May 24, 2019 Project No. 923-1000.005.2000

Mr. Bill Kombol
Landsburg PLP Group
31407 Highway 169
PO Box 10
Black Diamond, WA 98010

LANDSBURG MINE SITE INTERIM GROUNDWATER MONITORING REPORT MARCH 2019 SAMPLING

Dear Bill,

Golder Associates Inc. (Golder) completed a quarterly interim groundwater monitoring event at the Landsburg Mine Site during March 2019. Groundwater samples were collected from monitoring wells LMW-2, LMW-4, LMW-10, LMW-12, and LMW-13R (Figure 1). Quarterly monitoring for all Site groundwater monitoring wells located on the north end of the Site has been conducted since May 2018 to provide additional data on the detection of 1,4-dioxane in LMW-2, LMW-4 and LMW-12.

Monitoring wells LMW-2, LMW-4, LMW-10, LMW-12 and LMW-13R are completed to monitor shallow, middle, and deeper zones within the north end of the Rogers Coal Mine subsidence trench. LMW-12 and LMW-13R were installed in spring 2018 as sentinel wells at the north portal (Portal #2) of the Rogers Coal Mine subsidence trench. Figure 2 presents a cross-section along the strike at the coal seam that also depicts the location of the monitoring wells[1].

Groundwater sampling was conducted in accordance with the *Compliance Monitoring Plan, Landsburg Mine Site* (Ecology 2017)[2], and included the following activities:

- Measurement of static water levels at monitoring wells.
- Well purging with the dedicated pumping systems installed in each well to ensure sample representativeness.
- Measurement of field parameters including: pH, specific conductance, temperature, dissolved oxygen, redox potential (Eh), and turbidity.

[1] Groundwater elevations provided in Figure 2 were obtained on April 22, 2019, after the March 2019 groundwater monitoring event was completed. A full round of groundwater elevations was obtained after the installation and survey of LMW-14.

[2] Washington State Department of Ecology (Ecology). 2017. Exhibit D of the Consent Decree – Compliance Monitoring Plan Landsburg Mine Site MTCA Remediation Project, Ravensdale, Washington. Prepared by Golder Associates Inc. June 7.

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- Collection of representative samples in appropriate containers provided by the analytical laboratory.
- Analyses of groundwater samples for volatile organic compounds (VOCs) by United States Environmental Protection Agency (EPA) Method 8260C and for 1,4-dioxane by EPA Method 8270D.

Appendix A presents the laboratory analytical report for all analyses and the data validation report with added data qualifiers noted. Field sampling activities were documented on Sample Integrity Data Sheets (SIDS). Copies of the completed SIDS are provided in Appendix B. Table 1 presents depth to groundwater measured on March 5, 2019 and calculated static water level elevations.

Following sample collection, all bottles were sealed, labeled, and placed in an iced cooler until delivery to the laboratory. Groundwater samples were transported under chain-of-custody procedures to Analytical Resources Incorporated (ARI), of Tukwila, Washington, for analyses.

Table 2 presents the field parameter measurements and laboratory analytical results for each groundwater sample.

The laboratory data packages underwent data validation. The data validation package is included in Appendix A. All data were determined acceptable and usable for the intended purpose. Based on historical Site data, the laboratory results for 1,4-dioxane in samples LMW-04-0319 and LMW-10-0319 appeared to have been switched by the laboratory. Well LMW-10 has never had a detection of 1,4-dioxane and well LMW-4 has consistently had low-level detections of 1,4-dioxane. The initial March 2019 laboratory data package did not have 1,4-dioxane detected in LMW-4 but had a detection of 1.7 ug/L in LMW-10. Golder requested the laboratory re-extract and re-analyze sample LMW-04-0319 and LMW-10-0319 for 1,4-dioxane. The re-analysis confirmed that the original samples had been switched. The re-analysis indicated 1,4-dioxane was not detected in the sample from LMW-10 and was detected at a concentration of 1.6 ug/L in LMW-4. Because the re-analysis was run outside of the recommended hold time, the original result of 1.7 ug/L was applied to sample LMW-04-0319.

The only parameters detected in groundwater samples above the laboratory reporting limits (RLs) during this sampling event were 1,1-dichloroethane, and 1,4-dioxane.

1,1-Dichloroethane was detected in LMW-12 at a concentration of 0.21 µg/L. The MTCA Method B groundwater cleanup level is 7.68 µg/L.

1,4-Dioxane was detected in LMW-2 (1.5 µg/L), LMW-4 (1.7 µg/L), and LMW-12 (1.1 µg/L). The MTCA Method B groundwater cleanup level for 1,4-dioxane is 0.438 µg/L. 1,4-Dioxane was initially detected in LMW-2 and LMW-4 in the November 2017 sampling event, which was the first sampling round that included analysis of 1,4-dioxane at the Site. LMW-12 and LMW-13R were installed at the north end of the Site in March and April 2018. LMW-12 and LMW-13R were included in the May 2018, August 2018, December 2018, and March 2019 sampling rounds. 1,4-Dioxane is detected in LMW-12 at low concentrations but has not been detected in the deep north sentinel well LMW-13R. Concentrations detected in LMW-2, LMW-4, and LMW-12 indicate 1,4-dioxane levels appear to be decreasing. 1,4-Dioxane has not been detected in any other Site monitoring wells. The 1,4-dioxane detection is being addressed by the Group in cooperation with Ecology.

If you have any questions or require any additional information, please contact Gary Zimmerman at (425) 883-0777.

Sincerely,

Golder Associates Inc.

