [D] = [A] matrix

A -7.2794E-06

B -1.2444E-05

C 0.002684581

Well MW-10 was inaccessible and not gauged/sampled.

Well MW-11 was dry

Groundwater Gradient:	0.0054
Conductivity (ft/day):	1.542
Effective porosity:	30%
GW velocity:	0.02760 ft/day
	10.07 ft/year
Flow direction:	-120.33 degrees from the positive x-axis

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [X] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H36 and H41.

Site: **McCullum Park/Former Emander Landfill - Deep Aquifer, 1st Quarter 2025**

Measurement Date: **3/18/2025**

Well ID	[X] matrix		GW Elev.	[D] matrix		Pt											
	X-axis	Y-axis		D													
MW-12	881.62	719.01	377.63	1													
MW-14	213.79	2027.73	379.71	1		881.62	213.79	1401.93	194	867.27	430.2	11.87					
MW-15	1401.93	991.00	375.96	1		719.01	2027.73	991	1232	723.98	834.6	856					
MW-16	193.95	1231.98	378.57	1		377.63	379.71	375.96	378.6	377.96	377.9	377.9					
MW-17	867.27	723.98	377.96	1													
MW-18	430.16	834.63	377.88	1	{[P]t{P}}												
MW-19	11.87	855.95	377.86	1		3763320.181	3693033.096	1509539									
MW-20	0.3	1017.5	378.34	1		3693033.096	10117230.98	3177852									
9	0	0	0	1		1509538.546	3177851.815	1143012									
10	0	0	0	1													
11	0	0	0	1	{[P]t{P}'												
12	0	0	0	1		6.36254E-07	2.50056E-07	-1.54E-06									
13	0	0	0	1		2.50056E-07	8.78291E-07	-2.77E-06									
14	0	0	0	1		-1.5355E-06	-2.7721E-06	1.06E-05									
15	0	0	0	1													
16	0	0	0	1	{[P]t{P}]{P}t												
17	0	0	0	1		0.000160877	6.00274E-05	0.000563	-1E-04	0.000152483	-1E-04	-4E-04					
18	0	0	0	1		-0.000194875	0.0007818	0.000179	8E-05	-0.000195013	-2E-04	-3E-04					
19	0	0	0	1		0.000659717	-0.00192067	-0.000911	3E-04	0.000671476	0.001	0.002					
20	0	0	0	1													

{[P]t{P}]{P}t [D] = [A] matrix

- A 3.29335E-06
- B -2.9404E-06
- C 0.002649389

Well MW-13 was inaccessible and not gauged/sampled.

Groundwater Gradient:	0.0017
Conductivity (ft/day):	15.584
Effective porosity:	30%
GW velocity:	0.08656 ft/day
	31.60 ft/year
Flow direction:	-41.76 degrees from the positive x-axis

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [X] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H36 and H41.

Site: **McCullum Park/Former Emander Landfill - Shallow Aquifer, 2nd Quarter 2025**

Measurement Date: **6/3/2025**

Well ID	[X] matrix		GW Elev.	[D] matrix		Pt											
	X-axis	Y-axis		D													
BH-03A	222.89	1076.77	377.15	1													
BH-05	899.19	716.67	377.08	1		222.89	899.19	658.91	436.3	223.9	0	0	0				
BH-06	658.91	680.07	376.69	1		1076.77	716.67	680.07	849.7	2097.01	0	0	0				
BH-07	436.29	849.69	377.32	1		377.15	377.08	376.69	377.3	382.47	0	0	0				
BH-08	223.90	2097.01	382.47	1													
6	0	0	0	1													
7	0	0	0	1													
8	0	0	0	1		1532865.17	2172760.475	921590.3									
9	0	0	0	1		2172760.475	7254968.763	2055170									
10	0	0	0	1		921590.3124	2055169.743	714980.5									
11	0	0	0	1													
12	0	0	0	1													
13	0	0	0	1		5.66234E-06	2.00145E-06	-1.31E-05									
14	0	0	0	1		2.00145E-06	1.44956E-06	-6.75E-06									
15	0	0	0	1		-1.30517E-05	-6.7465E-06	3.76E-05									
16	0	0	0	1													
17	0	0	0	1													
18	0	0	0	1		-0.001505251	0.001604383	0.000176	-8E-04	0.00047299	0	0	0				
19	0	0	0	1		-0.000537492	0.000294573	-0.000237	-4E-04	0.000907535	0	0	0				
20	0	0	0	1		0.004012715	-0.00238734	0.000981	0.003	-0.002683391	0	0	0				

{[P]t[P]}'[P]t [D] = [A] matrix

- A -5.8202E-06
- B -1.2837E-05
- C 0.002688823

Well MW-10 was inaccessible and not gauged/sampled.

Well MW-11 was dry

Groundwater Gradient:	0.0052
Conductivity (ft/day):	1.542
Effective porosity:	30%
GW velocity:	0.02694 ft/day
	9.83 ft/year
Flow direction:	-114.39 degrees from the positive x-axis

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [X] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H36 and H41.

Site: **McCullum Park/Former Emander Landfill - Deep Aquifer, 2nd Quarter 2025**

Measurement Date: **6/3/2025**

Well ID	[X] matrix		GW Elev.	[D] matrix		Pt										
	X-axis	Y-axis		D												
MW-12	881.62	719.01	376.97	1												
MW-14	213.79	2027.73	378.88	1		881.62	213.79	1401.93	194	867.27	430.2	11.87				
MW-15	1401.93	991.00	377.64	1		719.01	2027.73	991	1232	723.98	834.6	856				
MW-16	193.95	1231.98	377.93	1		376.97	378.88	377.64	377.9	376.95	377.1	376.8				
MW-17	867.27	723.98	376.95	1												
MW-18	430.16	834.63	377.07	1												
MW-19	11.87	855.95	376.79	1												
MW-20	0.3	1017.5	376.98	1		3763320.181	3693033.096	1509773								
9	0	0	0	1		3693033.096	10117230.98	3172864								
10	0	0	0	1		1509772.864	3172863.729	1139457								
11	0	0	0	1												
12	0	0	0	1												
13	0	0	0	1		6.41334E-07	2.55575E-07	-1.56E-06								
14	0	0	0	1		2.55575E-07	8.81717E-07	-2.79E-06								
15	0	0	0	1		-1.56142E-06	-2.7938E-06	1.07E-05								
16	0	0	0	1												
17	0	0	0	1												
18	0	0	0	1		0.000160565	6.37561E-05	0.000563	-2E-04	0.000152663	-1E-04	-4E-04				
19	0	0	0	1		-0.0001939	0.000784004	0.000177	8E-05	-0.000193129	-2E-04	-3E-04				
20	0	0	0	1		0.000658007	-0.00193506	-0.000907	3E-04	0.000666314	0.001	0.002				

$\{[P]t[P]'\}[P]t [D] = [A]$ matrix

A -1.0686E-06

B -4.5825E-06

C 0.002663867

Well MW-13 was inaccessible and not gauged/sampled.

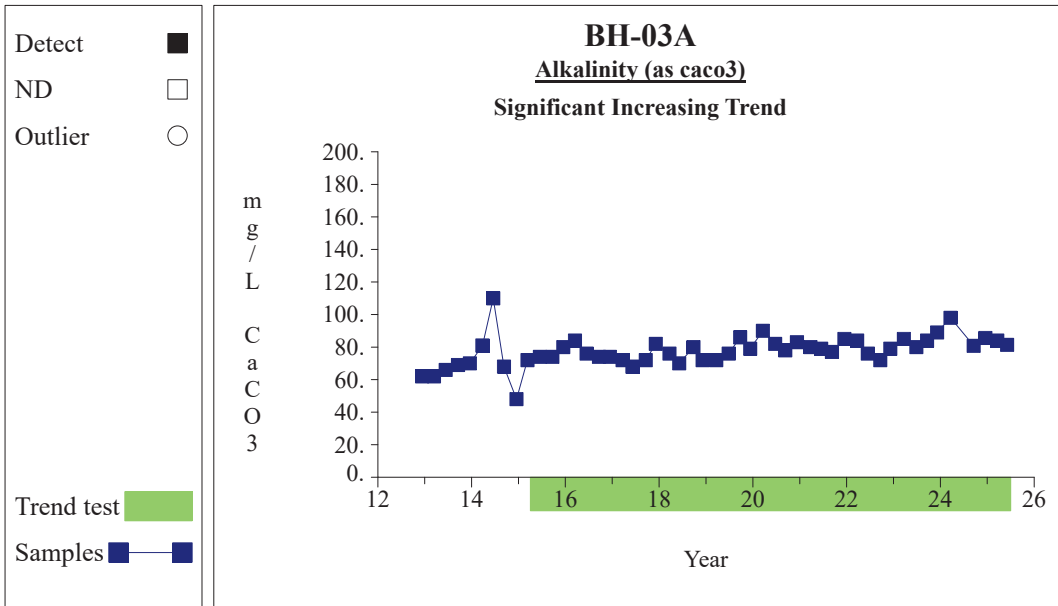
Groundwater Gradient:	0.0018
Conductivity (ft/day):	15.584
Effective porosity:	30%
GW velocity:	0.09176 ft/day
	33.49 ft/year
Flow direction:	-103.13 degrees from the positive x-axis

This spreadsheet is from the paper, "A Spreadsheet Method For Estimating Hydraulic Gradient With Heads From Multiple Wells" submitted to Ground Water, March, 2002. To use the program, enter the coordinates for the well locations in the columns labeled x and y (part of the [X] matrix), and the water levels in the z column. The matrices are automatically updated and the gradient magnitude and direction are calculated in cell H36 and H41.

