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March 18, 2024 Project No. TR0837I

Andrew Smith
Site Manager
Washington Department of Ecology
Southwest Regional Office
300 Desmond Drive
Lacey, WA 98503

Dear Mr. Smith:

Re: Remedial Action Operation and Maintenance and Groundwater Monitoring Annual Report – 2023
Bonneville Power Administration Site
Consent Order No. 97206045

On behalf of Occidental Chemical Corporation, Geosyntec Consultants is submitting the enclosed "Remedial Action Operation and Maintenance and Groundwater Monitoring Annual Report 2023". This report summarizes the operation and maintenance (O&M) activities and groundwater monitoring results for the period of November 2022 through November 2023 and presents an overview of the effectiveness of the Site remedy.

Based on the review of the Site remedy and Compliance Monitoring Program analytical data it is concluded that:

- The Remedial Action has been effective in addressing the concerns for protection of human health and the environment as laid forth in the Consent Decree.
- No further remedial action is required at the Site at this time.

Should you have any questions, require additional information, or wish to meet to discuss the performance of the Remedial Action, please do not hesitate to contact us.

Yours truly,

Geosyntec Consultants

Rick Bieber

cc: R. Bakemeier (Bakemeier PC)
C. Babcock (GSHI)
I. Richardson (Geosyntec)

Geosyntec consultants

engineers | scientists | innovators

Remedial Action Operation and Maintenance and Groundwater Monitoring Annual Report – 2023

Bonneville Power Administration Site
Tacoma, Washington
Consent Order No. 97206045

Prepared for

Occidental Chemical Corporation
605 Alexander East Ave
Tacoma, WA 98421

Prepared by

Geosyntec Consultants
520 Pike Street, Suite 2600
Seattle, WA 98101

Project Number TR0837D

February 2023

Executive Summary

In March 1997, Occidental Chemical Corporation (OCC) and the Bonneville Power Administration (BPA) entered into a Consent Decree with the Washington Department of Ecology (Ecology) to provide for the performance of a Remedial Action (RA) at the Site. The RA included excavation of impacted fill materials and soils and placement of these excavated materials in an on Site engineered landfill. The RA was considered complete on August 24, 1998.

The RA Operation and Maintenance (O&M) Program includes the performance of routine Site inspections, compliance monitoring of groundwater, and comprehensive annual reporting to evaluate the effectiveness of the RA in addressing the concerns of Ecology, stated in the Consent Decree as follows:

i) Ongoing impact of groundwater in the Lower Sand unit by volatile organic compounds (VOCs) in buried sludge and soils

ii) Potential for direct human exposure to asbestos contained in the sludge

iii) Potential for direct human exposure to metal contained in grit and shot

iv) Potential surface and groundwater impacts from metals contained in the grit and shot

The O&M Program commenced with baseline groundwater monitoring in September 1998 following completion of the RA. This annual report has been prepared covering the period of November 2022 through November 2023.

The results of the O&M and Compliance Monitoring activities demonstrate that:

i) The security and integrity of the landfill was maintained throughout this reporting period; therefore, there was no potential for direct human exposure to impacted materials.

ii) There were no systematic increases in the concentrations of monitoring parameters in groundwater during this reporting period; therefore, there is no ongoing impact of chemicals to groundwater in the Lower Sand unit.

The O&M activities and Compliance Monitoring performed during this reporting period demonstrate that the RA is effective in mitigating Ecology's concerns for human health exposure and groundwater impacts.

Table of Contents

List of Tables

List of Figures

List of Appendices

1. Introduction

The Bonneville Power Administration (BPA) property (Site) is located at the corner of Taylor Way and Highway 509 in Tacoma, Washington. In the late 1960s and early 1970s, fill material from the Occidental Chemical Corporation (OCC) Tacoma facility was deposited at the Site. At about the same time, baghouse grit/shot material from an unidentified source was also placed at the Site.

In March 1997, OCC and BPA entered into a Consent Decree with the Washington Department of Ecology (Ecology) to provide for the performance of a Remedial Action (RA) at the Site. The RA included excavation of impacted fill materials and soils and placement of these excavated materials in an on-Site engineered landfill. The RA was considered complete on August 24, 1998.

An RA Operation and Maintenance (O&M) Plan was submitted to Ecology with the remedial design documents. The RA O&M Plan includes the performance of routine Site inspections, compliance monitoring of groundwater, and comprehensive annual reporting. The O&M Program commenced in September 1998.

This report presents the annual report for the period of November 2022 through November 2023. The report is organized as follows:

i) Section 1 Introduction: The introduction presents a brief summary of the project history and the organization of the report.

ii) Section 2 Operation and Maintenance Activities: The O&M activities performed during this reporting period are discussed in Section 2.

iii) Section 3 Compliance Monitoring: The groundwater compliance monitoring activities performed during this reporting period are described in Section 3 and the resultant data are presented.

iv) Section 4 Assessment of Site Conditions: An assessment of the Site conditions in terms of the effectiveness of the remedy is presented in Section 4.

v) Section 5 Conclusions and Recommendations: Section 5 presents the conclusions drawn from the Site assessment.

The current project coordinators for the Site are:

Ecology:

Mr. Andrew Smith
300 Desmond Drive
Lacey, Washington 98503

BPA:

Chad Browning
Environmental Engineer
707 W. Main Street, Suite 500
Spokane, Washington 99201-0641

OCC:

Mr. Clint Babcock
Director Operations
Glenn Springs Holdings, Inc.
605 Alexander Avenue
Tacoma, WA 98421

The designated Site Custodian is:

Geosyntec:

520 Pike Street, Suite 2600
Seattle, WA 98101
Telephone: (253) 993-0190
The primary contact at Geosyntec is Rick Bieber.

2. Operation and Maintenance Activities

O&M activities performed during this reporting period included Site inspections and compliance monitoring. The O&M activities were performed by GHD, on behalf of OCC in accordance with the requirements of the "Operation and Maintenance Plan" (May 1997) with the modifications approved by Ecology in letters dated August 3, 1998, September 16, 1998, March 18, 1999, and November 14, 2003. The approved modifications consist of:

i) The use of monitoring well 9-30 instead of monitoring well 5-21 (August 3, 1998)

ii) The use of low-flow well purging and sampling techniques in the Compliance Monitoring Plan (CMP) (September 16, 1998)

iii) Revision of the analyte list for compliance monitoring (March 18, 1999, and November 14, 2003)

iv) Reduction in monitoring points from 7 to 2 (November 14, 2003)

v) Reduction in the frequency of sampling from semi-annual to annual (November 14, 2003)

vi) Installation of a replacement well for 1-20 in 2020

vii) Following the 2020 review Ecology requested the addition of monitored natural attenuation parameters bringing the new target analytes list to the following:

Table 2.0 Target Analytes		
Matrix	Analyte	Method
GW	SSPL VOCs (annual)	8260
GW	Dissolved Gases (methane , ethane, ethene)	RSK 175
GW	Total Iron and Manganese	200.7
GW	Dissolved Iron and Manganese	200.7
GW	Chloride, Sulfate	300
GW	Total Organic Carbon	9060A
GW	Nitrate	300

2.1 Site Inspections and Corrective Actions

Site inspections were performed on a quarterly basis during this reporting period. Observations were logged on inspection log sheets. The inspection log sheets for the 2023 reporting period are contained in Appendix A.

Descriptions of the inspection observations are presented in the following subsections. No deficiencies requiring corrective action were observed during this reporting period.

2.1.1 Security

The security features include landfill perimeter fence, fence gates and locks, and signs. Each feature was examined during each Site inspection. No damage to security features was noted and the integrity of the security features was maintained. The security features and their conditions during this reporting period are described below.

Perimeter Fence

No damage to the perimeter fence was identified during the quarterly inspections conducted for this reporting period.

Gates and Locks

No damage to perimeter fence gates or locks was identified during the quarterly inspections conducted for this reporting period.

Signs

All signs were in place and legible.

2.1.2 Site

The Site features include final and vegetative covers, drainage swales, and monitoring wells. Each of these features was examined during each Site inspection. The integrity of the Site features was maintained. The condition of the Site features during this reporting period is described below.

Final and Vegetative Covers

No surface cracking or failure of the landfill cap was observed during this reporting period. Issues identified during the quarterly inspections included deep rooted vegetation and stressed vegetation due to area drought. The deep rooted growth was hand pulled during maintenance activities in September 2023. Mowing of the entire mound was conducted following the hand removal of weeds. The cut vegetation was raked and removed. No burrows were observed during recent inspections and during the mowing of the cap, GHD will continue to monitor for the presence of burrowing animals during quarterly inspections.

Drainage Swales

No erosion or excessive buildup of sediment was identified in the drainage swales during the quarterly inspections conducted for this reporting period. Limited vegetation has begun to encroach on the drainage swales. In September 2023 contractors applied an Ecology approved herbicide to knock back the vegetation from the rockery in the swales and the vegetation has been significantly reduced.

Monitoring Wells

The inspection of the monitoring wells was conducted in November 30, 2023 and included the verification of the presence and condition of well caps and locks, integrity of protective casings, and inspection for settlement or displacement of the wells. Each of the wells were found in proper working order.

2.2 Routine Maintenance

The O&M Plan requires that the landfill cap vegetative cover be fertilized and maintained as necessary. In September 2023 crews hand removed the deep-rooted vegetation and sprayed the encroaching vegetation in the rockery in the swales. Mowing of the mound was completed following the hand weeding. Overall the landfill cap is in good condition and no repairs outside of the routine maintenance activities are required at this time.

3. Compliance Monitoring

The CMP is included as Appendix B of the O&M Plan. The groundwater CMP commenced in September 1998 at the completion of the RA. The CMP states that groundwater monitoring will be conducted semi-annually for 5 years following which a review will be conducted. The first 5-year review period ended in September 2003. A review of the groundwater monitoring program

was presented in the "Remedial Action Operation and Maintenance and Groundwater Monitoring Annual Report – 2004." Based on the review, a modified groundwater monitoring program was approved by Ecology (see letter from G. Barrett (Ecology) to C. Barron (CRA) dated November 14, 2003).

The second 5-year review period ended in September 2008. A review of the groundwater monitoring program was presented in the "Remedial Action Operation and Maintenance and Groundwater Monitoring Annual Report – 2008." There were no approved modifications to the CMP following the second 5-year review period; however, potentiometric contour lines have been added to the site plan, as recommended by Ecology (see letter from G. Barrett (Ecology) to J. Cornetta (CRA) dated February 4, 2008). A third 5-year review was completed by Ecology in 2014, results were presented in a March 2015 report. A fourth 5-year review was completed by Ecology in 2018 with results presented in the 2019 report. No amendments to the CMP were made following this review. In 2020 Ecology requested in response to public comment for natural attenuation parameters be added to the annual analysis. Starting in November 2020 to following parameters have been added to the sampling suite:

Compliance monitoring currently consists of:

- Metals – Iron, Iron (dissolved), Manganese, Manganese (dissolved)
- Dissolved Gases – Ethane, Ethene, Methane
- General Chemistry – Chloride, Nitrate (as N), Sulfate, Total organic carbon (TOC)

i) Annual hydraulic monitoring of all site monitoring wells

ii) Annual groundwater sample collection and analyses of two wells, 1-20 and 7-26

The monitoring wells included in the Site monitoring program are listed in Table 3.1 and shown on Figure 3.1.