Joseph Xi, PE
Senior Project Engineer

Gary Zimmerman
Principal

JX/GZ/ks

Attachments: Table 1: Groundwater Elevation Data Collection March 5, 2019 Landsburg Mine Site
Table 2: March 2019 Groundwater Analytical Results Landsburg Mine Site
Figure 1: Groundwater Monitoring Locations
Figure 2: Cross-Section along Strike at Coal Seam
Appendix A: Data Validation and Quality Assurance / Quality Control Review Memorandum and March 2019 Laboratory Analytical Report
Appendix B: Sample Integrity Data Sheets (SIDS)

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Tables

Table 1: Groundwater Elevation Data Collection March 5, 2019 Landsburg Mine Site

	UNITS	LMW-2	LMW-4[1]	LMW-10	LMW-12	LMW-13R
Water Depths						
Time of data collection		9:04 AM	10:40 AM	12:25 PM	1:45 PM	2:40 PM
Measured to Top of PVC	ft btc	6.48	7.90	0.20	5.02	5.52
Measured to Top of Monument	ft btm	NC	NC	0.96	NC	NC
Surveyed Elevation						
Top of PVC	ft asl	617.79	619.27	618.98	625.35	625.86
Top of Monument	ft asl	618.38	619.89	619.10	625.49	625.91
Ground Level	ft asl	614.92	617.37	615.78	621.90	622.07
Corrected Water Elevation						
Using PVC elevation	ft asl	**611.31**	**611.37**	**618.78**	**620.33**	**620.34**
Using Monument elevation	ft asl	NA	NA	NA	NA	NA

Notes:
[1] Data corrected to accommodate well inclination of 20° from vertical
NA = Not applicable
NC = Data not collected
ft btc = feet below top of casing
ft btm = feet below top of monument
ft asl = feet above sea level

Table 2: March 2019 Groundwater Analytical Results Landsburg Mine Site

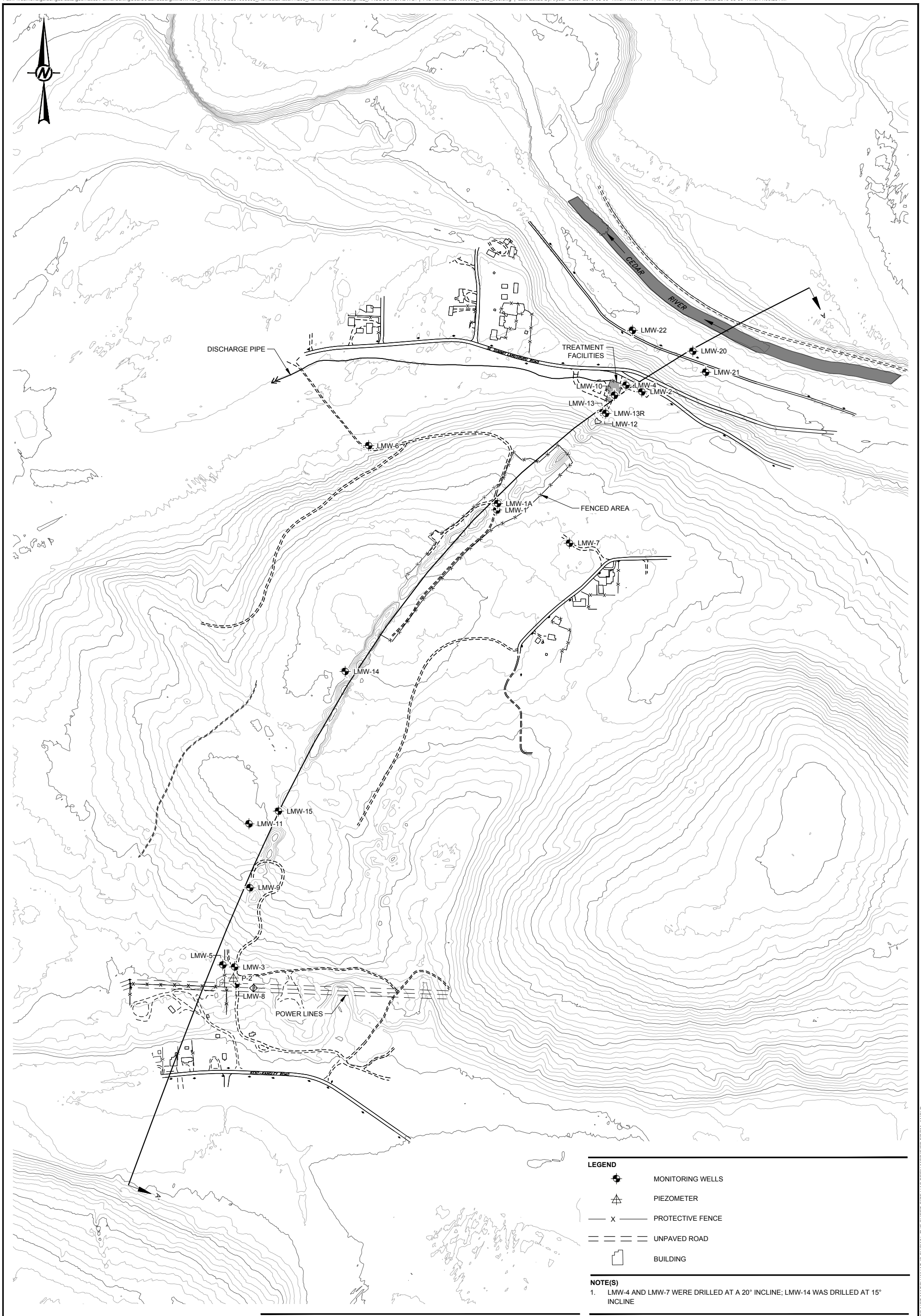
ANALYTE	UNITS	LMW-2		LMW-4		LMW-10		LMW-12		LMW-12 Duplicate		LMW-13R		Field Blank		Trip Blank	
		3/5/2019		3/5/2019		3/5/2019		3/5/2019		3/5/2019		3/5/2019		3/5/2019		3/5/2019	
Field Parameter																	
pH	stnd	6.95		6.98		8.76		6.91		-		7.50		-		-	
Conductivity	uS/cm	712		710		253.1		960		-		649		-		-	
Dissolved Oxygen	mg/L	0.49		0.53		0.52		0.54		-		0.46		-		-	
Temperature	^{o}C	10.1		9.9		8.9		9.1		-		9.4		-		-	
E_h	Rel mV	-280.0		-250.4		-217.3		-95.5		-		-179.7		-		-	
Turbidity	NTU	0.30		0.10		0.67		26.1		-		0.23		-		-	
Volatile Organic Compounds (VOCs)																	
Acetone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U	3.56	J	2.26	J
Acrolein	ug/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
Acrylonitrile	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Benzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.05	J	0.2	U	0.2	U
Bromobenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Bromochloromethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Dichlorobromomethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Bromoethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Bromoform	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Bromomethane	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
methyl ethyl ketone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
n-Butylbenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Sec-Butylbenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
tert-butylbenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Carbon Disulfide	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U	**0.12**		0.04	J
Carbon Tetrachloride	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Chlorobenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Chloroethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-Chloroethyl vinyl ether	ug/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Chloromethane	ug/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Chlorotoluene	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
4-Chlorotoluene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Dichlorodifluoromethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2-Dibromo-3-Chloropropane	ug/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Ethylene Dibromide	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Dibromomethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2-Dichlorobenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3-Dichlorobenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,4-Dichlorobenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.04	J	0.2	U
Trans-1,4-Dichloro-2-butene	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	ug/L	0.2	U	0.2	U	0.2	U	**0.21**		**0.23**		0.2	U	0.2	U	0.2	U
1,2-Dichloroethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1-Dichloroethene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cis-1,2-Dichloroethene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Trans-1,2-Dichloroethene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U

