

# **2018 Annual Report**

**Land & Gas Reclamation Landfill  
WDNR License No. 01118  
Dodge County, Wisconsin**

**Prepared For:  
Advanced Disposal Services  
Glacier Ridge Landfill  
N7296 Highway V  
Horicon, WI 53032**

**Prepared By:  
Environmental Sampling Corporation  
P.O. Box 12  
Muskego, WI 53150-0012**

**April 2019**



April 15, 2019

Mr. Trevor Bannister  
Wisconsin Dept. of Natural Resources  
3911 Fish Hatchery Road  
Fitchburg, WI 53711

**RE: 2018 Annual Report  
Land & Gas Reclamation Landfill, WDNR Lic. #01118  
Dodge County, WI**

Dear Mr. Bannister:

On behalf of Advanced Disposal Services Glacier Ridge Landfill LLC., Environmental Sampling Corporation (ESC) is submitting one copy of the 2018 Annual Report for the closed Land & Gas Reclamation Landfill.

If you have any questions regarding this report, please contact Frank Perugini of ESC at (414) 427-5033 or the undersigned at (920) 387-0949.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Lonni Walter', is written over a blue horizontal line.

Lonni Walter  
General Manager

Attachment

cc: Ann Bekta, WDNR-SCR Janesville  
Sheila Desai, USEPA Region 5  
Adam Hogan, WDNR-SCR Fitchburg  
WDNR-SCR Horicon, File Copy  
WDNR Madison, File Copy  
ADS-Glacier Ridge Landfill, File Copy  
Jacob Margelofsky, ADS-Glacier Ridge Landfill (electronic copy)  
Tim Curry, ADS-Midwest (electronic copy)  
Kari Rabideau, ADS-Midwest (electronic copy)  
Tyler Field, Cornerstone Environmental Group (electronic copy)  
Sherren Clark, SCS Engineers (electronic copy)  
Frank Perugini, ESC (electronic copy)

**2018 ANNUAL REPORT  
LAND & GAS RECLAMATION LANDFILL, LICENSE #01118  
DODGE COUNTY, WISCONSIN**

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- Annual Reports for the Advanced Disposal Services Glacier Ridge Landfill, (Lic. #3068), Biopile (Lic. #3792) and Land and Gas Reclamation Landfill (Lic. #1118), dated May 2, 2017

**Appendix B: 2018 Groundwater Data Assessment (SCS Engineers)**

Attachment B-1: Groundwater Monitoring Results: April 2018

Groundwater Monitoring Results: October 2018

Attachment B-2: Historic VOC Monitoring Results and Concentrations vs. Time Plots

Figure 1: Groundwater Table Map: October 2018

**2018 ANNUAL REPORT  
LAND & GAS RECLAMATION LANDFILL, LICENSE #01118  
DODGE COUNTY, WISCONSIN**

**Section 1. Introduction**

This annual report addresses the 2018 annual report requirements for the former Land and Gas Reclamation Landfill (LGRL) facility. LGRL was a closed landfill located in the W ½ of Section 35, Township 12-North, Range 16-East, in the Town of Williamstown, Dodge County, Wisconsin. Beginning in 2014, in accordance with the WDNR approved LGRL Waste Relocation Project, the waste from LGRL was removed and relocated to the adjacent Advanced Disposal Services Glacier Ridge Landfill (ADS-GRL).

The LGRL Waste Relocation Project began during first quarter 2014. Phase A of removal began on March 3, 2014 and was completed on July 21, 2014. A total of 625,784 cubic yards of waste was relocated during Phase A of the project. Phase B of the waste relocation project began on February 3, 2015 and was completed on May 21, 2015 and a total of 523,244 cubic yards of waste were relocated. Phase C of the waste relocation project was started on January 4, 2016 and was completed on March 23, 2016 and an estimated 388,550 cubic yards of waste were relocated.

Since all waste from LGRL has been removed and relocated to the active ADS-GRL, the Department determined that several annual report requirements listed in the May 19, 2000 Plan of Operation Approval Modification dated were no longer necessary. The current reporting requirements are outlined in the May 2, 2017 correspondence provided as **Appendix A, Attachment A-1**.

The format of this 2018 annual report restates the relevant annual report requirements for LGRL. The approval references are presented below in bold italic font followed by ADS-GRL's response in normal font.

## **Section 2. Annual Report Requirements**

### **Approval Reference**

**May 19, 2000**

***Plan of Operation Approval Modification, Superior Glacier Ridge Landfill (Lic. No. 3068), Biopile (Lic. No. 3792), Land and Gas Reclamation Landfill (Lic. No. 1118), and Demolition Landfill (Lic. No. 3568)***

- 3. Superior shall submit an annual report to the Department by April 15<sup>th</sup> of each year which contains the following information about the Land and Gas Reclamation Landfill:**

### **Response**

To meet this requirement Advanced Disposal Services is providing the WDNR with this annual report for Land and Gas Reclamation Landfill (LGRL), which discusses the results of the 2018 environmental monitoring program for the facility. Annual report requirements provided as Conditions 3.b., 3 h., and 3.i. of the May 19, 2000 Approval Modification are discussed below. As indicated in the May 2, 2017 correspondence (**Appendix A, Attachment A-1**), the remaining annual report requirements are no longer necessary.

### **Approval Reference**

**May 19, 2000**

***Plan of Operation Approval Modification, Superior Glacier Ridge Landfill (Lic. No. 3068), Biopile (Lic. No. 3792), Land and Gas Reclamation Landfill (Lic. No. 1118), and Demolition Landfill (Lic. No. 3568)***

- b. An evaluation of the monitoring data generated for the facility, including groundwater gradients and quality, leachate head and quality data, gas quality and extraction rate data, condensate volume data, and settlement data.**

### **Response**

An evaluation of the groundwater monitoring data for the facility is summarized below. Due to the completion of the LGRL Waste Relocation Project, there was no leachate head, leachate quality, gas extraction, gas condensate, or settlement monitoring during 2018.

### **Groundwater Monitoring Program**

The groundwater monitoring program is performed in accordance with the WDNR Plan Modification approval for monitoring at Land and Gas Reclamation Landfill dated April 14, 1995 and the WDNR Expedited Plan Modification, Land and Gas Reclamation Landfill, dated February 22, 2002. Additional groundwater monitoring was conducted, beyond the scope of the permit,

in accordance with the WDNR approved Off-Site Investigation of Chlorinated VOC Plume in Bedrock, Land and Gas Reclamation Landfill, dated April 11, 2012.

The routine semi-annual monitoring is conducted in April and October. Routine annual monitoring is conducted in October. During 2018, the additional investigation monitoring was conducted in conjunction with the routine monitoring events. The LGRL groundwater monitoring network is outlined below.

- Seventeen monitoring wells are monitored semi-annually for inorganics (hardness, alkalinity, chloride, and arsenic) in addition to water elevations and field parameters (i.e. specific conductance, pH, and temperature). Monitoring wells A-3A and MW-204A were abandoned after the April 2018 monitoring event in accordance with the Plan of Operations Approval for Glacier Ridge Landfill.
- VOC analyses are conducted semi-annually at seven of these monitoring wells (MW-1RR, MW-1AR, W-3R, W-3AR, MW-210, MW-210A, and MW-210B) and annually in October at four of these monitoring wells (W-163, W-163A, W-214, and W-214A). No VOC analysis is required at the remaining four wells (MW-6R, MW-203A, MW-7R, and MW-8R).
- Three additional monitoring wells (MW-201, MW-201A, and MW-201B) are monitored semi-annually for water elevation and field parameters only.
- Investigation groundwater monitoring includes semi-annual monitoring at nine monitoring wells (MW-1B, P-401D, P-402E, P-422B, P-423D, P-424D, P424SS, P-426D, and P-429SS) for inorganics (hardness, alkalinity, and chloride), VOCs, water elevations, and field parameters.
- Investigation private well monitoring includes monthly monitoring for VOCs at one private well (PW-21RR), semi-annual monitoring for VOCs and inorganics (hardness, alkalinity, and chloride) at seven private wells (PW-19, PW-20, PW-21RR, PW-23, PW-28, PW-32, and PW-38), and annual monitoring for VOCs and inorganics at three additional private wells (PW-42, PW-43, and PW-44). Field parameters are also recorded during each sampling event.

During 2018, groundwater monitoring was conducted by Environmental Sampling Corporation (ESC) of Muskego, Wisconsin. Samples were analyzed by Pace Analytical Services of Green Bay, Wisconsin (Wisconsin Laboratory Certification No. 999407970).

SCS Engineers prepared and submitted a summary of the groundwater monitoring results and an electronic data submission for each semi-annual monitoring event. The semi-annual monitoring reports are provided as **Appendix B, Attachment B-1**. Private well results were provided to the homeowners and the WDNR throughout the reporting period.

Additionally, SCS Engineers prepared the Phase 3 Investigation Report – Off-Site Investigation of Chlorinated Volatile Organic Compounds in Groundwater in Bedrock, dated May 10, 2018. This report provided background on Phases 1-3, described the Phase 3 field investigation activities, and summarized the results of the groundwater and water supply well monitoring. The report

also proposed to continue the groundwater and water supply well monitoring with the new well P-429SS added to the semi-annual Investigation groundwater monitoring program. An update regarding the Investigation monitoring will be provided to WDNR by SCS Engineers in 2019.

Historic VOC Monitoring Results and Concentrations vs. Time Plots for total DCE, TCE and vinyl chloride for selected routine monitoring wells were prepared by SCS Engineers and are included as **Appendix B, Attachment B-2**. Additional discussion regarding the groundwater quality trends is provided below in response to approval condition 3.i.

In general, the groundwater flow direction trends to the north across the site with gradients ranging from 0.003 ft/ft to 0.005 ft/ft in the area of the former LGRL facility as shown on the Groundwater Table Map (**Appendix B, Figure 1**).

### **Approval Reference**

**May 19, 2000**

***Plan of Operation Approval Modification, Superior Glacier Ridge Landfill (Lic. No. 3068), Biopile (Lic. No. 3792), Land and Gas Reclamation Landfill (Lic. No. 1118), and Demolition Landfill (Lic. No. 3568)***

- h. A listing of all monitoring points or monitoring periods where sampling was not conducted as required. The annual report shall propose a schedule to supplement the approved monitoring program to compensate for the missing monitoring points or periods.***

### **Response**

In accordance with the WDNR approved Waste Relocation Project, the LGRL gas collection system components, leachate head monitoring points, gas probes, and settlement hubs were abandoned prior to 2018.

Groundwater wells and staff gauges are the only monitoring points that currently remain at the facility. During the April 2018 semi-annual event, routine monitoring wells MW-7R and MW-214 were frozen and could not be sampled. ESC personnel conducted a supplemental sampling event in May 2019 to collect samples from MW-7R and MW-214.

During the October 2018 monitoring event, routine monitoring wells MW-210, MW-210A, and MW-210B were inaccessible due to high water in the wetland area. Investigation well P-429SS was also inaccessible during the October 2018 event due to high water and wet conditions in the farm field in which the well is located. These wells remained inaccessible throughout 2018 and could not be sampled. A sample was collected from P-429SS in January 2019 when the well could be accessed with equipment for sampling. Monitoring wells MW-210, MW-210A, and MW-210B were still inaccessible during the January 2019 monitoring event due to high water in the

wetland. Sampling will be attempted at these wells during the next routine monitoring event in April 2019.

**Approval Reference**

**May 19, 2000**

***Plan of Operation Approval Modification, Superior Glacier Ridge Landfill (Lic. No. 3068), Biopile (Lic. No. 3792), Land and Gas Reclamation Landfill (Lic. No. 1118), and Demolition Landfill (Lic. No. 3568)***

- i. ***An overall evaluation of the effectiveness of the remedy in reducing environmental impacts of the site.***

**Response**

As of March 23, 2016, and the completion of the WDNR approved Waste Relocation Project, all of the LGRL waste has been exhumed and disposed of in the active ADS Glacier Ridge Landfill thus removing the source of the environmental impacts.

An assessment of environmental impacts over time is presented in the Historic VOC Monitoring Results and Concentrations vs. Time Plots prepared by SCS Engineers (**Appendix B, Attachment B-2**). Plots for total cis-1,2-DCE, TCE and Vinyl Chloride show concentrations to be stable or trending downward in the samples collected from MW-1AR, MW-1RR, W-3AR, MW-210, and MW-214. Concentrations of 1,2-DCE and TCE in the samples collected from W-3R, MW-210B, and MW-214A have been stable or not detected, but concentrations of vinyl chloride have been variable (W-3R) or displayed an increasing trend (MW-210B and MW-214A). Concentrations of TCE and VC in the samples collected from MW-210A have been stable or trending downward, but the DCE concentrations have increased slightly in recent years and are again trending downward.

The Groundwater Monitoring Results (April and October 2018) in **Appendix B, Attachment B-1** prepared by SCS Engineers provides further data interpretation related to the April and October 2018 groundwater monitoring events.