3.1 Hydraulic Monitoring

Site-wide hydraulic monitoring is performed in conjunction with each groundwater sampling event. A tabulation of the groundwater elevations measured since the commencement of the CMP is presented in Table 3.2. Groundwater elevations, potentiometric contour lines and groundwater flow direction are presented on Figure 3.1.

3.2 Water Quality Monitoring

Groundwater samples were collected in accordance with the low-flow monitoring well purging and sample collection procedures approved by Ecology on September 16, 1998 with one exception. As noted above, GHD was unable to use the bladder pump lodged in the well. The sample was collected using a peristaltic pump following approval from Ecology. A sample collection summary log is contained in Appendix B.

Groundwater samples collected during this reporting period were analyzed for the parameters listed in Table 3.3. Cleanup levels for the monitoring parameters listed in Table 3.3 are the Model Toxic Control Act (MTCA) Method B groundwater levels, or the analytical method's Practical Quantitation Limit (PQL) where the Method B levels are lower than the PQL.

The groundwater analytical data generated during this reporting period and cleanup levels are presented in Table 3.4. The results are consistent with the historic data. The addition of the monitored natural attenuation (MNA) parameters are presented in table 3.5. As we collected more rounds of MNA data, trends will be plotted and presented in this section. The data validation for this reporting period is contained in Appendix C of this report. A complete groundwater analytical database is presented in Appendix D. All investigative samples were analyzed within the recommended holding time.

4. Assessment of Site Conditions

One of the purposes of the annual review of the O&M activities and monitoring data is to assess the current Site conditions in terms of the effectiveness of the RA.

Based upon the findings of the site investigations performed prior to the RA, Ecology stated the following concerns regarding fill materials present at the Site:

i) Ongoing impact to groundwater in the Lower Sand unit by volatile organic compounds (VOCs) in buried sludge and soils

ii) Potential for direct human exposure to asbestos contained in the sludge

iii) Potential for direct human exposure to metals contained in grit and shot

iv) Potential surface and groundwater impacts from metals contained in the grit and shot

These concerns were presented in Exhibit B, "Cleanup Action Plan," of the Consent Decree filed March 3, 1997.

The RA addressed each of these concerns through the removal of impacted sludge, grit, and shot and containment of these materials in the on-Site engineered landfill. Confirmatory analyses were performed on samples of in situ soils to confirm that concentrations of the Site compounds which exceeded the cleanup standards specified in Table 2 of Exhibit B of the Consent Decree did not remain following the completion of the RA.

The following subsections present evaluations of the current Site condition relative to these concerns. The evaluations are based upon the O&M activities performed during this reporting period and on the Compliance Monitoring data.

4.1 Direct Contact with Impacted Materials

The security and integrity of the landfill was maintained throughout this reporting period; therefore, there was no potential for direct human exposure to asbestos contained in sludge or metals contained in grit or shot.

4.2 Groundwater and Surface Water Impact

The sludge and soils containing concentrations of the Site compounds at concentrations exceeding the cleanup standards are isolated within the landfill and the integrity of the landfill was maintained throughout this reporting period. Therefore, the sludge or soils no longer represent a continuing source of VOCs or metals to groundwater or surface water.

The groundwater points of compliance are Lower Sand Unit monitoring wells located adjacent to the containment facility (MW-2) and at the downgradient boundaries of the Site (1-20, 2-27, 6-26, and 7-26). The locations of the points of compliance are shown on Figure 3.1. In the first 5-year review of the groundwater monitoring program conducted in November 2003, it was demonstrated that compliance with cleanup standards was achieved and maintained at all monitoring points except 1-20 and 7-26. Therefore, routine monitoring of the remaining compliance points is no longer required.

The 2023 groundwater sampling event was conducted on November 30, 2023. Samples were collected from monitoring wells 1-20 and 7-26. Data results for fall 2023 show an increase in vinyl chloride above site cleanup levels. The analytical data for cis-1,2-DCE and vinyl chloride in monitoring wells 1-20 and 7-26 have been graphed as shown on Figures 4.1 and 4.2. To assist in the evaluation of chemical presence at these locations, linear trend lines have been added to the graphs. The graphs show overall downward trends in the cis-1,2-DCE concentrations in these wells since the baseline monitoring event was conducted in September 1998. The graphs also show a downward trend in vinyl chloride concentrations in well 1-20 and stable concentrations in well 7-26.

For the last 8 years the concentrations of cis-1,2-DCE in well 1-20 have continued to show some variability hovering at or below the clean-up criteria for the site. Data results for fall 2023 show an increase in vinyl chloride above site cleanup levels. These detections are consistent with the historic data and the general decreasing trend of both contaminates continues. This increase will be further assessed following the fall 2024 sampling event. Continued monitoring is scheduled and appropriate.

The presence of cis-1,2-DCE, vinyl chloride, and ethene suggest that natural attenuation is occurring at the site. We will continue to monitor the MNA parameters and prepare trend graphics in subsequent sampling rounds. It is expected that, over time, the natural attenuation process will restore the Lower Sand groundwater to a quality that meets or exceeds the cleanup standards.

5. Conclusions and Recommendations

The O&M activities and Compliance Monitoring performed during this reporting period demonstrate that the RA remains effective in mitigating the concerns for human health exposure and groundwater impact that are stated in the Cleanup Action Plan. There is no further remedial action required at the Site at this time.

Tables

Table 3.1
Compliance Monitoring Points
Bonneville Power Administration Site
Taylor Way
Tacoma, Washington

Well No.	Hydraulic Monitoring	Water Quality
1-20	X	X
2-27	X	
6-26	X	
7-26	X	X
9-30	X	
MW-1	X	
MW-2	X	

Table 3.2
Summary of Groundwater Elevations
Bonneville Power Administration Site
Taylor Way
Tacoma, Washington

Well No.	Top of Casing*	Nov. 98	May 99	Nov. 99	May 00	Nov. 00	May 01	Nov. 01	May 02	Nov. 02
1-20	8.40	2.00	2.94	2.24	3.42	3.10	3.15	2.24	3.70	2.01
2-27	14.92	3.14	5.13	3.48	5.44	4.34	5.00	3.58	6.07	2.96
6-26	13.27	2.38	4.09	2.77	4.55	3.57	4.06	2.87	4.87	2.41
7-26	12.73	1.85	2.91	2.14	3.55	2.94	3.02	2.14	3.54	1.90
9-30	14.65	3.76	5.74	4.22	5.99	4.96	5.66	4.28	6.43	3.49
MW-1	13.97	2.42	4.03	1.87	4.48	4.06	4.11	NM	4.88	3.85
MW-2	12.32	2.12	3.03	2.42	3.92	3.23	3.28	2.25	3.85	NM

Well No.	Top of Casing*	May. 03	Nov. 03	Nov. 04	Nov. 05	Nov. 06	Nov. 07	Nov. 08	Nov. 09	Nov. 10
1-20	8.40	3.58	3.04	3.01	3.66	1.04	2.71	4.29	-0.36	4.39
2-27	14.92	5.76	5.02	4.81	5.34	3.18	4.16	6.36	6.30	6.60
6-26	13.27	4.66	4.04	3.86	4.59	2.49	3.45	5.73	5.39	5.76
7-26	12.73	3.46	2.86	2.92	3.58	1.91	2.73	4.15	3.20	4.38
9-30	14.65	6.28	5.68	5.52	5.82	3.82	4.74	6.27	6.14	6.68
MW-1	13.97	4.73	4.02	3.94	4.57	NM	3.11	5.56	5.42	5.59
MW-2	12.32	3.79	2.92	3.15	3.8	2.00	2.90	4.47	4.39	4.45

Well No.	Top of Casing*	Nov. 11	Nov. 12	Nov. 13	Nov. 14	Nov. 15	Nov. 16	Nov. 17	Nov. 18	Nov. 19
1-20	8.40	2.71	4.78	3.80	4.10	4.55	4.93	4.09	2.28	2.37
2-27	14.92	3.93	6.93	5.94	5.96	6.79	7.53	5.85	3.21	3.02
6-26	13.27	3.27	6.09	4.99	5.2	5.96	6.80	5.30	2.62	2.47
7-26	12.73	2.62	4.72	3.79	4.04	5.47	4.01	4.47	2.21	1.87
9-30	14.65	4.43	7.01	6.21	6.25	6.70	7.26	6.54	3.68	3.88
MW-1	13.97	3.17	5.92	4.92	5.12	5.71	6.51	4.30	1.99	2.37
MW-2	12.32	2.74	4.90	3.88	4.14	4.66	5.15	4.25	2.26	3.05

Well No.	Top of Casing*	Nov. 20	Nov. 21	Nov. 22	Nov. 23
1-20	12.40	2.37	4.7	2.4	4.22
2-27	14.92	3.02	7.12	3.02	4.37
6-26	13.27	2.47	6.49	2.57	4.22
7-26	12.73	1.87	4.93	2.8	4.93
9-30	14.65	3.88	6.35	3.26	5.07
MW-1	13.97	2.37	6.16	2.34	4.81
MW-2	12.32	3.05	4.82	2.32	4.06

Notes:
* Elevation surveyed January 2010. Vertical Datum: NGVD 29. Water level elevations updated based on 2010 survey. 1-20 replaced 202(
NM Not measured

Table 3.3
Groundwater Compliance Monitoring Analytical Parameters
Bonneville Power Administration Site
Taylor Way
Tacoma, Washington

Parameter[1]	Cleanup Level[2] (µg/L)
cis-1,2-Dichloroethene	70
Dichloromethane (methylene chloride)	5
Tetrachloroethene	5
Trichloroethene	5
Vinyl chloride	10*

Notes:

(1) Analytical parameter list modified in January 2004.

(2) Model Toxic Control Act (MTCA Method B Surface Water Standard, Cleanup Levels and Risk Calculations (CLARC), Version 3.1, updated November 2001.

* Practical Quantitation Limit (PQL), "Washington State Department of Ecology Toxics Cleanup Program, Guidance on Sampling and Data Analysis Methods," January 1995.