Table 2: March 2019 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2		LMW-4		LMW-10		LMW-12		LMW-12 Duplicate		LMW-13R		Field Blank		Trip Blank	
1,2-Dichloropropane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3-Dichloropropane	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
2,2-Dichloropropane	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
1,1-Dichloropropene	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Cis-1,3-Dichloropropene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Trans-1,3-Dichloropropene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Ethylbenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Hexachlorobutadiene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
2-Hexanone	ug/L	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Iodomethane	ug/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Isopropyl Benzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
4-Isopropyl Toluene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Methylene Chloride	ug/L	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Methyl isobutyl ketone	ug/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
Naphthalene	ug/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
n-Propylbenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Styrene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2,3-Trichlorobenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2,4-Trichlorobenzene	ug/L	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1,2-Tetrachloroethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1,2,2-Tetrachloroethane	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Tetrachloroethene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Toluene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.06	J	0.2	U	0.2	U
1,1,1-Trichloroethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,1,2-Trichloroethane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Trichloroethene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
CFC-11	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
CFC-113	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2,3-Trichloropropane	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,2,4-Trimethylbenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
1,3,5-Trimethylbenzene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vinyl Acetate	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vinyl Chloride	ug/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
m, p-Xylene	ug/L	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
o-Xylene	ug/L	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Total Xylenes	ug/L	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
Semi-Volatile Organic Compounds (SVOCs)																	
1,4-Dioxane	ug/L	**1.5**		**1.7**		0.4	U	**1.1**		**1.2**		0.4	U	0.4	U	NS	

Notes:
U - Analyte was not detected above the Reporting Limit (RL).
J - Analyte was detected above the Method Detection Limit (MDL) but below the RL.

Figures



LEGEND

- MONITORING WELLS
- PIEZOMETER
- PROTECTIVE FENCE
- UNPAVED ROAD
- BUILDING

NOTE(S)