Attachment 5

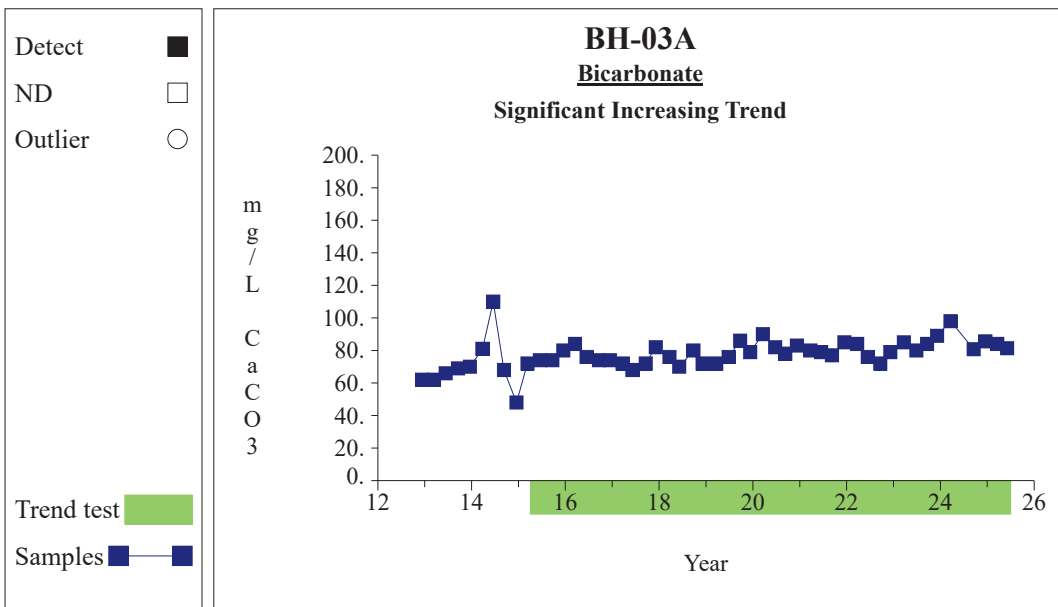
Statistical Time Series Plots

Time Series



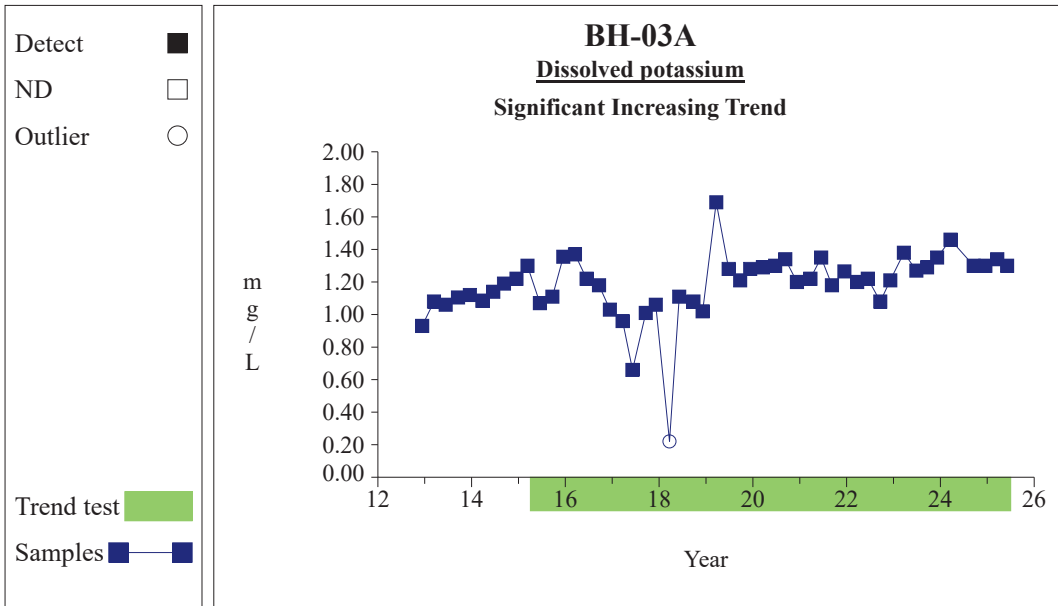
Graph 5

Time Series



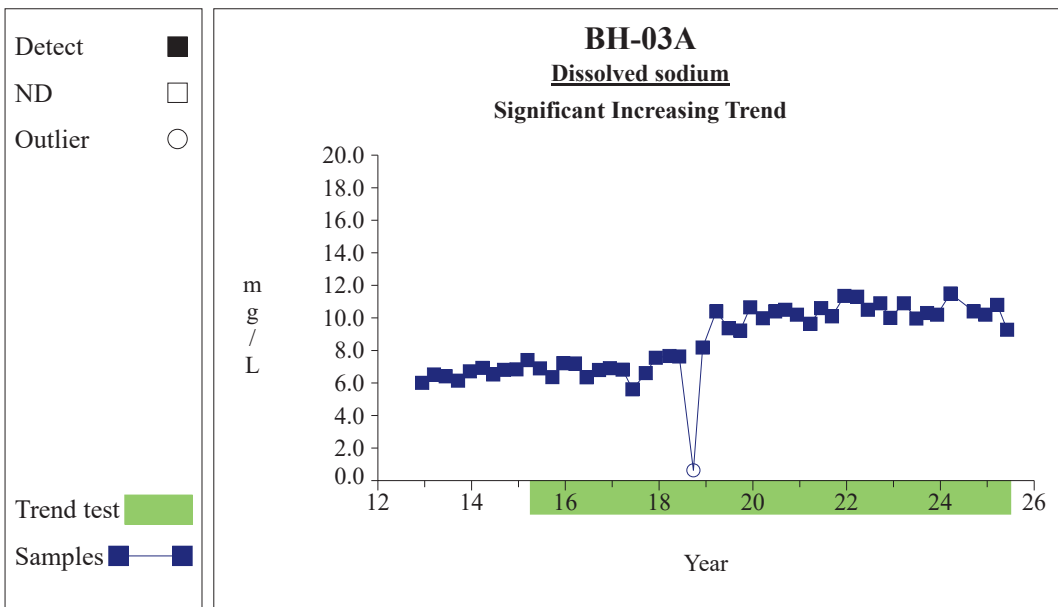
Graph 8

Time Series



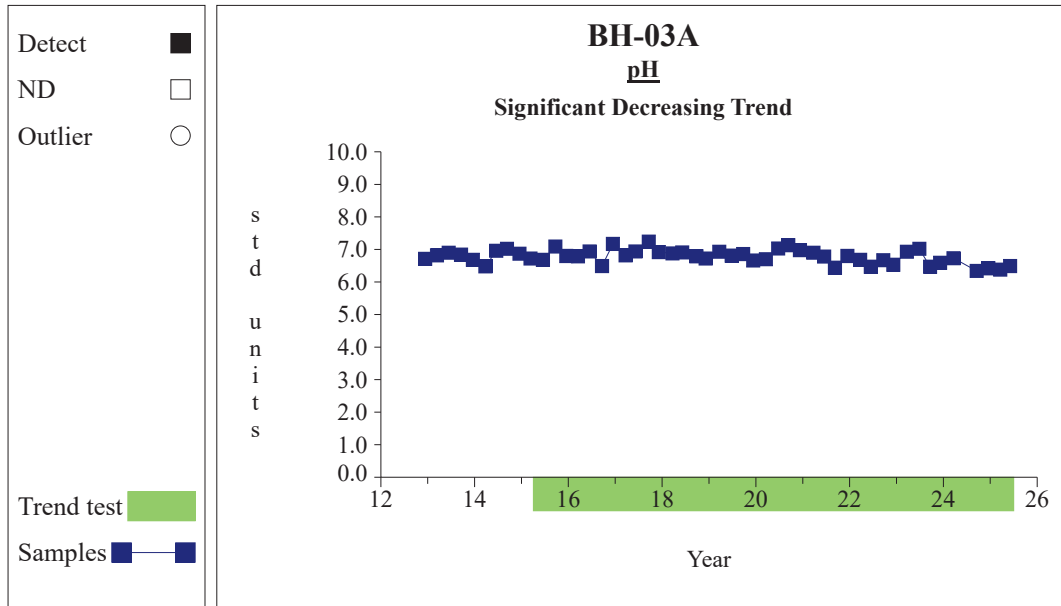
Graph 31

Time Series



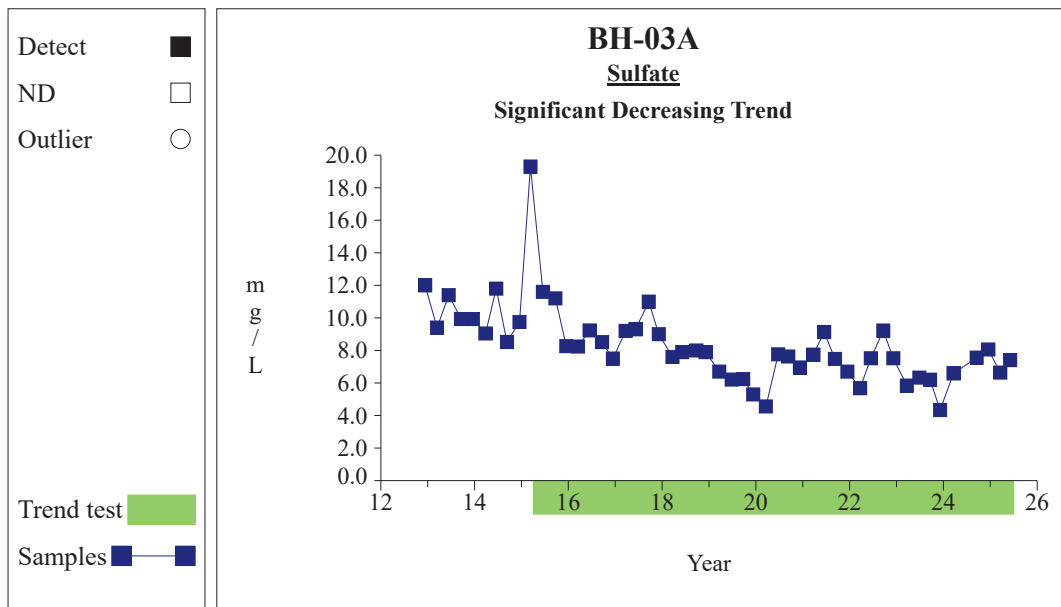
Graph 34

Time Series



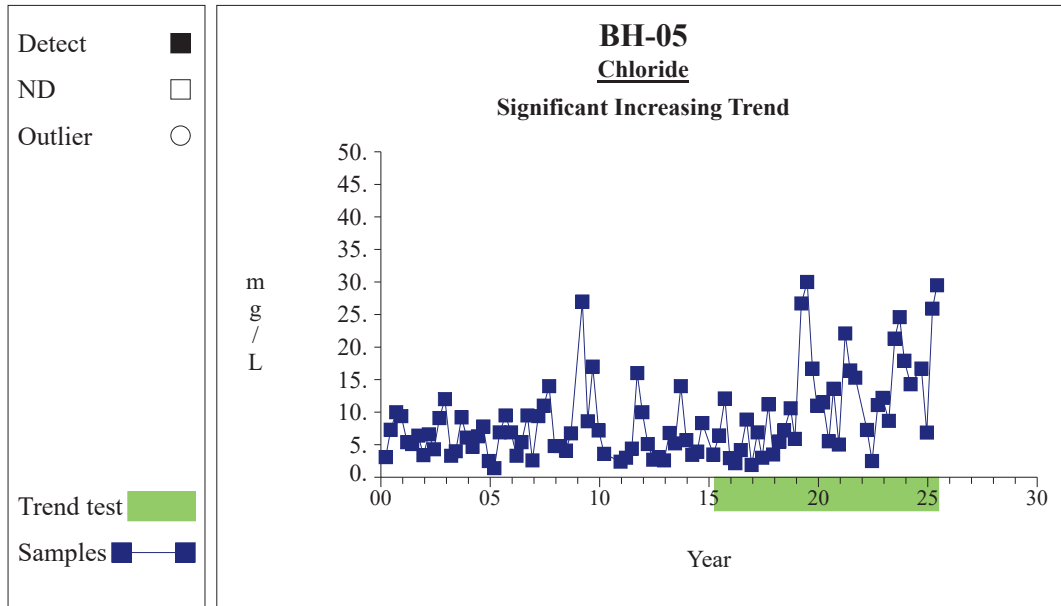
Graph 43

Time Series



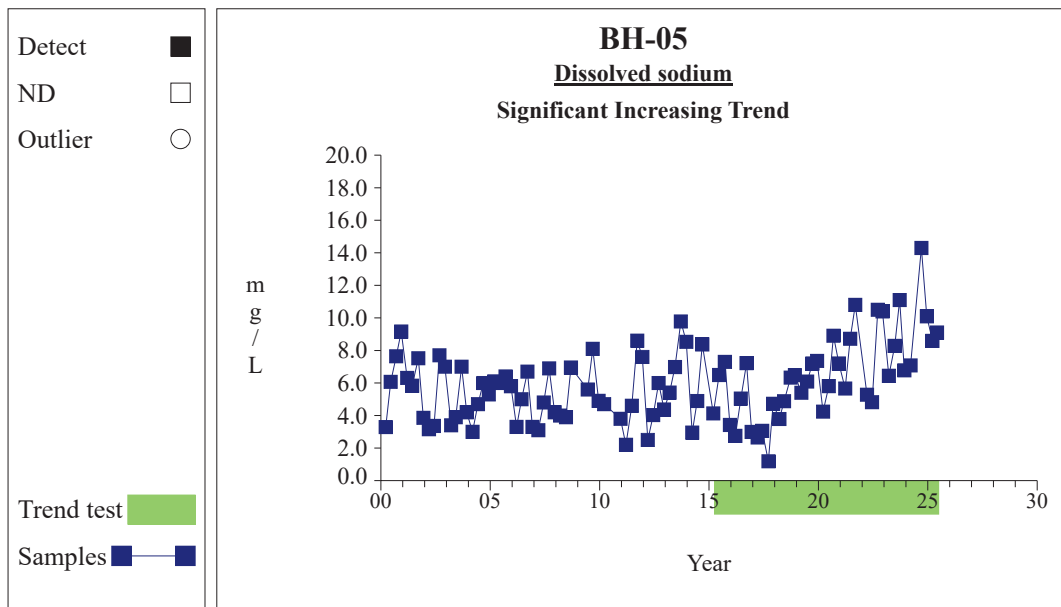
Graph 45

Time Series



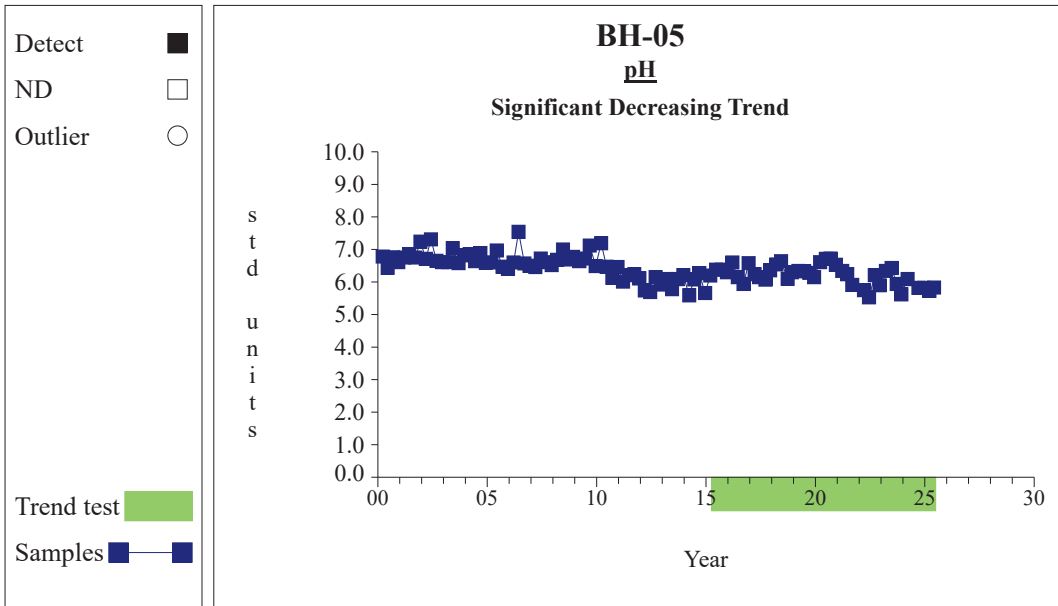
Graph 62

Time Series



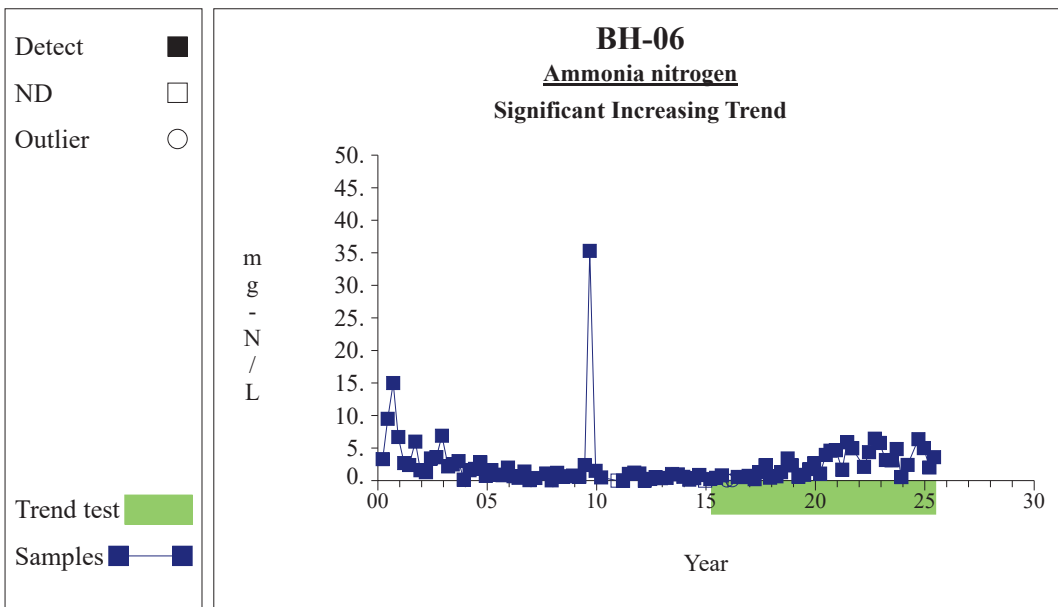
Graph 85

Time Series



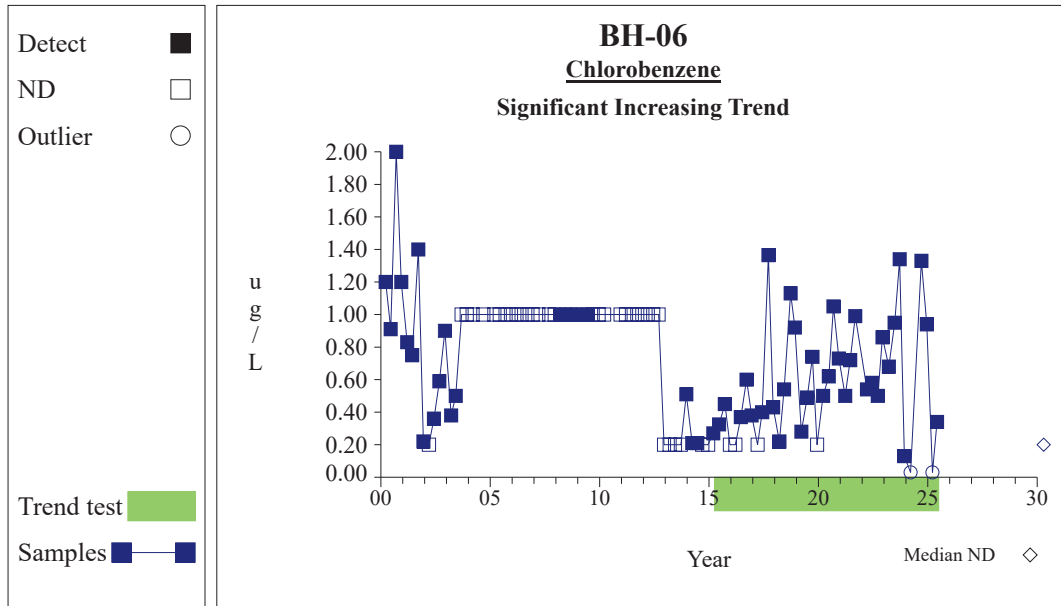
Graph 94

Time Series



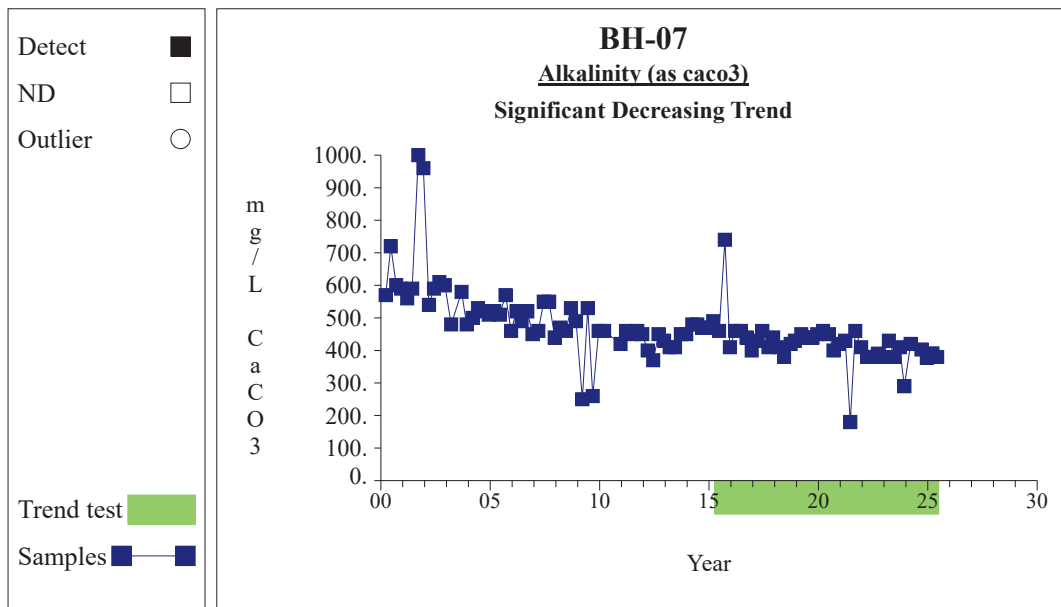
Graph 108

Time Series



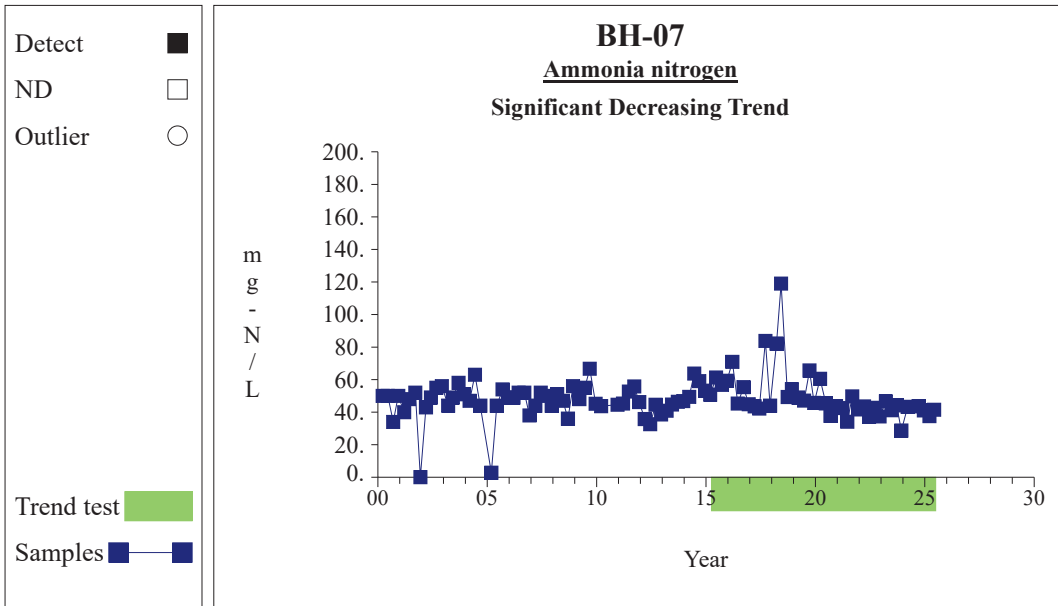
Graph 114

Time Series



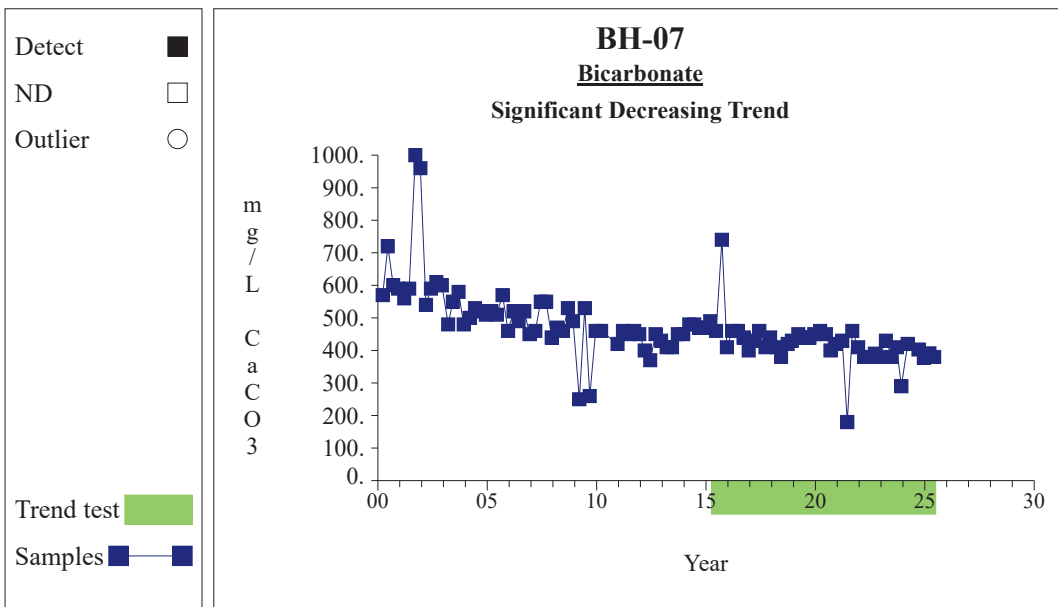