## **APPENDIX A**

### **Facility Information**

## **Attachment A-1**

### **WDNR Correspondence**

State of Wisconsin  
DEPARTMENT OF NATURAL RESOURCES  
3911 Fish Hatchery Road  
Fitchburg WI 53711-5397

Scott Walker, Governor  
Cathy Stepp, Secretary  
Telephone 608-266-2621  
Toll Free 1-888-936-7463  
TTY Access via relay - 711



May 2, 2017

FILE REF: FID# 114063950  
FID# 114052290  
Dodge County  
SW Approvals

Mr. Lonn Walter  
Advanced Disposal Services Glacier Ridge Landfill, LLC  
N7296 Highway V  
Horicon, WI 53032

SUBJECT: Annual Reports for the Advanced Disposal Services Glacier Ridge Landfill, (Lic. #3068),  
Biopile (Lic. #3792) and Land and Gas Reclamation Landfill (Lic. #1118)

Dear Mr. Walter:

The Department has received the annual reports for the Glacier Ridge Landfill, the biopile processing facility (Biopile) and the Land and Gas Reclamation Landfill (LGRL). These reports are required by the Department's May 19, 2000 plan of operation approval modification and October 13, 2013 southeast expansion plan of operation approval.

The May 19, 2000 approval contains annual report requirements for Glacier Ridge Landfill, Biopile, LGRL and Demolition Landfill. The annual report requirements for the Glacier Ridge landfill have been superseded by the October 13, 2013 plan of operation approval. The Biopile requirements are still active and should continue to be followed. The Demolition landfill was removed as part of the south expansion of the Glacier Ridge landfill and the annual reports are no longer necessary.

As approved by the October 13, 2013 southeast expansion plan of operation approval, the waste from LGRL was removed and relocated to the adjacent Glacier Ridge Landfill. The waste relocation project began in 2014 and was completed in 2016. All the waste has been removed and relocated; therefore some of the LGRL annual reporting requirements in the May 19, 2000 approval will not be needed in future annual reports. Reporting requirements for the LGRL final cover (conditions 3a and 3d) and gas extraction system (conditions 3c, e, f and g) are no longer necessary. However, the evaluation of the groundwater monitoring data (condition 3b), the list of monitoring points (condition 3h), and the evaluation of the effectiveness of the remedy (condition 3i) will continue to be required in annual reports to the Department.

If you have any questions regarding this letter, please contact Ann Bekta at (608)743-4845.

Sincerely,

Cynthia Moore, Supervisor  
Waste and Materials Management Program  
South Central Region

cc: Ann Bekta – Janesville  
Adam Hogan - SCR  
Jake Margelofsky - [jacob.margelofsky@advanceddisposal.com](mailto:jacob.margelofsky@advanceddisposal.com)  
Tyler Field - [Tyler.Field@Cornerstoneeg.com](mailto:Tyler.Field@Cornerstoneeg.com)

## **APPENDIX B**

### **2018 Groundwater Data Assessment (SCS Engineers)**

## **Attachment B-1**

**Groundwater Monitoring Results: April 2018**  
**Groundwater Monitoring Results: October 2018**

## SCS ENGINEERS

June 27, 2018  
File No. 25218008.00

GEMS Data Submittal Contact – WA/5  
Wisconsin Department of Natural Resources  
P.O. Box 7921  
Madison, WI 53707-7921

Subject: Groundwater Monitoring Results – April 2018  
Land & Gas Reclamation Landfill – Horicon, Wisconsin  
WDNR License #1118  
FID #114052290

Dear GEMS Data Submittal Contact:

Enclosed are the electronic data file, NR 140 exceedance summary, and monitoring data certification form for monitoring performed in April 2018 at the former Land & Gas Reclamation Landfill (LGRL) site. Monitoring data in this submittal include laboratory results and associated field data from the following monitoring points in the required LGRL monitoring program:

- Monitoring wells (MW1AR through MW214A)
- Surface water staff gauges (SW2 through SW5)

The groundwater samples were collected by Environmental Sampling Corporation (ESC). Laboratory analysis was performed by Pace Analytical Services.

The data CD also includes monitoring data for some of the wells that were installed for the ongoing investigation of volatile organic compounds (VOCs) in the bedrock aquifer. Investigation wells that have been assigned Department of Natural Resources (DNR) IDs, and are included on the data CD, include bedrock monitoring wells P-401D, P-402E, and P-423D; and deep unconsolidated aquifer monitoring wells MW-1B and P-422B. These wells are not part of the routine LGRL monitoring program. Additional investigation wells P-424D, P-424SS, P-426D, and P-429SS have not been assigned DNR IDs and are not included on the data CD. Results for all groundwater monitoring associated with the VOC investigation will be provided to the Wisconsin Department of Natural Resources (WDNR) in the next investigation update report.

This letter provides a preliminary analysis of the cause and significance of the NR 140 groundwater standard exceedances for monitoring data included in the data CD. An explanation of any deviations from the approved sampling plan is also included in the Monitoring Program Comments section of this letter.



## NR 140 EXCEEDANCES

NR 140 standard exceedances for the April 2018 sampling round are listed in the attached NR 140 Exceedance Summary table. The following discussion addresses the NR 140 enforcement standard (ES) and preventive action limit (PAL) exceedances for this event.

### Public Health Parameters

**Arsenic** was reported at concentrations less than the ES, but above the PAL of 1 microgram per liter ( $\mu\text{g/L}$ ), in samples from the following wells: MW-1AR, MW-1RR, MW-8R, MW-203A, MW-204A, MW-210, MW-210A, W-3R, W-3AR, W-163, and W-163A. Arsenic concentrations within this range have been detected in samples collected from many wells around the former LGRL site and the adjacent Glacier Ridge Landfill, and are likely attributable to naturally occurring arsenic. Arsenic was reported in the sample from MW-6R at an estimated concentration equal to the PAL, but below the limit of quantitation (LOQ) (“J” flag). This result is not considered a PAL exceedance without additional confirmation in accordance with NR 140.14(3).

**VOCs** including 1,1-dichloroethylene, cis-1,2-dichloroethene (DCE), trichloroethylene, and/or vinyl chloride were detected at concentrations exceeding the PAL or ES and the LOQ in samples collected from the following wells: MW-1AR, MW-1B, MW-1RR, MW-210A, MW-210B, P-402E, P-423D, W-3AR, and W-3R. The specific VOCs exceeding the PAL or ES at each well are shown in the attached NR 140 Exceedance Summary (**Table 1**). All of these wells are located downgradient from the former LGRL site, and the VOCs are likely due to LGRL.

In addition to the NR 140 standard exceedances described above, there were some VOC results reported at estimated concentrations above the PAL or ES, but below the LOQ (“J” flag). These results are not considered PAL or ES exceedances without additional confirmation in accordance with NR 140.14(3). VOCs reported at concentrations above the PAL, but below the LOQ, included benzene, 1,1-dichloroethylene, tetrahydrofuran, and/or trichloroethylene in samples from the following wells: MW-1AR, MW-1RR, MW-210A, P402E, P-423D, and W-3AR. 1,1-Dichloroethylene was detected in the sample from MW-1AR at an estimated concentration slightly exceeding the ES but below the LOQ.

These wells are located adjacent to or downgradient from the former LGRL site, and the detected VOCs are likely due to LGRL.

The PAL exceedances and reported concentrations for VOCs were generally consistent with previous results

### Public Welfare Parameters

**Chloride** was reported above the NR 140 ES of 250  $\mu\text{g/L}$  in the sample from MW-1AR. Chloride was reported above the PAL of 125  $\mu\text{g/L}$  in the samples from MW-1B,

MW-210A, MW-214A, and W-3AR. All of these wells are located downgradient of LGRL, and the chloride detections may be associated with LGRL. This was the first PAL exceedance for chloride at MW-1B.

## MONITORING PROGRAM COMMENTS

The approved monitoring program was followed except that samples and/or water levels could not be collected in April due to field conditions at the following monitoring locations:

- Monitoring wells MW-7R and MW-214 were not sampled because the water in the wells was frozen.
- Surface water elevations were not reported for staff gages SW-2, SW-4, and SW-5 because standing water was not present at these locations.
- Surface water elevation was not reported for staff gage SW-3 because ice was present at this location.

If you have any questions regarding this submittal, please call Sherren Clark at 608.216.7323.

Sincerely,



Sherren Clark, PE, PG  
Project Director  
**SCS ENGINEERS**



Betty J. Socha, PhD, PG  
Senior Project Manager  
**SCS ENGINEERS**

SCC/AJR/BJS

cc: Adam Hogan, WDNR (without CD)  
Lonn Walter, Advanced Disposal Services (2 copies of letter, 1 CD)  
Kari Rabideau, Advanced Disposal Services (via email)  
Tim Curry, Advanced Disposal Services (via email)  
Frank Perugini, Environmental Sampling Corp. (via email)

Enclosures: Table 1 - NR 140 Exceedance Summary  
Groundwater Monitoring Data Certification Form  
GEMS Data CD



**Table 1**  
**NR 140 Exceedance Summary**

**Site ID:** 1118  
**Site Name:** Land and Gas Reclamation Landfill  
**Reporting Period:** April 2018

Note: Includes NR 140 exceedances for wells in the LGRL monitoring plan approved by the WDNR Solid Waste program and additional wells in the off-site monitoring plan that have been assigned GEMS IDs

**Groundwater Results Exceeding NR 140 Standards**

Well	Parameter	Result	PAL	ES	Exceedance Type
MW-001AR	Arsenic, dissolved (ug/l As)	3	1	10	PAL
	Chloride, dissolved (mg/l as Cl)	586	125	250	ES
	cis-1,2-Dichloroethene (ug/l)	1060	7	70	ES
	Vinyl chloride (ug/l)	1600	0.02	0.2	ES
MW-001B	Chloride, dissolved (mg/l as Cl)	128	125	250	PAL
	Vinyl chloride (ug/l)	3.4	0.02	0.2	ES
MW-001RR	Arsenic, dissolved (ug/l As)	5.9	1	10	PAL
	Vinyl chloride (ug/l)	6.9	0.02	0.2	ES
MW-008R	Arsenic, dissolved (ug/l As)	3.6	1	10	PAL
MW-203A	Arsenic, dissolved (ug/l As)	8.3	1	10	PAL
MW-204A	Arsenic, dissolved (ug/l As)	1.7	1	10	PAL
MW-210	Arsenic, dissolved (ug/l As)	2.4	1	10	PAL
MW-210A	Arsenic, dissolved (ug/l As)	8.6	1	10	PAL
	Chloride, dissolved (mg/l as Cl)	140	125	250	PAL
	cis-1,2-Dichloroethene (ug/l)	330	7	70	ES
	Vinyl chloride (ug/l)	86	0.02	0.2	ES
MW-210B	Vinyl chloride (ug/l)	4.3	0.02	0.2	ES
MW-214A	Chloride, dissolved (mg/l as Cl)	185	125	250	PAL
P-402E	1,1-Dichloroethylene (ug/l)	1.1	0.7	7	PAL
	cis-1,2-Dichloroethene (ug/l)	337	7	70	ES
	cis-1,2-Dichloroethene (ug/l)	324	7	70	ES
	Trichloroethylene (ug/l)	2.5	0.5	5	PAL
	Vinyl chloride (ug/l)	25.7	0.02	0.2	ES
	Vinyl chloride (ug/l)	27.2	0.02	0.2	ES
P-423D	cis-1,2-Dichloroethene (ug/l)	92.4	7	70	ES
	Vinyl chloride (ug/l)	3.3	0.02	0.2	ES

Well	Parameter	Result	PAL	ES	Exceedance Type
W-003AR	Arsenic, dissolved (ug/l As)	1.3	1	10	PAL
	Chloride, dissolved (mg/l as Cl)	129	125	250	PAL
	cis-1,2-Dichloroethene (ug/l)	88.9	7	70	ES
	Vinyl chloride (ug/l)	63.3	0.02	0.2	ES
W-003R	Arsenic, dissolved (ug/l As)	1.1	1	10	PAL
	Vinyl chloride (ug/l)	5.6	0.02	0.2	ES
W-163	Arsenic, dissolved (ug/l As)	6	1	10	PAL
W-163A	Arsenic, dissolved (ug/l As)	2.3	1	10	PAL

### Groundwater Results with Estimated Concentration Above an NR 140 PAL or ES and Below the LOQ

Note: If both the result and the PAL or ES are above the limit of detection but below the limit of quantitation, the result is not considered a PAL or ES exceedance under NR 140.14(3)(c). If the PAL or ES is below the limit of detection and the result is below the limit of quantitation, the result is not considered a PAL or ES exceedance without additional confirmation as described in NR 140.14(3)(b).

Well	Parameter	Result	LOD/LOQ	PAL	ES
MW-001AR	1,1-Dichloroethylene (ug/l)	7.2 J	4.1/10	0.7	7
	Tetrahydrofuran (ug/l)	34.6 J	20.3/50	10	50
MW-001RR	Benzene (ug/l)	0.58 J	0.5/1	0.5	5
MW-006R	Arsenic, dissolved (ug/l As)	1 J	0.28/1	1	10
MW-210A	1,1-Dichloroethylene (ug/l)	1.6 J	1/2.5	0.7	7
	Trichloroethylene (ug/l)	1.9 J	0.83/2.5	0.5	5
P-402E	Trichloroethylene (ug/l)	2.4 J	0.83/2.5	0.5	5
P-423D	Trichloroethylene (ug/l)	0.74 J	0.33/1	0.5	5
W-003AR	1,1-Dichloroethylene (ug/l)	0.89 J	0.82/2	0.7	7
	Benzene (ug/l)	1.3 J	1/2	0.5	5

Notes:

PAL = Preventive Action Limit

ES = Enforcement Standard

LOQ = Limit of Quantitation

J = Result is an estimated value below the laboratory's limit of quantitation.