Table 3.4
Analytical Results Summary
Bonneville Power Administration Site
Taylor Way
Tacoma, Washington

Sample Location:			**1-20**	**7-26**	**7-26**
Sample ID:			**GW-113023-MM-1-20**	**GW-113023-MM-7-26**	**GW-113023-MM-7-26-DUP**
Sample Date:			**11/30/2023**	**11/30/2023**	**11/30/2023 (Duplicate)**
Parameter	**Units**	**Cleanup Level[(1)]**			
Volatile Organic Compounds					
cis-1,2-Dichloroethene	µg/L	70	28	5.2	5.3
Methylene chloride	µg/L	5	5.0U	5.0U	5.0U
Tetrachloroethene	µg/L	5	1.0U	1.0U	1.0U
Trichloroethene	µg/L	5	1.0U	1.0U	1.0U
Vinyl chloride	µg/L	10*	2.5	0.50	0.5

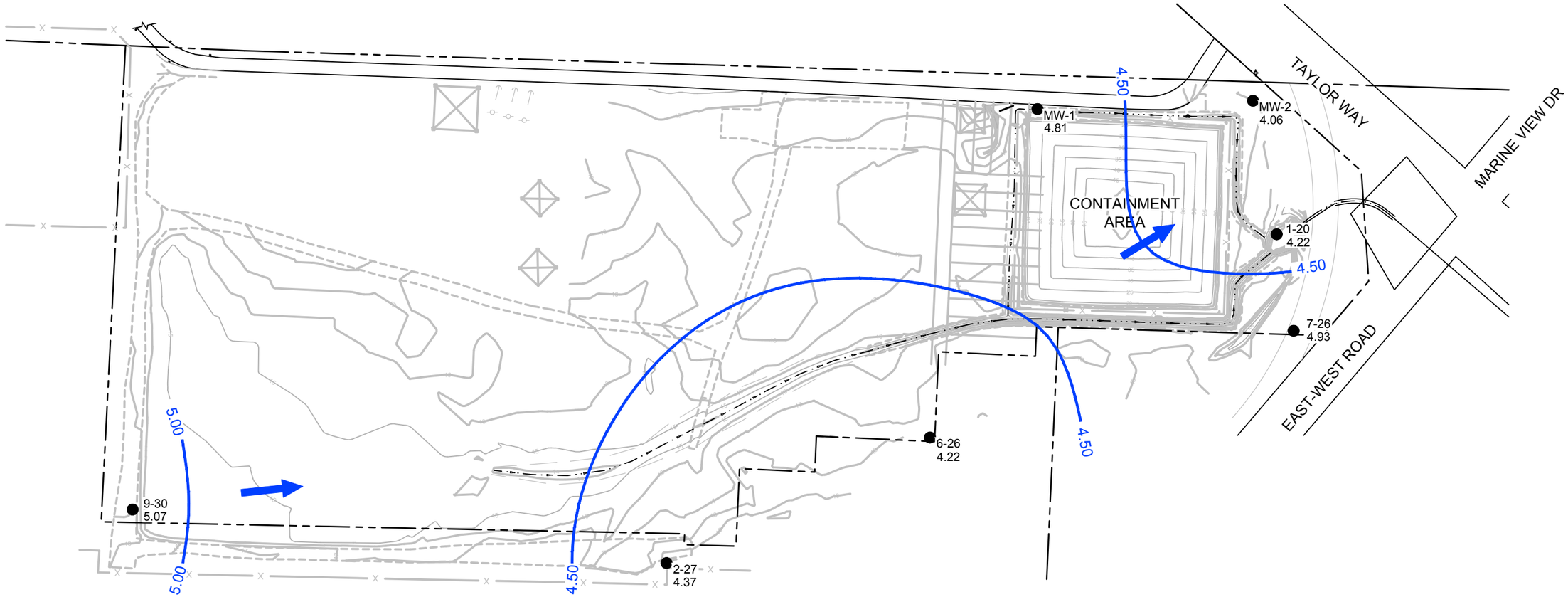
Notes:
(1) Model Toxic Control Act (MTCA Method B Surface Water Standard, Cleanup Levels and Risk Calculations (CLARC) Version 3.1, updated November 2001.
J Estimated.
U Non-detect at associated value.
* Practical quantitation limit.
Concentration exceeds the cleanup standard.

Table 3.5
Monitored Natural Attenuation Analytical Results Summary
Bonneville Power Administration Site
Taylor Way
Tacoma, Washington

	Sample Location:	1-20	7-26	7-26
	Sample ID:	GW-113023-MM-1-20	GW-113023-MM-7-26	GW-113023-MM-7-26-DUP
	Sample Date:	11/30/2023	11/30/2023	11/30/2023 (Duplicate)
Parameter	**Units**			
Dissolved Gases				
Ethane	µg/L	0.010U	0.010U	0.010U
Ethene	µg/L	0.010U	0.010U	0.010U
Methane	µg/L	0.16	0.59	0.55
Metals				
Iron	µg/L	41000	33000	31000
Iron (dissolved)	µg/L	40000	31000	31000
Manganese	µg/L	2700	3600	3500
Manganese (dissolved)	µg/L	2700	3300	3400
General Chemistry				
Chloride	µg/L	30	22	25
Nitrate (as N)	µg/L	0.15U	0.15U	0.15U
Sulfate	µg/L	45	25	22
Total organic carbon (TOC)	µg/L	33	50 U	18

Notes:
(1) Model Toxic Control Act (MTCA Method B Surface Water Standard, Cleanup Levels and Risk Calculations (CLARC), Version 3.1, updated November 2001.
J Estimated.
U Non-detect at associated value.
* Practical quantitation limit.
Concentration exceeds the cleanup standard.
- Not Sampled

Figures



LEGEND

- PROPERTY LINE
- 18 — FINAL CONTOUR LINE AND ELEVATION
- DITCH LINE
- 9-30 — MONITORING WELL
- 5.07 — GROUNDWATER ELEVATION (NGVD)
- 5.00 — GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION

0 75 150 ft

SCALE IN FEET

SITE PLAN AND GROUNDWATER CONTOUR MAP - NOVEMBER 2023

COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION SITE
TACOMA, WASHINGTON

Geosyntec consultants

PROJECT NO: TR0837 | FEBRUARY 2024 | FIGURE 3.1

\\SEATTLE-01\DATA\PROJECTS\OXYCHEM TR0837\900 GIS AND CAD\910 CAD\BPA ANNUAL REPORT 2023\TR0837-BPA ANNUAL REPORT 2023-G001 - Last Saved by: MJerome on 2/16/24

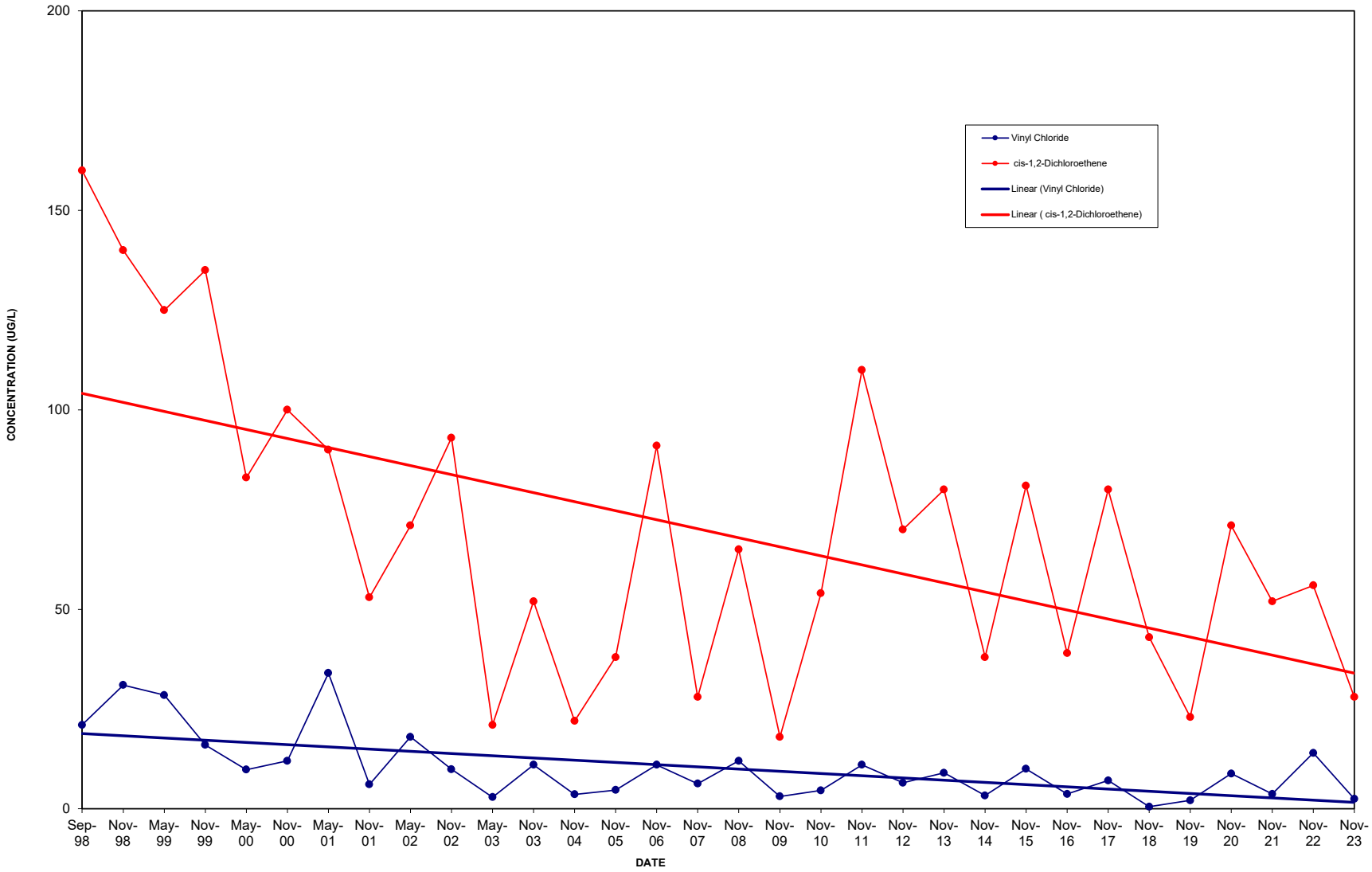


figure 4.1

CONCENTRATION VS. TIME - 1-20
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION
Tacoma, Washington