Graph 158

Time Series



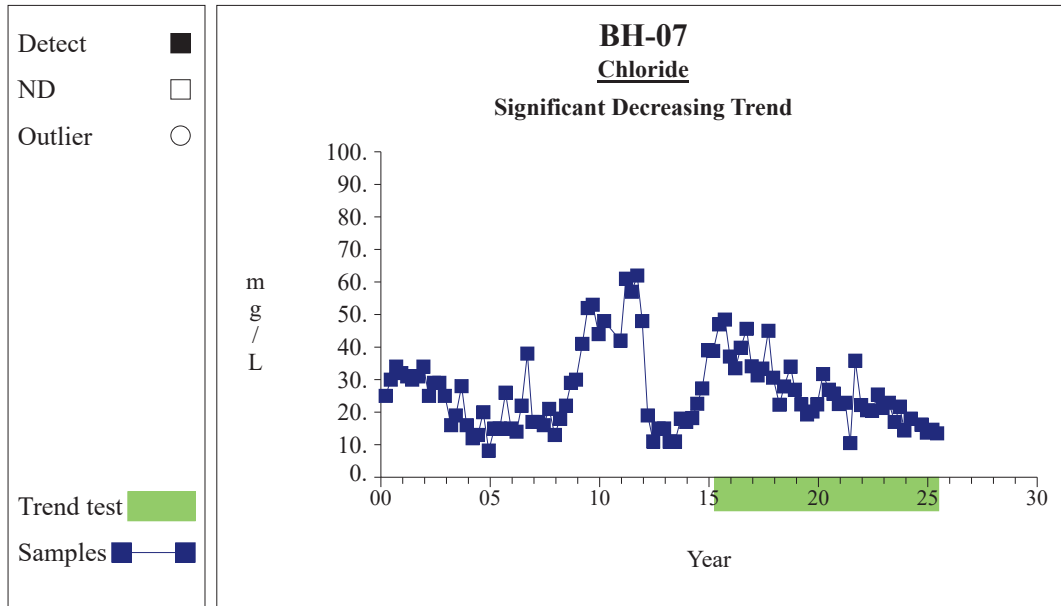
Graph 159

Time Series



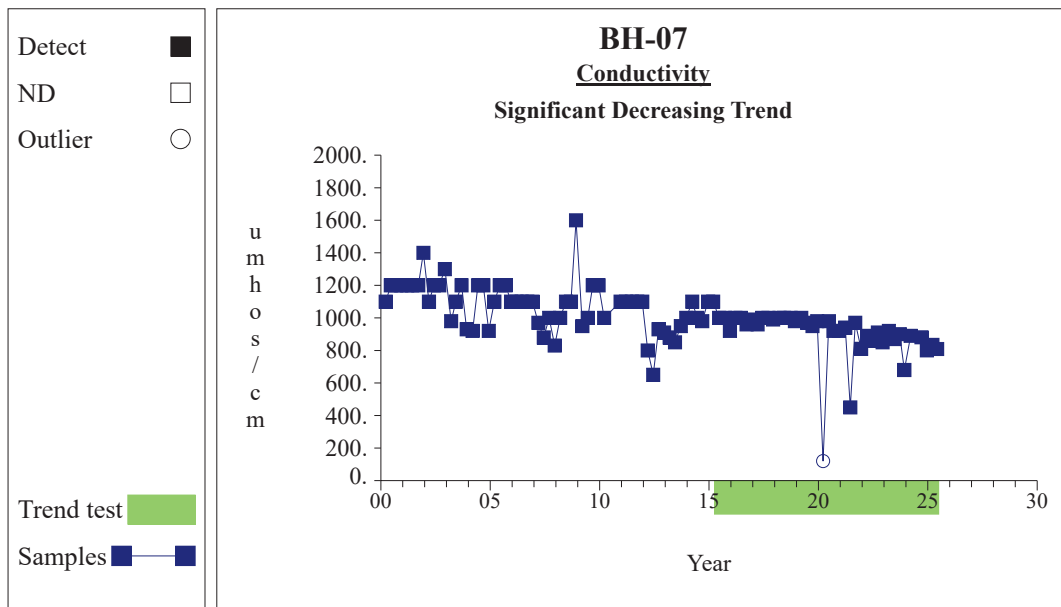
Graph 161

Time Series



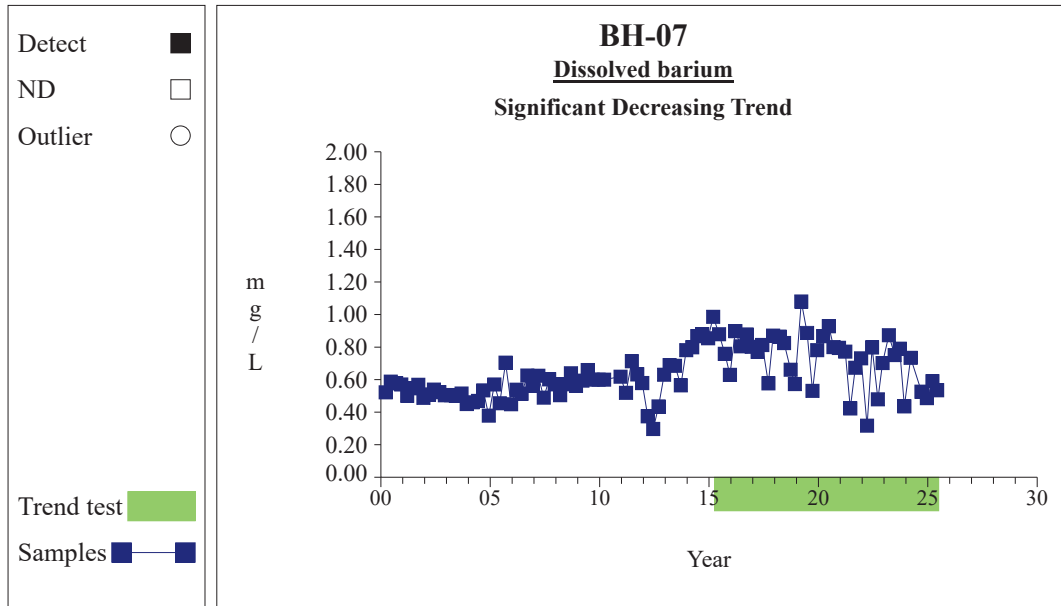
Graph 164

Time Series



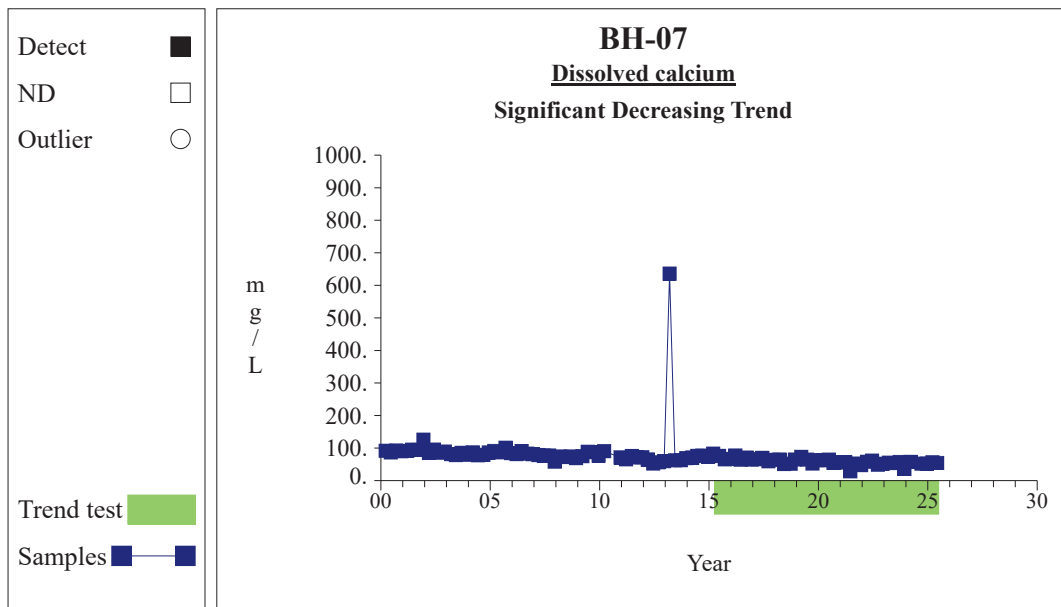
Graph 169

Time Series



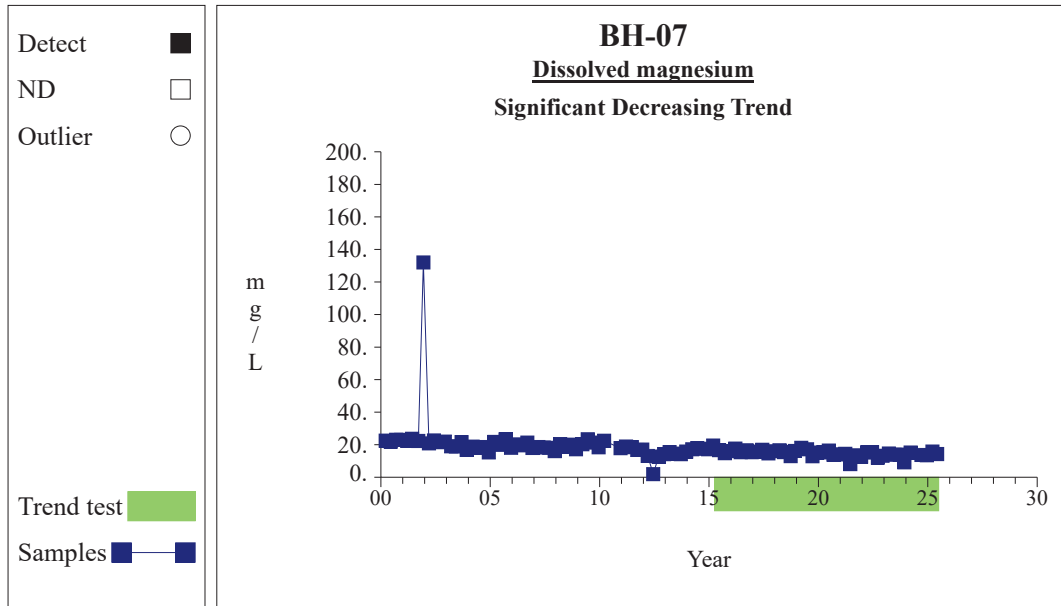
Graph 172

Time Series



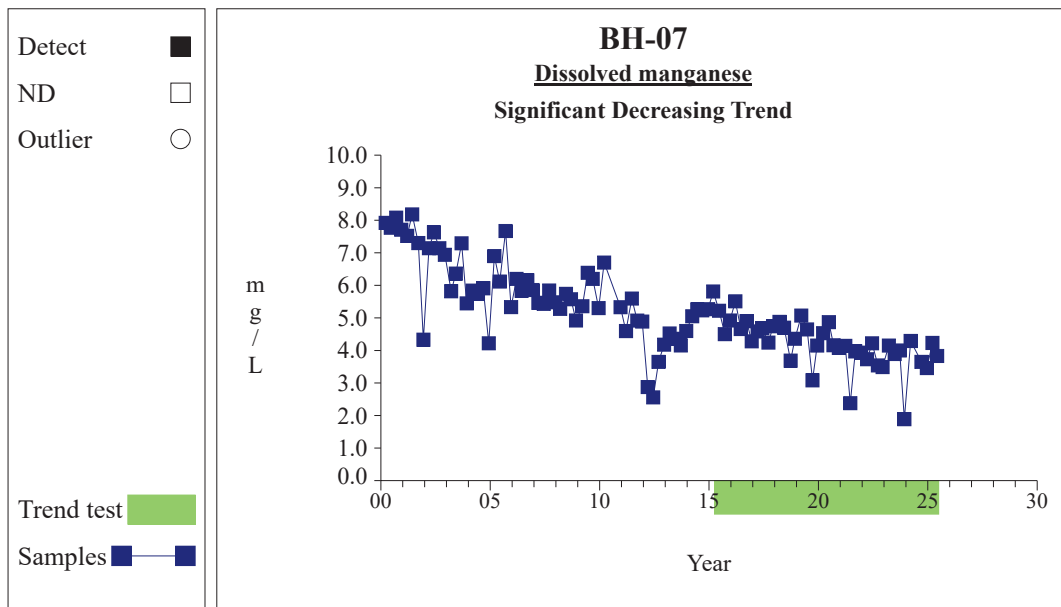
Graph 175

Time Series



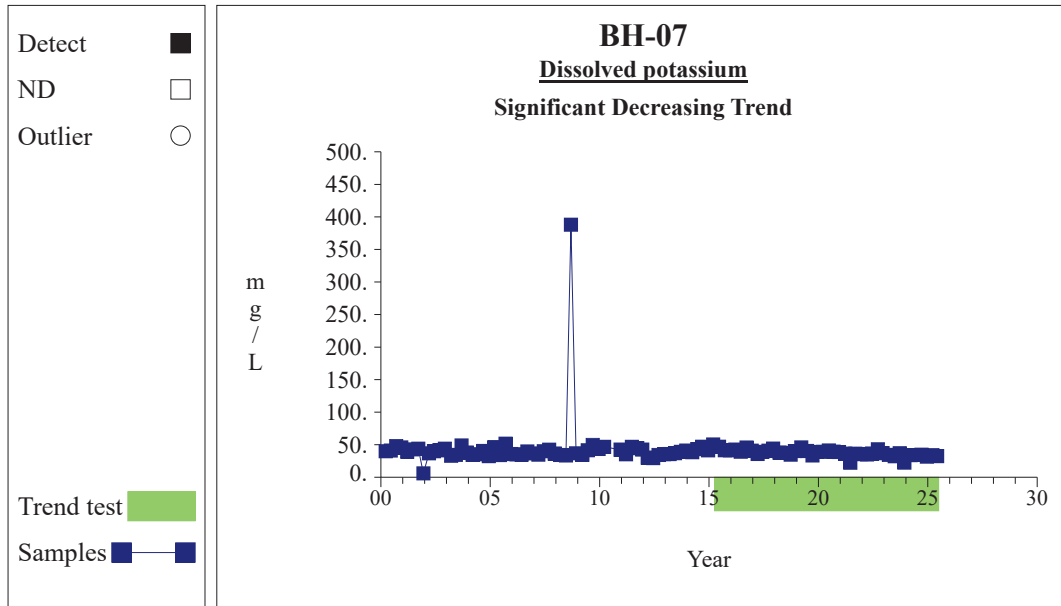
Graph 181

Time Series



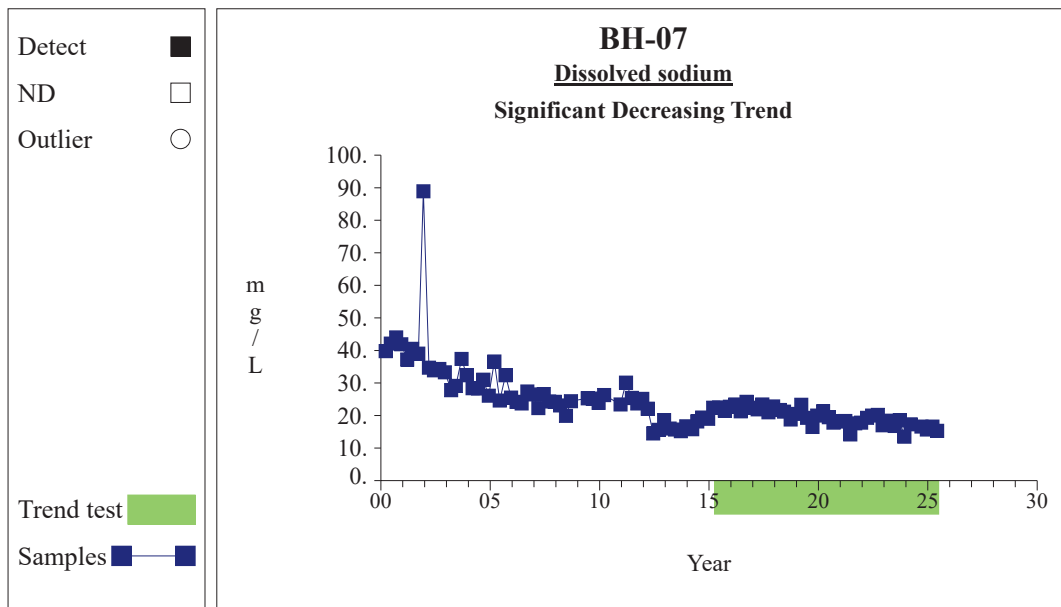
Graph 182

Time Series



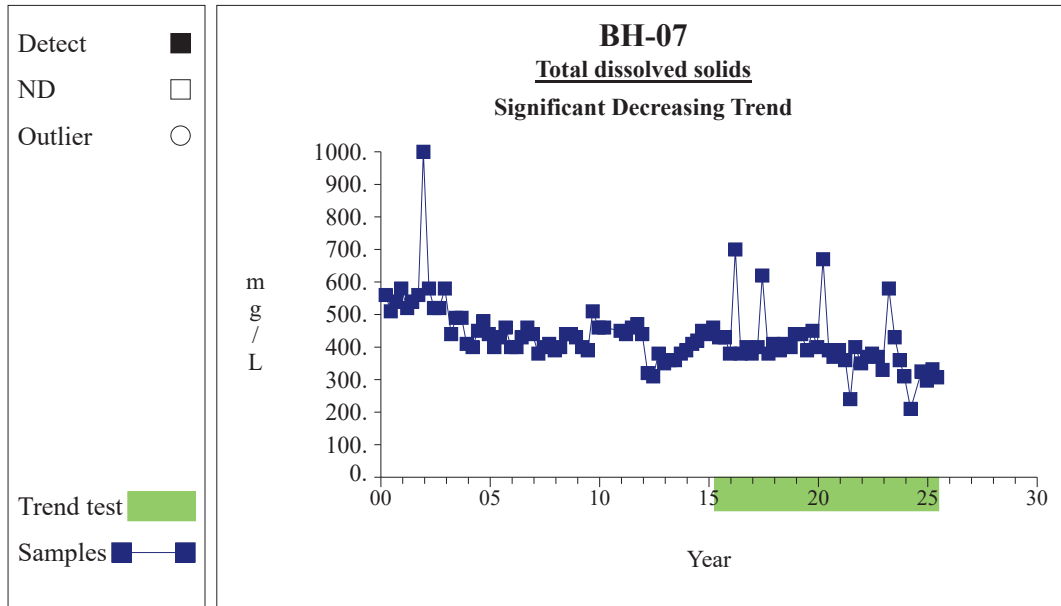
Graph 184

Time Series



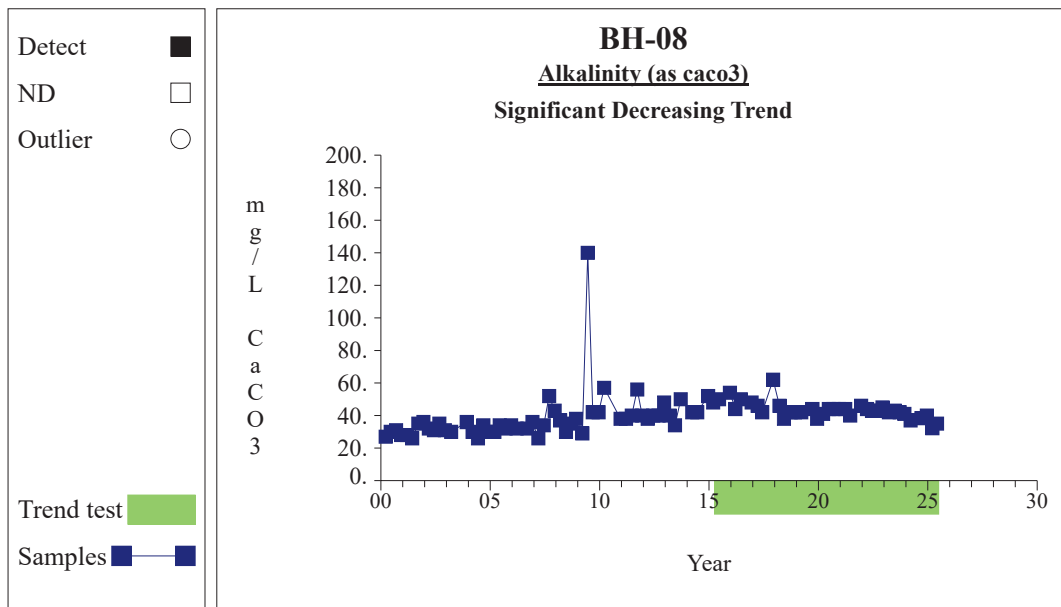
Graph 187

Time Series



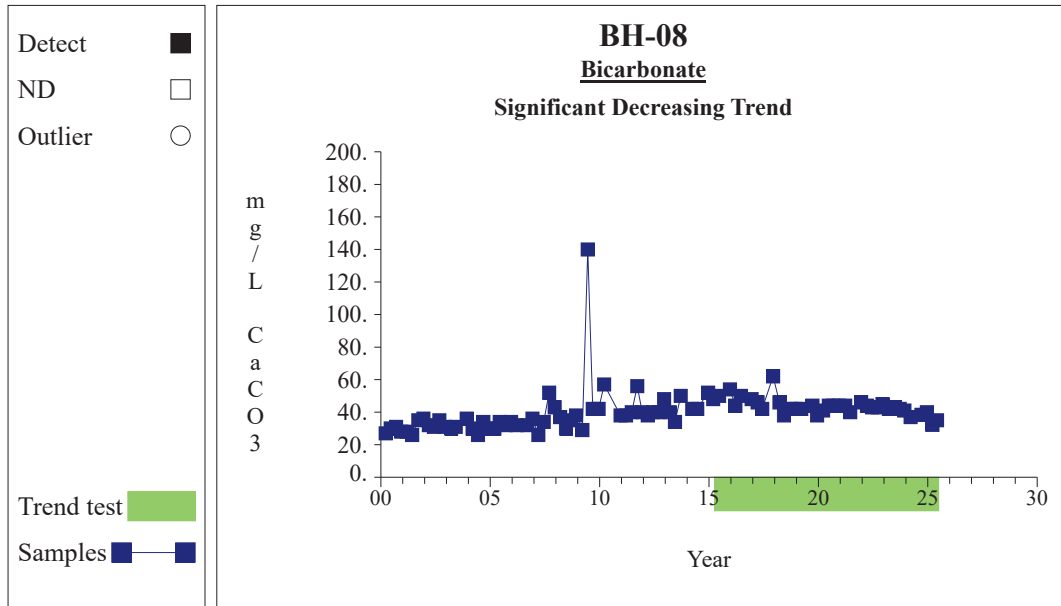
Graph 200

Time Series



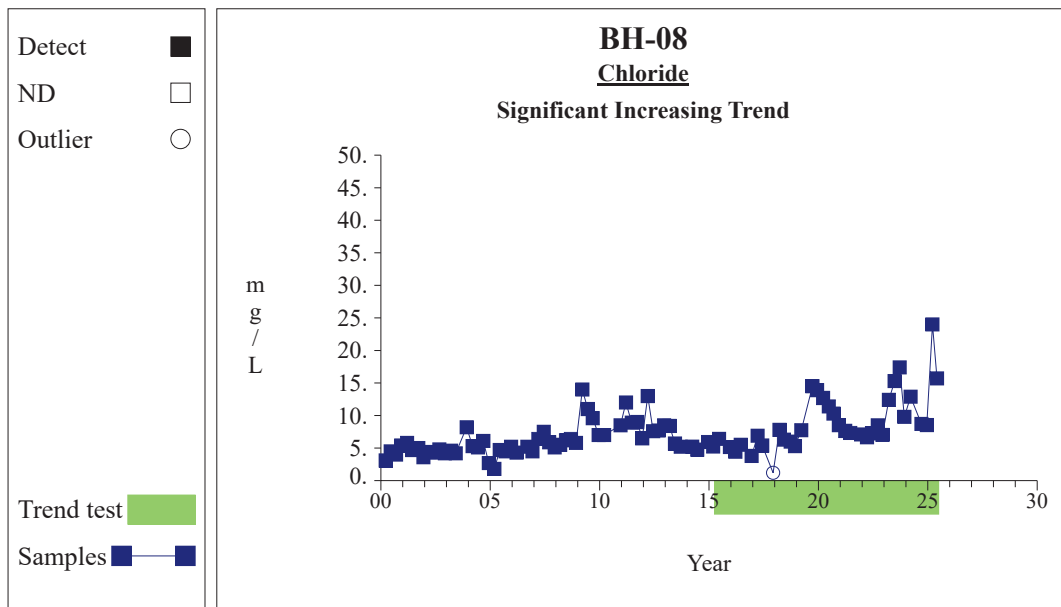
Graph 209

Time Series



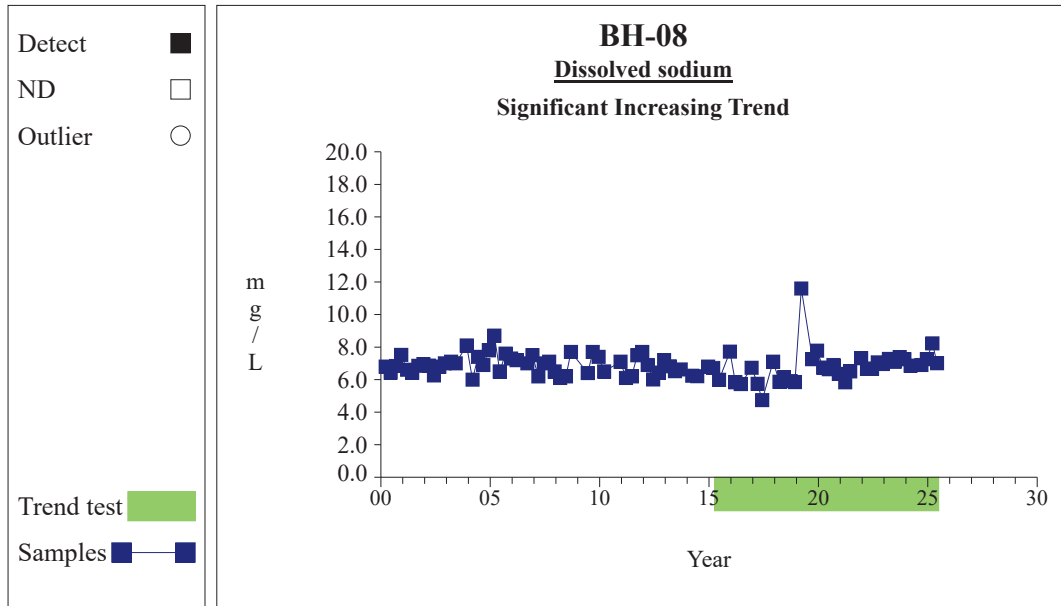