\* = Two results indicate duplicate samples.

ug/l = micrograms per liter

mg/l = milligrams per liter

Prepared by: AJR, 6/12/2018

Checked by: SCC, 6/21/18

**Notice:** Personally identifiable information collected will be used for program administration and enforcement purposes. The Department may also provide this information to requesters as required under Wisconsin's Open Records law, ss. 19.31 to 19.39, Wis. Stats. When submitting monitoring data, the owner or operator of the facility, practice or activity is required to notify the Department in writing that a groundwater standard or an explosive gas level has been attained or exceeded, as specified in ss. NR 140.24(1)(a); NR 140.26(1)(a); NR 507.30NR 635.14(9)(a); NR 635.18(20) and NR 507.30, Wis. Adm. Code. Failure to report may result in fines, forfeitures or other penalties resulting from enforcement under ss. 289.97, 291.97 or 299.95, Wis. Stats

**Instructions:**

- Prepare one form for each license or monitoring ID.
- Please type or print legibly.
- Attach a notification of any values that attain or exceed groundwater standards (that is, preventive action limits, enforcement standards or alternative concentration limits). The notification must include a preliminary analysis of the cause and significance of each value.
- Attach a notification of any gas values that attain or exceed explosive gas levels.
- Send the original signed form, any notification, and Electronic Data Deliverable [EDD] to:

GEMS Data Submittal Contact - WA/5  
 Wisconsin Department of Natural Resources  
 P.O. Box 7921  
 Madison, WI 53707-7921

**Monitoring Data Submittal Information**

Name of entity submitting data (laboratory, consultant, facility owner)  
 SCS Engineers

Contact for questions about data formatting. Include data preparer's name, telephone number and Email address:

Name Ashley Radunzel	Phone No. (include area code) (608) 224-2830
-------------------------	---

Email  
 aradunzel@scsengineers.com

Facility Name  
 Land & Gas Reclamation Landfill

License # / Monitoring ID 1118	Facility ID (FID) 114052290
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Actual sampling dates (e.g., July 2-6, 2003) April 2, 4-6, 25, 2018	The enclosed results are for sampling required in the month(s) of: (e.g., June 2003) April 2018
--	--

Type of Data Submitted (Check all that apply):

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Groundwater monitoring data from monitoring wells | <input type="checkbox"/> Gas monitoring data                     |
| <input type="checkbox"/> Groundwater monitoring data from private water supply wells  | <input type="checkbox"/> Air monitoring data                     |
| <input type="checkbox"/> Leachate monitoring data                                     | <input checked="" type="checkbox"/> Other (specify): Staff Gauge |


Notification attached?

- No. No groundwater standards or explosive gas limits were exceeded.
- Yes, a notification of values exceeding a groundwater standard is attached. It includes a list of monitoring points, dates, sample values, groundwater standard and preliminary analysis of the cause and significance of any concentration.
- Yes, a notification of values exceeding an explosive gas limit is attached. It includes the monitoring points, dates, sample values and explosive gas limits.

**Certification**

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards.

Facility Representative Name (Print) Sherren Clark, SCS Engineers	Title Project Manager	Phone No. (include area code) (608) 216-7323
--	--------------------------	---

  
 Signature

6-21-18  
 Date Signed (mm/dd/yyyy)

<b>For DNR Use Only</b>	
Check action taken, and record date and your initials. Describe on back side if necessary.	
<input type="checkbox"/> Found uploading problems on _____	Initials _____
<input type="checkbox"/> Notified contact of problems on _____	Uploaded data successfully on _____
EDD format(s): <input type="checkbox"/> Diskette <input type="checkbox"/> CD (initial submittal and follow-up) <input type="checkbox"/> E-mail (follow-up only) <input type="checkbox"/> Other: _____	

December 26, 2018  
File No. 25218008.00

GEMS Data Submittal Contact – WA/5  
Wisconsin Department of Natural Resources  
P.O. Box 7921  
Madison, WI 53707-7921

Subject: Groundwater Monitoring Results – October 2018  
Land & Gas Reclamation Landfill – Horicon, Wisconsin  
WDNR License #1118  
FID #114052290

Dear GEMS Data Submittal Contact:

Enclosed are the electronic data file, NR 140 exceedance summary, and monitoring data certification form for monitoring performed in October 2018 at the former Land & Gas Reclamation Landfill (LGRL) site. Monitoring data in this submittal include laboratory results and associated field data from the following monitoring points in the required LGRL monitoring program:

- Monitoring wells (MW1AR through MW214A)
- Surface water staff gauges (SW2 through SW5)

The groundwater samples were collected by Environmental Sampling Corporation (ESC). Laboratory analysis was performed by Pace Analytical Services.

The data CD also includes monitoring data for some of the wells that were installed for the ongoing investigation of volatile organic compounds (VOCs) in the bedrock aquifer. Investigation wells that have been assigned Wisconsin Department of Natural Resources (WDNR) IDs, and are included on the data CD; including bedrock monitoring wells P-401D, P-402E, and P-423D; and deep unconsolidated aquifer monitoring wells MW-1B and P-422B. These wells are not part of the routine LGRL monitoring program. Additional investigation wells P-424D, P-424SS, P 426D, and P-429SS have not been assigned WDNR IDs and are not included on the data CD. Results for all groundwater monitoring associated with the VOC investigation will be provided to the WDNR in the next investigation update report.

This letter provides a preliminary analysis of the cause and significance of the NR 140 groundwater standard exceedances for monitoring data included in the data CD. An explanation of any deviations from the approved sampling plan is also included in the Monitoring Program Comments section of this letter.

## **NR 140 EXCEEDANCES**

NR 140 standard exceedances for the October 2018 sampling round are listed in the attached NR 140 Exceedance Summary table. The following discussion addresses the NR 140 enforcement standard (ES) and preventive action limit (PAL) exceedances for this event.



## Public Health Parameters

**Arsenic** was reported at concentrations less than the ES, but above the PAL of 1 microgram per liter ( $\mu\text{g}/\text{L}$ ), in samples from the following wells: MW-1AR, MW-1RR, MW-7R, MW-8R, MW-203A, W-3R, W-3AR, W-163, and W-163A. Arsenic concentrations within this range have been detected in samples collected from many wells around the former LGRL site and the adjacent Glacier Ridge Landfill, and are likely attributable to naturally occurring arsenic.

**VOCs** including benzene, cis-1,2 dichloroethene (DCE), and vinyl chloride were detected at concentrations exceeding the PAL or ES and the Limit of Quantitation (LOQ) in samples collected from the following wells: MW-1AR, MW-1B, MW 1RR, MW 214A, P-402E, P-423D, W-3AR, and W-3R. The specific VOCs exceeding the PAL or ES at each well are shown in the attached NR 140 Exceedance Summary (**Table 1**). All of these wells are located downgradient from the former LGRL site, and the VOCs are likely due to LGRL.

In addition to the NR 140 standard exceedances described above, there were some VOC results reported at estimated concentrations above the PAL or ES, but below the LOQ ("J" flag). These results are not considered PAL or ES exceedances without additional confirmation in accordance with NR 140.14(3). VOCs reported at concentrations above the PAL, but below the LOQ, included benzene, 1,1-dichloroethylene, tetrahydrofuran, and trichloroethylene in samples from the following wells: MW-1AR, MW-1RR, P402E, P-423D, and W-3AR. Tetrahydrofuran was detected in the sample from MW 1AR at an estimated concentration slightly exceeding the ES but below the LOQ.

These wells are located adjacent to or downgradient from the former LGRL site, and the VOCs are likely due to LGRL.

The PAL and ES exceedances and reported concentrations for VOCs were generally consistent with previous results.

## Public Welfare Parameters

Chloride was reported above the NR 140 ES of  $250 \mu\text{g}/\text{L}$  in the sample from MW 1AR. Chloride was reported above the PAL of  $125 \mu\text{g}/\text{L}$  in the samples from MW-214A and W-3AR. These wells are located downgradient of LGRL, and the chloride detections may be associated with LGRL.

## MONITORING PROGRAM COMMENTS

The approved monitoring program was followed except that samples and/or water levels could not be collected in October due to field conditions at the following monitoring locations:

- Monitoring wells A-3A and MW-204A were abandoned prior to the October 2018 sampling as part of the Phase 9A cell construction.
- Monitoring wells MW-210, MW-210A, and MW-210B were not sampled due to standing water around the wells. They will be sampled in spring 2019.
- Monitoring well P-429SS was not sampled because it was inaccessible due to very wet conditions in October. ESC will sample this well in January 2019.

- A surface water elevation was not reported for staff gage SW-2 because water was not present at this location.
- Surface water elevation was not reported for staff gages SW-3 and SW-5 because the gage reference elevation needs to be resurveyed.

If you have any questions regarding this submittal, please call Sherren Clark at 608.216.7323.

Sincerely,



Sherren Clark, PE, PG  
Project Director  
SCS Engineers



Betty J. Socha, PhD, PG  
Senior Project Manager  
SCS Engineers

DLN/AJR/SCC/BJS

cc: Adam Hogan, WDNR (without CD)  
Lonn Walter, Advanced Disposal Services (2 copies of letter, 1 CD)  
Kari Rabideau, Advanced Disposal Services (via email)  
Tim Curry, Advanced Disposal Services (via email)  
Frank Perugini, Environmental Sampling Corp. (via email)

Encl. Table 1 - NR 140 Exceedance Summary  
Groundwater Monitoring Data Certification Form  
GEMS Data CD

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**Table 1**  
**NR 140 Exceedance Summary**

**Site ID:** 1118  
**Site Name:** Land and Gas Reclamation Landfill  
**Reporting Period:** October 2018

Note: Includes NR 140 exceedances for wells in the LGRL monitoring plan approved by the WDNR Solid Waste program and additional wells in the off-site monitoring plan that have been assigned WDNR IDs

**Groundwater Results Exceeding NR 140 Standards**

Well	Parameter	Result *	PAL	ES	Exceedance Type
MW-001AR	Arsenic, dissolved (ug/l As)	3	1	10	PAL
	Chloride, dissolved (mg/l as Cl)	506	125	250	ES
	cis-1,2-Dichloroethene (ug/l)	1050	7	70	ES
	Vinyl chloride (ug/l)	1670	0.02	0.2	ES
MW-001B	Vinyl chloride (ug/l)	2.3	0.02	0.2	ES
MW-001RR	Arsenic, dissolved (ug/l As)	9.5	1	10	PAL
	Vinyl chloride (ug/l)	5.2	0.02	0.2	ES
MW-007R	Arsenic, dissolved (ug/l As)	1.8/1.7	1	10	PAL
MW-008R	Arsenic, dissolved (ug/l As)	2.5	1	10	PAL
MW-203A	Arsenic, dissolved (ug/l As)	8.7	1	10	PAL
MW-214A	Chloride, dissolved (mg/l as Cl)	187	125	250	PAL
	Vinyl chloride (ug/l)	44.5	0.02	0.2	ES
P-402E	cis-1,2-Dichloroethene (ug/l)	268	7	70	ES
	Vinyl chloride (ug/l)	27.9	0.02	0.2	ES
P-423D	cis-1,2-Dichloroethene (ug/l)	82.5	7	70	ES
	Vinyl chloride (ug/l)	2.9	0.02	0.2	ES
W-003AR	Arsenic, dissolved (ug/l As)	1.6	1	10	PAL
	Benzene (ug/l)	1.1	0.5	5	PAL
	Chloride, dissolved (mg/l as Cl)	128	125	250	PAL
	cis-1,2-Dichloroethene (ug/l)	74.5	7	70	ES
	Vinyl chloride (ug/l)	60.7	0.02	0.2	ES
W-003R	Arsenic, dissolved (ug/l As)	1.5/1.8	1	10	PAL
	Vinyl chloride (ug/l)	6.4/6.8	0.02	0.2	ES
W-163	Arsenic, dissolved (ug/l As)	3.1	1	10	PAL
W-163A	Arsenic, dissolved (ug/l As)	1.6	1	10	PAL

### Groundwater Results with Estimated Concentration Above an NR 140 PAL or ES and Below the LOQ

Note: If both the result and the PAL or ES are above the limit of detection but below the limit of quantitation, the result is not considered a PAL or ES exceedance under NR 140.14(3)(c). If the PAL or ES is below the limit of detection and the result is below the limit of quantitation, the result is not considered a PAL or ES exceedance without additional confirmation as described in NR 140.14(3)(b).

Well	Parameter	Result	LOD/LOQ	PAL	ES
MW-001AR	1,1-Dichloroethylene (ug/l)	6.9 J	2.4/10	0.7	7
	Tetrahydrofuran (ug/l)	54.2 J	23.2/200	10	50
MW-001RR	Benzene (ug/l)	0.52 J	0.25/1	0.5	5
P-402E	Trichloroethylene (ug/l)	2.1 J	0.64/2.5	0.5	5
P-423D	Trichloroethylene (ug/l)	0.7 J	0.26/1	0.5	5
W-003AR	1,1-Dichloroethylene (ug/l)	0.78 J	0.24/1	0.7	7

Notes:

PAL = Preventive Action Limit

ES = Enforcement Standard

LOQ = Limit of Quantitation

J = Result is an estimated value below the laboratory's limit of quantitation.