Geosyntec

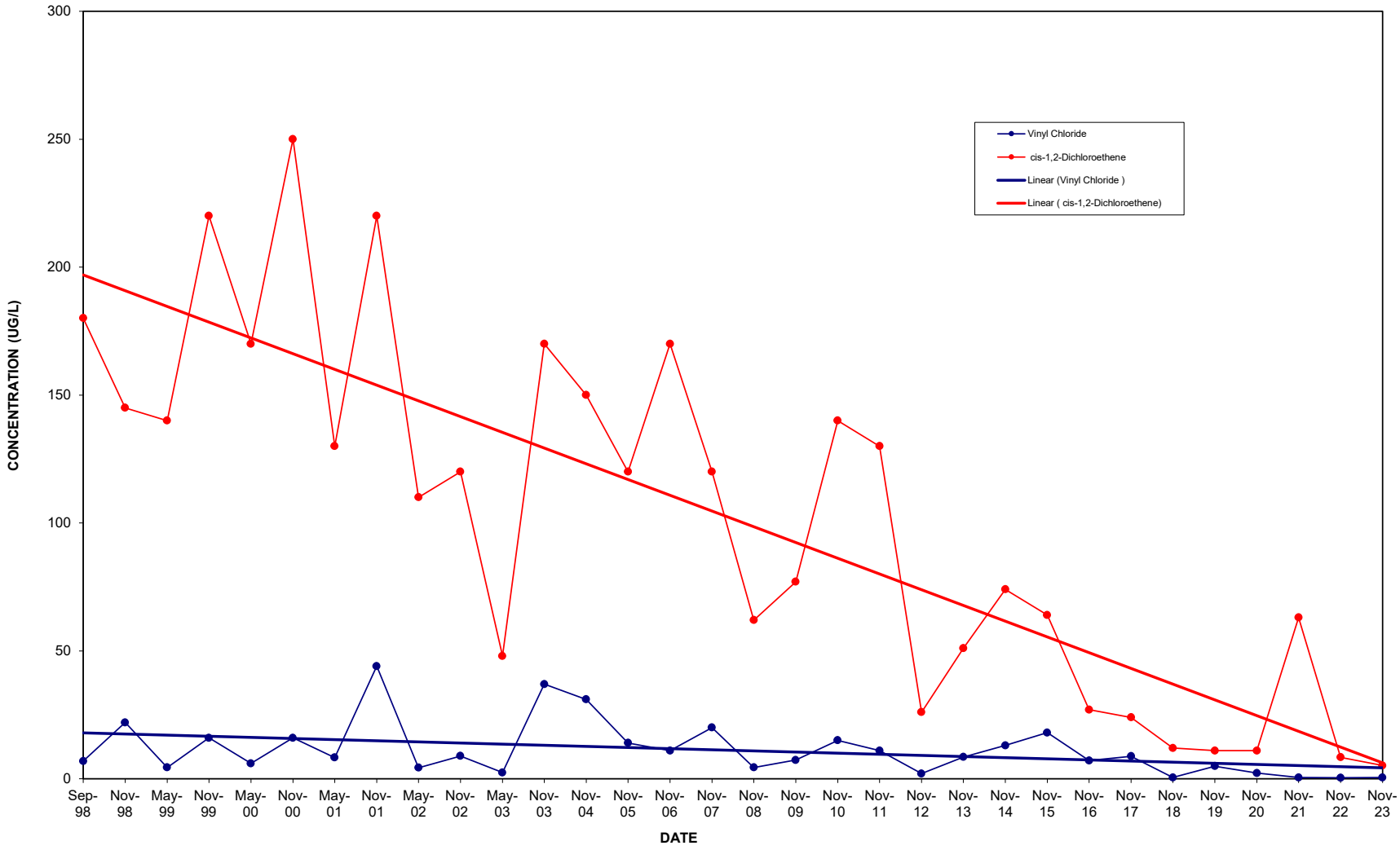


figure 4.2

CONCENTRATION VS. TIME - 7-26
COMPLIANCE MONITORING PROGRAM
BONNEVILLE POWER ADMINISTRATION
Tacoma, Washington

Geosyntec

Appendix A
Site Inspection Sheets

INSPECTION LOG SHEET
BONNEVILLE POWER ADMINISTRATION/OXYCHEM SITE
TACOMA, WASHINGTON

SITE

Specific Item		*No*	*Yes (If yes give details below)*
Erosion or Settlement of Low Permeability Cap		✓	
Surface Cracking or Failure of Cap Along Slopes		✓	
Emergence/Presence of Deep Rooted Vegetation (i.e. trees, brush, etc.)		✓	
Vegetation Burnout		✓	
Excessive Growth of Vegetation	Cap	✓	
	Drainage Swale		
Presence of Burrowing Mammals		✓	
Well Protective Casings and Appurtenances in Acceptable Condition			✓
Erosion of Drainage Swale/Ditch		✓	

Comments: If no problems with cap noted - state "No Problems Noted."
If problems noted summarize problems below and corrective actions taken, use additional sheets if necessary.

No problems noted

Rick Breber
(Inspector's Name - Please Print)

2/13/23
(Inspector's Signature and Date of Inspection)

INSPECTION LOG SHEET
BONNEVILLE POWER ADMINISTRATION/OXYCHEM SITE
TACOMA, WASHINGTON

SECURITY

Specific Item		*No*	*Yes (If yes give details below)*
Perimeter Fence (i.e. damage or excessive deterioration)		✓	
Gates and Locks (missing damaged or inoperable)		✓	
Signs (damaged, missing or no longer readable)		✓	
Comments: If no problems with perimeter fence, gates or locks noted - state "No Problems Noted." If problems noted summarize problems below and corrective actions taken, use additional sheets if necessary. No problems noted			

Rick Bieber
(Inspector's Name - Please Print)

(Inspector's Signature and Date of Inspection) 2/13/23

INSPECTION LOG SHEET
BONNEVILLE POWER ADMINISTRATION/OXYCHEM SITE
TACOMA, WASHINGTON

SITE

Specific Item		*No*	*Yes (If yes give details below)*
Erosion or Settlement of Low Permeability Cap		✓	
Surface Cracking or Failure of Cap Along Slopes		✓	
Emergence/Presence of Deep Rooted Vegetation (i.e. trees, brush, etc.)		✓	
Vegetation Burnout		✓	
Excessive Growth of Vegetation	Cap	✓	
	Drainage Swale		
Presence of Burrowing Mammals		✓	
Well Protective Casings and Appurtenances in Acceptable Condition			✓
Erosion of Drainage Swale/Ditch		✓	

Comments: If no problems with cap noted - state "No Problems Noted."
If problems noted summarize problems below and corrective actions taken, use additional sheets if necessary.

No problems noted

Rick Barber
(Inspector's Name - Please Print)

5/17/23
(Inspector's Signature and Date of Inspection)

INSPECTION LOG SHEET
BONNEVILLE POWER ADMINISTRATION/OXYCHEM SITE
TACOMA, WASHINGTON

SECURITY

Specific Item		*No*	*Yes (If yes give details below)*
Perimeter Fence (i.e. damage or excessive deterioration)		✓	
Gates and Locks (missing damaged or inoperable)		✓	
Signs (damaged, missing or no longer readable)		✓	
Comments: If no problems with perimeter fence, gates or locks noted - state "No Problems Noted." If problems noted summarize problems below and corrective actions taken, use additional sheets if necessary. No problems noted			

Rick Bebee
(Inspector's Name - Please Print)

5/17/20
(Inspector's Signature and Date of Inspection)

INSPECTION LOG SHEET
BONNEVILLE POWER ADMINISTRATION/OXYCHEM SITE
TACOMA, WASHINGTON

SITE

Specific Item		*No*	*Yes (If yes give details below)*
Erosion or Settlement of Low Permeability Cap		✓	
Surface Cracking or Failure of Cap Along Slopes		✓	
Emergence/Presence of Deep Rooted Vegetation (i.e. trees, brush, etc.)		✓	
Vegetation Burnout		✓	
Excessive Growth of Vegetation	Cap	✓	
	Drainage Swale	✓	
Presence of Burrowing Mammals		✓	
Well Protective Casings and Appurtenances in Acceptable Condition			✓
Erosion of Drainage Swale/Ditch		✓	

Comments: If no problems with cap noted - state "No Problems Noted."
If problems noted summarize problems below and corrective actions taken, use additional sheets if necessary.

No problems noted

Rick Bitner
(Inspector's Name - Please Print)

(Inspector's Signature and Date of Inspection) 9/17/21

INSPECTION LOG SHEET
BONNEVILLE POWER ADMINISTRATION/OXYCHEM SITE
TACOMA, WASHINGTON

SECURITY

Specific Item		*No*	*Yes (If yes give details below)*
Perimeter Fence (i.e. damage or excessive deterioration)		✓	
Gates and Locks (missing damaged or inoperable)		✓	
Signs (damaged, missing or no longer readable)		✓	

Comments: If no problems with perimeter fence, gates or locks noted - state "No Problems Noted."
If problems noted summarize problems below and corrective actions taken, use additional sheets if necessary.

No problems noted

Rich Bieber
(Inspector's Name - Please Print)

6/17/23
(Inspector's Signature and Date of Inspection)

INSPECTION LOG SHEET
BONNEVILLE POWER ADMINISTRATION/OXYCHEM SITE
TACOMA, WASHINGTON

SITE

Specific Item		*No*	*Yes (If yes give details below)*
Erosion or Settlement of Low Permeability Cap		✓	
Surface Cracking or Failure of Cap Along Slopes		✓	
Emergence/Presence of Deep Rooted Vegetation (i.e. trees, brush, etc.)		✓	
Vegetation Burnout		✓	
Excessive Growth of Vegetation	Cap	✓	
	Drainage Swale		
Presence of Burrowing Mammals			✓
Well Protective Casings and Appurtenances in Acceptable Condition		✓	
Erosion of Drainage Swale/Ditch		✓	

Comments: If no problems with cap noted - state "No Problems Noted."
If problems noted summarize problems below and corrective actions taken, use additional sheets if necessary.