Graph 212

Time Series



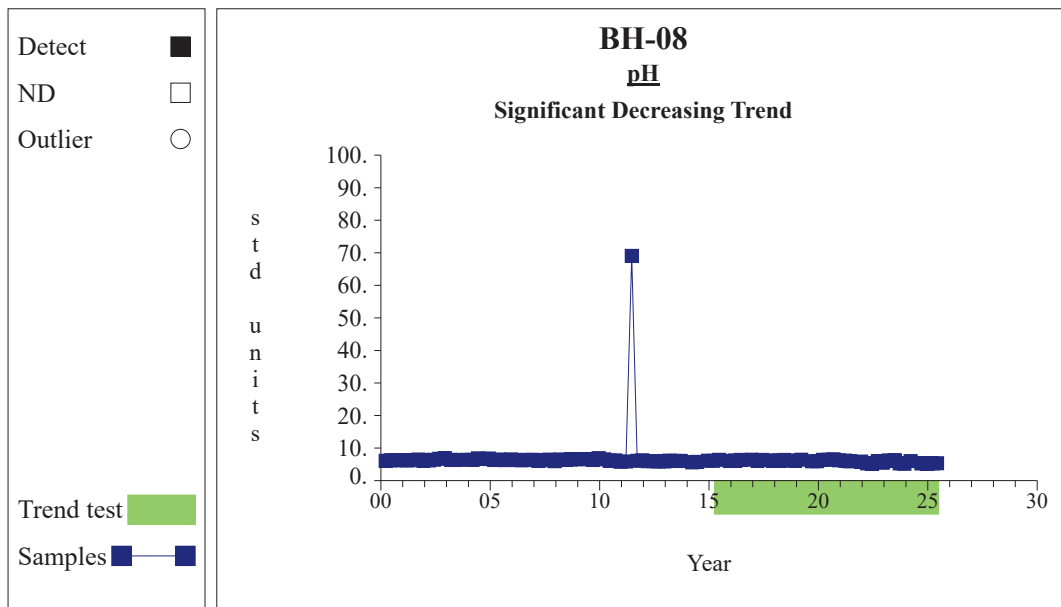
Graph 215

Time Series



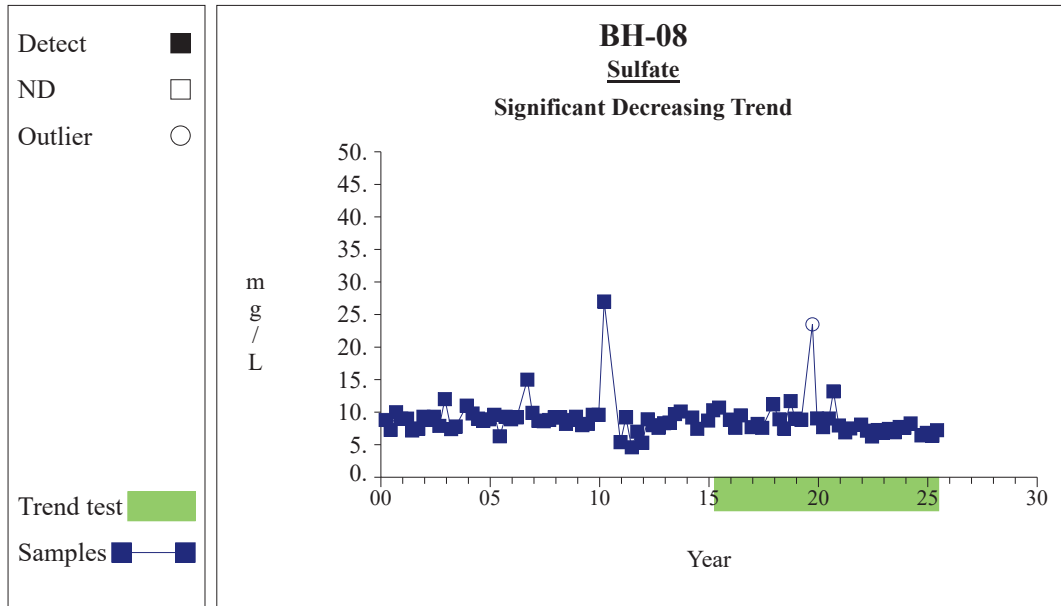
Graph 238

Time Series



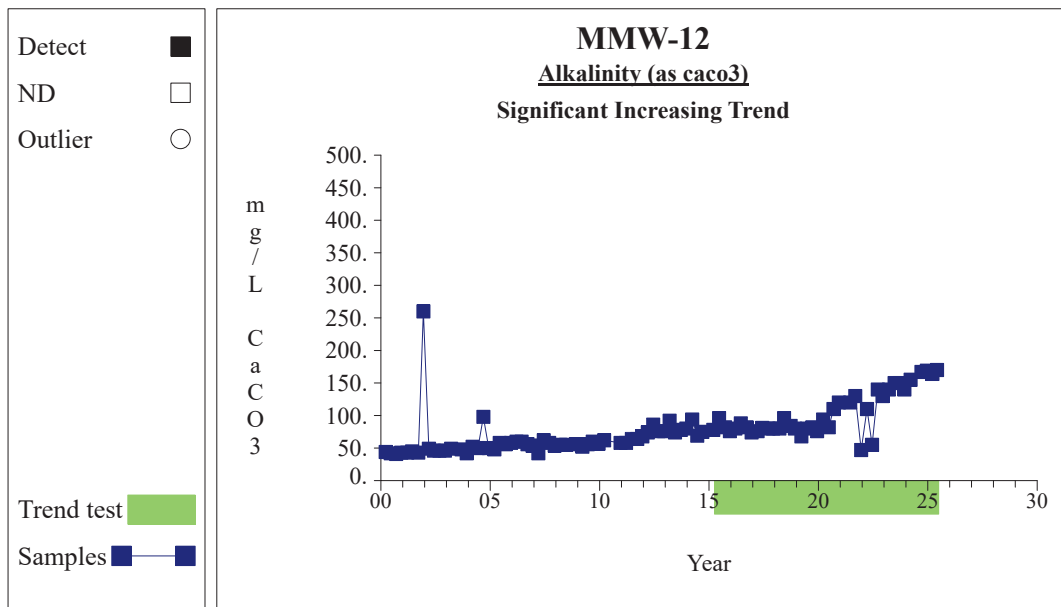
Graph 247

Time Series



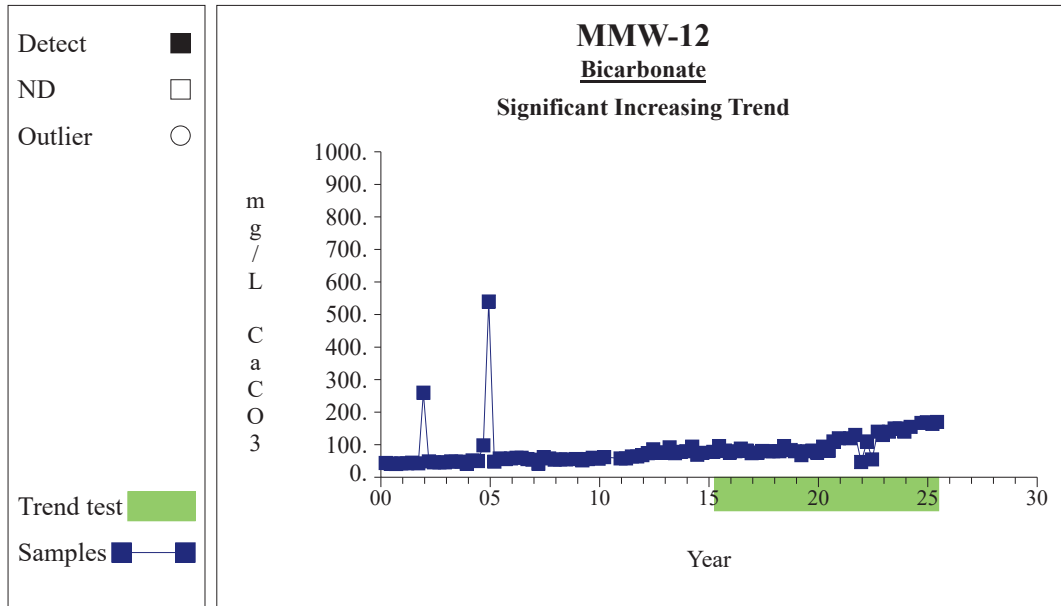
Graph 249

Time Series



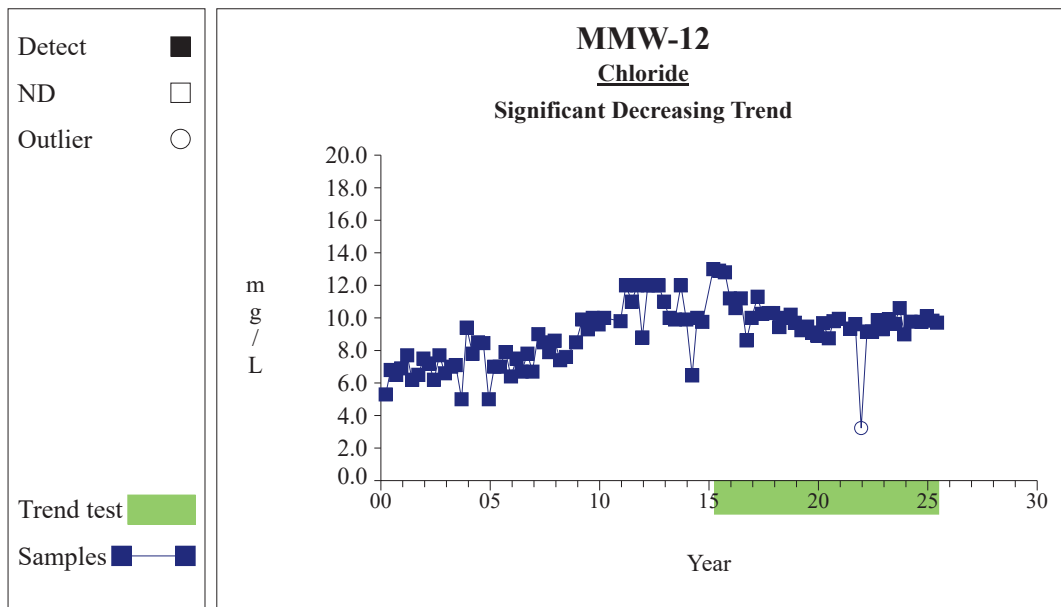
Graph 5

Time Series



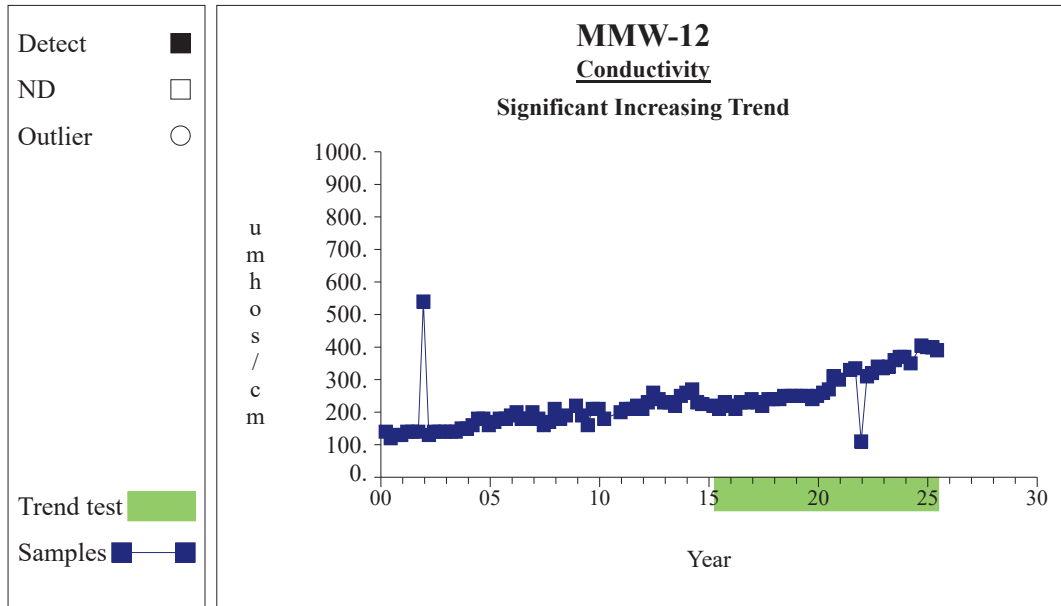
Graph 8

Time Series



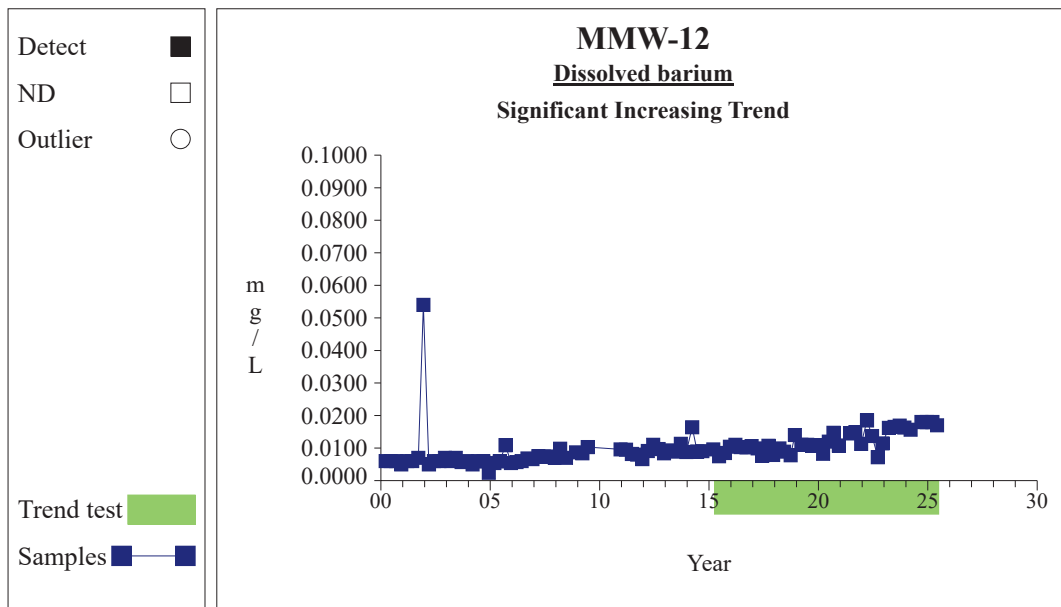
Graph 11

Time Series



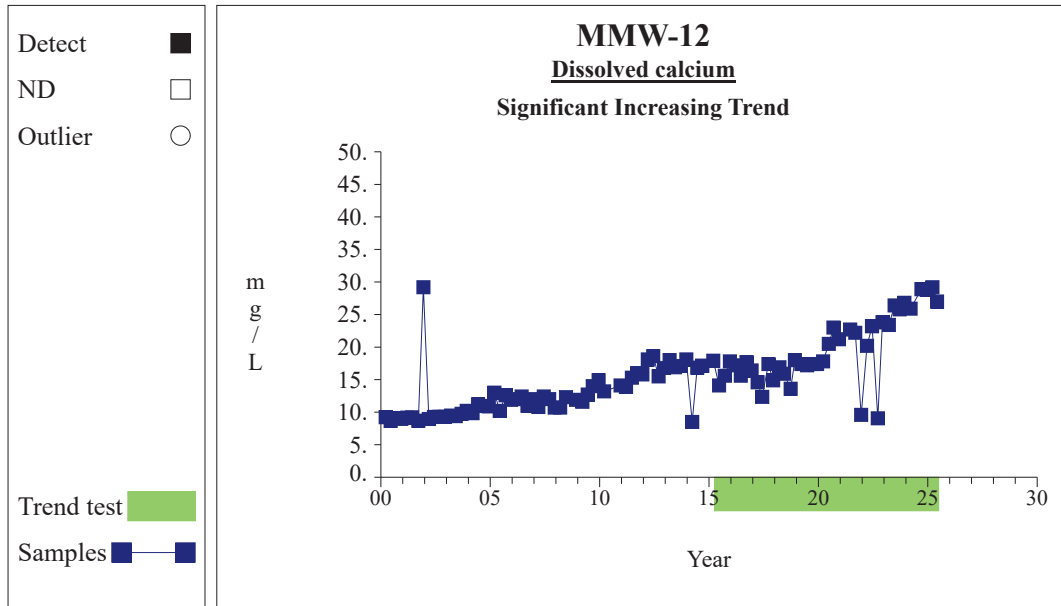
Graph 14

Time Series



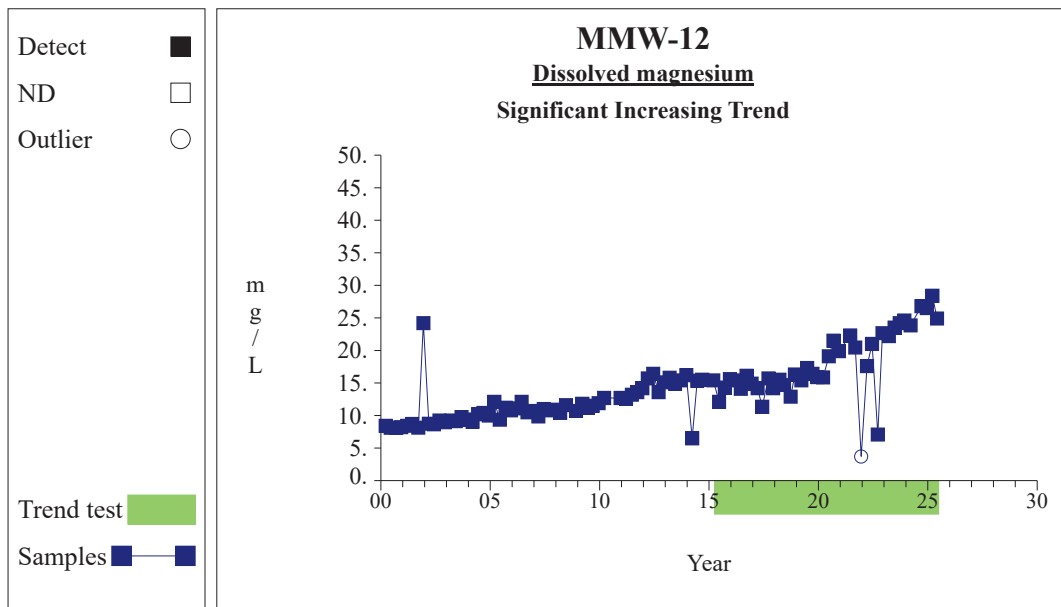
Graph 17

Time Series



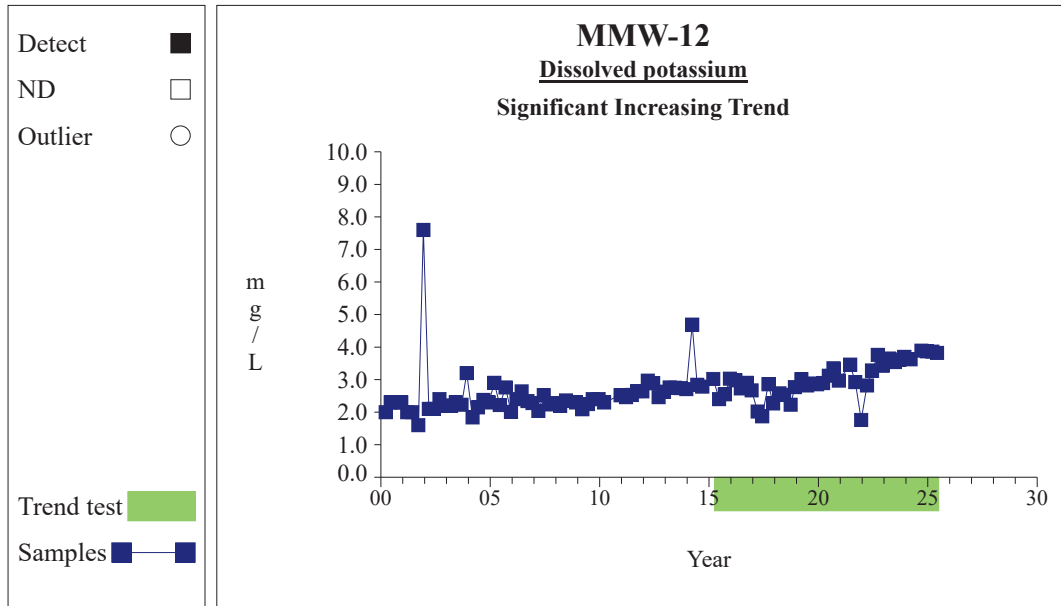
Graph 20

Time Series



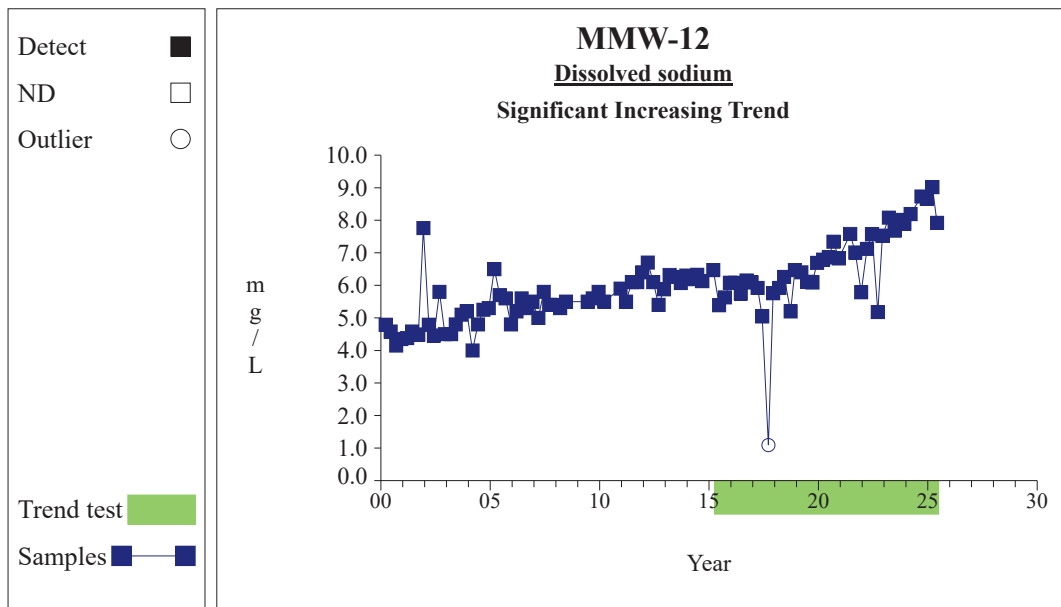
Graph 26

Time Series



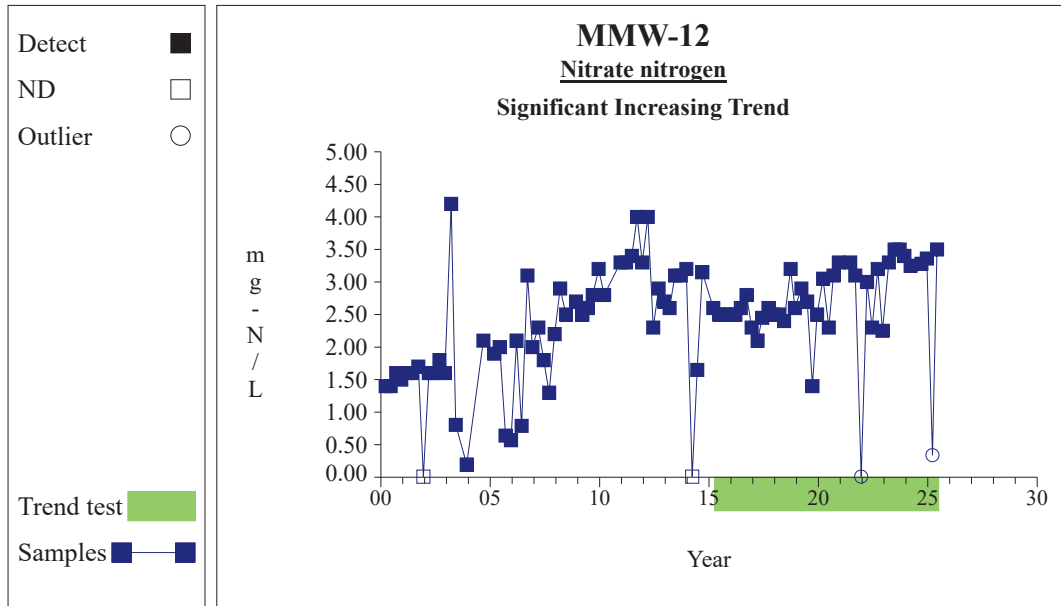
Graph 29

Time Series



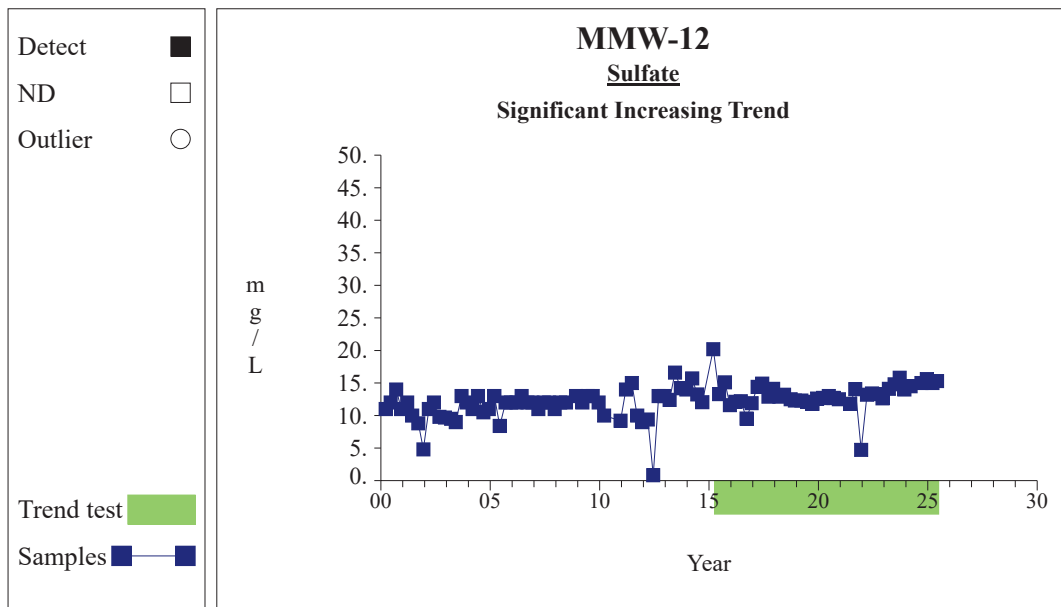