\* = Two results indicate duplicate samples.

ug/l = micrograms per liter

mg/l = milligrams per liter

Prepared by: AJR, 12/6/2018

Checked by: DLN, 12/17/2018



**Notice:** Personally identifiable information collected will be used for program administration and enforcement purposes. The Department may also provide this information to requesters as required under Wisconsin's Open Records law, ss. 19.31 to 19.39, Wis. Stats. When submitting monitoring data, the owner or operator of the facility, practice or activity is required to notify the Department in writing that a groundwater standard or an explosive gas level has been attained or exceeded, as specified in ss. NR 140.24(1)(a); NR 140.26(1)(a); NR 507.30NR 635.14(9)(a); NR 635.18(20) and NR 507.30, Wis. Adm. Code. Failure to report may result in fines, forfeitures or other penalties resulting from enforcement under ss. 289.97, 291.97 or 299.95, Wis. Stats

**Instructions:**

- Prepare one form for each license or monitoring ID.
- Please type or print legibly.
- Attach a notification of any values that attain or exceed groundwater standards (that is, preventive action limits, enforcement standards or alternative concentration limits). The notification must include a preliminary analysis of the cause and significance of each value.
- Attach a notification of any gas values that attain or exceed explosive gas levels.
- Send the original signed form, any notification, and Electronic Data Deliverable [EDD] to:

GEMS Data Submittal Contact - WA/5  
 Wisconsin Department of Natural Resources  
 P.O. Box 7921  
 Madison, WI 53707-7921

**Monitoring Data Submittal Information**

Name of entity submitting data (laboratory, consultant, facility owner)

SCS Engineers

Contact for questions about data formatting. Include data preparer's name, telephone number and Email address:

Name Ashley Radunzel	Phone No. (include area code) (608) 224-2830
-------------------------	---

Email  
aradunzel@scsengineers.com

Facility Name  
Land & Gas Reclamation Landfill

License # / Monitoring ID 1118	Facility ID (FID) 114052290
-----------------------------------	--------------------------------

Actual sampling dates (e.g., July 2-6, 2003) October 1, 3-5, 30, 2018	The enclosed results are for sampling required in the month(s) of: (e.g., June 2003) October 2018
--	--

Type of Data Submitted (Check all that apply):

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Groundwater monitoring data from monitoring wells | <input type="checkbox"/> Gas monitoring data                     |
| <input type="checkbox"/> Groundwater monitoring data from private water supply wells  | <input type="checkbox"/> Air monitoring data                     |
| <input type="checkbox"/> Leachate monitoring data                                     | <input checked="" type="checkbox"/> Other (specify): Staff Gauge |

Notification attached?

- No. No groundwater standards or explosive gas limits were exceeded.
- Yes, a notification of values exceeding a groundwater standard is attached. It includes a list of monitoring points, dates, sample values, groundwater standard and preliminary analysis of the cause and significance of any concentration.
- Yes, a notification of values exceeding an explosive gas limit is attached. It includes the monitoring points, dates, sample values and explosive gas limits.

**Certification**

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards.

Facility Representative Name (Print) Sherren Clark, SCS Engineers	Title Project Manager	Phone No. (include area code) (608) 216-7323
--	--------------------------	---



Signature

12-17-18  
Date Signed (mm/dd/yyyy)

**For DNR Use Only**

Check action taken, and record date and your initials. Describe on back side if necessary.

- Found uploading problems on \_\_\_\_\_ Initials \_\_\_\_\_
- Notified contact of problems on \_\_\_\_\_ Uploaded data successfully on \_\_\_\_\_
- EDD format(s):  Diskette  CD (initial submittal and follow-up)  E-mail (follow-up only)  Other: \_\_\_\_\_

## **Attachment B-2**

### **Historic VOC Monitoring Results and Concentrations vs. Time Plots**

**Historic VOC Monitoring Results**  
**Land and Gas Reclamation Landfill**  
(concentrations in ug/L)

MW-1RR				MW-1AR			
Date	cis-1,2-DCE	TCE	VC	Date	cis-1,2-DCE	TCE	VC
<b>NR 140 ES</b>	<b>70</b>	<b>5</b>	<b>0.2</b>	<b>NR 140 ES</b>	<b>70</b>	<b>5</b>	<b>0.2</b>
11/21/1991		1,900	2,900	11/19/1991		130	3,000
5/29/1992		2,800	4,300	5/29/1992		100	2,800
6/17/1993		580	1,800	6/17/1993		30	2,200
6/21/1994		10.7	198	6/21/1994		24.9	1,160
4/14/1995	1,500	2,000	3,800	4/14/1995	7,100	200	2,900
10/4/1995	6,400	620	3,400	10/4/1995	6,100	180	2,800
4/4/1996	1,900	130	1,300	4/4/1996	6,600	150	2,600
10/12/1996	16,000	1,600	3,600	10/12/1996	8,500	200	2,300
4/10/1997	3,800	80	3,100	4/10/1997	6,000	86	2,400
10/3/1997	2,500	190	1,600	10/3/1997	6,300	0	2,700
4/10/1998	2,800	120	2,300	4/10/1998	7,200	150	2,500
10/14/1998	11,000	820	3,100	10/15/1998	6,500	95	1,900
4/6/1999	2,100	0	2,300	4/6/1999	5,500	0	2,300
10/7/1999	13,000	6,800	3,400	10/8/1999	6,100	0	2,000
4/3/2000	2,400	77	1,500	4/3/2000	5,700	54	2,200
10/4/2000	4,600	0	1,210	10/5/2000	4,920	0	1,190
4/4/2001	2,260	0	1,240	4/4/2001	5,040	0	1,300
10/3/2001	6,090	411	2,300	10/3/2001	4,910	0	2,000
4/3/2002	4,890	274	535	4/3/2002	5,320	0	795
10/1/2002	4,800	525	1,180	10/1/2002	5,660	0	1,220
4/2/2003	1,260	29.2	593	4/2/2003	4,860	17	1,100
10/9/2003	2,020	0	700	10/9/2003	4,470	0	1,200
4/5/2004	1,220	26.7	1,220	4/5/2004	4,130	16.8	1,550
10/4/2004	4,590	440	2,060	10/4/2004	3,950	0	1,800
4/1/2005	2,510	0	736	4/1/2005	3,990	0	882
10/1/2005	5,130	351	1,150	10/1/2005	4,420	0	951
4/6/2006	2,680	0	785	4/6/2006	3,820	0	659
10/5/2006	4,340	295	1,160	10/5/2006	3,590	0	1,020
4/5/2007	708	0	360	4/5/2007	2,020	0	887
10/22/2007	605	8.46	351	10/22/2007	2,280	<20	1,060
4/10/2008	265	1.92	207	4/10/2008	590	0.51	196
10/9/2008	199	<4	221	10/9/2008	2,020	<40	1,070
4/8/2009	145	<4.0	245	4/8/2009	2,260	<4.0	1,780
10/6/2009	90.2	<4	232	10/6/2009	1,610	<40	1,520
4/6/10	77.5	<4	152	4/6/10 <sup>(1)</sup>	24,000	<4.0	17,500
10/26/10	94.4	1.41	190	10/26/10	2,370	1.49	1,630
4/7/11	63.6	<4	137	4/7/11	1,700	<40	1,170
10/5/11	90.3	<4	168	10/5/11	1,400	<40	1,110
4/12/12	62.7	<4	136	4/12/12	2,090	<4	1,620
10/2/12	49.9	0.68	107	10/2/12	2,090	<4.8	1,390
4/1/13	23.1	0.58	75.1	4/1/13	1,940	<1.2	1,310
10/3/13	29.5	0.65	85.7	10/1/13	1,620	<3.6	1,580
4/2/14	13.1	0.37	63.7	4/2/14	1,610	<3.3	1,630
10/6/14	8.4	<0.33	35.9	10/6/14	1,720	<6.6	1,400
4/16/15	14.4	0.53	56.6	4/16/15	1,450	<3.3	1,190
10/7/15	3.9	<0.33	18.3	10/8/15	808	<3.3	1,050
4/6/16	2.4	<0.33	11.6	4/6/16	1,240	<3.3	1,960
10/5/16	4.8	<0.33	24	10/5/16	1,050	<3.3	1,980
4/6/17	1.3	<0.33	5.2	4/6/17	1,140	<3.3	1,540
10/5/17	<0.26	<0.33	2.5	10/5/17	1,030	<3.3	1,480
4/5/18	1.4	<0.50	6.9	4/5/18	1,060	<3.3	1,600
10/3/18	1.4	<0.26	5.2	10/3/18	1,050	<2.6	1,670

**Historic VOC Monitoring Results**  
**Land and Gas Reclamation Landfill**  
(concentrations in ug/L)

W-3R				W-3AR			
Date	cis-1,2-DCE	TCE	VC	Date	cis-1,2-DCE	TCE	VC
<b>NR 140 ES</b>	<b>70</b>	<b>5</b>	<b>0.2</b>	<b>NR 140 ES</b>	<b>70</b>	<b>5</b>	<b>0.2</b>
11/13/1991		0	0	11/14/1991		5	770
5/29/1992		0	0	5/29/1992		78	1,000
6/17/1993		0	0.5	6/17/1993		57	1,300
6/21/1994		0	0	6/21/1994		12	720
4/14/1995	0	0	2.2	4/14/1995	1,200	6.6	110
10/4/1995	0	0	1.2	10/4/1995	1,200	12	1,400
4/4/1996	0	0	0	4/4/1996	1,000	0	550
10/12/1996	0	0	4	10/12/1996	1,800	13	1,100
4/10/1997	0	0	0.56	4/10/1997	1,100	0	740
10/3/1997	0	0	1.5	10/3/1997	1,200	0	780
4/7/1998	0.44	0	0.89	4/7/1998	1,000	0	720
10/14/1998	0	0	6.4	10/14/1998	1,200	0	660
4/6/1999	0.3	0	0.65	4/6/1999	900	0	710
10/6/1999	0.27	0	2.9	10/7/1999	1,200	0	650
4/3/2000	0.29	0	0.17	4/3/2000	1,000	0	890
10/3/2000	0	0	0.133	10/3/2000	1,100	0	404
4/3/2001	0	0	0	4/3/2001	1,050	0	554
10/2/2001	0	0	2.74	10/2/2001	1,130	0	901
4/4/2002	0	0	0	4/4/2002	1,150	0	375
10/1/2002	0	0	14.1	10/1/2002	1,230	0	446
4/1/2003	0	0	0.703	4/1/2003	674	0	601
10/8/2003	0	0	1.98	10/8/2003	712	0	407
4/7/2004	0	0	0	4/7/2004	753	0	519
10/4/2004	0	0	0	10/4/2004	685	0	626
4/1/2005	0	0	0	4/1/2005	567	0	265
10/1/2005	0	0	0	10/1/2005	628	0	258
4/6/2006	0	0	0	4/6/2006	700	1.15	352
10/5/2006	0	0	0	10/4/2006	450	0	279
4/4/2007	0	0	0	4/4/2007	418	0	402
10/22/2007	<0.2	<0.2	3.20	10/22/2007	421	<2	410
4/11/2008	<0.3	<0.4	14.30	4/11/2008	476	<4	382
10/9/2008	<0.3	<0.4	5.32	10/9/2008	322	<4	281
4/7/2009	<0.3	<0.4	2.48	4/7/2009	351	0.8	357
10/7/2009	<0.4	<0.4	<0.2	10/7/2009	339	<4.0	358
4/7/10	<0.4	<0.4	0.95	4/7/10	339	<4	334
10/27/10	<0.4	<0.4	2.46	10/27/10	257	<4	194
4/6/11	<0.4	<0.4	3.14	4/6/11	201	0.51	256
10/5/11	<0.4	<0.4	1.45	10/5/11	170	<4	181
4/11/12	<0.4	<0.4	3.18	4/11/12	190	0.51	205
10/2/12	<0.83	<0.48	18.50	10/2/12	183	0.55	190
4/1/13	<0.83	<0.48	2.90	4/4/13	164	<0.48	146
10/3/13	<0.42	<0.36	3.40	10/3/13	87.8	<0.33	99.3
1/9/14	<0.42	<0.36	3.70	1/9/14	146	<0.36	211
4/2/14	0.26	<0.33	2.00	4/2/14	145	0.39	175
10/7/14	0.35	<0.33	4.00	10/7/14	145	<0.33	196
4/17/15	<0.26	<0.33	1.50	4/17/15	111	<0.33	112
10/7/15	0.27	<0.33	1.70	10/7/15	110	<0.33	118
4/6/16	<0.26	<0.33	<0.18	4/6/16	121	<0.33	129
10/6/16	0.39	<0.33	2.5	10/6/16	125	0.5	178
4/5/17	<0.26	<0.33	5.10	4/5/17	92.6	<0.33	78.4
10/3/17	<0.26	<0.33	12.90	10/3/17	53.5	<0.33	47.7
4/5/18	<0.26	<0.33	5.60	4/5/18	88.9	<0.66	63.3
10/4/18	<0.27	<0.26	6.40	10/4/18	74.5	0.36 J	60.7

**Historic VOC Monitoring Results  
Land and Gas Reclamation Landfill**

(concentrations in ug/L)