No problems noted

L. de Bruler
(Inspector's Name - Please Print)

10/30/23
(Inspector's Signature and Date of Inspection)

INSPECTION LOG SHEET
BONNEVILLE POWER ADMINISTRATION/OXYCHEM SITE
TACOMA, WASHINGTON

SECURITY

Specific Item		*No*	*Yes (If yes give details below)*
Perimeter Fence (i.e. damage or excessive deterioration)		✓	
Gates and Locks (missing damaged or inoperable)		✓	
Signs (damaged, missing or no longer readable)		✓	
Comments: If no problems with perimeter fence, gates or locks noted - state "No Problems Noted." If problems noted summarize problems below and corrective actions taken, use additional sheets if necessary. No problems noted			

Rick Bielec
(Inspector's Name - Please Print)

11/30/23
(Inspector's Signature and Date of Inspection)

Appendix B
Groundwater Sample Collection Summary Logs

Table B
Sample Collection Data Sheet - Groundwater Sampling Program
Occidental Chemical Corporation
BPA Site
Tacoma, Washington

SAMPLE COLLECTION DATA SHEET - GROUNDWATER SAMPLING PROGRAM

PROJECT NAME: BPA — PROJECT NO.: TR0837

SAMPLING CREW MEMBERS: Matt Mohr — SUPERVISOR: R. Bieber

DATE OF SAMPLE COLLECTION: 11/30/2023

[Note: For 2" dia. well, 1 ft. = 0.14 gal (imp) or 0.16 gal (us)]

Sample I.D. Number	Well Number	Measuring Point Elev. (NGVD)	Water Depth (ft. btoc)	Water Elevation (NGVD)	Volume Flow (ml/min)	Volume Purged (gal US)	Field pH	Field Temp. (C)	Field Cond. (uS/cm)	Time	Sample Description & Analysis
GW-113023-MM-1-20	1-20	12.40	8.18	4.22	--	8	6.67	10.3	779	14:40	Clear
GW-113023-MM-7-26	7-26	12.73	7.6	5.13	--	9	6.85	12.3	599	12:45	Clear

Additional Comments: SAMPLE SET: 3 x 40ml glass w/ HCl preserve for VOC

Copies to: (1) MS / MSD taken
(2) field duplicate taken

Geosyntec consultants

Appendix C
Analytical Data Verification and Assessment

Data Verification Report

January 11, 2024

To	Rick Bieber-Geosyntec	**Project No.**	11218874
Copy to	File	**DVR No.**	N/A
From	Sheri Finn/eew/10	**Contact No.**	716-205-1977
Project Name	Biennial Groundwater Sampling-Tacoma	**Email**	Sheri.finn@ghd.com
Subject	Analytical Results and Data Verification Biennial Groundwater Sampling Glenn Springs Holdings, Inc. - Tacoma Tacoma, Washington November 2023		

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

1. Introduction

This document details a reduced validation of analytical results for groundwater samples collected in support of the Biennial Groundwater Monitoring at the Tacoma Site located in Tacoma, Washington during November 2023. Samples were submitted to ALS Environmental Laboratory located in Everett, Washington. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Standard GHD report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody form, finished report forms, method blank data, recovery data from surrogate spikes/laboratory control samples (LCS)/matrix spike/matrix spike duplicates (MS/MSD), and field QA/QC samples.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 1 and applicable guidance from the documents entitled:

i) January 2017 Guidelines for Organic Superfund Methods Data Review" (EPA-540-R-2017-002)

ii) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", United States Environmental Protection Agency (USEPA) 540-R-2017-001

Items i) and ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses is summarized in Table 3. The sample chain of custody document and analytical report were used to determine sample holding times. Samples were analyzed within the required holding times.

All samples were properly preserved, delivered on ice, and stored by the laboratory at the required temperature (0-6°C).

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries-Organic Analysis

In accordance with the method employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for volatile organic compounds (VOC) determinations were spiked with the appropriate number of surrogate compounds prior to sample analysis.

Surrogate recoveries were assessed against laboratory control limits. All surrogate recoveries met the laboratory criteria.

5. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the method employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

To evaluate the effects of sample matrices on the preparation process, measurement procedures, and accuracy of a particular analysis, samples are spiked with known concentrations of the analytes of concern and analyzed as MS/MSD samples. The relative percent difference (RPD) between the MS and MSD is used to assess analytical precision.

MS/MSD analysis was performed as specified in Table 1.

The MS/MSD sample was spiked with all analytes of interest. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

7. Field QA/QC Samples

The field QA/QC consisted of one trip blank and one field duplicate sample sets.

7.1 Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, a trip blank was submitted to the laboratory for VOC analysis. All results were non-detect for the compounds of interest.

7.2 Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, one field duplicate sample was collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with the duplicate sample must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criterion is one times the RL value.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

8. Analyte Reporting

The laboratory evaluated detected results down to the laboratory's method detection limit (MDL) for each analyte. No positive analyte detections less than the RL but greater than the MDL were reported. Non-detect results were presented as non-detect at the RL in Table 2.

9. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.

Regards

Sheri Finn
Analyst

Table 1

Sample Collection and Analysis Summary
Biennial Groundwater Monitoring
Glenn Springs Holdings, Inc. - Tacoma BPA
Tacoma, Washington
November 2023

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis					Comments
					Volatiles	Dissolved Gases	Metals	Total Organic Carbon	Chloride,Nitrate, Sulfate	
GW-113023-MM-1-20	MW1-20	Water	11/30/2023	15:00	X	X	X	X	X	MS/MSD
GW-113023-MM-7-26	MW7-26	Water	11/30/2023	12:45	X	X	X	X	X	
GW-113023-MM-7-26-DUP	MW7-26	Water	11/30/2023	12:50	X	X	X	X	X	Field Duplicate of GW-113023-MM-7-26
Trip Blank	-	Water	11/30/2023	08:00	X					Trip Blank

Notes:

"-" - Not applicable

MS/MSD - Matrix Spike/Matrix Spike Duplicate

Table 2

Analytical Results Summary
Biennial Groundwater Monitoring
Glenn Springs Holdings, Inc. - Tacoma BPA
Tacoma, Washington
November 2023

Location ID:		**MW1-20**	**MW7-26**	**MW7-26**	**Trip Blank**
Sample Name:		**GW-113023-MM-1-20**	**GW-113023-MM-7-26**	**GW-113023-MM-7-26-DUP**	**Trip Blank**
Sample Date:		**11/30/2023**	**11/30/2023**	**11/30/2023**	**11/30/2023**
				Duplicate	
Parameters	**Unit**				
Volatile Organic Compounds					
Chloroform (Trichloromethane)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	µg/L	2.5	0.50 U	0.50 U	0.50 U
Dissolved Gases					
Ethane	mg/L	0.010 U	0.010 U	0.010 U	--
Ethene	mg/L	0.010 U	0.010 U	0.010 U	--
Methane	mg/L	0.16	0.59	0.55	--
Metals					
Iron	µg/L	41000	33000	31000	--
Iron (dissolved)	µg/L	40000	31000	31000	--
Manganese	µg/L	2700	3600	3500	--
Manganese (dissolved)	µg/L	2700	3300	3400	--

Table 2

Analytical Results Summary
Biennial Groundwater Monitoring
Glenn Springs Holdings, Inc. - Tacoma BPA
Tacoma, Washington
November 2023

Location ID:		**MW1-20**	**MW7-26**	**MW7-26**	**Trip Blank**
Sample Name:		**GW-113023-MM-1-20**	**GW-113023-MM-7-26**	**GW-113023-MM-7-26-DUP**	**Trip Blank**
Sample Date:		**11/30/2023**	**11/30/2023**	**11/30/2023**	**11/30/2023**
				Duplicate	
Parameters	**Unit**				
General Chemistry					
Chloride	mg/L	30	22	25	--
Nitrate	mg/L	0.15 U	0.15 U	0.15 U	--
Sulfate	mg/L	45	25	22	--
Total organic carbon (TOC)	mg/L	33	50 U	18	--

Notes:

"--" - Not analyzed

U - Not detected at the associated reporting limit

Table 3

Analytical Method
Biennial Groundwater Monitoring
Glenn Springs Holdings, Inc. - Tacoma BPA
Tacoma, Washington
November 2023

Parameter	Method	Matrix	Holding Time Collection to to Analysis (Days)
Volatile Organic Compounds (VOCs)	SW-846 8260B	Water	14
Dissolved Gases	RSK-175	Water	28
Metals	EPA 200.8	Water	180
Total Organic Carbon(TOC)	SM 5310C	Water	28
Chloride, Nitrate,Sulfate	EPA 300	Water	48 hours/ 28

Notes:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, Third Edition, 1986, with subsequent revisions

EPA - “Methods for Chemical Analysis of Water and Waste,” EPA-600/4-79-020, revised March 1983, with subsequent revisions

SM - "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992, with subsequent revisions

Appendix D
Analytical Database

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**
Sample ID:		**W-7412-092398-MW1-20-DG**	**MW1-20-1198-TR**	**MW1-20-0599-TR**	**MWD1-0599-TR**	**MW1-20-1199-TR**	**MWD1-1199-TR**	**MW1-20-0500-TR**	**MW1-20-1100-TR**	**FD1-1100-TR**	**MW1-20-0501-TR**	**FD1-0501-TR**	**MW1-20-1101-TR**	**FD1-1101-TR**
Sample Date:		**9/23/1998**	**11/5/1998**	**5/12/1999**	**5/12/1999**	**11/8/1999**	**11/8/1999**	**5/9/2000**	**11/9/2000**	**11/9/2000**	**5/21/2001**	**5/21/2001**	**11/9/2001**	**11/9/2001**
					Duplicate		***Duplicate***			***Duplicate***		***Duplicate***		***Duplicate***
Parameter	***Units***													
Volatiles														
cis-1,2-Dichloroethene	µg/L	160 J	140 J	130	120	130	140	83	100	100	90	89	51	55
Methylene chloride	µg/L	5 J	5	5	5	1.0 U	1.0 U	2.3 U	4.0 U	10 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	5 J	5	5	5	1.0 U	1.0 U	1.0 U	4.0 U	10 U	2.5 U	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	9 J	8.0	4.1 J	4.4 J	3.4	3.6	2.2	1.2 J	10 U	1.7 J	1.7 J	1.3 J	1.3 J
Vinyl chloride	µg/L	21 J	31	25	32	16	16	9.8	12	12	33	34	5.8	6.4
Semi-Volatiles														
bis(2-Ethylhexyl)phthalate	µg/L	3.5J	3.5	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	1.3J	1.3	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	0.75	0.75	-	-	-	-	-	-	-	-	-	-	-
Metals														
Arsenic	µg/L	-	-	-	-	-	-	-	-	-	-	-	1.0 U	1.0 U
Arsenic (Dissolved)	µg/L	1.5	5.2	4.8	4.2	4.2 U	4.2 U	4.2 U	3.0 UJ	3.0 UJ	1.0 U	1.0 U	-	-
Lead	µg/L	-	-	-	-	-	-	-	-	-	-	-	3.0 U	3.0 U
Lead (Dissolved)	µg/L	5	5 J	5	5	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	3.0 UJ	3.0 UJ	-	-
Iron	µg/L													
Manganese	µg/L													
Manganese (Dissolved)	µg/L													
Dissolved Gases														
Ethane	µg/L													
Ethene	µg/L													
Methane	µg/L													
General Chemistry														
Chloride	mg/l													
Nitrate (as N)	mg/l													
Sulfate	mg/l													
Total Organic Carbon (TOC)	mg/l													