Graph 32

Time Series



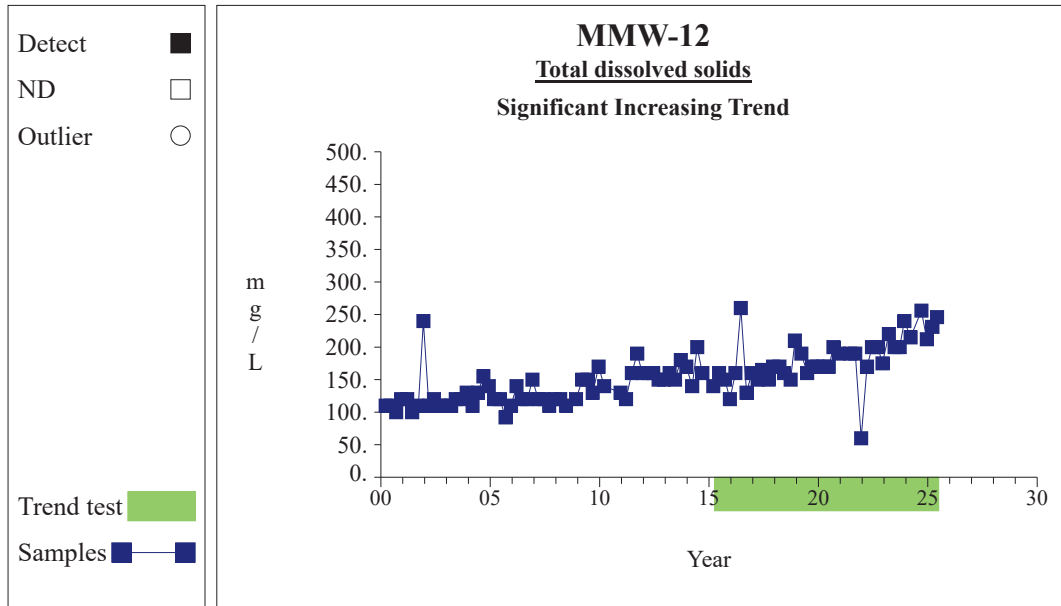
Graph 38

Time Series



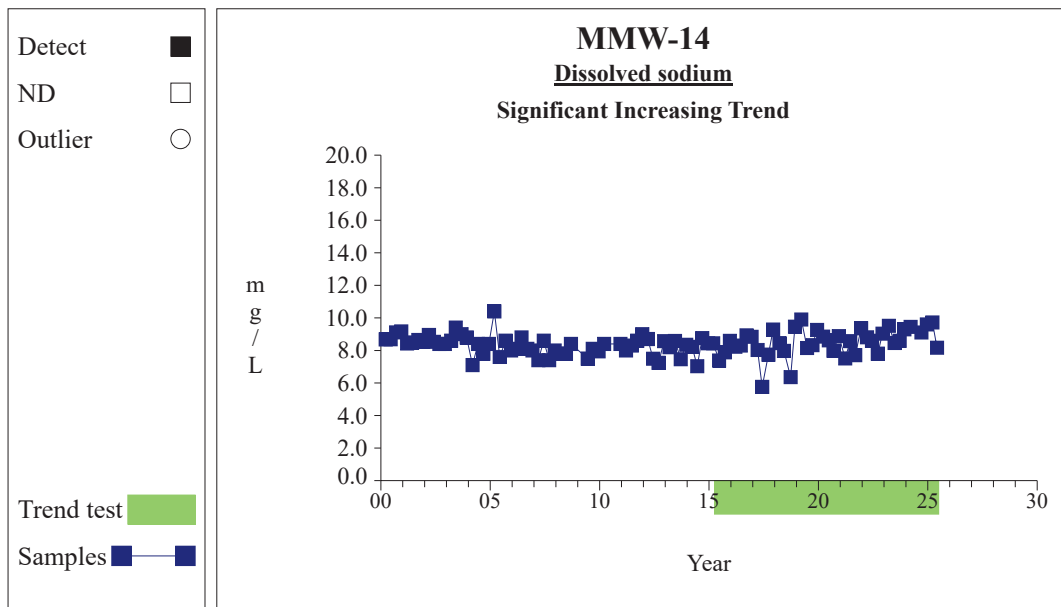
Graph 43

Time Series



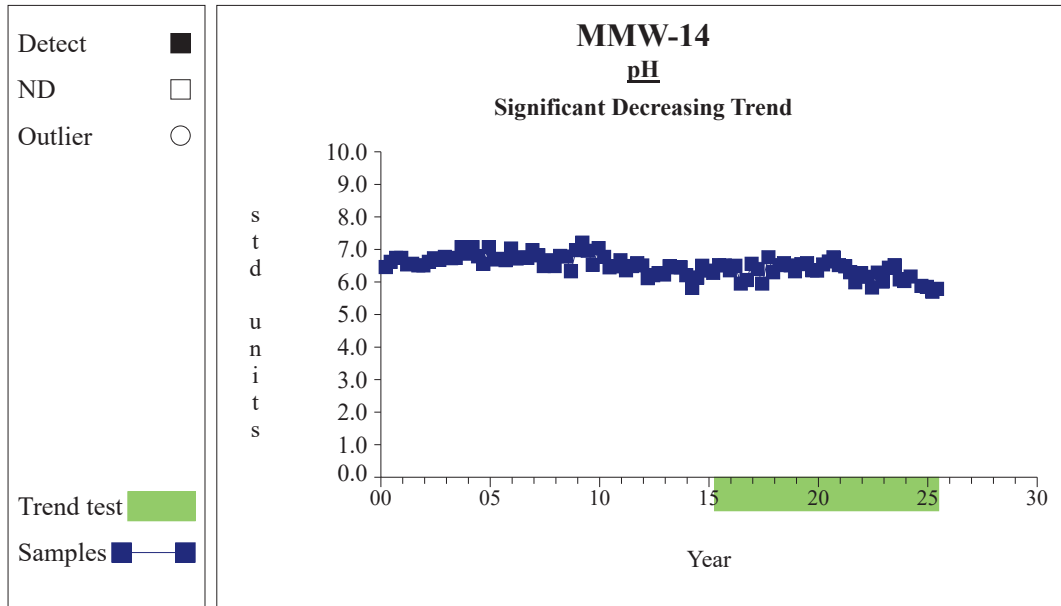
Graph 45

Time Series



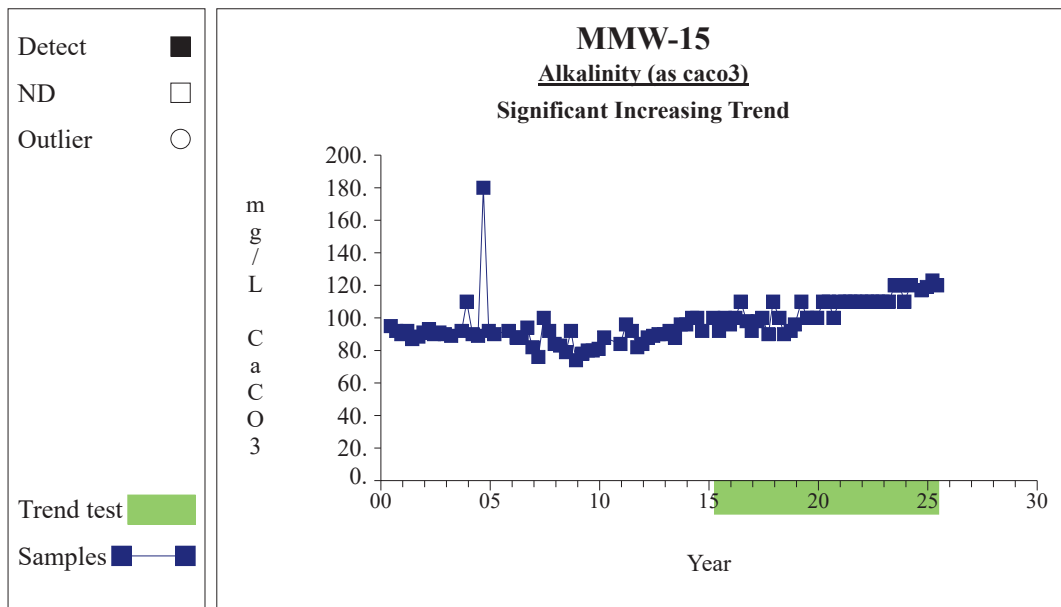
Graph 128

Time Series



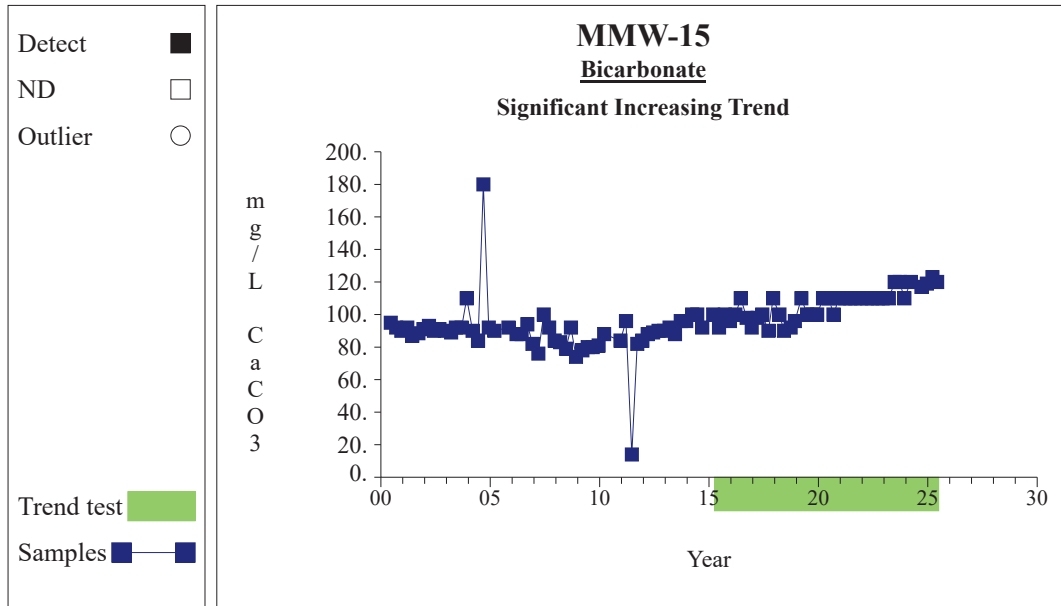
Graph 137

Time Series



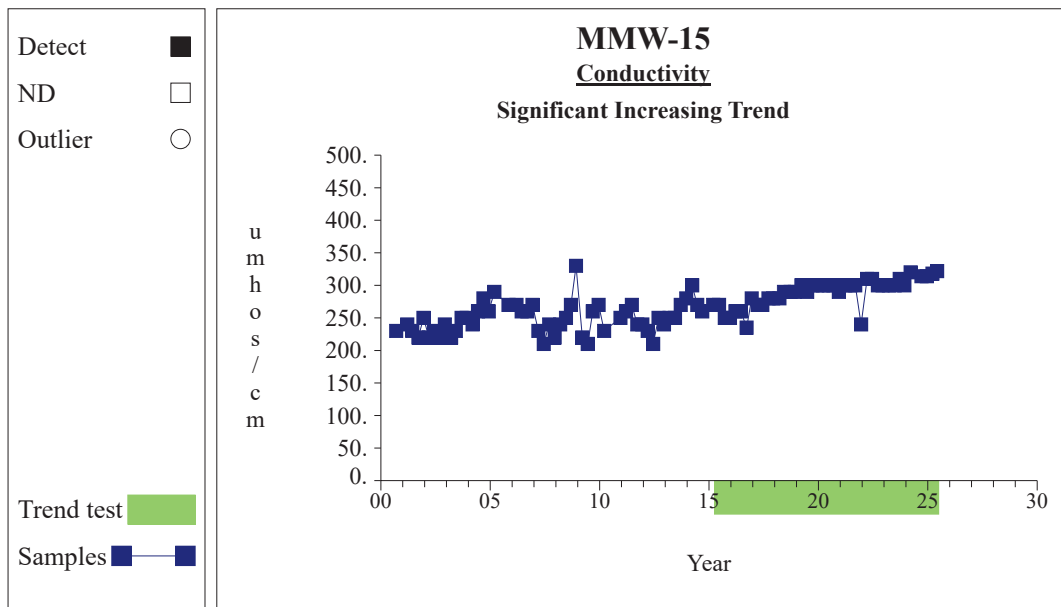
Graph 149

Time Series



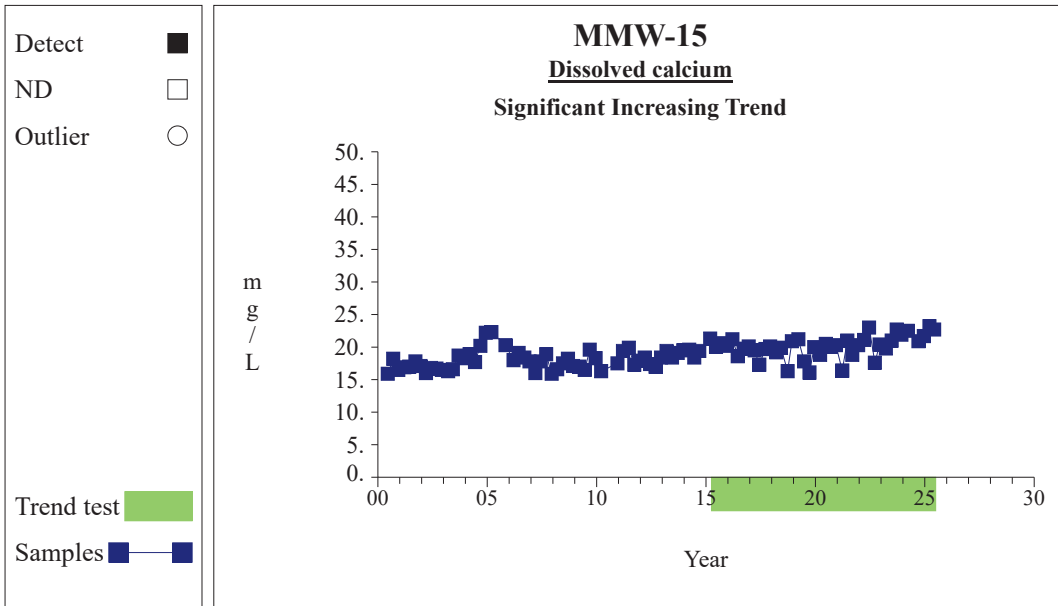
Graph 152

Time Series



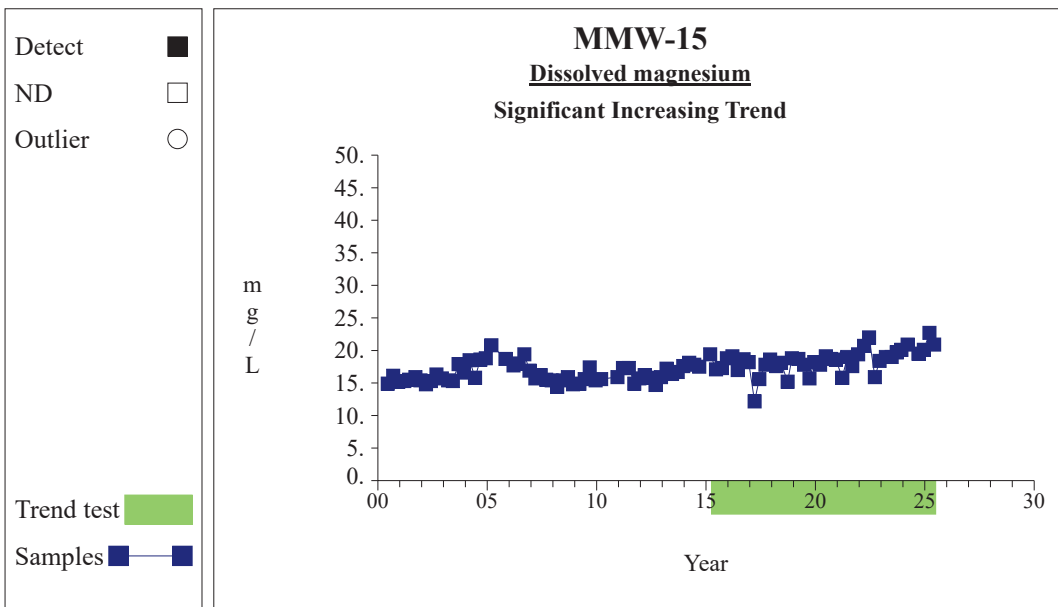
Graph 158

Time Series



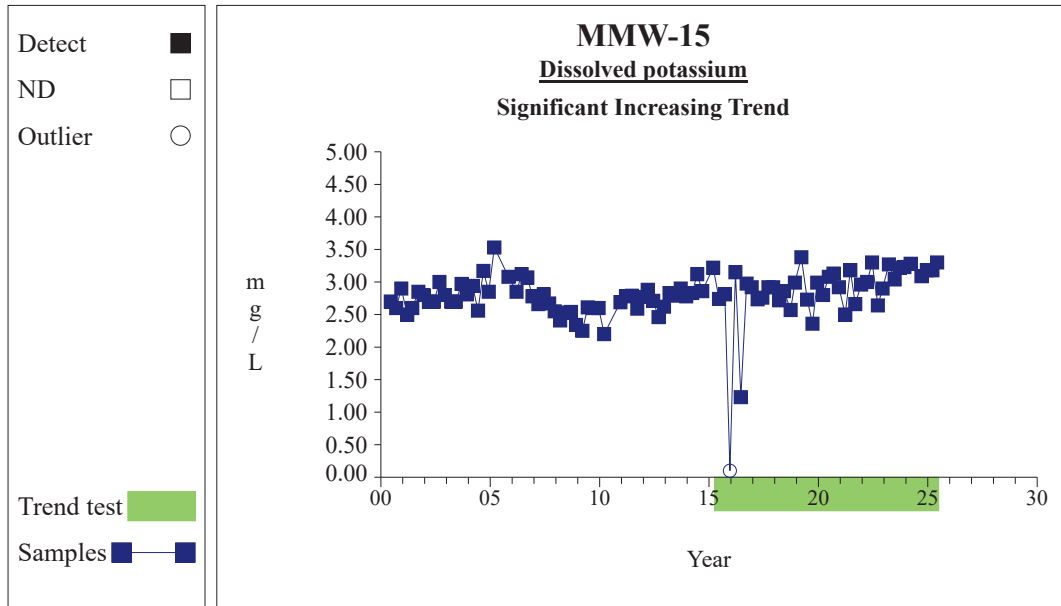
Graph 164

Time Series



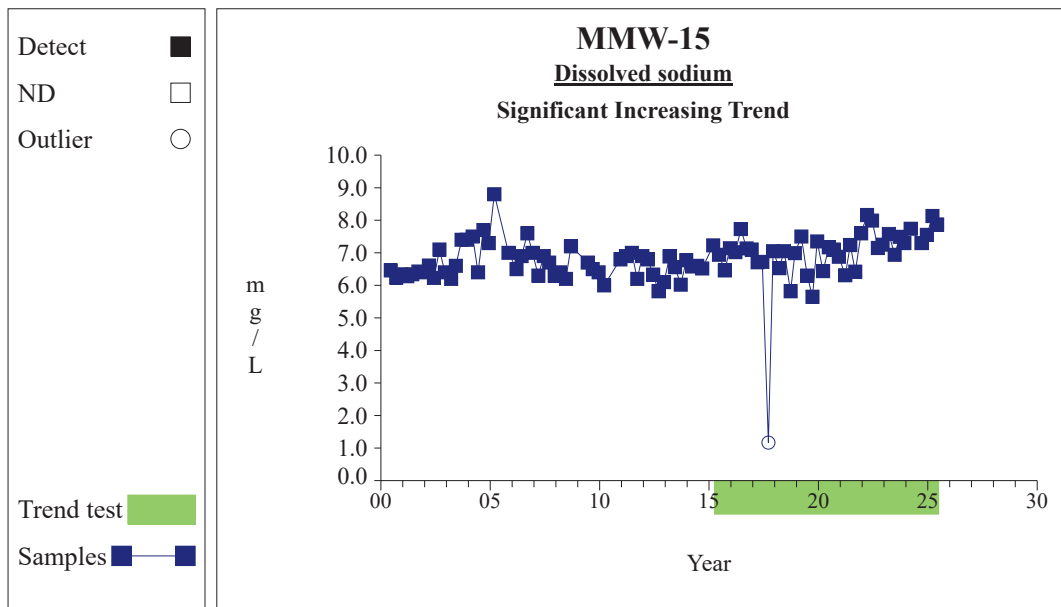
Graph 170

Time Series



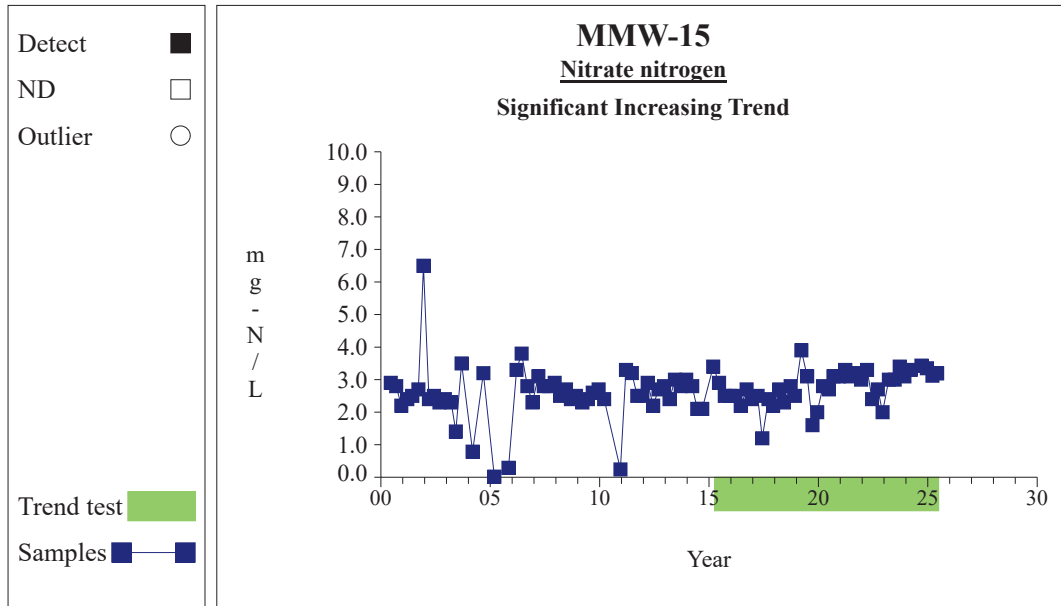
Graph 173

Time Series



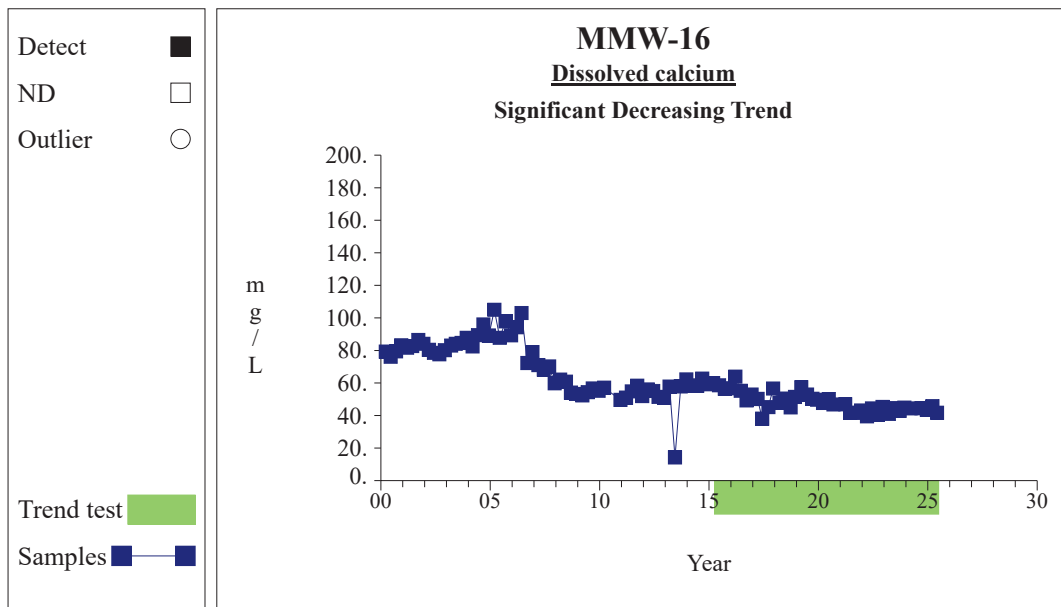
Graph 176

Time Series



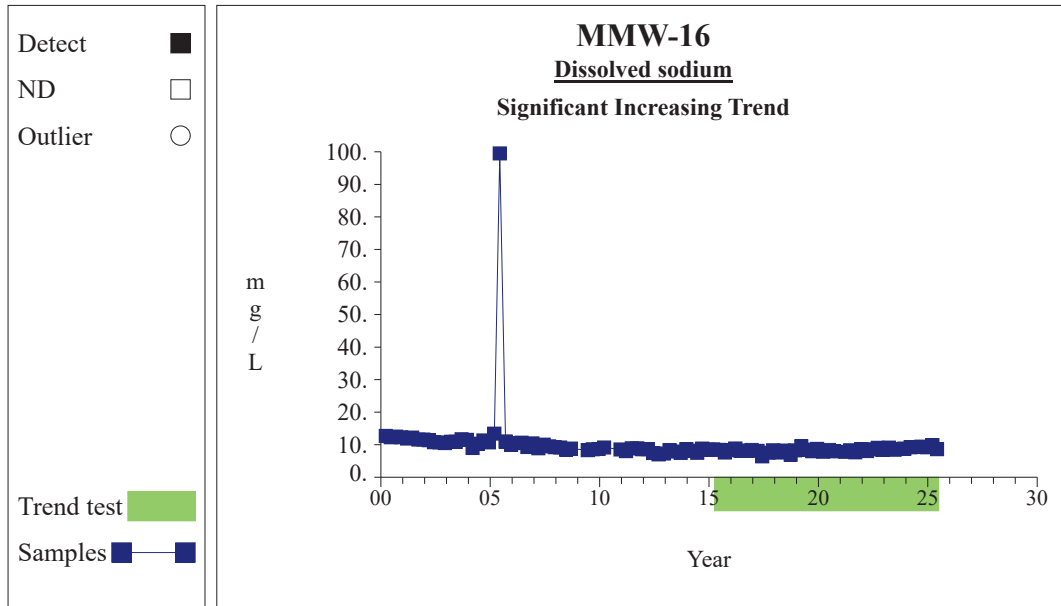