MW-210				MW-210A				MW-210B			
Date	cis-1,2-DCE	TCE	VC	Date	cis-1,2-DCE	TCE	VC	Date	cis-1,2-DCE	TCE	VC
NR 140 ES	70	5	0.2	NR 140 ES	70	5	0.2	NR 140 ES	70	5	0.2
12/6/1991		0	0	12/6/1991		0	180	12/6/1991		0	0
5/28/1992		0	0	5/28/1992		0	200	5/27/1992		0	0
				6/17/1993		7	370				
7/6/1994		0	28.3	7/6/1994		8.6	220	7/6/1994		0	0
4/14/1995	41	0	27	4/14/1995	1,400	13	350	4/14/1995	0	0	0
10/4/1995	26	0	22	10/4/1995	1,600	20	600	10/4/1995	0	0	0
4/4/1996	32	0	27	4/4/1996	1,900	35	450	4/4/1996	0	0	0
10/12/1996	12	0	7.9	10/12/1996	2,300	47	670	10/12/1996	0	0	0
4/10/1997	13	0	20	4/10/1997	1,900	38	420	4/10/1997	0	0	0
10/3/1997	10	0	23	10/3/1997	1,700	66	480	10/3/1997	0	0	0
4/7/1998	6.5	0	14	4/7/1998	1,600	57	540	4/7/1998	0	0	0
10/15/1998	46	0	44	10/15/1998	1,600	47	510	10/15/1998	0	0	no data
4/6/1999	7.3	0	10	4/6/1999	1,200	40	500	4/6/1999	0	0	0
10/11/1999	98	0	240	10/11/1999	800	40	440	10/11/1999	0	0	0
4/4/2000	2.9	0	6.3	4/4/2000	820	32	440	4/4/2000	0	0	0
10/5/2000	1.61	0	5.3	10/5/2000	372	0	157	10/5/2000	0	0	0
4/5/2001	1.12	0	2.47	4/5/2001	421	0	214	4/5/2001	0	0	0
10/3/2001	1.21	0	13.2	10/3/2001	520	55.9	425	10/3/2001	0	0	0
4/4/2002	0.384	0	3.22	4/4/2002	730	0	206	4/4/2002	0	0	0
10/3/2002	1.59	0	12.8	10/3/2002	940	0	327	10/3/2002	0	0	0
4/2/2003	0	0	0.386	4/2/2003	401	0	233	4/2/2003	0	0	0.591
10/8/2003	0	0	1.02	10/8/2003	293	10	29.2	10/8/2003	0	0	0.274
4/7/2004	0	0	0.383	4/7/2004	272	0	76.3	4/7/2004	0	0	0.891
10/5/2004	0	0	1.46	10/5/2004	230	7.38	45.6	10/5/2004	0	0	1.15
4/1/2005	0	0	0	4/1/2005	220	0	52.7	4/1/2005	0	0	0.549
10/1/2005	0	0	0	10/1/2005	220	0	29.5	10/1/2005	0	0	0.706
5/6/2006	0.82	0	0	5/6/2006	252	7.32	109	5/6/2006	0	0	1.13
10/4/2006	0.49	0	0.45	10/4/2006	184	5.62	45.2	10/4/2006	0	0	1.65
5/30/2007	0.28	0	0.23	5/30/2007	198	5.66	33.7	5/30/2007	0	0	1.42
10/25/2007	0.23	<0.2	<0.2	10/25/2007	251	5.71	73.2	10/25/2007	<2	<2	<2
5/27/2008	<0.3	<0.4	<0.2	5/27/2008	237	8.1	74.1	5/27/2008	0.51	<0.4	<0.2
10/9/2008	0.41	<0.4	<0.2	10/9/2008	325	7.72	124	10/9/2008	<0.3	<0.4	2.26
10/7/2009	0.63	<0.4	0.65	10/7/2009	284	5.3	125	10/7/2009	<0.4	<0.4	2.72
4/7/10	0.56	<0.4	0.43	4/7/10	222	4.66	111	4/7/10	<0.4	<0.4	2.64
11/29/10	0.64	<0.4	<0.2	11/29/10	192	<4	87.6	11/29/10	<0.4	<0.4	2.5
4/8/11	0.66	<0.4	0.46	4/8/11	163	<4	94.7	4/8/11	<0.4	<0.4	2.76
10/6/11	0.64	<0.4	0.48	10/6/11	177	<4	120	10/6/11	<0.4	<0.4	2.52
4/11/12	0.66	<0.4	0.54	4/11/12	164	3.54	74.3	4/11/12	<0.4	<0.4	2.5
10/1/12	<0.83	<0.48	1.1	10/1/12	182	3.8	28.3	10/1/12	<0.83	<0.48	2.2
4/2/13	<0.83	<0.48	0.21	4/2/13	169	2.6	102	4/2/13	<0.2	<0.48	3.5
10/2/13	<0.42	<0.36	0.19	10/2/13	221	2.2	97.4	10/2/13	<0.29	<0.36	3.4
5/20/14	0.32	<0.33	<0.18	5/20/14	215	2.1	95.3	5/20/14	<0.26	<0.33	3.6
10/8/14	0.43	<0.33	<0.18	10/8/14	235	2.3	103	10/8/14	<0.26	<0.33	3.2
4/16/15	<0.50	<0.33	<0.18	4/16/15	296	1.7	149	4/16/15	<0.26	<0.33	4.1
10/9/15	<0.26	<0.33	<0.18	10/9/15	332	1.5	124	10/9/15	<0.26	<0.33	3.3
4/7/16	0.36	<0.33	0.19	4/7/16	360	1.9	104	4/7/16	<0.26	<0.33	3.6
10/6/16	0.44	<0.33	0.23	10/6/16	542	2.4	85.5	10/6/16	<0.26	<0.33	4.4
4/5/17	<0.26	<0.33	<0.18	4/5/17	461	2	71.7	4/5/17	<0.26	<0.33	3.7
10/6/17	0.32	<0.33	0.2	10/6/17	440	2.3	64.7	10/6/17	<0.26	<0.33	3.4
4/5/18	0.39J	<0.33	<0.18	4/5/18	330	1.9 J	86	4/5/18	<0.26	<0.33	4.3

**Historic VOC Monitoring Results  
Land and Gas Reclamation Landfill**


(concentrations in ug/L)

MW-214				MW-214A			
Date	cis-1,2-DCE	TCE	VC	Date	cis-1,2-DCE	TCE	VC
NR 140 ES	70	5	0.2	NR 140 ES	70	5	0.2
6/9/1992		0	0	6/9/1992		0	0
7/6/1994		0	0	7/6/1994		0	0
10/4/1995	0	0	0	10/4/1995	0	0	0
4/4/1996	0	0	0	4/4/1996	0	0	0
10/12/1996	0	0	0	10/12/1996	0	0	0
4/10/1997	0	0	0	4/10/1997	0	0	0
4/7/1998	0	0	0	4/7/1998	0	0	0
4/6/1999	0	0	0	4/6/1999	0	0	0
4/6/2000	0	0	0	4/6/2000	0	0	0
10/4/2001	0	0	0	10/4/2001	0	0	0
10/3/2002	0	0	0	10/3/2002	0	0	0
10/8/2003	0	0	0	10/8/2003	0	0	0.225
10/6/2004	0	0	0	10/6/2004	0	0	0.912
10/1/2005	0	0	0	10/1/2005	0	0	0.488
10/5/2006	0	0	0	10/4/2006	0	0	1.67
10/24/07 <sup>(2)</sup>	<0.2	<0.2	2.93	10/24/07 <sup>(2)</sup>	<0.2	<0.2	<0.2
3/14/2008	<0.3	<0.4	<0.2	3/14/2008	<0.3	<0.4	4.74
10/9/2008	<0.3	<0.3	<0.4	10/9/2008	<0.3	<0.4	6.54
10/7/2009	<0.4	<0.4	<0.2	10/7/2009	<0.4	<0.4	15.1
10/27/10	<0.4	<0.4	<0.2	10/27/10	<0.4	<0.4	16.9
10/6/11	<0.4	<0.4	<0.2	10/3/11	<0.4	<0.4	23.4
10/1/12	<0.83	<0.48	<0.18	10/1/12	<0.83	<0.48	29.6
10/3/13	<0.42	<0.36	<0.18	10/1/13	<0.42	<0.36	19.3
10/7/14	<0.26	<0.33	<0.18	10/7/14	<0.26	<0.33	45.6
10/7/15	<0.26	<0.33	<0.18	10/7/15	<0.26	<0.33	37
10/6/16	<0.26	<0.33	<0.18	10/6/16	<0.26	<0.33	34.5
10/3/17	<0.26	<0.33	<0.18	10/3/17	<0.26	<0.33	41
10/4/18	<0.27	<0.26	<0.17	10/4/18	<0.27	<0.26	44.5

**Historic VOC Monitoring Results**  
**Land and Gas Reclamation Landfill**  
(concentrations in ug/L)

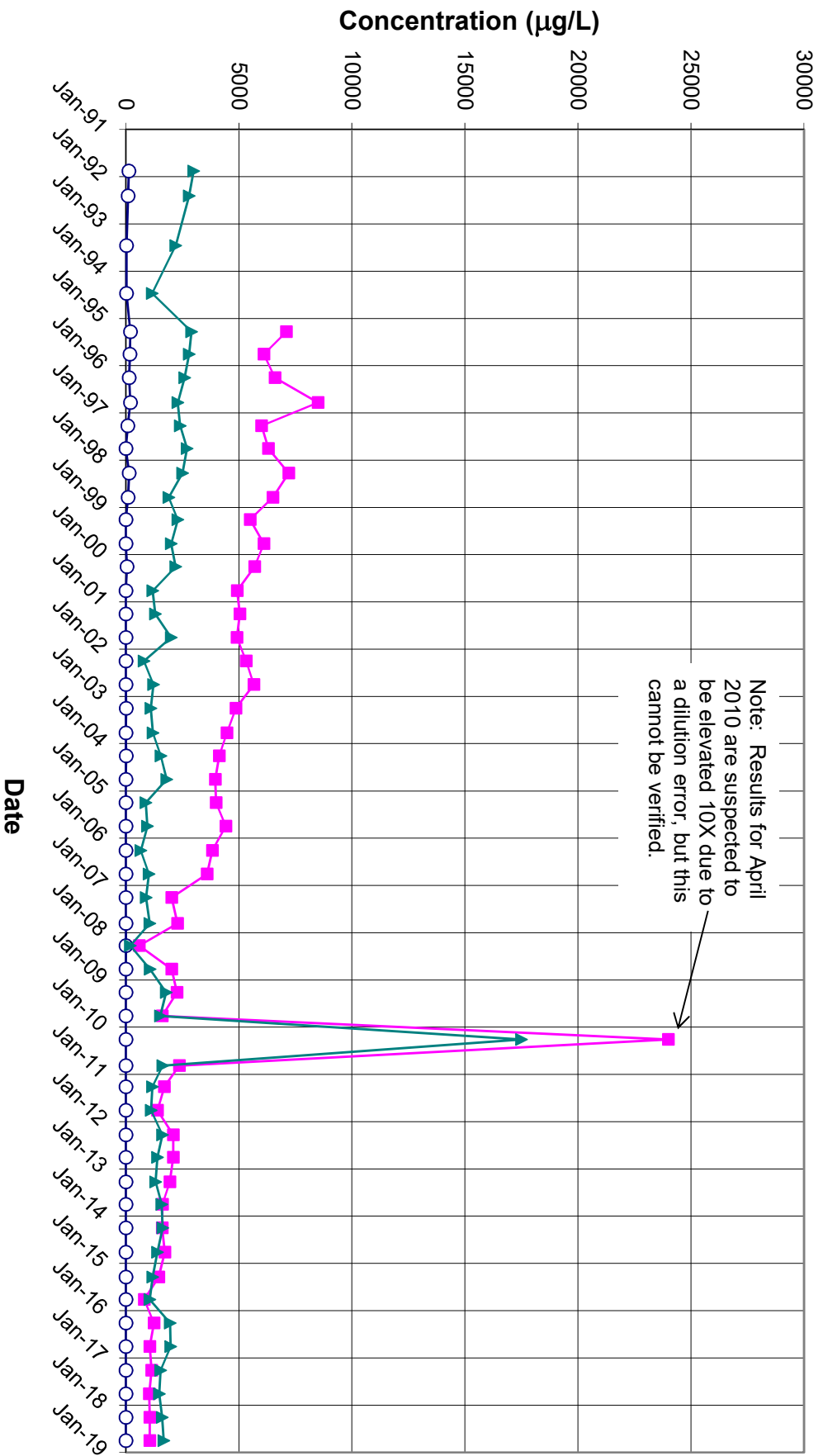
Notes: (1) Results for MW-1AR for April 2010 are suspected to be elevated 10 times due to a dilution error, but this cannot be verified.  
(2) Based on sample results for MW-214 and MW-214A for October 2007, it appears that the sample vials were switched, but this cannot be confirmed.