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**
Sample ID:		**MW1-20-0502-TR**	**FD1-0502-TR**	**MW1-20-1102-DC**	**FD1-1102-DC**	**I-20-0503**	**FD1-0503**	**1-20-1103**	**1-20-1104**	**1-20-1105-NR-001**	**1-20-1105-NR-002**	**1-20-1106-ILM-001**	**1-20-1107-ILM-001**	**GW-111408-TG-BPA-1-20-01**
Sample Date:		**5/1/2002**	**5/1/2002**	**11/14/2002**	**11/14/2002**	**5/8/2003**	**5/8/2003**	**11/11/2003**	**11/11/2004**	**11/18/2005**	**11/18/2005**	**11/3/2006**	**11/2/2007**	**11/14/2008**
			Duplicate		***Duplicate***		***Duplicate***				***Duplicate***			
Parameter	***Units***													
Volatiles														
cis-1,2-Dichloroethene	µg/L	72	71	94	91	22 UJ	19	52	22 J	38 J	160J	91	28 J	65
Methylene chloride	µg/L	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5UJ	2.5U	2.5U	2.5 U
Tetrachloroethene	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5UJ	2.5U	2.5U	2.5 U
Trichloroethene	µg/L	2.5 U	2.5 U	2.0 J	1.9 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5UJ	0.43J	2.5U	0.26 J
Vinyl chloride	µg/L	18	18	10	9.8	3.1	2.7	11	3.6	4.7 J	14J	11	6.3	12
Semi-Volatiles														
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals														
Arsenic	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (Dissolved)	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	0.4	0.7	0.7	-	-	-	-	-	-
Lead	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead (Dissolved)	µg/L	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	-	-	-	-	-	-
Iron	µg/L													
Manganese	µg/L													
Manganese (Dissolved)	µg/L													
Dissolved Gases														
Ethane	µg/L													
Ethene	µg/L													
Methane	µg/L													
General Chemistry														
Chloride	mg/l													
Nitrate (as N)	mg/l													
Sulfate	mg/l													
Total Organic Carbon (TOC)	mg/l													

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**
Sample ID:		**GW-110609-TG-1-20**	**GW-111610-JS-1-20**	**GW-111610-JS-1-20**	**GW-111711-AK-1-20**	**GW-112912-MD-1-20**	**GW-112613-BP-1-20**	**GW-111814-BP-1-20**	**GW-113015-BP-1-20**	**GW-111716-NT-1-20**
Sample Date:		**11/6/2009**	**11/16/2010**	**11/16/2010** *Duplicate*	**11/17/2011**	**11/29/2012**	**11/26/2013**	**11/18/2014**	**11/30/2015**	**11/17/16**
Parameter	***Units***									
Volatiles										
cis-1,2-Dichloroethene	µg/L	18	54	50	110	70	80	38	81	39 J
Methylene chloride	µg/L	2.5U	2.5 U	2.5 U	2.5 U	2.0 U	2.0 U	2.0 U	2.0 U	2.5 U
Tetrachloroethene	µg/L	2.5U	2.5 U	2.5 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U	2.5 U
Trichloroethene	µg/L	0.17J	2.5 U	2.5 U	2.5 U	0.10 J	0.50 U	0.50 U	0.50 U	2.5 U
Vinyl chloride	µg/L	3.1	4.6	4.2	11	6.5	9.0	3.3	10	3.7
Semi-Volatiles										
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-
Metals										
Arsenic	µg/L	-	-	-	-	-	-	-	-	-
Arsenic (Dissolved)	µg/L	-	-	-	-	-	-	-	-	-
Lead	µg/L	-	-	-	-	-	-	-	-	-
Lead (Dissolved)	µg/L	-	-	-	-	-	-	-	-	-
Iron	µg/L									
Manganese	µg/L									
Manganese (Dissolved)	µg/L									
Dissolved Gases										
Ethane	µg/L									
Ethene	µg/L									
Methane	µg/L									
General Chemistry										
Chloride	mg/l									
Nitrate (as N)	mg/l									
Sulfate	mg/l									
Total Organic Carbon (TOC)	mg/l									

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**	**1-20**
Sample ID:		**GW-201117-NT-1-20**	**GW-201117-NT-FD1**	**GW-110618-NT-1-20**	**GW-112519-NT-1-20**	**GW-112519-NT-FD3**	**GW-111820-NT-1-20**	**1-20-111721-RB**	**1-20-111722-MM**	**1-20-111722-MM**
Sample Date:		**11/20/17**	**11/20/17**	**11/06/2018**	**11/25/2019**	**11/25/19**	**11/18/2020**	**11/17/2021**	**11/16/2022**	**11/16/2022**
			Duplicate			***Duplicate***				***Duplicate***
Parameter	***Units***									
Volatiles										
cis-1,2-Dichloroethene	µg/L	80	75	43	23	23	71J	52	56	59
Methylene chloride	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	µg/L	2.5 U	2.5 U	2.5 U	0.15 U	0.15 U	2.5 U	2.0 U	2.0 U	2.0 U
Trichloroethene	µg/L	2.5 U	2.5 U	2.5 U	0.46 J	0.15 U	2.5 U	2.0 U	2.0 U	2.0 U
Vinyl chloride	µg/L	7.1	5.5	0.5 U	2.1	2.3	8.8	3.7	14	15
Semi-Volatiles										
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-				
Hexachlorobenzene	µg/L	-	-	-	-	-				
Hexachlorobutadiene	µg/L	-	-	-	-	-				
Metals										
Arsenic	µg/L	-	-	-	-	-				
Arsenic (Dissolved)	µg/L	-	-	-	-	-				
Lead	µg/L	-	-	-	-	-				
Lead (Dissolved)	µg/L	-	-	-	-	-				
Iron	µg/L						45900	60000	38000	37000
Manganese	µg/L						3070	2700	2800	2700
Manganese (Dissolved)	µg/L						2720		2600	2600
Dissolved Gases										
Ethane	µg/L						11J	0.01U	-	
Ethene	µg/L						6.9	0.01U	-	
Methane	µg/L						6400	0.11	-	
General Chemistry										
Chloride	mg/l						30.2	34	31	31
Nitrate (as N)	mg/l						0.050J	0.66	0.15U	0.15U
Sulfate	mg/l						43.3	37	27	26
Total Organic Carbon (TOC)	mg/l						31.2	36	36	37

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**1-20**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**
Sample ID:		**GW-113023-MM-1-20**	**W-7412-092398-MW7-26-DG**	**MW7-26-1198-TR**	**MWD1-1198-TR**	**MW7-26-0599-TR**	**MW7-26-1199-TR**	**MW7-26-0500-TR**	**MW7-26-1100-TR**	**MW7-26-0501-TR**	**MW7-26-1101-TR**	**MW7-26-0502-TR**	**MW7-26-1102-DC**
Sample Date:		**11/30/23**	**9/23/1998**	**11/4/1998**	**11/4/1998**	**5/12/1999**	**11/8/1999**	**5/10/2000**	**11/9/2000**	**5/21/2001**	**11/8/2001**	**5/1/2002**	**11/14/2002**
					Duplicate								
Parameter	***Units***												
Volatiles													
cis-1,2-Dichloroethene	µg/L	28	180 J	140 J	150 J	140 J	220 D	170 D	250	130	220	110	120
Methylene chloride	µg/L	5.0U	5.3	5	5	5	1.0 U	5.3 D	8.0 U	2.5 U	2.5 U	2.5 U	2.5 UJ
Tetrachloroethene	µg/L	1.0U	5	5	5	5	1.0 U	1.3 U	8.0 U	2.5 U	2.5 U	2.5 U	2.5 UJ
Trichloroethene	µg/L	1.0U	10 J	9.2	9.4	5.5	4	1.8	8.0 U	1.4 J	2.5 U	2.5 U	2.0 J
Vinyl chloride	µg/L	2.5	6.9 J	22	22	4.4	16	6.0	16	8.3	44	4.3	8.9
Semi-Volatiles													
bis(2-Ethylhexyl)phthalate	µg/L		3.5	3.5	3.5	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L		1.3	1.3	1.3	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L		0.75	0.75	0.75	-	-	-	-	-	-	-	-
Metals													
Arsenic	µg/L		-	-	-	-	-	-	-	-	7.2	-	-
Arsenic (Dissolved)	µg/L		5.4	7.8	6.4	7.5 J	5.5 B	4.2	3.8 J	7.8	-	4	6.4
Lead	µg/L		-	-	-	-	-	-	-	-	3.0 U	-	-
Lead (Dissolved)	µg/L		5	5	5	5	2.7 U	2.7 U	2.7 U	3.0 UJ	-	3.0 U	3.0 U
Iron	µg/L	41000											
Manganese	µg/L	2700											
Manganese (Dissolved)	µg/L	2700											
Dissolved Gases													
Ethane	µg/L	0.010U											
Ethene	µg/L	0.010U											
Methane	µg/L	0.16											
General Chemistry													
Chloride	mg/l	30											
Nitrate (as N)	mg/l	0.15U											
Sulfate	mg/l	45											
Total Organic Carbon (TOC)	mg/l	33											

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**
Sample ID:		**7-26-0503**	**7-26-1103**	**FD1-1103**	**7-26-1104**	**FD1-1104**	**7-26-1105-NR**	**-26-1106-ILM-00**	**7-26-1106-ILM-003**	**7-26-1107-ILM**	**FDUP-1107-ILM**	**GW-111408-TG-BPA-7-26-04**	**GW-111408-TG-BPA-FD-05**
Sample Date:		**5/8/2003**	**11/10/2003**	**11/10/2003**	**11/11/2004**	**11/11/2004**	**11/18/2005**	**11/3/2006**	**11/3/2006**	**11/2/2007**	**11/2/2007**	**11/14/2008**	**11/14/2008**
				Duplicate		***Duplicate***			***Duplicate***		***Duplicate***		***Duplicate***
Parameter	***Units***												
Volatiles													
cis-1,2-Dichloroethene	µg/L	48	170	220	150	150	120	170J	170	110	100	62	94
Methylene chloride	µg/L	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5 U	2.5 U
Tetrachloroethene	µg/L	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	2.5U	0.24J	2.5U	2.5U	2.5 U	2.5 U
Trichloroethene	µg/L	2.5U	1.4J	1.5J	1.3J	1.3J	2.5U	0.78J	0.85J	2.5U	2.5U	0.34 J	0.44 J
Vinyl chloride	µg/L	2.4	37	37	31	31	14	11	11	16	20	4.4	7.5
Semi-Volatiles													
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Metals													
Arsenic	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic (Dissolved)	µg/L	7.1	7.6	8.1	-	-	-	-	-	-	-	-	-
Lead	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Lead (Dissolved)	µg/L	3.0 U	3.0 U	3.0 U	-	-	-	-	-	-	-	-	-
Iron	µg/L												
Manganese	µg/L												
Manganese (Dissolved)	µg/L												
Dissolved Gases													
Ethane	µg/L												
Ethene	µg/L												
Methane	µg/L												
General Chemistry													
Chloride	mg/l												
Nitrate (as N)	mg/l												
Sulfate	mg/l												
Total Organic Carbon (TOC)	mg/l												