Graph 182

Time Series



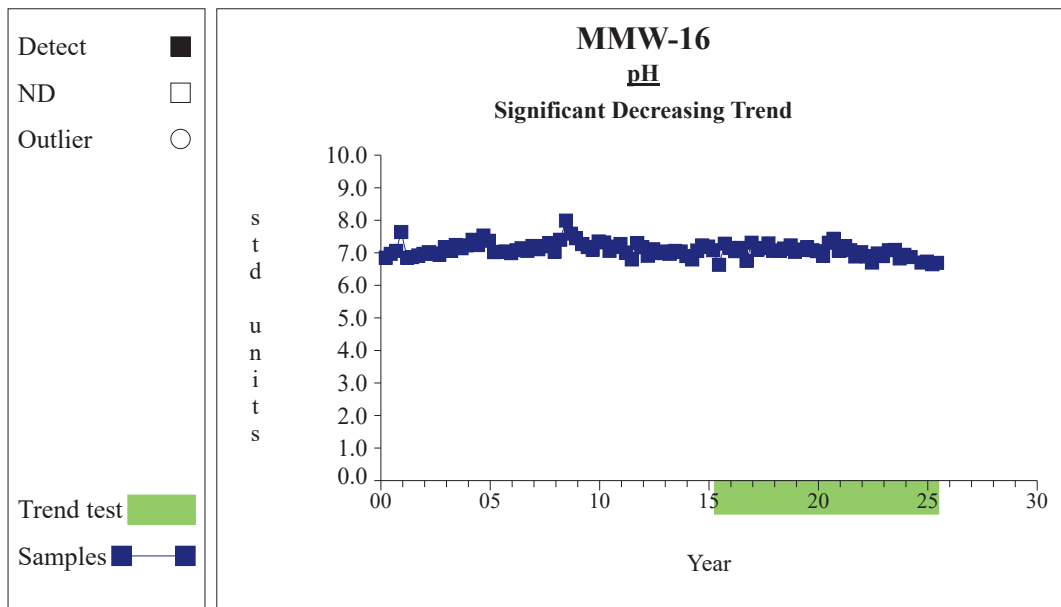
Graph 212

Time Series



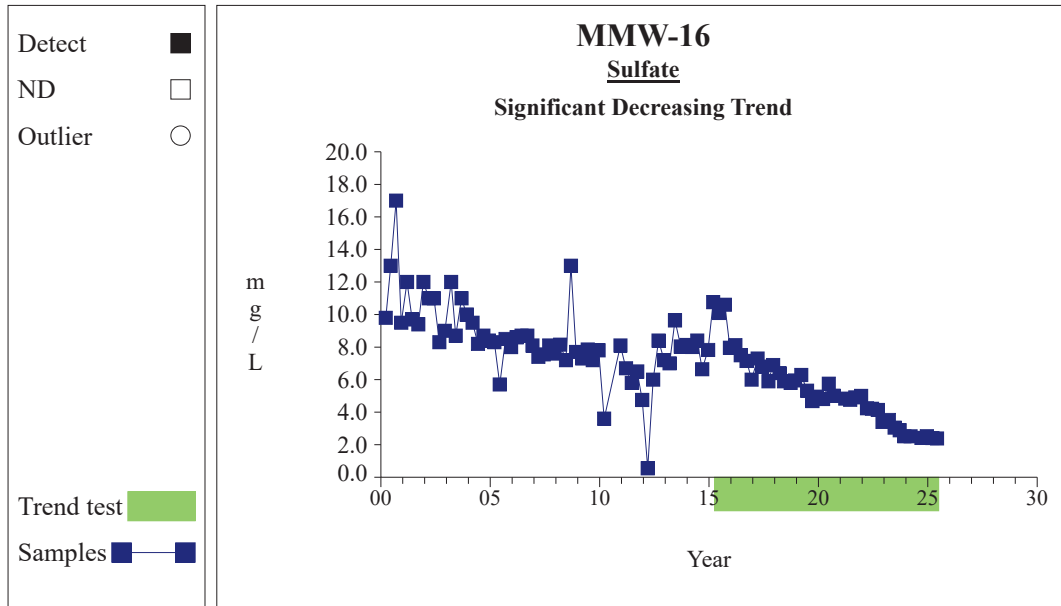
Graph 224

Time Series



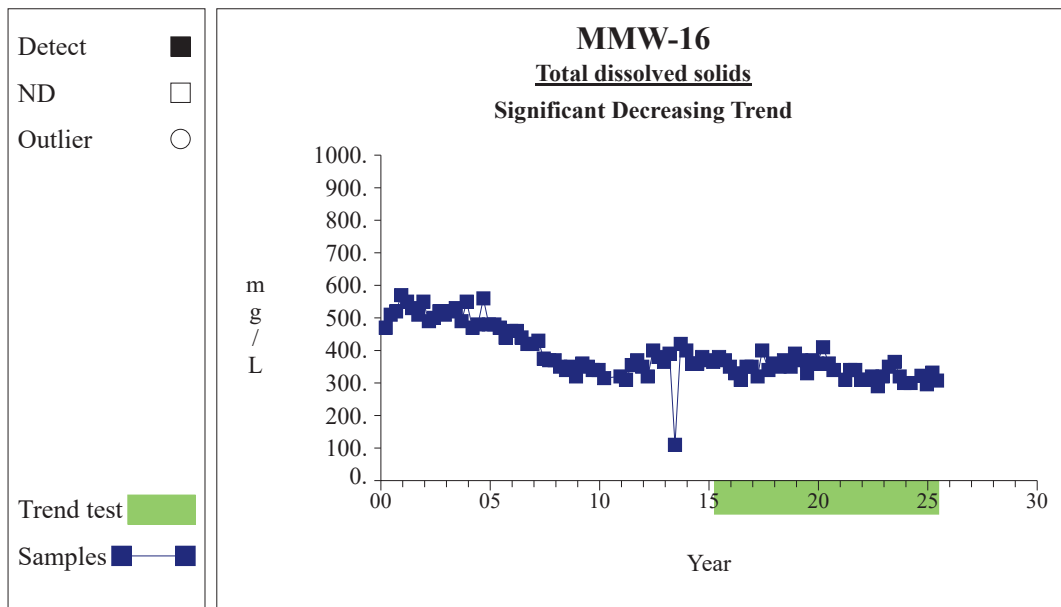
Graph 233

Time Series



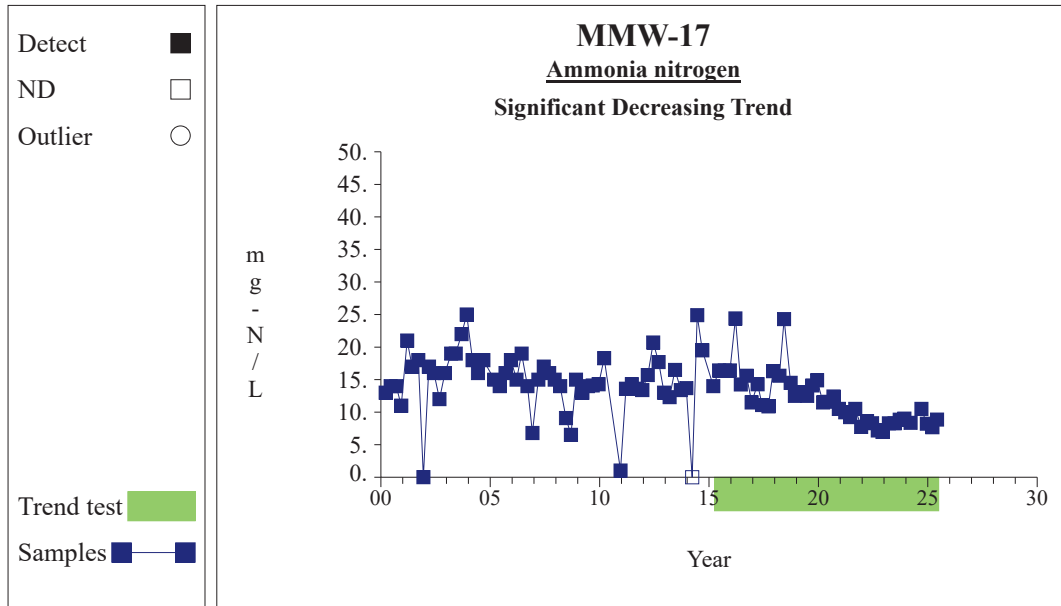
Graph 235

Time Series



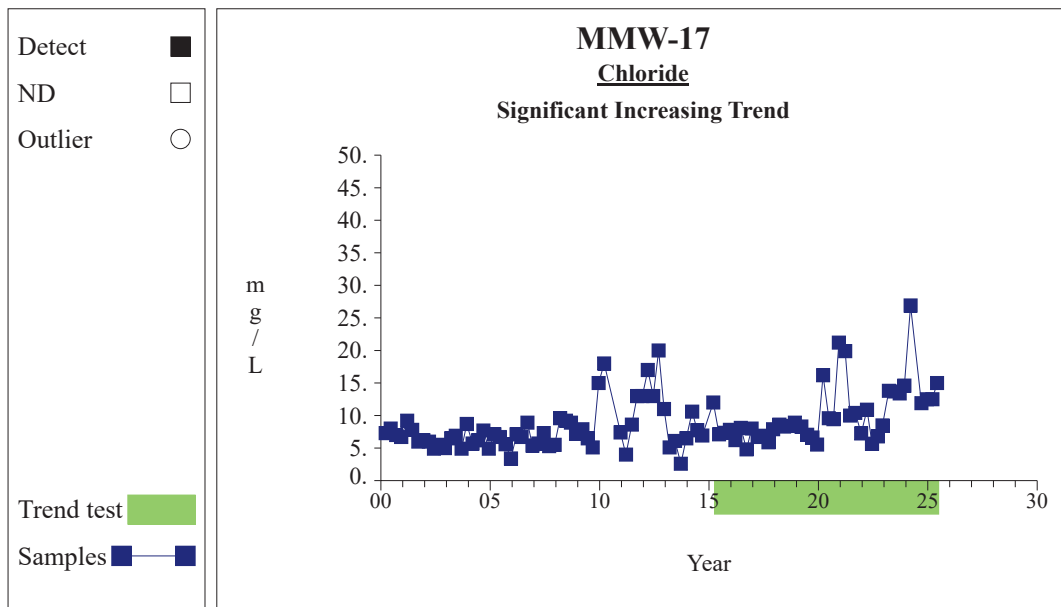
Graph 237

Time Series



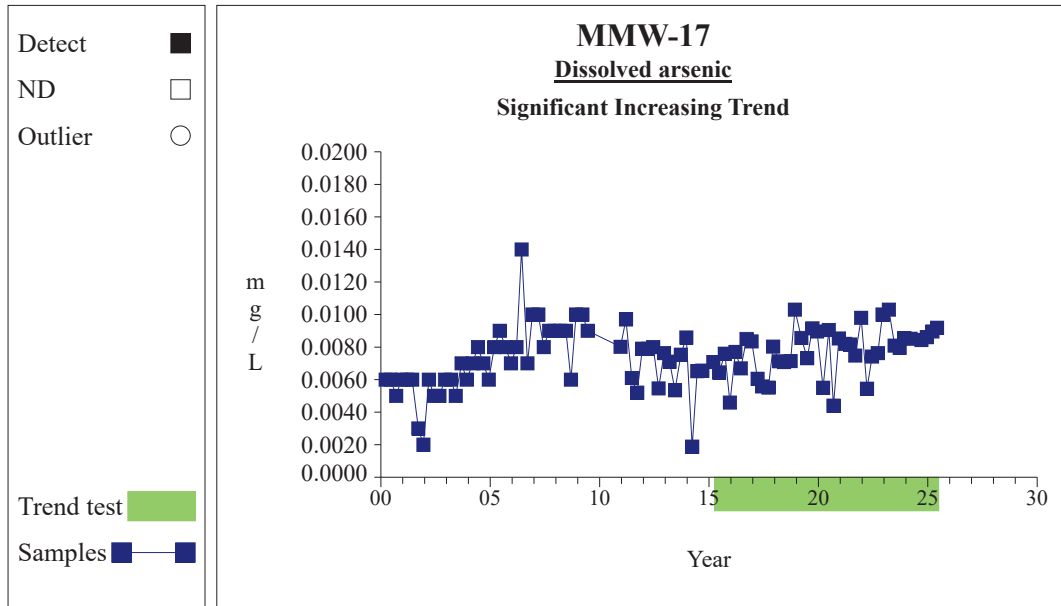
Graph 246

Time Series



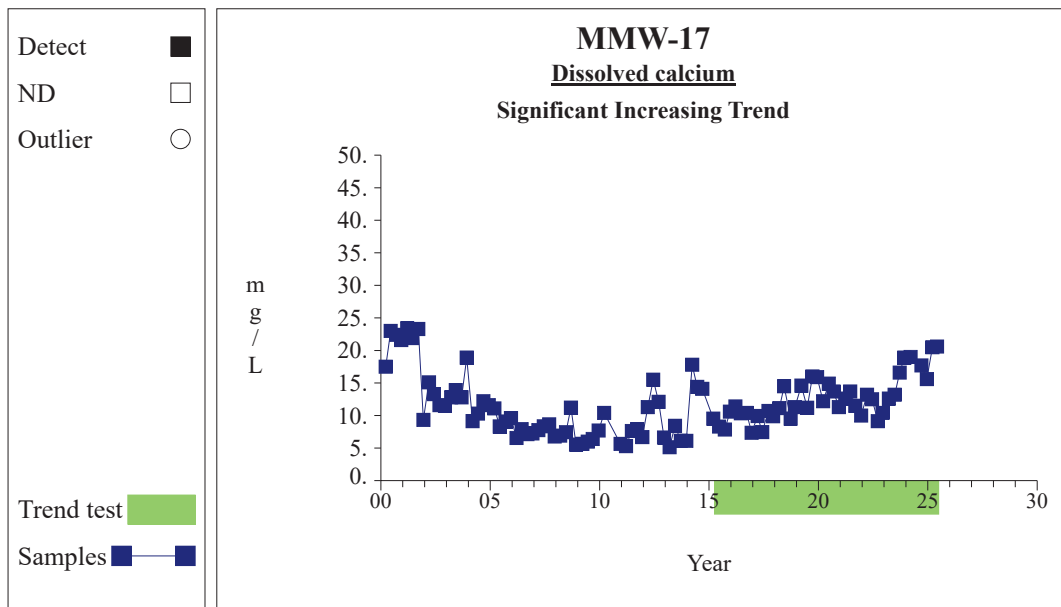
Graph 251

Time Series



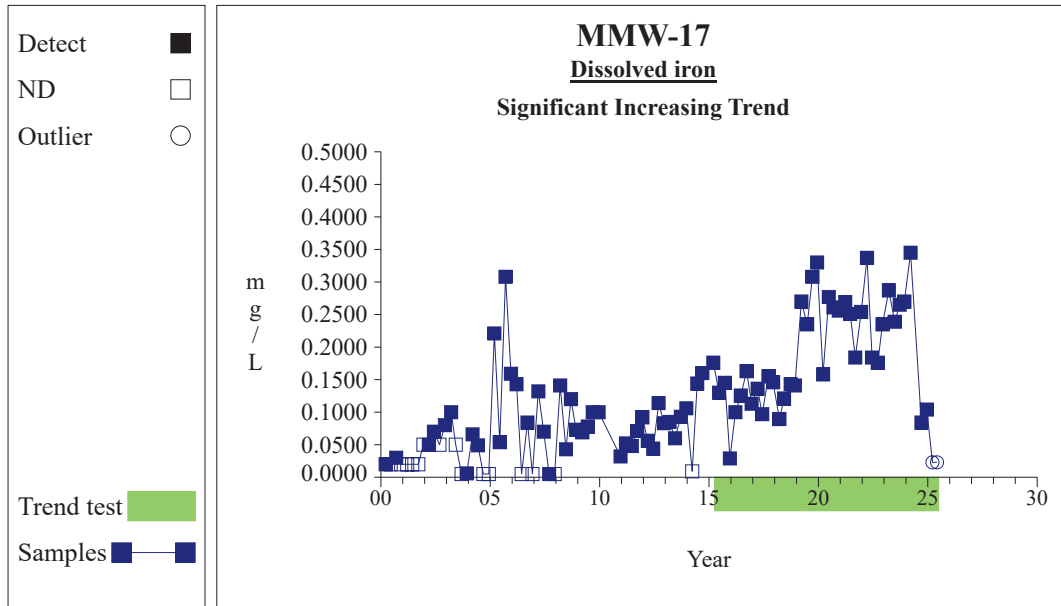
Graph 256

Time Series



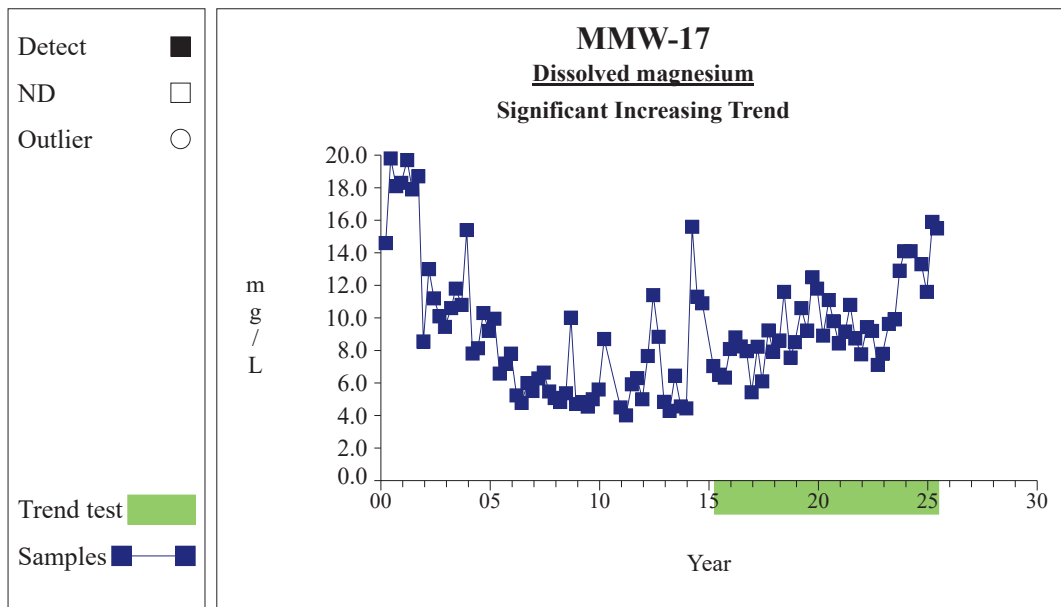
Graph 260

Time Series



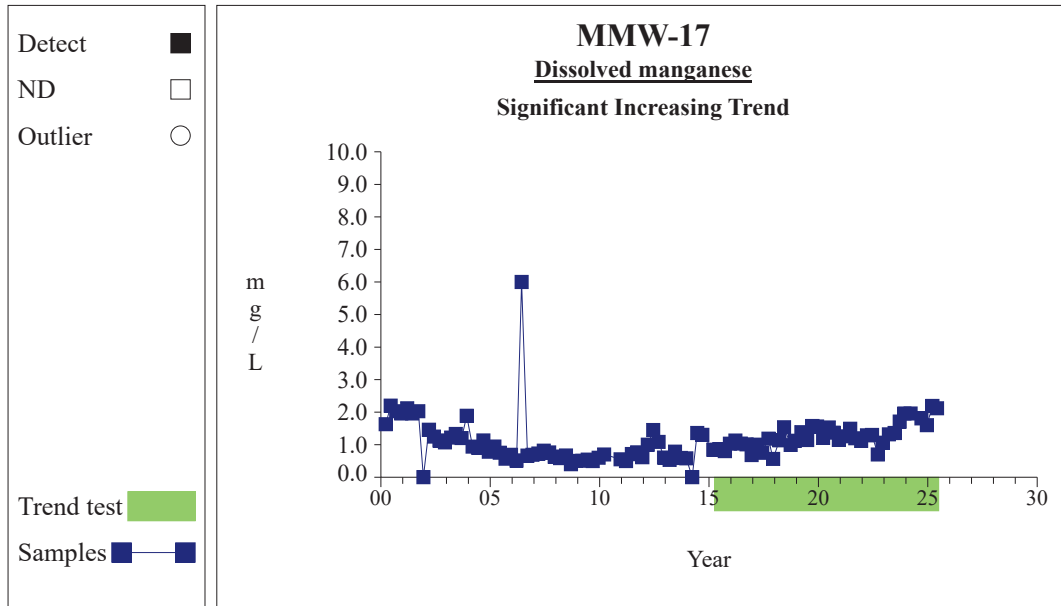
Graph 264

Time Series



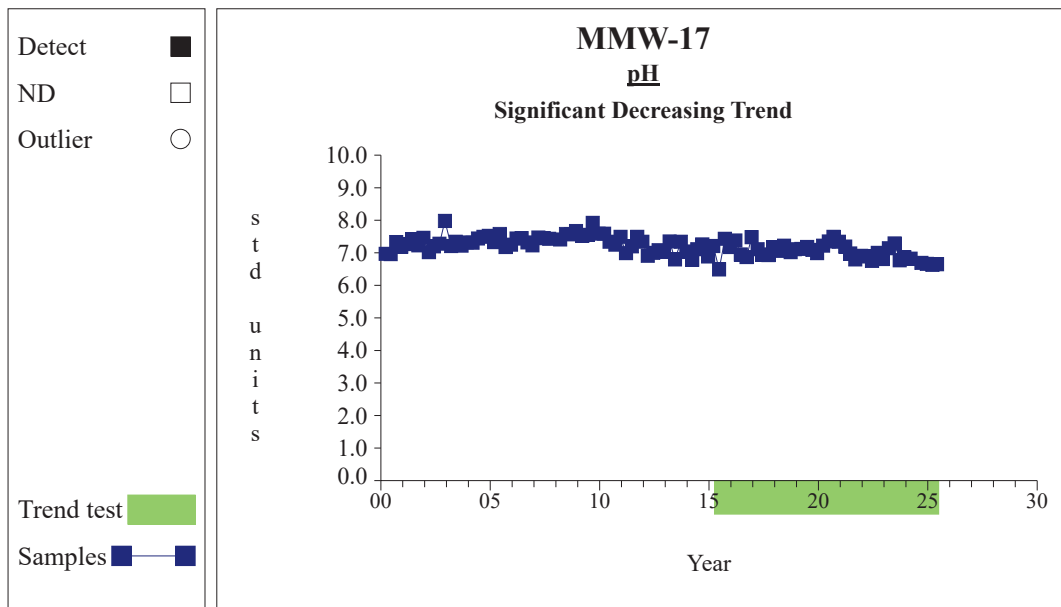
Graph 266

Time Series



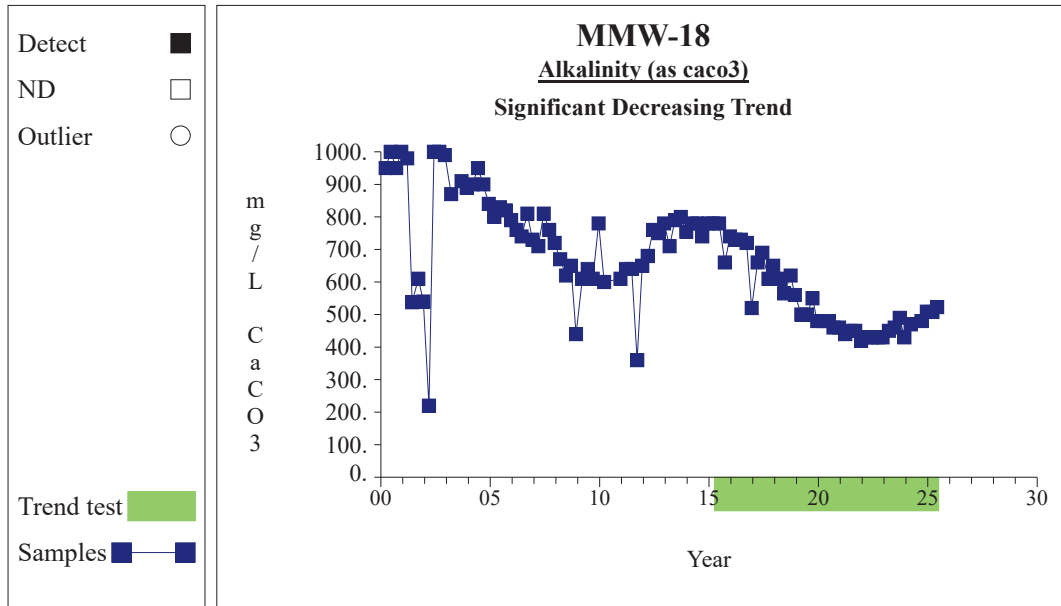
Graph 267

Time Series



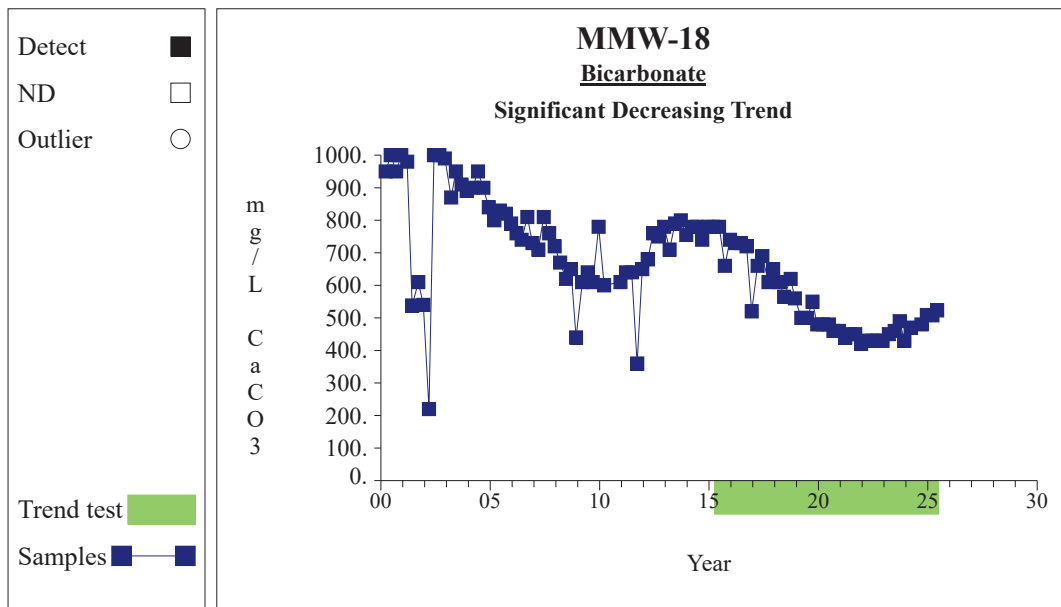