Updated for 2018 by: ACW, 3/27/2019  
Checked for 2018 by: AJR, 3/27/2019  
Reviewed for 2018 by: MDB, 4/1/2019

 Shaded cell indicates well was not sampled on a date when one or more other wells in the table was sampled

I:\25219008.00\Deliverables\Annual Report Graphs\LGRL VOC graphs 2018.xls>Data Table for Report

# MW-1AR



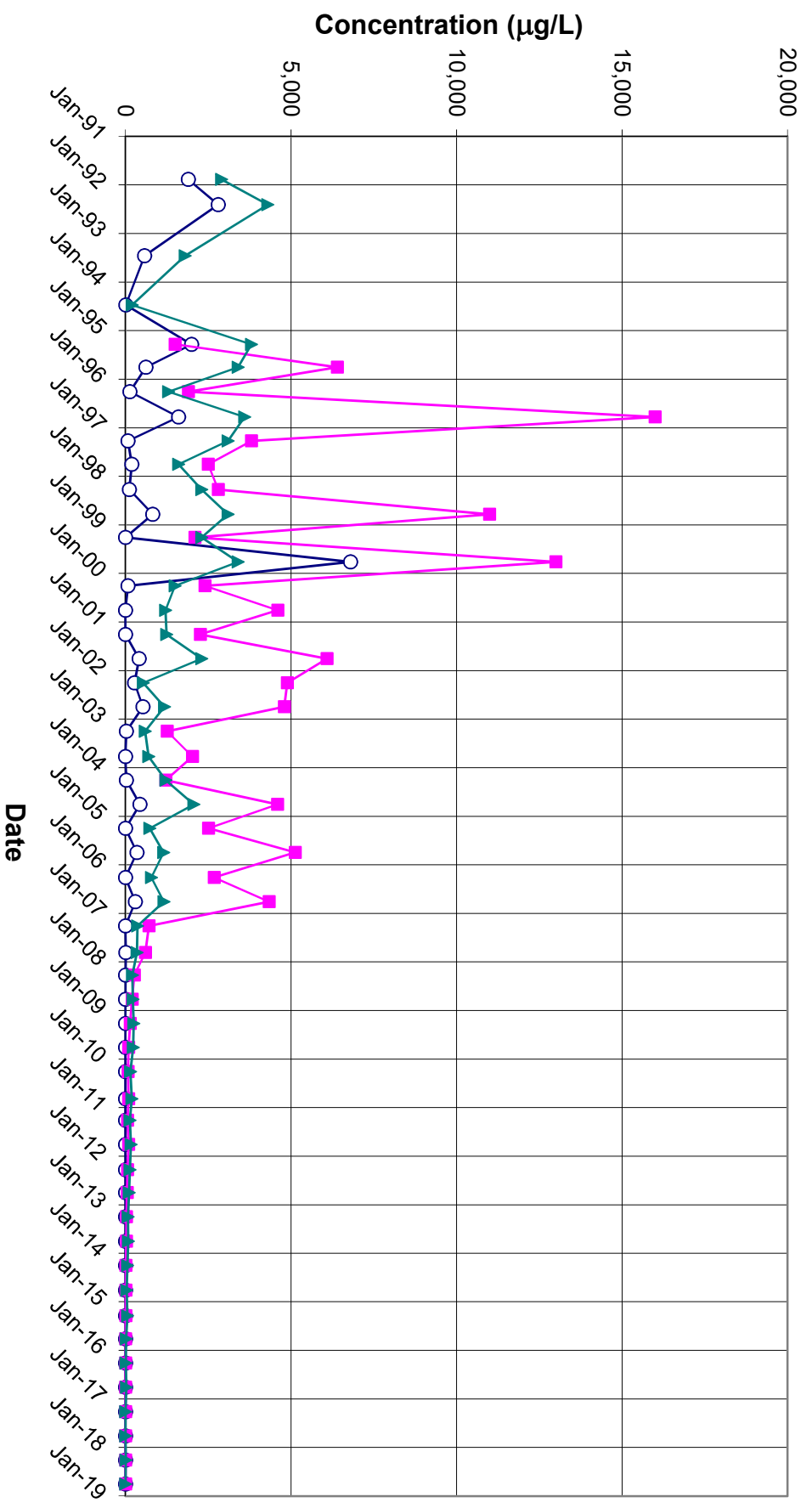
Note: Results for April 2010 are suspected to be elevated 10X due to a dilution error, but this cannot be verified.

Note: Non-detect results plotted as 0 µg/L.

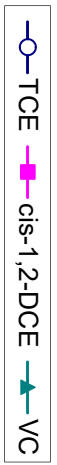
○ TCE    ■ cis-1,2-DCE    ▲ VC



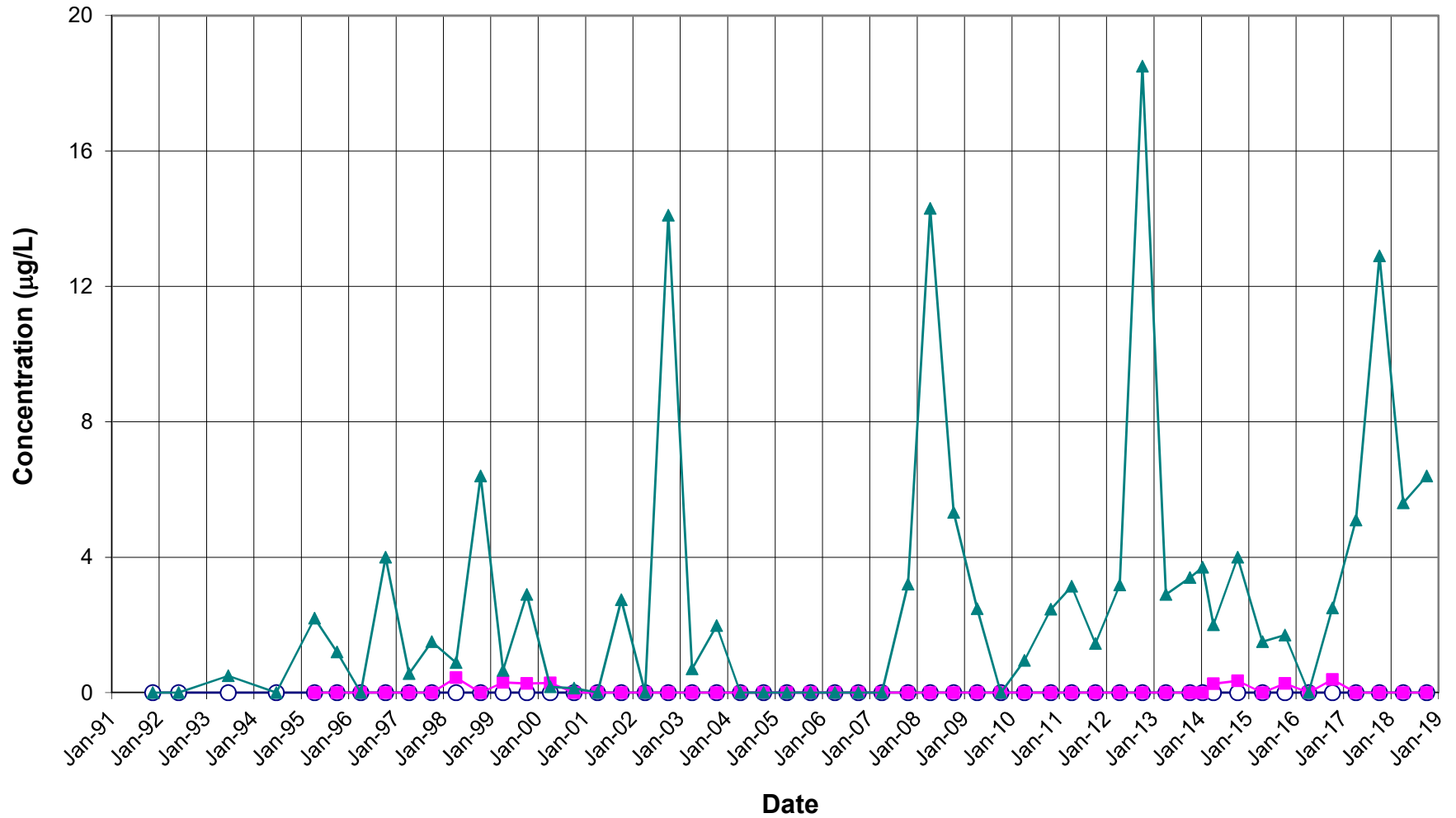
# MW-1RR



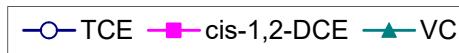
Note: Non-detect results plotted as 0 µg/L.



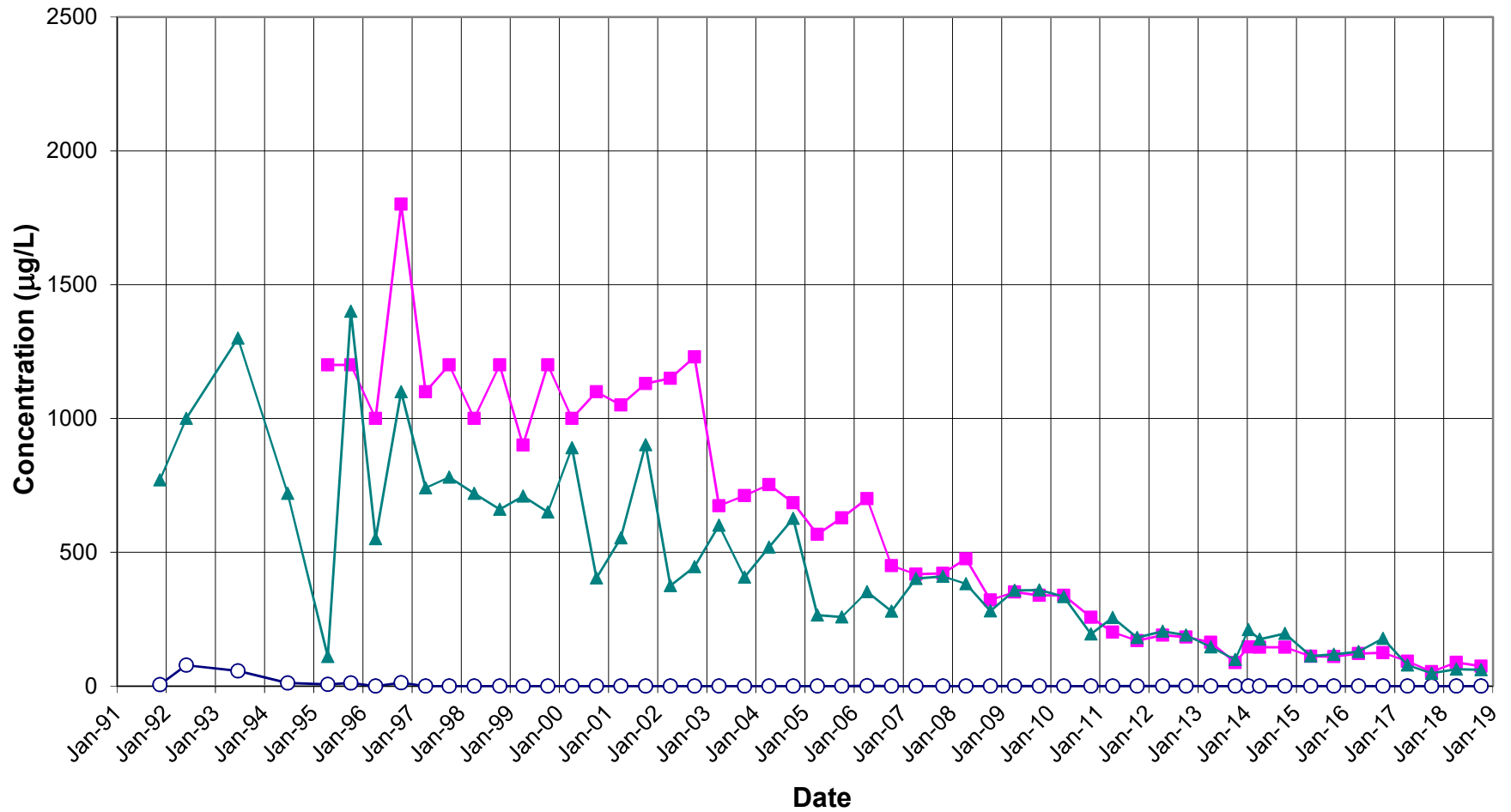
# W-3R



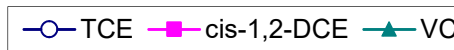
Note: Non-detect results plotted as 0 µg/L.



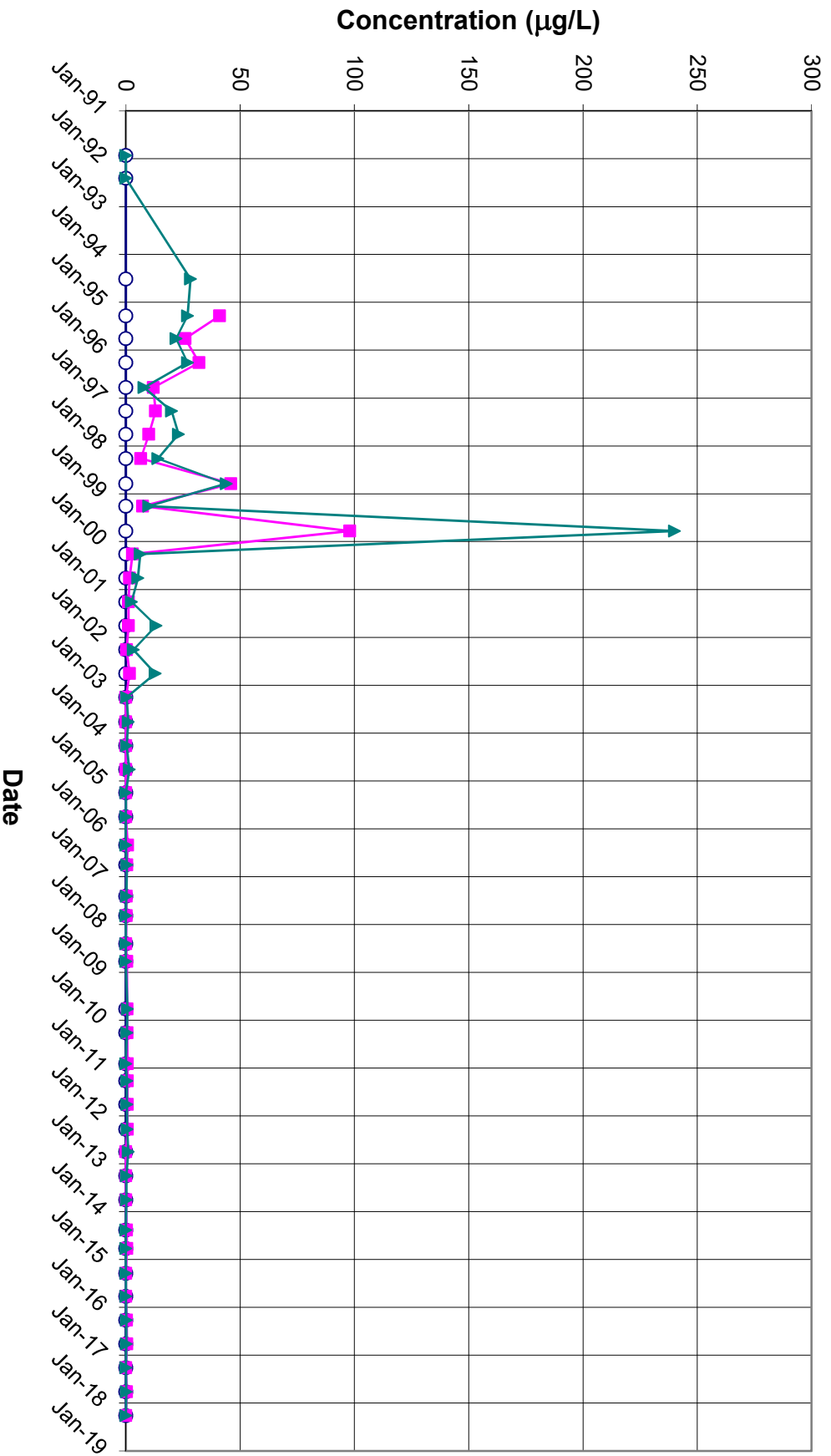
# W-3AR



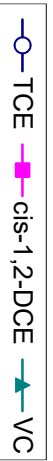
Note: Non-detect results plotted as 0 µg/L.