1. LMW-4 AND LMW-7 WERE DRILLED AT A 20° INCLINE; LMW-14 WAS DRILLED AT 15° INCLINE

0 300 600
1" = 300' FEET

CLIENT
LANDSBURG MINE SITE PLP GROUP

CONSULTANT
GOLDER

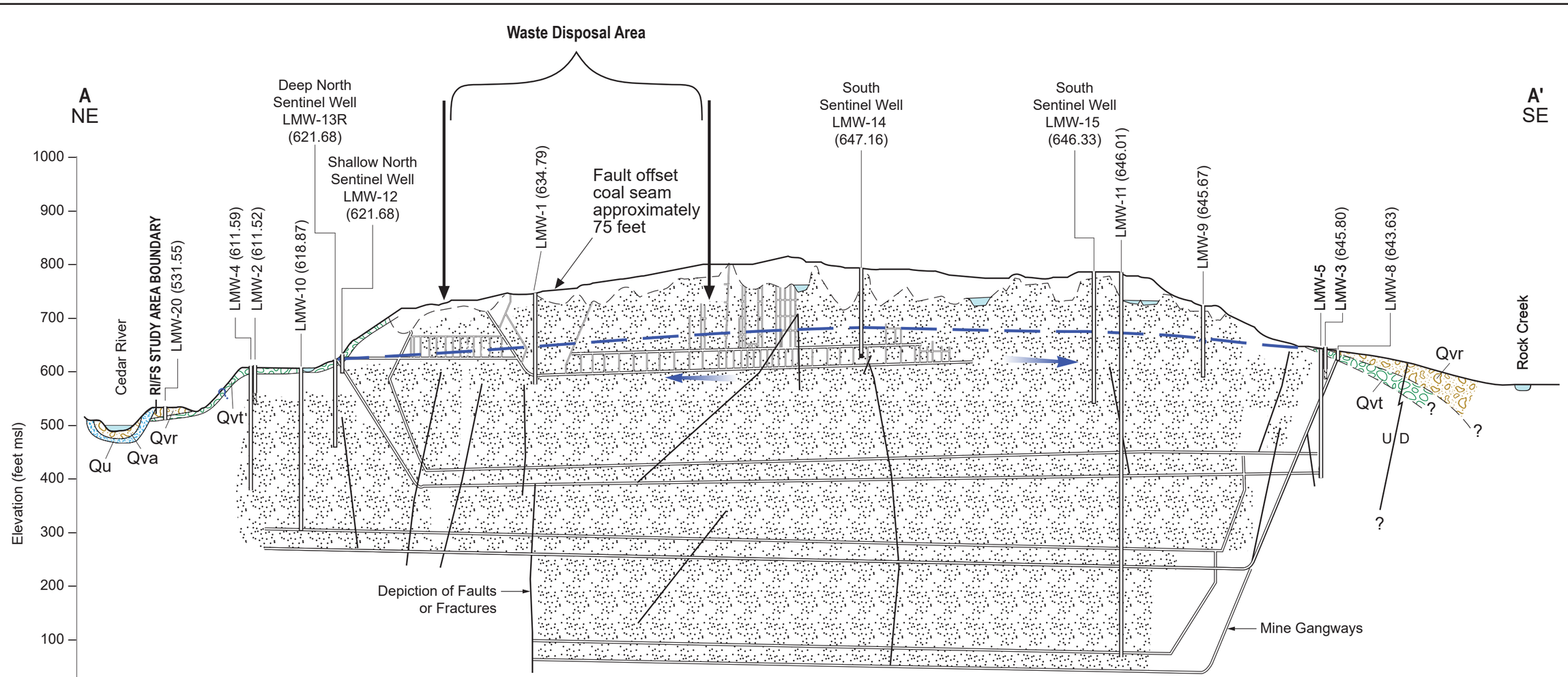
YYYY-MM-DD	2019-05-06
DESIGNED	REDMOND
PREPARED	JX
REVIEWED	JX
APPROVED	GZ

PROJECT
LANDSBURG MINE SITE
MTCA REMEDIAL ACTION

TITLE
GROUNDWATER MONITORING LOCATIONS

PROJECT NO.	PHASE	REV.	FIGURE
9231000005	1200	A	1

0 1 in
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D



EXPLANATION

- Potentiometric surface
- Outline of trench bottom
- LMW-2 (610.42) Well ID (water level in ft. amsl)
- Qvt Till, compact mixture of gravel occasional boulders in clayey silty sand matrix
- Sandstone
- Surface water feature
- Anticipated collapsed zone within mine
- Qu Drift, till, fluvial sand and gravel, lacustrine sand, silt, clay and peat
- Qvr Recessional outwash, well sorted sand and pebble-cobble
- Qva Advanced outwash pebble-cobble gravel may include very fine sand
- Monitoring Interval
- Groundwater Flow Direction

0 500
FEET

Sources for the Geology and Mine Information:
J.E. Luzier 1969; surficial geology
State of Washington, Water Well reports
Mine Superintendant's Records
Landsburg Well Logs

NOTE: Vertical to horizontal scale ratio is 2.5:1
Wells are project normal into the strike of the Cross-Section A-A'

Groundwater elevation obtained 4/22/2019

CLIENT
LANDSBURG PLP GROUP

CONSULTANT
GOLDER

YYYY-MM-DD	2019-04-29
PREPARED	REDMOND
DESIGN	
REVIEW	
APPROVED	

PROJECT
LANDSBURG MINE SITE

TITLE
CROSS-SECTION ALONG STRIKE AT COAL SEAM
CROSS-SECTION A-A'

PROJECT No.	PHASE	FIGURE
923-1000	2019	2

G:\PalmerCokingCoal\Col\LandsburgMineWA\99_PROJECTS\923100000002_Ph1_Remediation\R154102_PRODUCTION\INDD\923100_002_R154_003.indd

APPENDIX A

Data Validation and Quality Assurance / Quality Control Review Memorandum and March 2019 Laboratory Analytical Report

TECHNICAL MEMORANDUM

DATE March 28, 2019 **Project No.** 9231000.005.2000

TO Bill Kombol
Palmer Coking Coal Company

FROM Eric Adams **EMAIL eadams@golder.com**

LANDSBURG MINE SITE MARCH 2019 DATA VALIDATION & QUALITY ASSURANCE / QUALITY CONTROL REVIEW

This Data Usability Summary Report (DUSR) presents the findings of the data quality assessment performed on the analyses of water samples collected March 5, 2019 in Landsburg Mine Site in Washington (Site) as part of the Landsburg Groundwater sampling project. Samples in the laboratory sample delivery group (SDG) as indicated in Table 1 were reviewed in this DUSR to identify quality issues which could affect the use of the sample data for decision making purposes.

A total of eight (8) water samples (this includes one field duplicate, one trip blank, and one field blank) were collected by Golder Associates Inc. (Golder) in March. Samples were analyzed by Analytical Resources Inc. of Tukwila, Washington for the following parameters:

- Volatile Organic Compounds (VOCs) following United States Environmental Protection Agency (USEPA) USEPA SW-846[1] Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), August 2006; and,
- 1,4-Dioxane following USEPA SW-846 Method 8270D, Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), January 1998.

Quality assurance / quality control (QA/QC) reviews of laboratory data were performed in the laboratory in accordance with the laboratory quality assurance program plan. The data validation QA/QC review focused primarily on laboratory results and quality control data to ensure that work plan data quality objectives were met for the project.

Data validation was conducted in accordance with the criteria outlined in the National Functional Guidelines for Organic Review (EPA 2017), modified to include method specific requirements of the laboratory and laboratory standard operating procedures (SOPs). Where there was a discrepancy between the QC criteria in the Guidelines and the QC criterion established in the analytic methodology, method-specific criteria, the QAPP, or professional judgment was used.

In general, chemical results for the samples collected at the Site were evaluated based on laboratory preservation, hold times, laboratory and field blank contamination, outlying precision or accuracy parameters, or on the basis of professional judgment. The following definitions provide brief explanations of the qualifiers which may have been assigned to data during the data validation process.

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Data Qualifier Definitions

J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
U	The constituent was analyzed for, but was not detected above the reported sample quantitation limit.
UJ	The constituent was not detected; the associated quantitation limit is an estimated value because quality control criteria were not met.