Graph 281

Time Series



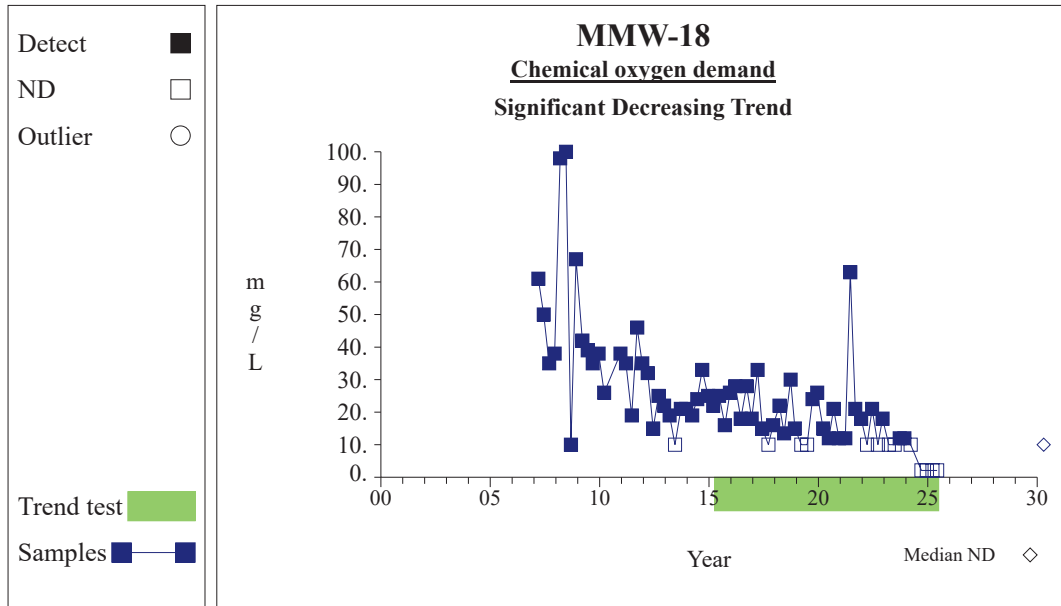
Graph 293

Time Series



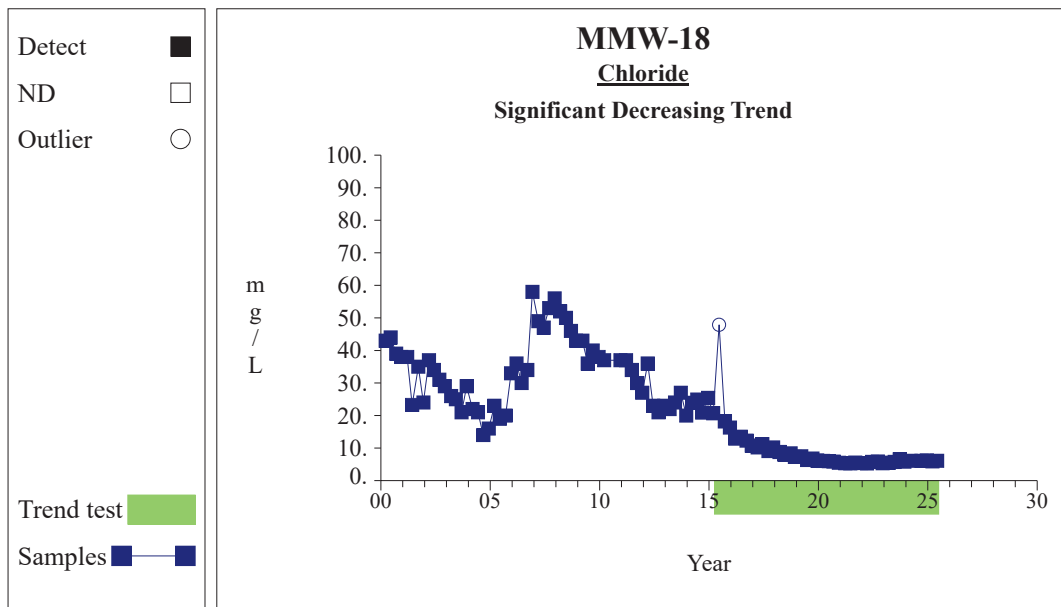
Graph 296

Time Series



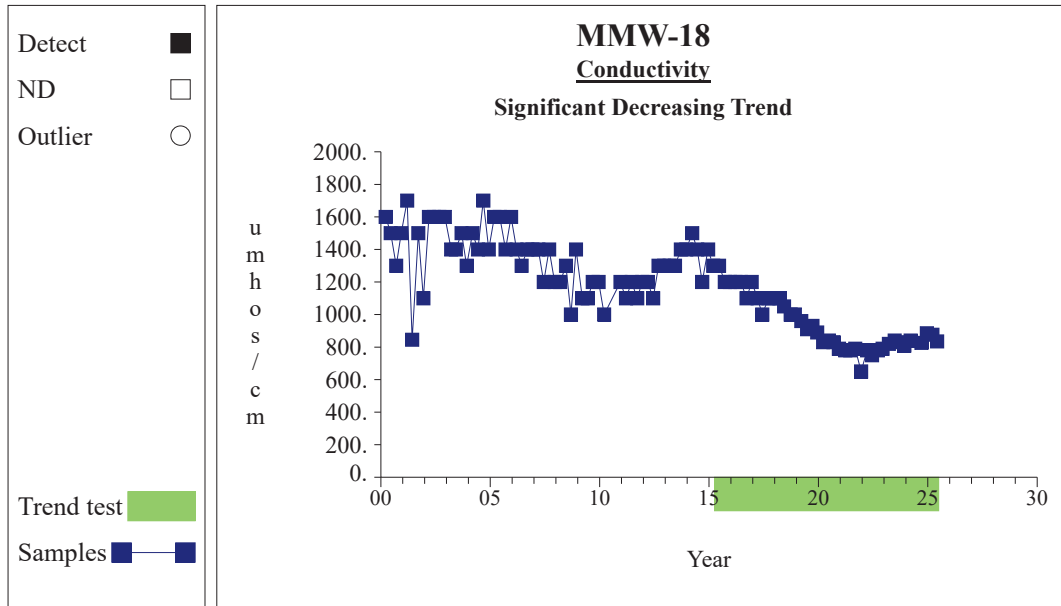
Graph 298

Time Series



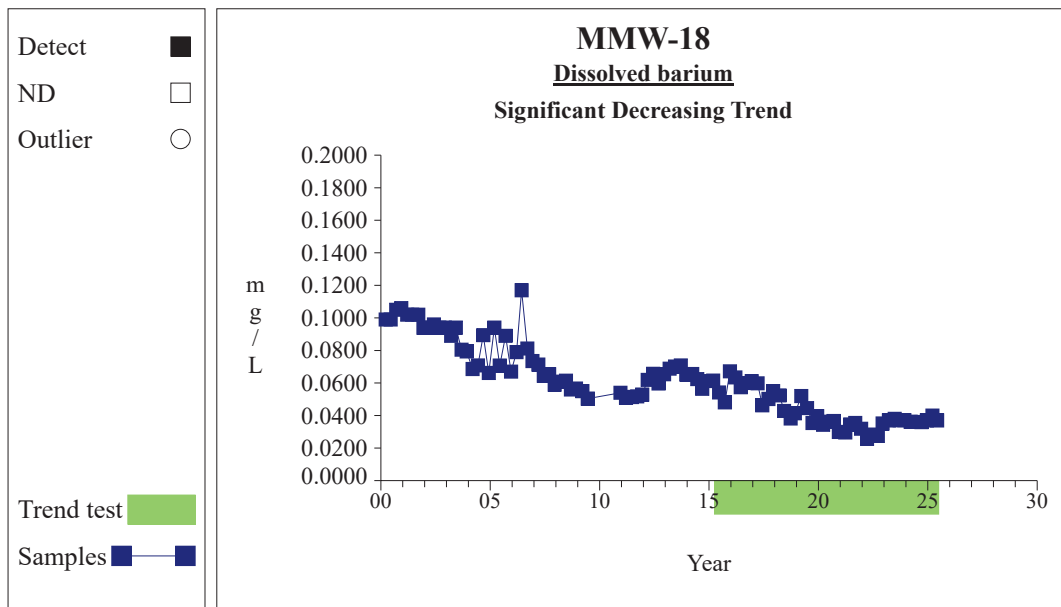
Graph 299

Time Series



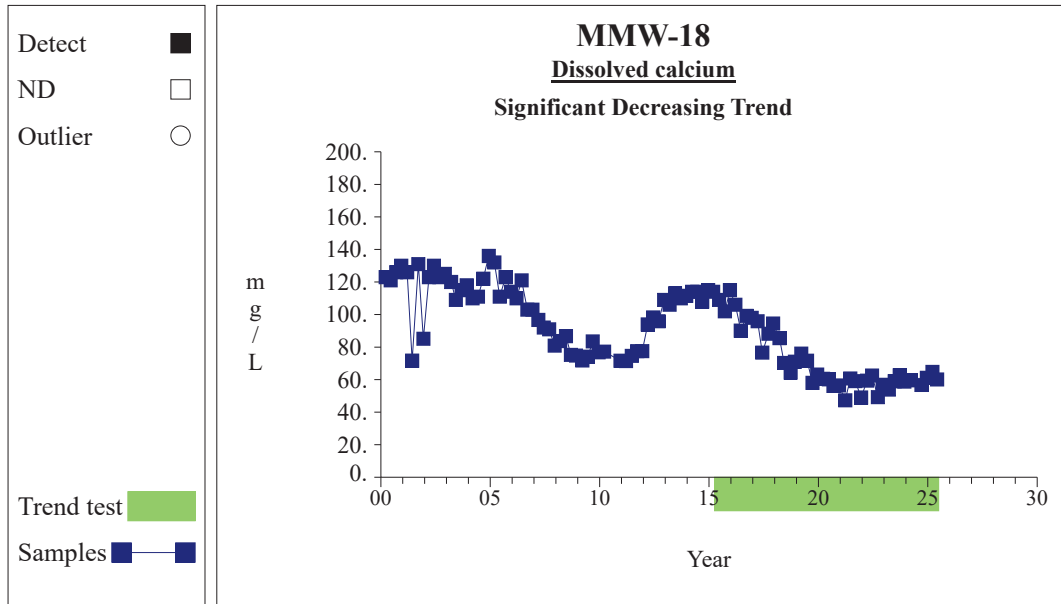
Graph 302

Time Series



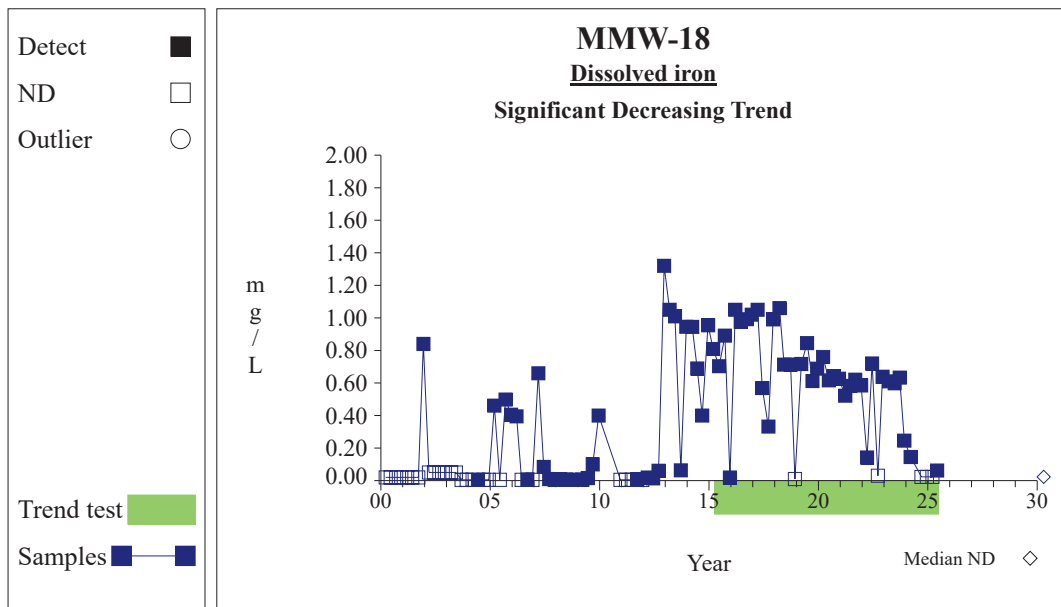
Graph 305

Time Series



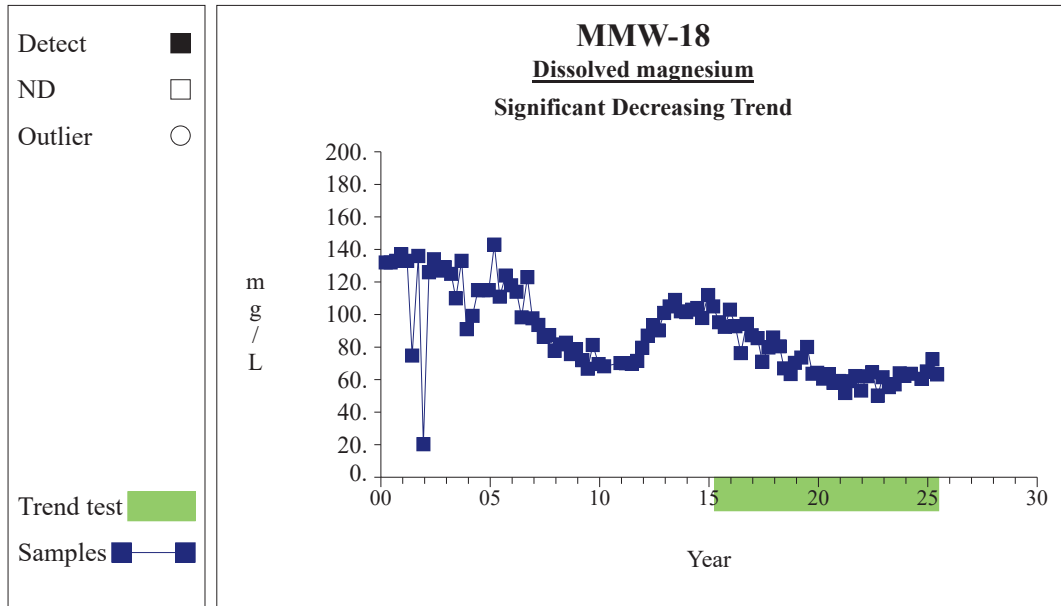
Graph 308

Time Series



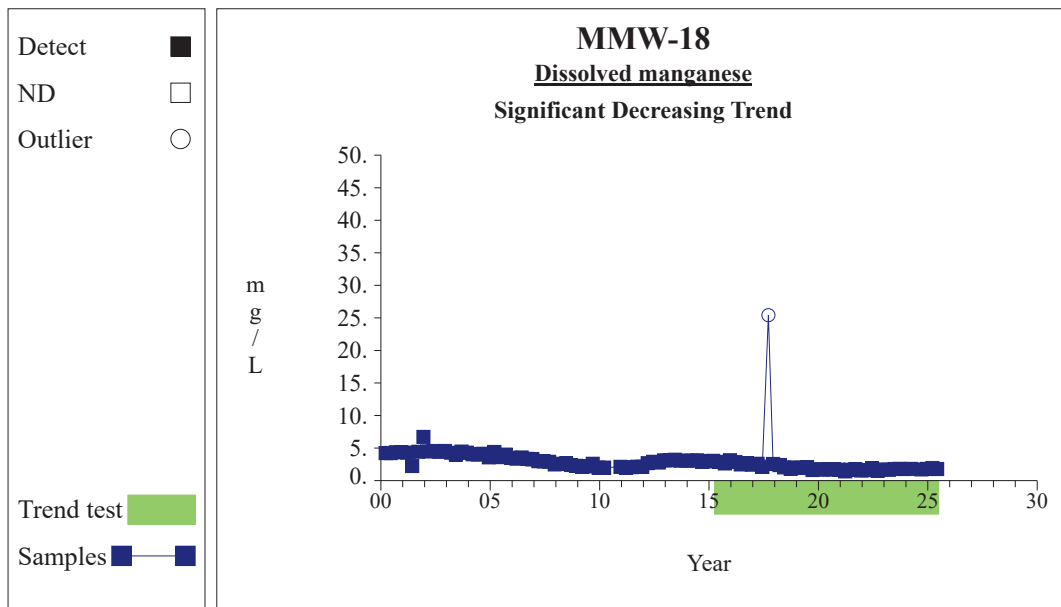
Graph 312

Time Series



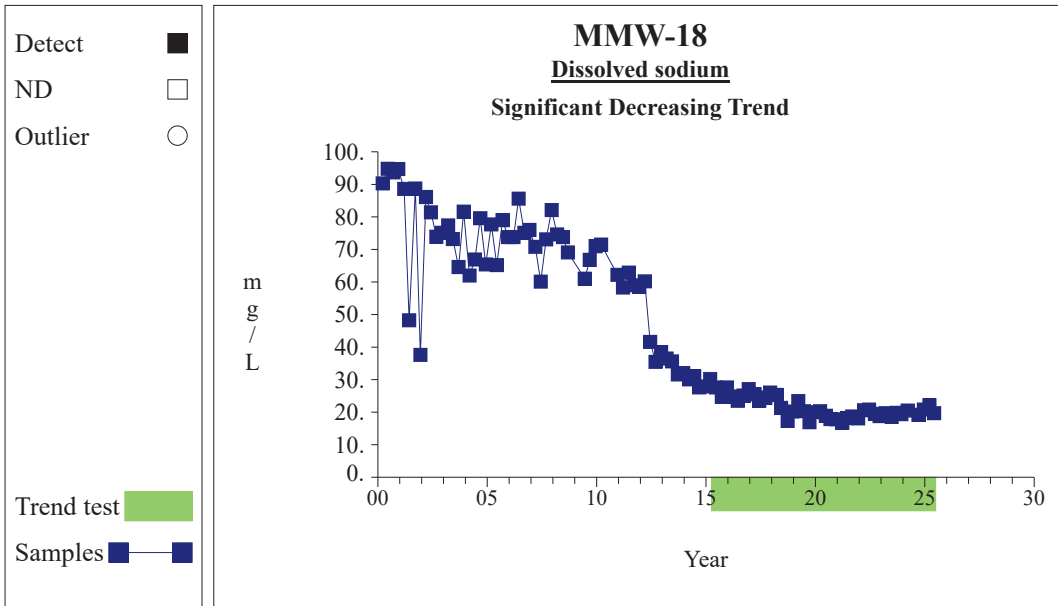
Graph 314

Time Series



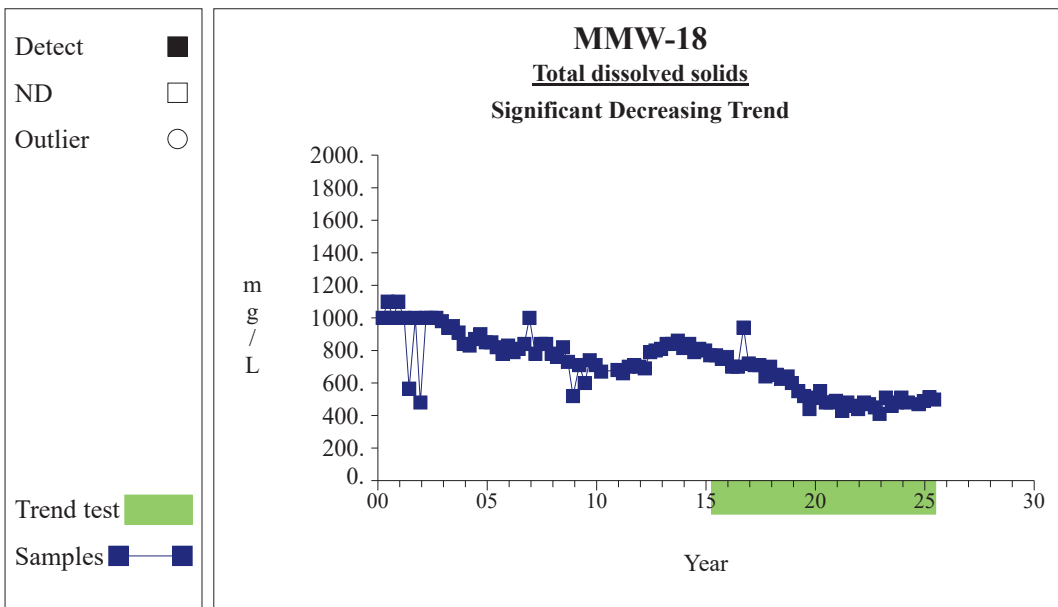
Graph 315

Time Series



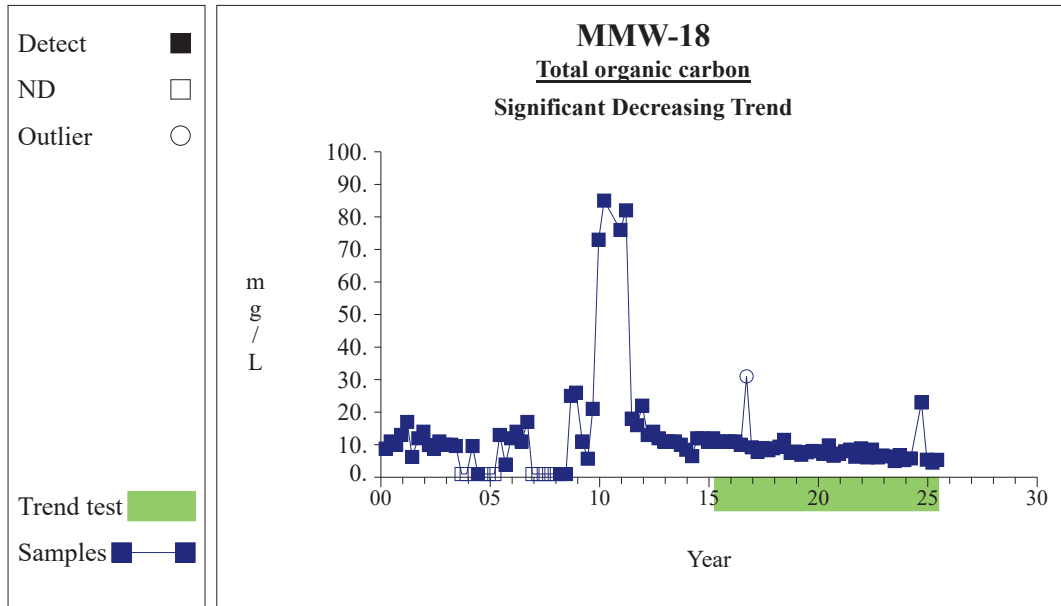
Graph 320

Time Series



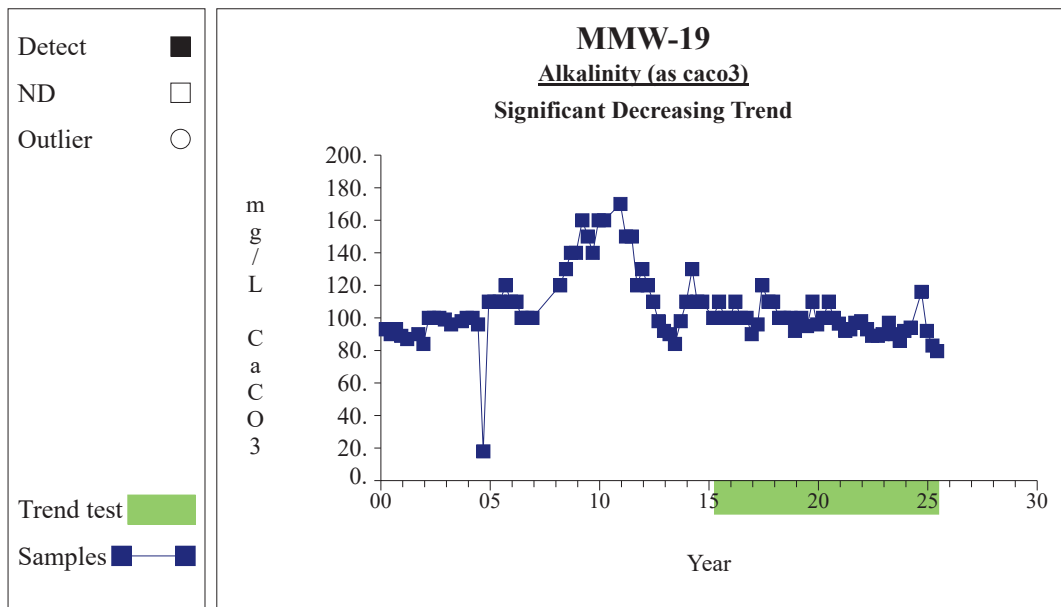
Graph 333

Time Series



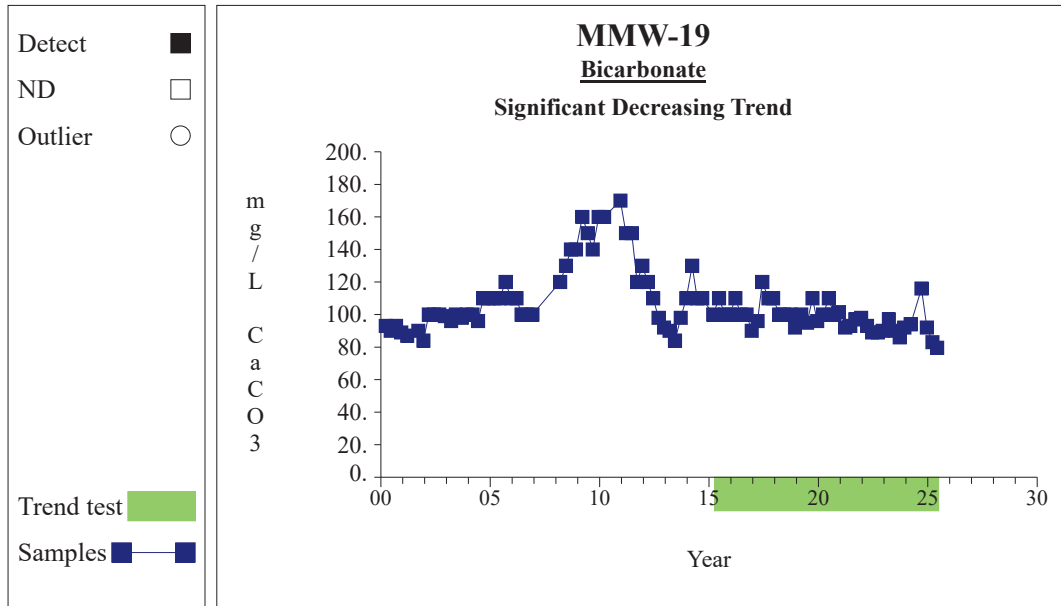