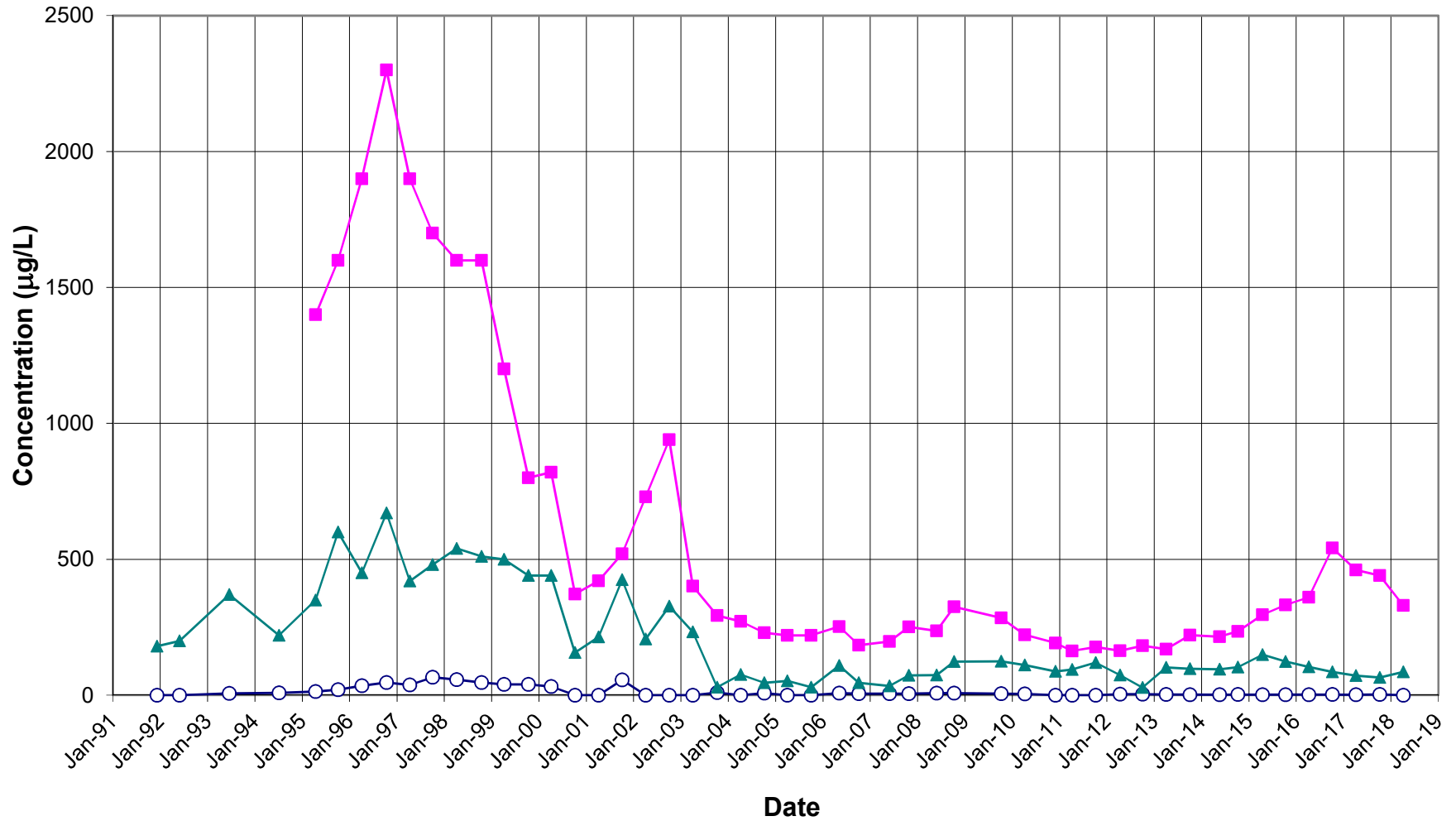
# MW-210



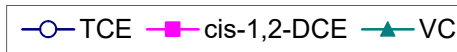
Note: Non-detect results plotted as 0 µg/L.



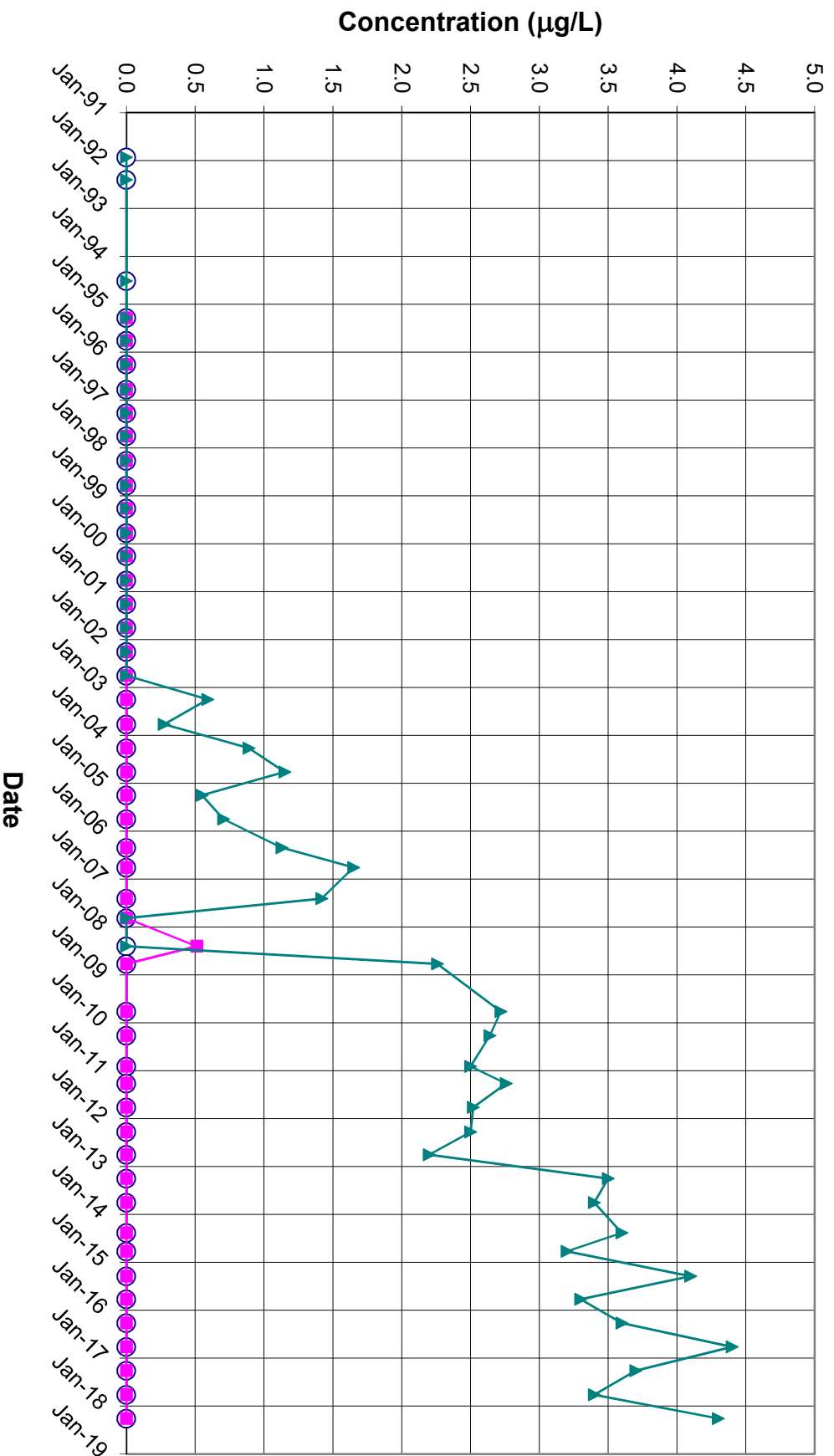
# MW-210A



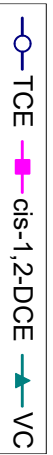
Note: Non-detect results plotted as 0 µg/L.



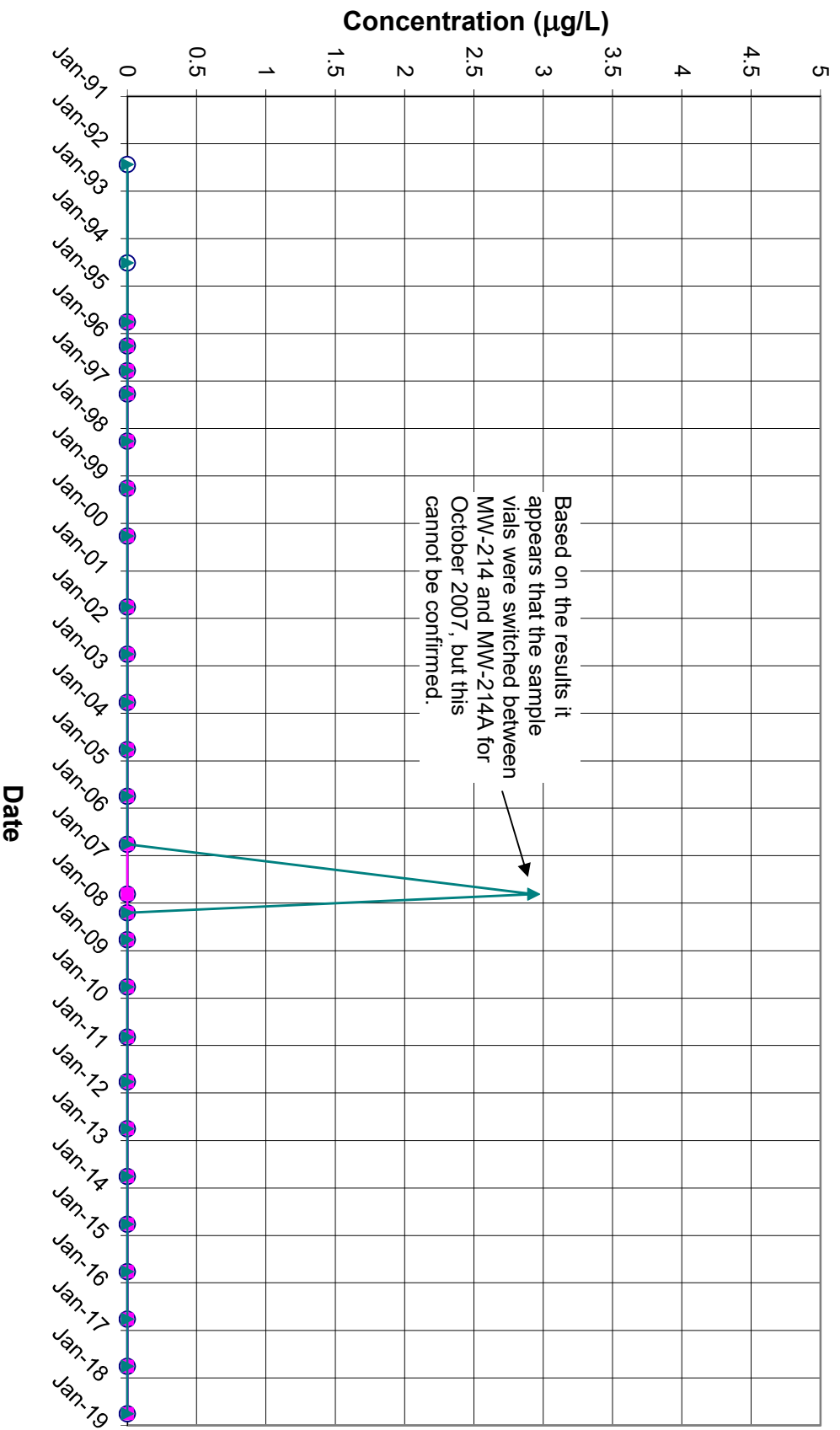
# MW-210B



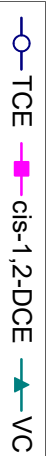
Note: Non-detected results plotted as 0 µg/L.