The validation level for the data is Tier 2A, and included the following:

- Data Package Completeness
- Verification of required deliverables
- Evaluation of holding times
- Laboratory narrative evaluation
- Evaluation and qualification of quality control elements for: Surrogates, Matrix Spike, Laboratory Control samples, Method Blanks, Field and Trip Blanks, and Field Duplicate evaluation as applicable
- Evaluation of detection limits

Raw data was not provided and calibration elements, including Gas Chromatograph (GC) instrument tuning and performance check, initial and continuing calibration, internal standard performance, and compound identification, were not evaluated unless information was provided by the lab in the case narratives. Data review and validation was performed by an experienced quality assurance chemist independent of the analytical laboratory and not directly involved in the project. Data qualifiers that were applied by the laboratory have been removed from the data summary report sheets, when applicable, and superseded by data validation qualifiers. Overall, the data review showed that data are acceptable for use except where indicated by data qualifiers. For details about the data validation, refer to the data validation checklist in Attachment A. Table 2 is a summary of the qualifiers applied to the data.

Attachments

Attachment A Tables

Table 1 – Sample Collection and Analysis Summary

Table 2 – Qualifier Summary Table

Attachment B Level 2A Data Validation Checklist

References

United States Environmental Protection Agency (EPA). 2015. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846. Third Edition. Washington DC: USEPA Office of Solid Waste. Available on the Web at: https://www.epa.gov/hw-sw846(accessed January 5, 2017).

EPA. 2017. USEPA Contract Laboratory Program, National Functional Guidelines for Inorganic Superfund Methods Data Review. OLEM 9355.0-135. EPA-540-R-2017-001, January.

EPA. 2017. USEPA Contract Laboratory Program, National Functional Guidelines for Organic Superfund Methods Data Review. OLEM 9355.0-136. EPA-540-R-2017-002, January. Available on the Web at: https://www.epa.gov/sites/production/files/2017-01/documents/national_functional_guidelines_for_organic_superfund_methods_data_review_013072017.pdf (accessed September 11, 2018)

ATTACHMENT A

Tables

Table 1:
Sample Collection and Analysis Summary
Landsburg Groundwater Monitoring - March 2019

SDG	Field Identification	Collection Date	Location	Lab Identification	Matrix	QC Samples	VOCs by SW8260C	1,4-Dioxane by SW8270D
19C0086	LMW-2-0319	3/5/2019	LMW-2	19C0086-01	Water	--	X	X
19C0086	LMW-4-0319	3/5/2019	LMW-4	19C0086-02	Water	--	X	X
19C0086	LMW-10-0319	3/5/2019	LMW-10	19C0086-03	Water	--	X	X
19C0086	LMW-12-0319	3/5/2019	LMW-12	19C0086-04	Water	--	X	X
19C0086	LMW-12-0319-D	3/5/2019	LMW-12	19C0086-05	Water	FD (LMW-12-0319)	X	X
19C0086	LMW-13R-0319	3/5/2019	LMW-13R	19C0086-06	Water	--	X	X
19C0086	Field Blank-0319	3/5/2019		19C0086-07	Water	FB	X	X
19C0086	TRIP BLANK	3/5/2019		19C0086-08	Water	TB	X	

Notes:
All analyses performed by ARI Laboratories

Abbreviations:
FB - Field Blank
FD - Field Duplicate
MS - Matrix Spike
MSD - Matrix Spike Duplicate
PCBs - Polychlorinated Biphenyls
QC - Quality Control
SDG - Sample Delivery Group
SVOCs - Semivolatile Organic Compounds
TB - Trip Blank
TPH - Total Petroleum Hydrocarbon
VOCs - Volatile Organic Compounds

Table 2:
Qualifier Summary Table
Landsburg Groundwater Monitoring - March 2019

SDG	Sample Name	Constituent	New Result	New RL	Qualifier	Reason
19C0086	LMW-2-0319	Acetone	5	--	U	Field and trip blank contamination
19C0086	LMW-4-0319	Acetone	5	--	U	Field and trip blank contamination
19C0086	LMW-12-0319	Acetone	5	--	U	Field and trip blank contamination
19C0086	LMW-12-0319-D	Acetone	5	--	U	Field and trip blank contamination
19C0086	LMW-2-0319	Carbon Disulfide	0.1	--	U	Method, Field and trip blank contamination
19C0086	LMW-4-0319	Carbon Disulfide	0.1	--	U	Method, Field and trip blank contamination
19C0086	LMW-10-0319	Carbon Disulfide	0.1	--	U	Method, Field and trip blank contamination
19C0086	LMW-12-0319-D	Carbon Disulfide	0.1	--	U	Method, Field and trip blank contamination
19C0086	LMW-13R-0319	Carbon Disulfide	0.11	--	U	Method, Field and trip blank contamination

Abbreviations
LCSD - Laboratory Control Sample Duplicate
RL - Reporting Limit
SDG - Sample Delivery Group

Qualifier Definitions
J+ - estimated, high bias
U - non detect
UJ - estimated, non-detect

ATTACHMENT B

Level 2A Data Validation Checklist

DATA REVIEW CHECKLIST - QA LEVEL II

Reviewing Company: Golder Associates
Project Manager: Gary Zimmerman
Project Name: Landsburg Groundwater 2019-03
Project Number: 923-1000-005.2000
Reviewer: Eric Adams
Validation Date: March 27, 2019
Reviewed by: Joseph Xi
Review Date: March 28, 2019
Laboratory: Analytical Resources, Inc (Tukwila, WA)
SDG #: 19C0086
Analytical Method (type and no.): See Table 1
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ Other

Work Plan or QAPP reference: Compliance Monitoring Plan and QAPP for Landsburg Mine Site (Exhibit D, to the Consent Decree, 2017).

Applicable Data Validation Guidance: National Functional Guidelines for Organic and Inorganic Review (USEPA 2017).

Sample Information: See Table 1 (attached)

Field/COC Information	**YES**	**NO**	**NA**	**COMMENTS**
a) Sampling dates noted?	☒	☐	☐	
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample type indicated (grab/composite)?	☐	☒	☐	Not indicated on COC
e) Field QC noted?	☒	☐	☐	Field duplicate, equipment blank, trip blank
f) Field parameters collected (note types)?	☒	☐	☐	pH, cond, temp, turb, DO, ORP
g) Was the COC signed by both field and laboratory personnel?	☒	☐	☐	
h) Were samples received in good condition?	☒	☐	☐	
i) Were the correct preservatives used?	☒	☐	☐	
j) Was the sample cooler temperature within QC limits?	☒	☐	☐	
Laboratory Case Narrative				
a) Does the laboratory narrative indicate deficiencies?	☒	☐	☐	See notes 1, 3, and 4

Note Deficiencies:

- Certain analytes in the ICV and CCV were outside of QC limits.
- Certain LCS/LCSD recoveries and RPDs were outside of QC limits.
- Certain samples were analyzed outside of hold time.