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**
Sample ID:		**GW-110609-TG-7-26**	**GW-110609-TG-FD1**	**GW-111610-JS-7-26**	**GW-111711-AK-7-26**	**GW-111711-AK-D1**	**GW-112912-MD-7-26**	**GW-112912-MD-FD1**	**GW-112613-BP-7-26**
Sample Date:		**11/6/2009**	**11/6/2009**	**11/16/2010**	**11/17/2011**	**11/17/2011**	**11/29/2012**	**11/29/2012**	**11/26/2013**
			Duplicate	***Duplicate***		***Duplicate***		***(Duplicate)***	
Parameter	***Units***								
Volatiles									
cis-1,2-Dichloroethene	µg/L	77	91	140	130	130	26	40	51 J
Methylene chloride	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.0 U	2.0 U	2.0 U
Tetrachloroethene	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	0.50 U	0.50 U	0.50 U
Trichloroethene	µg/L	0.40J	0.39J	0.30 J	0.30 J	0.31 J	0.21 J	0.22 J	0.22 J
Vinyl chloride	µg/L	7.3	9.7	15 J	11	9.9	2.0 J	3.7 J	8.5 J
Semi-Volatiles									
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-
Metals									
Arsenic	µg/L	-	-	-	-	-	-	-	-
Arsenic (Dissolved)	µg/L	-	-	-	-	-	-	-	-
Lead	µg/L	-	-	-	-	-	-	-	-
Lead (Dissolved)	µg/L	-	-	-	-	-	-	-	-
Iron	µg/L								
Manganese	µg/L								
Manganese (Dissolved)	µg/L								
Dissolved Gases									
Ethane	µg/L								
Ethene	µg/L								
Methane	µg/L								
General Chemistry									
Chloride	mg/l								
Nitrate (as N)	mg/l								
Sulfate	mg/l								
Total Organic Carbon (TOC)	mg/l								

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**
Sample ID:		**GW-112613-BP-FD-1**	**GW-111814-BP-7-26**	**GW-111814-BP-FD-1**	**GW-120115-BP-7-26**	**GW-120115-BP-FD-1**	**GW-111716-NT-7-26**	**GW-111716-NT-FD-1**	**GW-201117-NT-7-26**
Sample Date:		**11/26/2013**	**11/18/2014**	**11/18/2014**	**12/1/2015**	**12/1/2015**	**11/17/2016**	**11/17/2016**	**11/20/2017**
		(Duplicate)		***(Duplicate)***				***Duplicate***	
Parameter	***Units***								
Volatiles									
cis-1,2-Dichloroethene	µg/L	100 J	74	73	64	61	27	38	24J
Methylene chloride	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	0.26 J	0.23 J	0.20 J	0.20 J	0.20 J	0.23 J	2.5 U	0.21J
Vinyl chloride	µg/L	23 J	13	13	18	17	7.1	11	8.8
Semi-Volatiles									
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-
Metals									
Arsenic	µg/L	-	-	-	-	-	-	-	-
Arsenic (Dissolved)	µg/L	-	-	-	-	-	-	-	-
Lead	µg/L	-	-	-	-	-	-	-	-
Lead (Dissolved)	µg/L	-	-	-	-	-	-	-	-
Iron	µg/L								
Manganese	µg/L								
Manganese (Dissolved)	µg/L								
Dissolved Gases									
Ethane	µg/L								
Ethene	µg/L								
Methane	µg/L								
General Chemistry									
Chloride	mg/l								
Nitrate (as N)	mg/l								
Sulfate	mg/l								
Total Organic Carbon (TOC)	mg/l								

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**	**7-26**
Sample ID:		**GW-110618-NT-7-26**	**GW-110618-NT-FD1**	**GW-112519-NT-7-26**	**GW-111820-NT-7-26**	**GW-111820-NT-FD-1**	**7-26-111721-RB**	**7-26-111721-RB**	**7-26-111626-MM**
Sample Date:		**11/6/2018**	**11/6/2018**	**11/25/2019**	**11/18/2020**	**11/18/2020**	**11/17/2021**	**11/17/2021**	**11/16/2022**
						Duplicate		***Duplicate***	
Parameter	***Units***								
Volatiles									
cis-1,2-Dichloroethene	µg/L	12	12	11	11	10	6.3	6.6	8.4
Methylene chloride	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.0 U	5.0 U	5.0 U
Tetrachloroethene	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.0 U	2.0 U	2.0 U
Trichloroethene	µg/L	0.22 J	0.22 J	0.32 J	2.5 U	2.5 U	2.0 U	2.0 U	2.0 U
Vinyl chloride	µg/L	0.5 U	0.5 U	4.9	2.2	2.1	0.49	0.52	0.41
Semi-Volatiles									
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-				
Hexachlorobenzene	µg/L	-	-	-	-				
Hexachlorobutadiene	µg/L	-	-	-	-				
Metals									
Arsenic	µg/L	-	-	-	-				
Arsenic (Dissolved)	µg/L	-	-	-	-				
Lead	µg/L	-	-	-	-				
Lead (Dissolved)	µg/L	-	-	-	-				
Iron	µg/L				28100	28000	38000	36000	28000
Manganese	µg/L				1710J	666J	3400	3400	2700
Manganese (Dissolved)	µg/L				3220	3220			2700
					2760	2760			
Dissolved Gases									
Ethane	µg/L				64	67	0.01U	0.01U	-
Ethene	µg/L				9.6	11	0.01U	0.01U	-
Methane	µg/L				7000	6300	0.18	0.14	-
General Chemistry									
Chloride	mg/l				29.9	29.5	20	15	24
Nitrate (as N)	mg/l				0.5U	0.5U	0.31U	0.31U	0.15U
Sulfate	mg/l				40.4	40	24	26	28
Total Organic Carbon (TOC)	mg/l				16.4	16.5	19	20	15

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**7-26**	**7-26**	**MW1**	**MW1**	**MW1**	**MW1**	**MW1**	**MW1**	**MW1**	**MW1**	**MW1**	**MW1**
Sample ID:		**GW-1130223-MM-7-26**	**GW-1130223-MM-7-26**	**W-7412-092298-MW1-DG**	**MW1-1198-TR**	**MW1-0599-TR**	**MW1-1199-TR**	**MW1-0500-TR**	**MWD1-0500-TR**	**MW1-1100-TR**	**MW1-0501-TR**	**MW1-1101-DC**	**MW1-0502-TR**
Sample Date:		**11/30/2023**	**11/30/2023**	**9/22/1998**	**11/4/1998**	**5/11/1999**	**11/8/1999**	**5/9/2000**	**5/9/2000**	**11/9/2000**	**5/21/2001**	**11/8/2001**	**5/1/2002**
			Duplicate						***Duplicate***				
Parameter	***Units***												
Volatiles													
cis-1,2-Dichloroethene	µg/L	5.2	5.3	5	5 J	10	12	59	88	5.7	41	9.2	17
Methylene chloride	µg/L	5.0U	5.0U	5	5 J	5	1.0 U	1.0 U	2.7 U	4.0 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	1.0U	1.0U	5	5 J	5	1.0 U	1.0 U	1.0 U	4.0 U	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	1.0U	1.0U	2.4 J	5 J	5	1.0 U	1.0 U	2.6	4.0 U	2.5 U	2.5 U	2.5 U
Vinyl chloride	µg/L	0.5U	0.5U	0.18 J	0.18 J	26	13	15	11	2.3	16	0.5U	3.7
Semi-Volatiles													
bis(2-Ethylhexyl)phthalate	µg/L			4.4	3.5	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L			1.3	1.3	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L			0.75	0.75	-	-	-	-	-	-	-	-
Metals													
Arsenic	µg/L			-	-	-	-	-	-	-	-	1.0 U	-
Arsenic (Dissolved)	µg/L			3.2	4.5	4.4	4.2 U	4.2 U	4.2 U	3.0 UJ	1.0 U	-	1.0 U
Lead	µg/L			-	-	-	-	-	-	-	-	3.0 U	-
Lead (Dissolved)	µg/L			5	5 J	5	2.7 U	2.7 U	2.7 U	2.7 U	3.0 UJ	-	3.0 U
Iron	µg/L	33000	31000										
Manganese	µg/L	3500	3500										
Manganese (Dissolved)	µg/L	3400	3400										
Dissolved Gases													
Ethane	µg/L	0.010U	0.010U										
Ethene	µg/L	0.010U	0.010U										
Methane	µg/L	0.59	0.55										
General Chemistry													
Chloride	mg/l	22	25										
Nitrate (as N)	mg/l	0.15U	0.15U										
Sulfate	mg/l	25	22										
Total Organic Carbon (TOC)	mg/l	50U	18										

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**MW1**	**MW1**	**MW1**	**MW2**	**MW2**	**MW2**	**MW2**	**MW2**	**MW2**	**MW2**	**MW2**	**MW2**	**MW2**
Sample ID:		**MW-1-1102-DC**	**MW-1-0503**	**MW1-1103**	**W-7412-092298-MW2-DG**	**MW2-1198-TR**	**MW2-0599-TR**	**MW2-1199-TR**	**MW2-0500-TR**	**MW2-1100-TR**	**MW2-0501-TR**	**MW2-1101-TR**	**MW2-0502-TR**	**MW2-2-1102-DC**
Sample Date:		**11/14/2002**	**5/8/2003**	**11/11/2003**	**9/22/1998**	**11/5/1998**	**5/11/1999**	**11/8/1999**	**5/10/2000**	**11/9/2000**	**5/21/2001**	**11/9/2001**	**5/1/2002**	**11/14/2002**
Parameter	***Units***													
Volatiles														
cis-1,2-Dichloroethene	µg/L	8.6	15	6.2	100 J	72 J	35	27	18	16	15	10	11	16
Methylene chloride	µg/L	2.5 UJ	2.5 U	2.5 U	5	5.3	5	1.0 U	1.0 U	8.0 U	2.5 U	2.5 U	2.5 U	2.5 UJ
Tetrachloroethene	µg/L	2.5 U	2.5 U	2.5 U	5	5	5	1.0 U	1.0 U	8.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	2.5 U	2.5 U	2.5 U	5 J	5	5	1.0 U	1.0 U	8.0 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl chloride	µg/L	1.1	1.4	0.42 J	22 J	23	4.4	2.0	3.0	4.0	8.9	5.0	6.1	5.6
Semi-Volatiles														
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	3.5	3.5	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	-	1.3	1.3	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	0.75	0.75	-	-	-	-	-	-	-	-
Metals														
Arsenic	µg/L	-	-	-	-	-	-	-	-	-	-	1.0 U	-	-
Arsenic (Dissolved)	µg/L	1.0 U	1.0 U	0.05 U	5.3	6.0	7.9	4.2 U	4.2 U	3.0 UJ	1.0 U	-	1.0 U	1.0 U
Lead	µg/L	-	-	-	-	-	-	-	-	-	-	3.0 U	-	-
Lead (Dissolved)	µg/L	3.0 U	3.0 U	3.0 U	5	5 J	5	2.7 U	2.7 U	2.7 U	3.0 UJ	-	3.0 U	3.0 U
Iron	µg/L													
Manganese	µg/L													
Manganese (Dissolved)	µg/L													
Dissolved Gases														
Ethane	µg/L													
Ethene	µg/L													
Methane	µg/L													
General Chemistry														
Chloride	mg/l													
Nitrate (as N)	mg/l													
Sulfate	mg/l													
Total Organic Carbon (TOC)	mg/l													