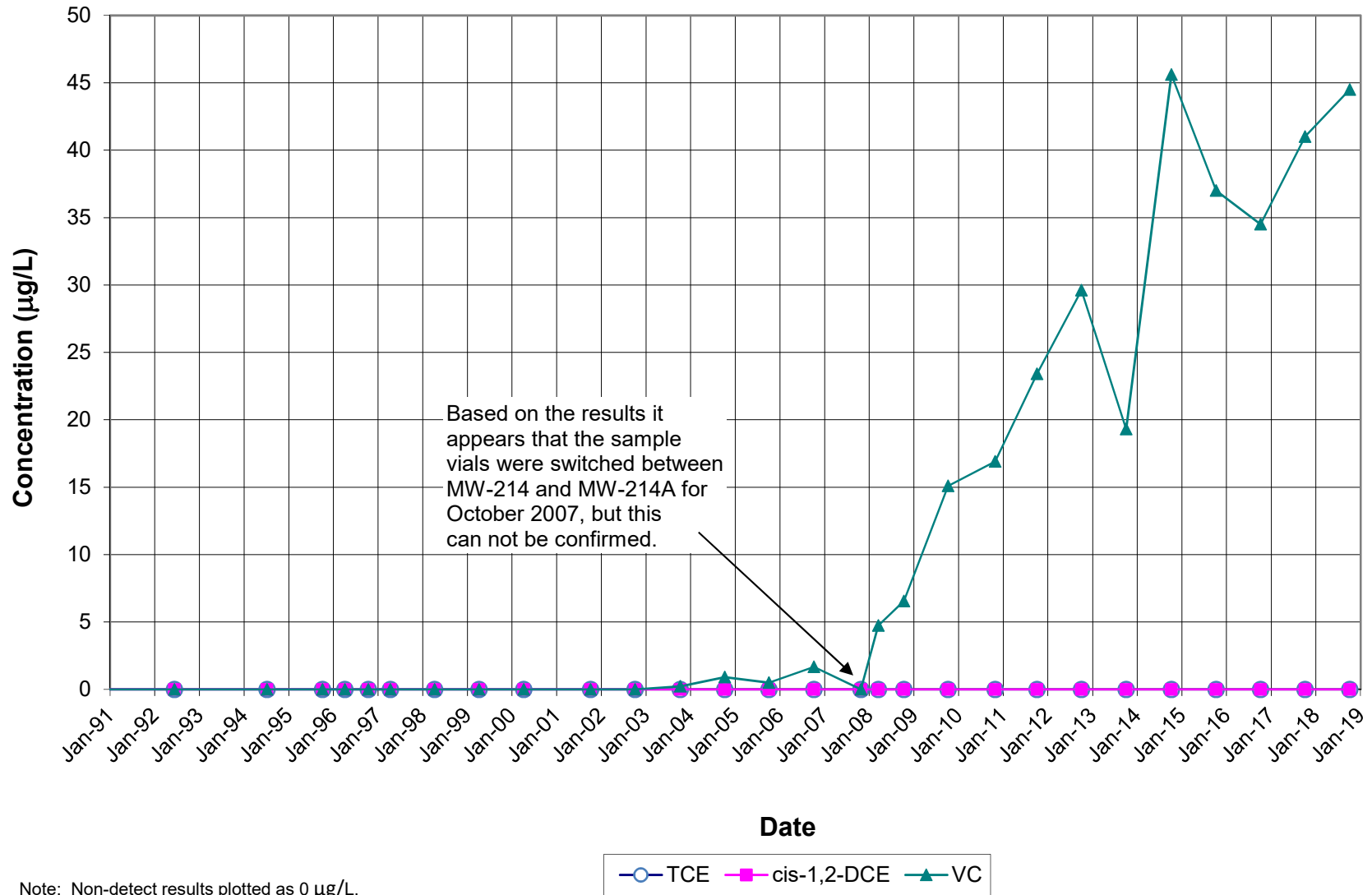
# MW-214



Note: Non-detect results plotted as 0  $\mu\text{g/L}$ .



# MW-214A

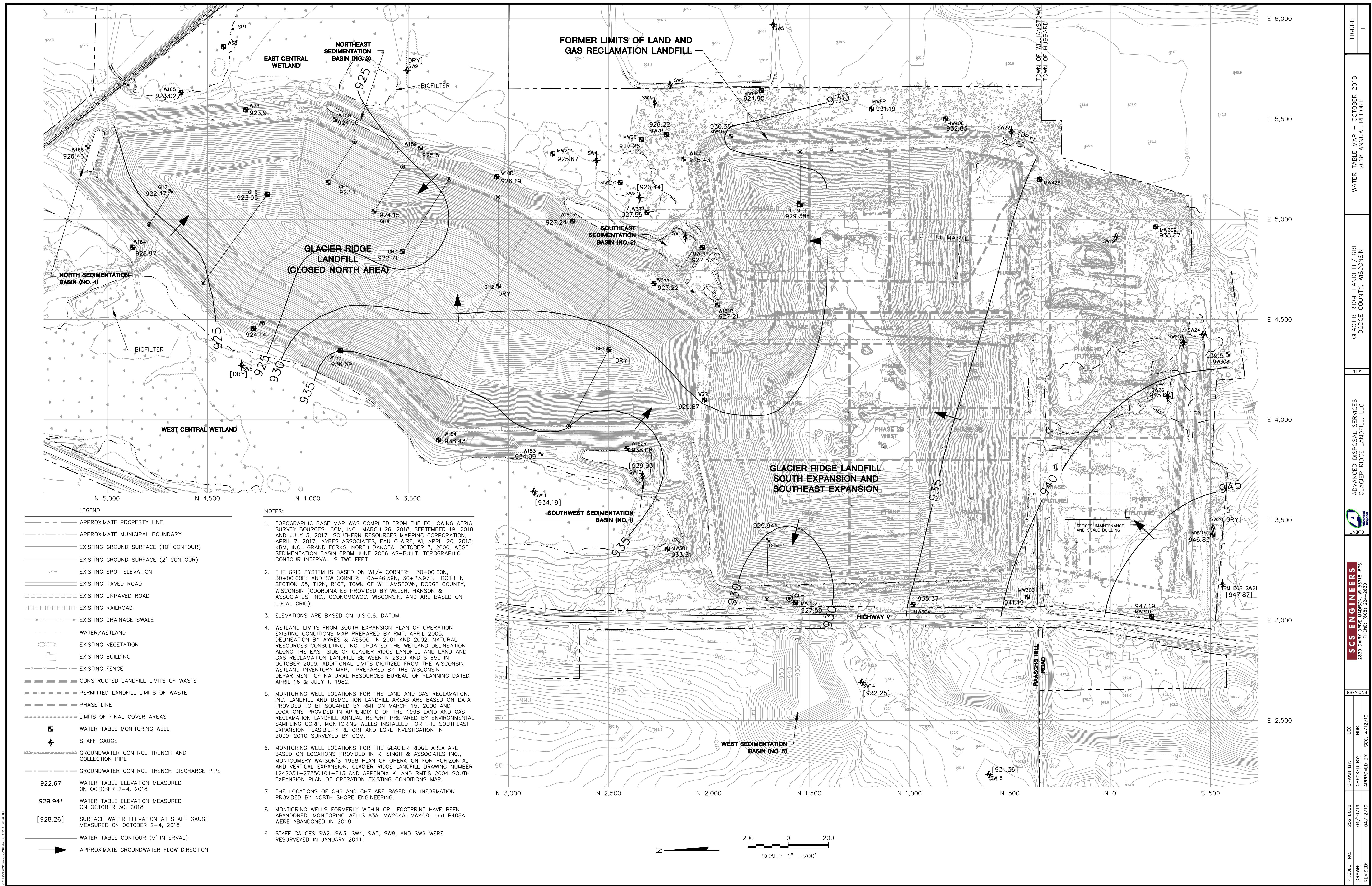




## **APPENDIX B**

### **Figure**

#### **Figure 1: Groundwater Table Map: October 2018**



**LEGEND**

- APPROXIMATE PROPERTY LINE
- APPROXIMATE MUNICIPAL BOUNDARY
- EXISTING GROUND SURFACE (10' CONTOUR)
- EXISTING GROUND SURFACE (2' CONTOUR)
- EXISTING SPOT ELEVATION
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- ||||| EXISTING RAILROAD
- EXISTING DRAINAGE SWALE
- WATER/WETLAND
- EXISTING VEGETATION
- EXISTING BUILDING
- EXISTING FENCE
- CONSTRUCTED LANDFILL LIMITS OF WASTE
- PERMITTED LANDFILL LIMITS OF WASTE
- PHASE LINE
- LIMITS OF FINAL COVER AREAS
- ☒ WATER TABLE MONITORING WELL
- ◆ STAFF GAUGE
- GROUNDWATER CONTROL TRENCH AND COLLECTION PIPE
- GROUNDWATER CONTROL TRENCH DISCHARGE PIPE

922.67 WATER TABLE ELEVATION MEASURED ON OCTOBER 2-4, 2018

929.94\* WATER TABLE ELEVATION MEASURED ON OCTOBER 30, 2018

[928.26] SURFACE WATER ELEVATION AT STAFF GAUGE MEASURED ON OCTOBER 2-4, 2018

--- WATER TABLE CONTOUR (5' INTERVAL)

➔ APPROXIMATE GROUNDWATER FLOW DIRECTION

- NOTES:**
1. TOPOGRAPHIC BASE MAP WAS COMPILED FROM THE FOLLOWING AERIAL SURVEY SOURCES: COM, INC., MARCH 26, 2018, SEPTEMBER 19, 2018 AND JULY 3, 2017; SOUTHERN RESOURCES MAPPING CORPORATION, APRIL 7, 2017; AYRES ASSOCIATES, EAU CLAIRE, WI, APRIL 20, 2013; KBM, INC., GRAND FORKS, NORTH DAKOTA, OCTOBER 3, 2000. WEST SEDIMENTATION BASIN FROM JUNE 2006 AS-BUILT. TOPOGRAPHIC CONTOUR INTERVAL IS TWO FEET.
  2. THE GRID SYSTEM IS BASED ON W1/4 CORNER: 30+00.00N, 30+00.00E; AND SW CORNER: 03+46.59N, 30+23.97E. BOTH IN SECTION 35, T12N, R16E, TOWN OF WILLIAMSTOWN, DODGE COUNTY, WISCONSIN (COORDINATES PROVIDED BY WELSH, HANSON & ASSOCIATES, INC., OCONOMOWOC, WISCONSIN, AND ARE BASED ON LOCAL GRID).
  3. ELEVATIONS ARE BASED ON U.S.G.S. DATUM.
  4. WETLAND LIMITS FROM SOUTH EXPANSION PLAN OF OPERATION EXISTING CONDITIONS MAP PREPARED BY RMT, APRIL 2005. DELINEATION BY AYRES & ASSOC. IN 2001 AND 2002. NATURAL RESOURCES CONSULTING, INC. UPDATED THE WETLAND DELINEATION ALONG THE EAST SIDE OF GLACIER RIDGE LANDFILL AND LAND AND GAS RECLAMATION LANDFILL BETWEEN N 2850 AND S 650 IN OCTOBER 2009. ADDITIONAL LIMITS DIGITIZED FROM THE WISCONSIN WETLAND INVENTORY MAP, PREPARED BY THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES BUREAU OF PLANNING DATED APRIL 16 & JULY 1, 1982.
  5. MONITORING WELL LOCATIONS FOR THE LAND AND GAS RECLAMATION, INC. LANDFILL AND DEMOLITION LANDFILL AREAS ARE BASED ON DATA PROVIDED TO BT SQUARED BY RMT ON MARCH 15, 2000 AND LOCATIONS PROVIDED IN APPENDIX D OF THE 1998 LAND AND GAS RECLAMATION LANDFILL ANNUAL REPORT PREPARED BY ENVIRONMENTAL SAMPLING CORP. MONITORING WELLS INSTALLED FOR THE SOUTHEAST EXPANSION FEASIBILITY REPORT AND LGRL INVESTIGATION IN 2009-2010 SURVEYED BY COM.
  6. MONITORING WELL LOCATIONS FOR THE GLACIER RIDGE AREA ARE BASED ON LOCATIONS PROVIDED IN K. SINGH & ASSOCIATES INC., MONTGOMERY WATSON'S 1998 PLAN OF OPERATION FOR HORIZONTAL AND VERTICAL EXPANSION, GLACIER RIDGE LANDFILL, DRAWING NUMBER 1242051-27350101-F13 AND APPENDIX K, AND RMT'S 2004 SOUTH EXPANSION PLAN OF OPERATION EXISTING CONDITIONS MAP.
  7. THE LOCATIONS OF GH6 AND GH7 ARE BASED ON INFORMATION PROVIDED BY NORTH SHORE ENGINEERING.
  8. MONITORING WELLS FORMERLY WITHIN GRL FOOTPRINT HAVE BEEN ABANDONED. MONITORING WELLS A3A, MW204A, MW408, and P408A WERE ABANDONED IN 2018.
  9. STAFF GAUGES SW2, SW3, SW4, SW5, SW8, AND SW9 WERE RESURVEYED IN JANUARY 2011.