These issues are addressed in the appropriate sections below.

General (reference QAPP or Method)	**YES**	**NO**	**NA**	**COMMENTS**
a) Was the correct method used?	☒	☐	☐	
b) Were hold times met for sample pretreatment?	☐	☒	☐	See note 1
c) Were hold times met for sample analysis?	☒	☐	☐	
d) Were appropriate reporting limits achieved?	☒	☐	☐	
e) Were any sample dilutions noted?	☐	☒	☐	
f) Were any matrix problems noted?	☐	☒	☐	

DATA REVIEW CHECKLIST - QA LEVEL II

Blanks	**YES**	**NO**	**NA**	**COMMENTS**
a) Were analytes detected in the method blank(s)?	☒	☐	☐	See note 2
b) Were analytes detected in the field blank(s)?	☒	☐	☐	See note 2
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☒	☐	☐	See note 2
e) Were analytes detected in the storage blank(s)?	☐	☐	☒	

Surrogate (System Monitoring) Compounds	**YES**	**NO**	**NA**	**COMMENTS**
a) Were surrogate compounds added to all samples?	☒	☐	☐	
b) Were recoveries within control limits?	☒	☐	☐	
c) Were surrogate recoveries not calculated due to dilutions?	☐	☒	☐	
d) Were recoveries not calculated due to interference?	☐	☒	☐	

Laboratory Control Sample	**YES**	**NO**	**NA**	**COMMENTS**
a) Was a LCS analyzed at the appropriate frequency?	☒	☐	☐	
b) Were the proper compounds included in the LCS?	☒	☐	☐	
c) Was the LCS accuracy criteria met?	☐	☒	☐	See note 3

Matrix Spike/Matrix Spike Duplicate	**YES**	**NO**	**NA**	**COMMENTS**
a) Was MS accuracy criteria met?	☐	☐	☒	No MS/MSDs analyzed this SDG
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☐	☒	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☐	☐	☒	

Duplicates	**YES**	**NO**	**NA**	**COMMENTS**
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	See Table 1
b) Were field dup. precision criteria met (20%)?	☒	☐	☐	All RPDs are <20% or results are <5x RL
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
d) Were lab dup. precision criteria met (Note RPD)?	☒	☐	☐	

ICP Serial Dilution (SD)	**YES**	**NO**	**NA**	**COMMENTS**
a) Was an ICP SD analyzed once per SDG?	☐	☐	☒	Not required for VOC/SVOC analyses
b) Was the ICP SD criteria met?	☐	☐	☒	

Overall Evaluation	**YES**	**NO**	**NA**	**COMMENTS**
a) Were there any other technical problems not previously addressed?	☒	☐	☐	See note 4
b) Checked for transcription errors?	☒	☐	☐	
c) Do target analytes fall within calibration ranges?	☒	☐	☐	
d) Data are acceptable and usable except as noted?	☒	☐	☐	

DATA REVIEW CHECKLIST - QA LEVEL II

Comments/Notes:

1. The laboratory re-extracted and re-analyzed sample LMW-04-0319 and LMW-10-0319 for 1,4-dioxane outside of hold time upon clients request because historical data indicated these sample results were switched for the March 2019 sampling event. Reanalysis confirmed results were similar with historical data and original results should be swapped between the two sample IDs. The sample was re-extracted 14 days after collection, which exceeds the extraction hold time of 7 days. The original 1,4-dioxane results should be reported and swapped between LMW-04-0319 and LMW-10-0319.

2. See table below for a summary of method, trip, and equipment blank contamination. Following the Guidelines and using professional judgment, when the blank contamination is less than the RL, associated detections that are less than the RL are qualified as non-detect (U) at the RL, while associated detections that are greater than the RL and non-detections do not require qualification.

   Using professional judgement, for common laboratory contaminants like acetone, when the blank result was less than the RL and associated sample results were greater than the RL but less than 2x the RL, the associated RL was reported as the sample result and qualified as non-detect (U). Associated non-detect sample results did not require qualification. See table 2 for sample qualifier summary.

Blank ID	Method	Analyte	Result (µg/L)	Qualifier	RL (µg/L)
BHC0421-BLK1	SW8260C	Carbon Disulfide	0.09	J	0.1
BHC0421-BLK1	SW8260C	1,3-Dichlorobenzene	0.04	J	0.2
BHC0421-BLK1	SW8260C	1,4-Dichlorobenzene	0.05	J	0.2
BHC0421-BLK1	SW8260C	n-Butylbenzene	0.05	J	0.2
BHC0421-BLK1	SW8260C	1,2-Dichlorobenzene	0.04	J	0.2
BHC0421-BLK1	SW8260C	Hexachlorobutadiene	0.15	J	0.2
Field Blank	SW8260C	Acetone	3.56	J	5.00
Field Blank	SW8260C	Carbon Disulfide	0.12		0.1
Field Blank	SW8260C	1,4-Dichlorobenzene	0.04	J	0.2
TRIP BLANK	SW8260C	Acetone	2.26	J	5
TRIP BLANK	SW8260C	Carbon Disulfide	0.04	J	0.1

3. See table below for a summary of LCS/LCSD RPDs that are outside of QC criteria. Following the Guidelines and using professional judgment, when LCS/LCSD RPD is outside of acceptance criteria, associated non-detections do not require qualification.