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**MW2**	**MW2**	**MW2-27**	**MW2-27**	**MW2-27**	**MW2-27**	**MW2-27**	**MW2-27**	**MW2-27**	**MW2-27**	**MW2-27**	**MW2-27**
Sample ID:		**MW-2-0503**	**MW2-1103**	**W-7412-092398-MW2-27-DG**	**W-7412-092398-MW100-DG**	**MW2-27-1198-TR**	**MW2-27-0599-TR**	**MW2-27-1199-TR**	**MW2-27-0500-TR**	**MW2-27-1100-TR**	**MW2-27-0501-TR**	**MW2-27-1101-TR**	**MW2-27-0502-TR**
Sample Date:		**5/8/2003**	**11/11/2003**	**9/23/1998**	**9/23/1998**	**11/4/1998**	**5/12/1999**	**11/8/1999**	**5/10/2000**	**11/9/2000**	**5/21/2001**	**11/8/2001**	**5/1/2002**
					Duplicate								
Parameter	***Units***												
Volatiles													
cis-1,2-Dichloroethene	µg/L	16	23	5	5	5	5	0.28 J	1.2	10 U	2.5 U	2.5 U	1.0 J
Methylene chloride	µg/L	2.5 U	2.5 U	10	38	5.1	5	1.0 U	1.0 U	10 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	2.5 U	2.5 U	5	5	5	5	1.0 U	1.0 U	10 U	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	2.5 U	2.5 U	5 J	5 J	5	5	1.0 U	1.0 U	10 U	2.5 U	2.5 U	2.5 U
Vinyl chloride	µg/L	6.1	5.0	0.18 J	0.18 J	0.18	0.49	0.5U	0.60	5.0 U	0.84	0.5 U	0.80
Semi-Volatiles													
bis(2-Ethylhexyl)phthalate	µg/L	-	-	5.3	4.4	3.5	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	1.3	1.3	1.3	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	0.75	0.75	0.75	-	-	-	-	-	-	-
Metals													
Arsenic	µg/L	-	-	-	-	-	-	-	-	-	-	1.0 U	-
Arsenic (Dissolved)	µg/L	1.0 U	0.1	4.8	5.2	5.9	4.5	4.2 U	4.2 U	3.0 UJ	1.0 U	-	1.2
Lead	µg/L	-	-	-	-	-	-	-	-	-	-	3.0 U	-
Lead (Dissolved)	µg/L	3.0 U	3.0 U	5	5	5	5	2.7 U	2.7 U	2.7 U	3.0 UJ	-	3.0 U
Iron	µg/L												
Manganese	µg/L												
Manganese (Dissolved)	µg/L												
Dissolved Gases													
Ethane	µg/L												
Ethene	µg/L												
Methane	µg/L												
General Chemistry													
Chloride	mg/l												
Nitrate (as N)	mg/l												
Sulfate	mg/l												
Total Organic Carbon (TOC)	mg/l												

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		MW2-27	MW2-27	MW2-27	6-26	6-26	6-26	6-26	6-26	6-26	6-26	6-26	6-26	6-26
Sample ID:		MW2-27-1102-DC	MW2-27-0503	2-27-1103	W-7412-092398-MW6-26-DG	MW6-26-1198-TR	MW6-26-0599-TR	MW6-26-1199-TR	MW6-26-0500-TR	MW6-26-1100-TR	MW6-26-0501-TR	MW6-26-1101-TR	MW6-26-0502-TR	MW6-26-1102-DC
Sample Date:		11/14/2002	5/8/2003	11/10/2003	9/23/1998	11/4/1998	5/12/1999	11/8/1999	5/10/2000	11/9/2000	5/21/2001	11/8/2001	5/1/2002	11/14/2002
Parameter	***Units***													
Volatiles														
cis-1,2-Dichloroethene	µg/L	2.5 U	2.5 U	2.5 U	4.0 J	5.1	4.1 J	3.6	2.8	10 U	2.1 J	2.5 U	1.6 J	1.2 J
Methylene chloride	µg/L	2.5 UJ	2.5 U	2.5 U	5	5	5	1.0 U	1.0 U	10 U	2.5 U	2.5 U	2.5 U	2.5 UJ
Tetrachloroethene	µg/L	2.5 U	2.5 U	2.5 U	5	5	5	1.0 U	1.0 U	10 U	2.5 U	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	2.5 U	2.5 U	2.5 U	5 J	5	5	1.0 U	0.34 J	10 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl chloride	µg/L	0.5 U	0.77	0.5 U	1.7 J	3.5	3.2	2.5	3.0	5.0 U	2.0	1.4	2.3	1.0
Semi-Volatiles														
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	3.5 J	3.5	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	-	1.3 J	1.3	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	0.75 J	0.75	-	-	-	-	-	-	-	-
Metals														
Arsenic	µg/L	-	-	-	-	-	-	-	-	-	-	0.47766 J	-	-
Arsenic (Dissolved)	µg/L	1.0 U	0.2	0.7	5.4	4.2	6.8 J	4.2 U	4.2 U	3.0 UJ	1.0 U	-	1.0 U	1.0 U
Lead	µg/L	-	-	-	-	-	-	-	-	-	-	3.0 U	-	-
Lead (Dissolved)	µg/L	3.0 U	3.0 U	3.0 U	5	5	5	2.7 U	2.7 U	2.7 U	3.0 UJ	-	3.0 U	3.0 U
Iron	µg/L													
Manganese	µg/L													
Manganese (Dissolved)	µg/L													
Dissolved Gases														
Ethane	µg/L													
Ethene	µg/L													
Methane	µg/L													
General Chemistry														
Chloride	mg/l													
Nitrate (as N)	mg/l													
Sulfate	mg/l													
Total Organic Carbon (TOC)	mg/l													

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**6-26**	**6-26**	**MW9**	**MW9**	**MW9**	**MW9**	**MW9-30**	**MW9-30**	**MW9-30**	**MW9-30**	**MW9-30**	**MW9-30**	**MW9-30**
Sample ID:		**6-26-0503**	**6-26-1103**	**W-7412-092398-MW9-DG**	**MW9-1198-TR**	**MW9-0599-TR**	**MW9-30-1199-TR**	**MW9-30-0500-TR**	**MW9-30-1100-TR**	**MW9-30-0501-TR**	**MW9-30-1101-TR**	**MW9-30-0502-TR**	**MW9-30-1102-DC**	**MW9-30-0503**
Sample Date:		**5/8/2003**	**11/10/2003**	**9/23/1998**	**11/4/1998**	**5/11/1999**	**11/8/1999**	**5/9/2000**	**11/9/2000**	**5/21/2001**	**11/8/2001**	**5/1/2002**	**11/14/2002**	**5/8/2003**
Parameter	***Units***													
Volatiles														
cis-1,2-Dichloroethene	µg/L	1.4 J	2.5 U	5	5	5	2.7 U	1.6 U	10 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Methylene chloride	µg/L	2.5 U	2.5 U	36	6.9	5	3.2 U	1.6 U	10 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Tetrachloroethene	µg/L	2.5 U	2.5 U	5	5	5	3.2 U	1.6 U	10 U	2.5 U	2.5 UJ	2.5 U	2.5 U	2.5 U
Trichloroethene	µg/L	2.5 U	2.5 U	J 5	5	5	3.2 U	1.6 U	10 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Vinyl chloride	µg/L	2.0	1.1	J0.18	0.18	0.49	3.2 U	1.6 U	5.0 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Semi-Volatiles														
bis(2-Ethylhexyl)phthalate	µg/L	-	-	J 3.5	3.5	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	µg/L	-	-	J 1.3	1.3	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	J0.75	0.75	-	-	-	-	-	-	-	-	-
Metals														
Arsenic	µg/L	-	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Arsenic (Dissolved)	µg/L	1.0 U	0.3	5.3	17 J	5 J	8.4 U	8.4 U	3.0 UJ	1.0 J	-	1.0 U	1.0 U	1.0 U
Lead	µg/L	-	-	-	-	-	-	-	-	-	3.0 U	-	-	-
Lead (Dissolved)	µg/L	3.0 U	3.0 U	5	5	5	2.7 U	2.7 U	2.7 U	3.0 UJ	-	3.0 U	3.0 U	15.0 U
Iron	µg/L													
Manganese	µg/L													
Manganese (Dissolved)	µg/L													
Dissolved Gases														
Ethane	µg/L													
Ethene	µg/L													
Methane	µg/L													
General Chemistry														
Chloride	mg/l													
Nitrate (as N)	mg/l													
Sulfate	mg/l													
Total Organic Carbon (TOC)	mg/l													

Notes:

B	< CRDL but >= Instrument Detection Limit (IDL).
D	Compounds at secondary dilution factor.
J	Estimated.
U	Non-detect at associated value.
UJ	The analyte was not detected above the sample quantitation limit. The reported quantitation is an estimated quantity.
-	Not applicable.
(1)	Analytical parameter list modified in January 2004.
(2)	Model Toxic Control Act (MTCA Method B Surface Water Standard, Cleanup Levels and Risk Calculations (CLARC), Version 3.1, updated November 2001.
*	Practical Quantitation Limit (PQL), "Washington State Department of Ecology Toxics Cleanup Program, Guidance on Sampling and Data Analysis Methods," January 1995.

Table D.1
Groundwater Analytical Database
Bonneville Administration Site
Taylor Way
Tacoma, Washington

Sample Location:		**MW9-30**
Sample ID:		**9-30-1103**
Sample Date:		**11/10/2003**
Parameter	***Units***	
Volatiles		
cis-1,2-Dichloroethene	µg/L	2.5 U
Methylene chloride	µg/L	2.5 U
Tetrachloroethene	µg/L	2.5 U
Trichloroethene	µg/L	2.5 U
Vinyl chloride	µg/L	0.5 U
Semi-Volatiles		
bis(2-Ethylhexyl)phthalate	µg/L	-
Hexachlorobenzene	µg/L	-
Hexachlorobutadiene	µg/L	-
Metals		
Arsenic	µg/L	-
Arsenic (Dissolved)	µg/L	0.1
Lead	µg/L	-
Lead (Dissolved)	µg/L	3.0 U
Iron	µg/L	
Manganese	µg/L	
Manganese (Dissolved)	µg/L	
Dissolved Gases		
Ethane	µg/L	
Ethene	µg/L	
Methane	µg/L	
General Chemistry		
Chloride	mg/l	
Nitrate (as N)	mg/l	
Sulfate	mg/l	
Total Organic Carbon (TOC)	mg/l	