Graph 334

Time Series



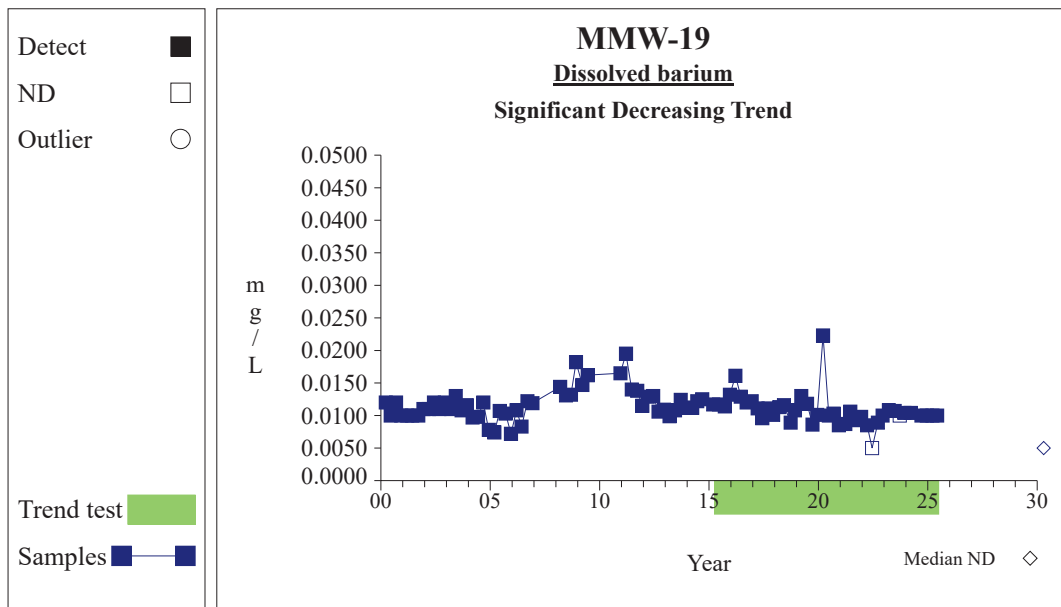
Graph 341

Time Series



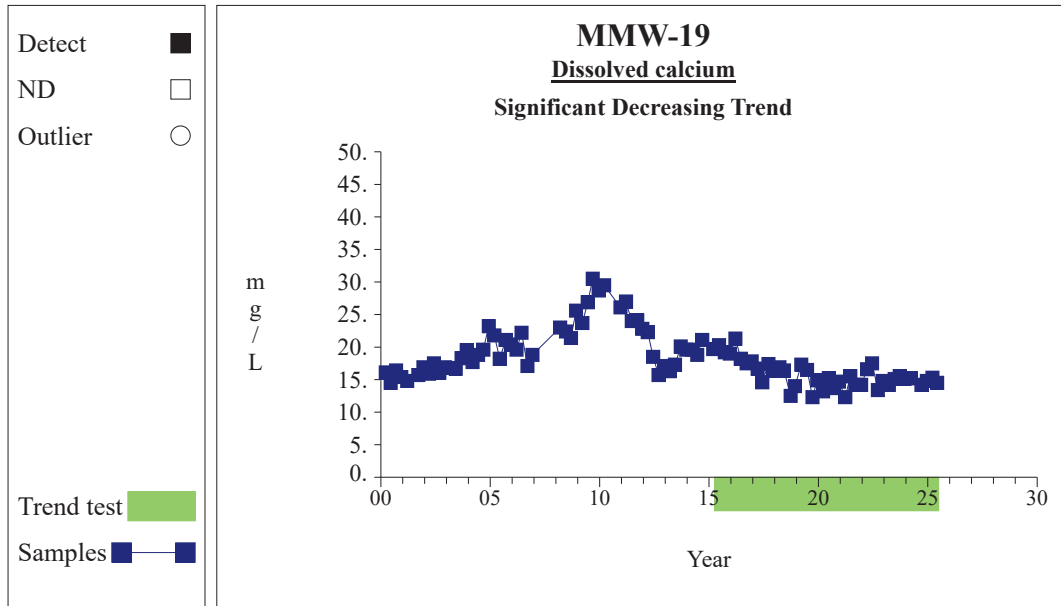
Graph 344

Time Series



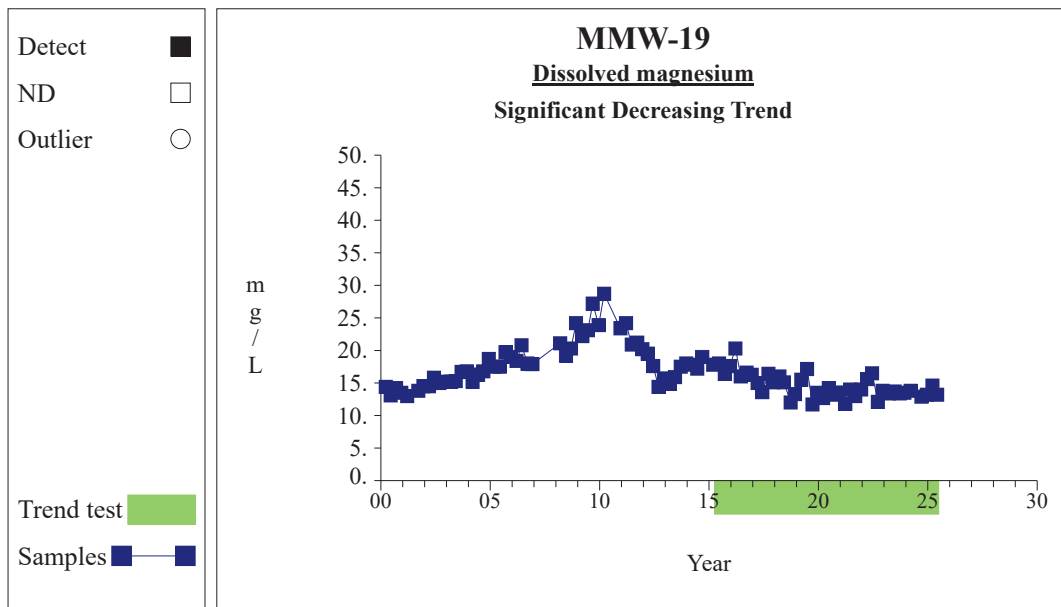
Graph 353

Time Series



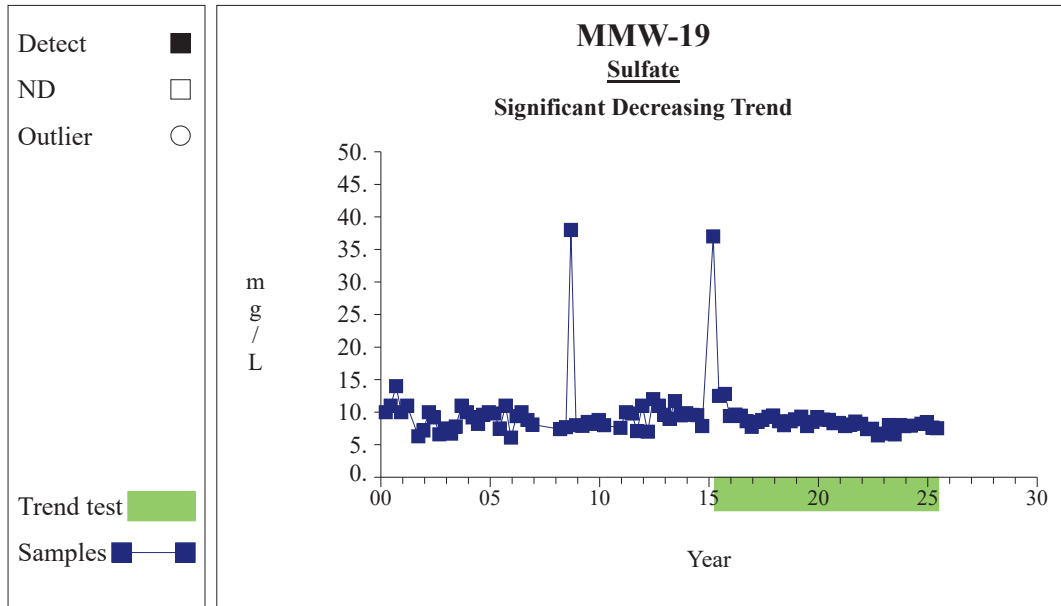
Graph 356

Time Series



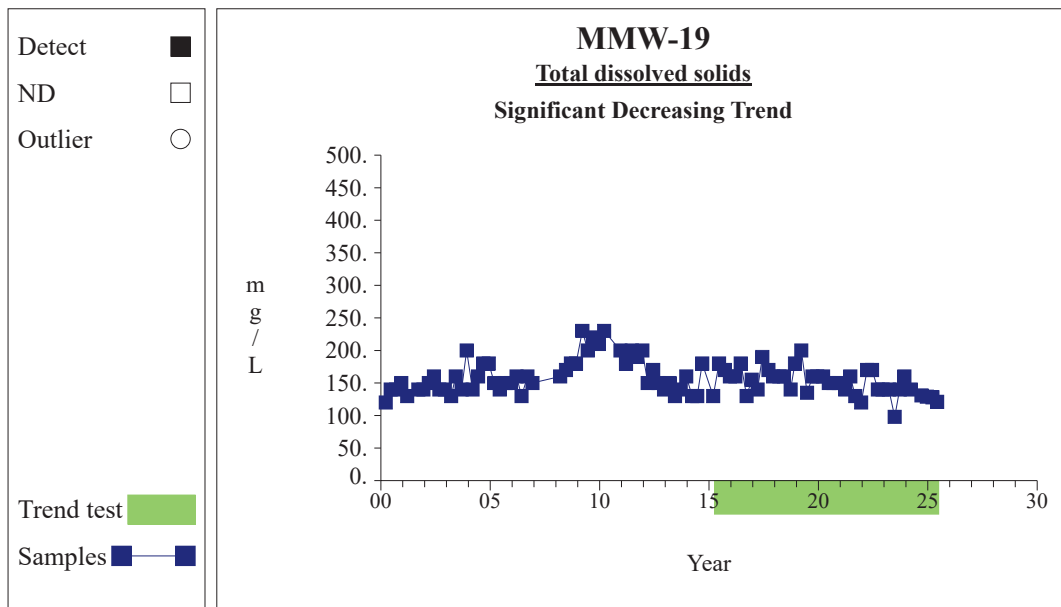
Graph 362

Time Series



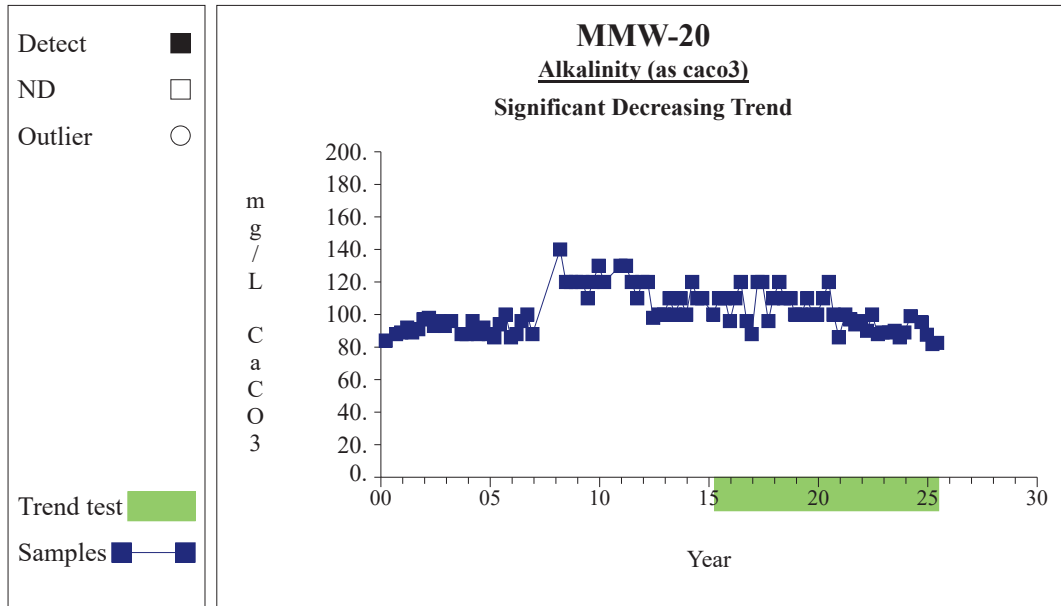
Graph 379

Time Series



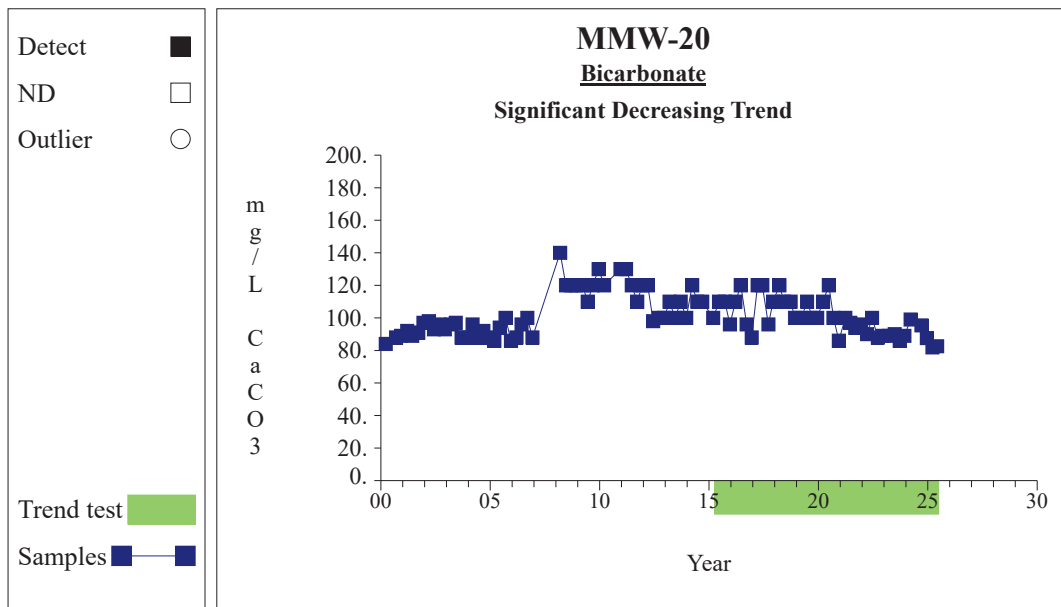
Graph 381

Time Series



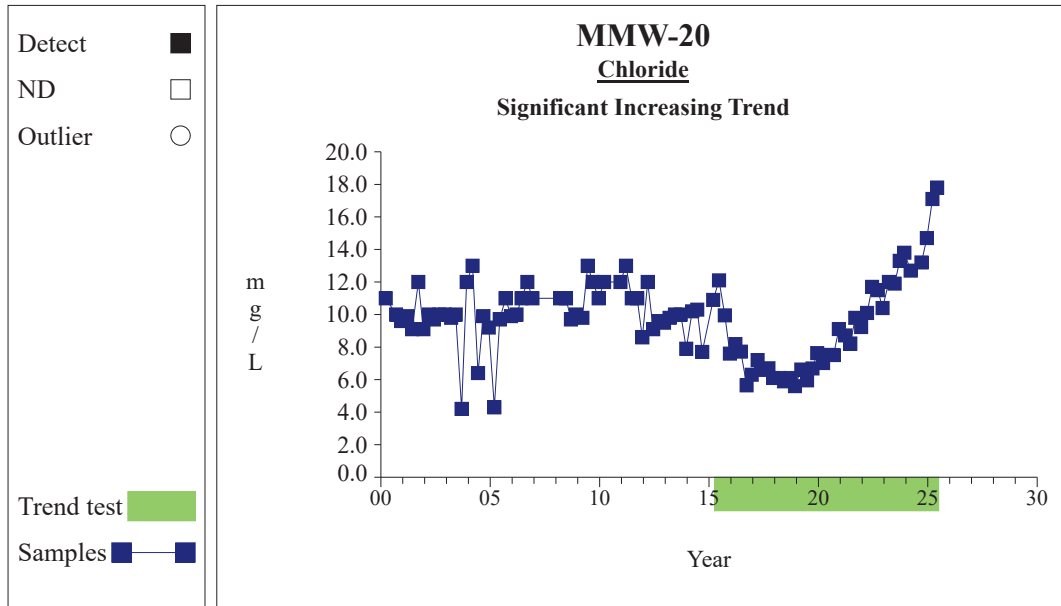
Graph 389

Time Series



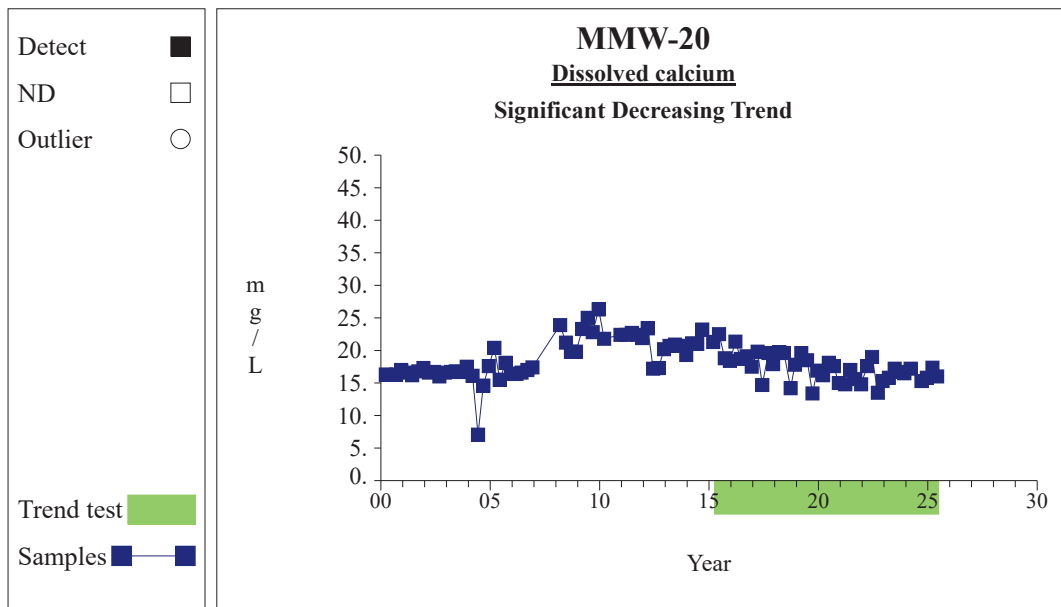
Graph 392

Time Series



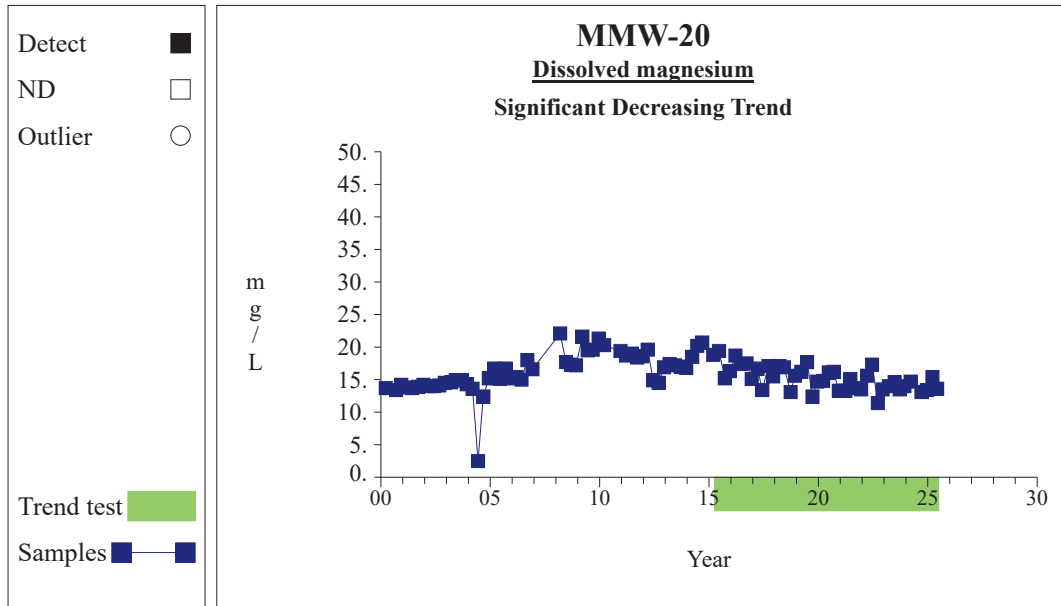
Graph 395

Time Series



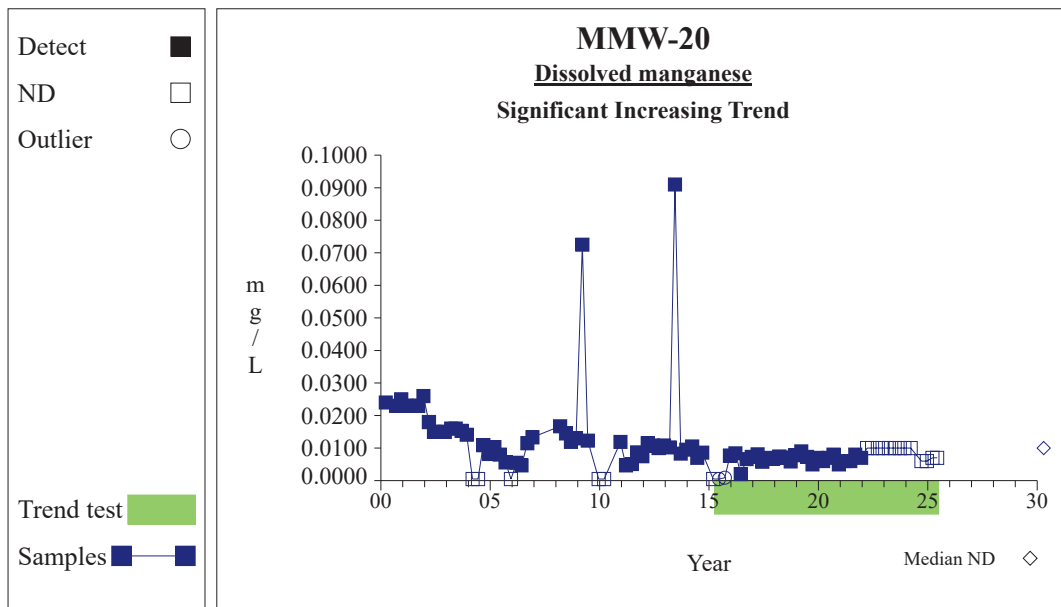
Graph 404

Time Series



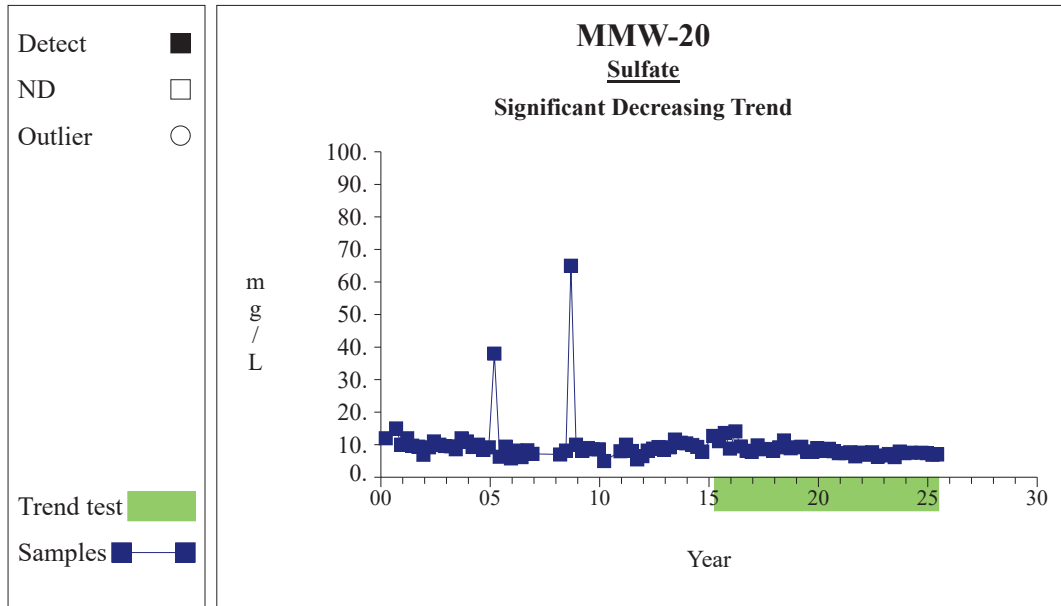
Graph 410

Time Series



Graph 411

Time Series



Graph 427