LCS/LCSD ID	Method	Analyte	Recovery (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)	
BHC0421-BS1 / -BSD1	SW8260C	Bromoform	83.6 / 90.7	51-134	8.18	30	
BHC0421- BSD1	SW8260C	2,2-Dichloropropane	126	78-125	5.43	30	

4. The laboratory case narrative indicated that certain VOC ICV and CCV recoveries were outside of control limits for some analytes. Review of calibration data is outside of the scope of a level II validation, and the calibration summaries were not provided by the lab as part of this data package. Using professional judgment, the ICV information provided in the case narrative was reviewed only to determine if serious deficiencies warranting data rejection were present. No rejection of data is required. Remove all “Q” qualifiers applied to primary samples.

Data Qualification: See Table 2.

DATA REVIEW CHECKLIST - QA LEVEL II

Definitions:

SDG: Sample Delivery Group	QC: Quality Control
COC: Chain of Custody	QAPP: Quality Assurance Project Plan
VOC: Volatile Organic Compound	SVOC: Semivolatile Organic Compound
TCL: Target Compound List	PCB: Polychlorinated Biphenyl
%D: Percent Difference	RPD: Relative Percent Difference
LCS: Laboratory Control Sample	RSD: Relative Standard Deviation
MS/MSD: Matrix Spike/Matrix Spike Duplicate	CRDL: Contract Required Quantitation Limit
MDL: Method Detection Limit	RL: Reporting Limit
%R: Percent Recovery	PEM: Performance Evaluation Mixture
CC: Continuing Calibration	SPCC: System Performance Check Compound
RRF: Relative Response Factor	RT: Retention Time
TCLP: Toxicity Characteristic Leaching Procedure	LOQ: Limit of Quantitation

Analytical Resources, Incorporated
Analytical Chemists and Consultants

26 March 2019

Gary Zimmerman
Golder Associates
18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333

RE: Landsburg

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

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

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

Associated Work Order(s)	Associated SDG ID(s)
19C0086	N/A

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

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

Analytical Resources, Inc.

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

Cert# 100006

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 19C0086	Turn-around Requested: Standard
ARI Client Company: Golder	Phone: 425-883-0777
Client Contact: Gary Zimmerman	
Client Project Name: Landsburg	
Client Project #: 923100005.2000	Samplers: J. Miller / R. Gregory

Page: 1 of 1	
Date: 3/5/19	Ice Present?
No. of Coolers: 1	Cooler Temps: 2.4

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: VOC Client List	1,4-Dioxane (8270-D)							Notes/Comments
LMW-2-0319		1000	W	5	X	X							Pls analyze under current MSA w/ Golder
LMW-4-0319		1120	W	5	X	X							
LMW-10-0319		1320	W	5	X	X							
LMW-12-0319		1420	W	5	X	X							
LMW-12-0319-D		1430	W	5	X	X							
LMW-13R-0319		1510	W	5	X	X							
Field Blank-0319		1530	W	5	X	X							
Trip Blank		—	W	3	X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
- Client Specific RLs - Ecology EIM EDD pls cc: jmiller@golder.com	Printed Name: Jane Miller	Printed Name: Stephanie Fish	Printed Name:	Printed Name:
	Company: Golder	Company: ARI	Company:	Company:
	Date & Time: 3/6/19 1455	Date & Time: 3-6-19 1455	Date & Time:	Date & Time:

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

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
LMW-2-0319	19C0086-01	Water	05-Mar-2019 10:00	06-Mar-2019 14:55
LMW-4-0319	19C0086-02	Water	05-Mar-2019 11:20	06-Mar-2019 14:55
LMW-10-0319	19C0086-03	Water	05-Mar-2019 13:20	06-Mar-2019 14:55
LMW-12-0319	19C0086-04	Water	05-Mar-2019 14:20	06-Mar-2019 14:55
LMW-12-0319-D	19C0086-05	Water	05-Mar-2019 14:30	06-Mar-2019 14:55
LMW-13R-0319	19C0086-06	Water	05-Mar-2019 15:10	06-Mar-2019 14:55
Field Blank	19C0086-07	Water	05-Mar-2019 15:30	06-Mar-2019 14:55
Trip Blank	19C0086-08	Water	05-Mar-2019 10:00	06-Mar-2019 14:55

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Work Order Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements except Bromoform and 1,2-Dibromo 3-Chloropropane which were out of control low. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

The LCS/LCSD percent recoveries and RPD were within control limits except 2,2-Dichloropropane which was out of control high and is flagged within the QC section of this report.

1,4-Dioxane- EPA Method SW8270D

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

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

The LCS percent recoveries were within control limits.

The client notified ARI and asked ARI to re-extract samples 19C0086-02 and 19C0086-03 as the data did not match historical data. The samples were re-extracted outside of the method holding time and both sets of data were submitted for your review.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Landsburg

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

Assigned ARI Job No: 19C0086 Tracking No: _____ (NA)

Preliminary Examination Phase:

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

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

Time 1455	2.4					
If cooler temperature is out of compliance fill out form 00070F					Temp Gun ID#	200256

Cooler Accepted by: SF Date: 3-10-19 Time: 1455

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	(NA)	YES	NO
Were all VOC vials free of air bubbles?	NA	(YES)	NO
Was sufficient amount of sample sent in each bottle?	JSW	(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)	2/22/19	

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: [signature] Date: 3/6/19 Time: 0908 Labels checked by: JSW

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

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

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-2-0319

19C0086-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 10:00
Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:03

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 19C0086-01 C
Preparation Batch: BHC0421 — Sample Size: 10 mL
Prepared: 14-Mar-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	**3.80**	ug/L	J
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.10	**0.06**	ug/L	J
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.05	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-2-0319

19C0086-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 10:00

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:03

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane				*80-120 %*	*106*	*%*	
Surrogate: 1,2-Dichloroethane-d4				*80-129 %*	*110*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-2-0319

19C0086-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 10:00

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:03

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		*80-120 %*	*96.6*	*%*	
Surrogate: 4-Bromofluorobenzene		*80-120 %*	*92.8*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*80-120 %*	*105*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-2-0319

19C0086-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 10:00

Instrument: NT6 Analyst: JZ — Analyzed: 03/18/2019 18:21

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-01 D 01

Preparation Batch: BHC0303 — Sample Size: 500 mL

Prepared: 12-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	**1.5**	ug/L	
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*61.1*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-4-0319

19C0086-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 11:20
Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:23

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 19C0086-02 B
Preparation Batch: BHC0421 — Sample Size: 10 mL
Prepared: 14-Mar-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	**4.46**	ug/L	J
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.10	**0.06**	ug/L	J
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.05	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-4-0319

19C0086-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 11:20

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:23

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane				*80-120 %*	*108*	*%*	
Surrogate: 1,2-Dichloroethane-d4				*80-129 %*	*109*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-4-0319

19C0086-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 11:20

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:23

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		*80-120 %*	*96.8*	*%*	
Surrogate: 4-Bromofluorobenzene		*80-120 %*	*91.2*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*80-120 %*	*106*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-4-0319

19C0086-02 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 11:20

Instrument: NT6 Analyst: JZ — Analyzed: 03/18/2019 18:55

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-02 D 01

Preparation Batch: BHC0303 — Sample Size: 500 mL

Prepared: 12-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	ND	ug/L	U
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*70.2*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-4-0319

19C0086-02RE1 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 11:20

Instrument: NT6 Analyst: JZ — Analyzed: 03/26/2019 13:53

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-02RE1 E 01

Preparation Batch: BHC0610 — Sample Size: 500 mL

Prepared: 25-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	**1.6**	ug/L	H
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*61.7*	*%*	H

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-10-0319

19C0086-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 13:20

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:44

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 19C0086-03 B

Preparation Batch: BHC0421 — Sample Size: 10 mL

Prepared: 14-Mar-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.10	**0.10**	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.05	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-10-0319

19C0086-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 13:20

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:44

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane				*80-120 %*	*107*	*%*	
Surrogate: 1,2-Dichloroethane-d4				*80-129 %*	*114*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-10-0319

19C0086-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 13:20

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 18:44

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		*80-120 %*	*96.8*	*%*	
Surrogate: 4-Bromofluorobenzene		*80-120 %*	*88.5*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*80-120 %*	*105*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-10-0319

19C0086-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 13:20

Instrument: NT6 Analyst: JZ — Analyzed: 03/18/2019 17:48

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-03 D 01

Preparation Batch: BHC0303 — Sample Size: 500 mL

Prepared: 12-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	**1.7**	ug/L	
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*61.6*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-10-0319

19C0086-03RE1 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 13:20

Instrument: NT6 Analyst: JZ — Analyzed: 03/26/2019 14:26

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-03RE1 E 01

Preparation Batch: BHC0610 — Sample Size: 500 mL

Prepared: 25-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	ND	ug/L	H, U
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*56.2*	*%*	H

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-12-0319

19C0086-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 14:20
Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:04

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 19C0086-04 B
Preparation Batch: BHC0421 — Sample Size: 10 mL
Prepared: 14-Mar-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	**5.11**	ug/L	
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	**0.21**	ug/L	
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.05	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-12-0319

19C0086-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 14:20

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:04

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane				*80-120 %*	*111*	*%*	
Surrogate: 1,2-Dichloroethane-d4				*80-129 %*	*115*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-12-0319

19C0086-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 14:20

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:04

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		*80-120 %*	*96.5*	*%*	
Surrogate: 4-Bromofluorobenzene		*80-120 %*	*90.1*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*80-120 %*	*105*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-12-0319

19C0086-04 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 14:20

Instrument: NT6 Analyst: JZ — Analyzed: 03/18/2019 19:29

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-04 D 01

Preparation Batch: BHC0303 — Sample Size: 500 mL

Prepared: 12-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	**1.1**	ug/L	
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*52.5*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-12-0319-D

19C0086-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 14:30

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:24

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 19C0086-05 A

Preparation Batch: BHC0421 — Sample Size: 10 mL

Prepared: 14-Mar-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	**4.75**	ug/L	J
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.10	**0.05**	ug/L	J
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	**0.23**	ug/L	
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.05	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-12-0319-D

19C0086-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 14:30

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:24

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane				*80-120 %*	*113*	*%*	
Surrogate: 1,2-Dichloroethane-d4				*80-129 %*	*120*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-12-0319-D

19C0086-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 14:30

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:24

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		*80-120 %*	*96.6*	*%*	
Surrogate: 4-Bromofluorobenzene		*80-120 %*	*90.2*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*80-120 %*	*105*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-12-0319-D

19C0086-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 14:30

Instrument: NT6 Analyst: JZ — Analyzed: 03/18/2019 20:02

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-05 D 01

Preparation Batch: BHC0303 — Sample Size: 500 mL

Prepared: 12-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	**1.2**	ug/L	
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*59.0*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-13R-0319

19C0086-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 15:10

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:45

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 19C0086-06 A

Preparation Batch: BHC0421 — Sample Size: 10 mL

Prepared: 14-Mar-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.10	**0.11**	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	**0.05**	ug/L	J
Trichloroethene	79-01-6	1	0.05	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	**0.06**	ug/L	J
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-13R-0319

19C0086-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 15:10

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:45

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane				*80-120 %*	*107*	*%*	
Surrogate: 1,2-Dichloroethane-d4				*80-129 %*	*109*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-13R-0319

19C0086-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 15:10

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 19:45

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		*80-120 %*	*95.2*	*%*	
Surrogate: 4-Bromofluorobenzene		*80-120 %*	*88.3*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*80-120 %*	*106*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

LMW-13R-0319

19C0086-06 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 15:10

Instrument: NT6 Analyst: JZ — Analyzed: 03/18/2019 20:35

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-06 D 01

Preparation Batch: BHC0303 — Sample Size: 500 mL

Prepared: 12-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	ND	ug/L	U
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*63.5*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Field Blank

19C0086-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 15:30
Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 17:23

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 19C0086-07 A
Preparation Batch: BHC0421 — Sample Size: 10 mL
Prepared: 14-Mar-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	**3.56**	ug/L	J
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.10	**0.12**	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.05	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Field Blank

19C0086-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 15:30

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 17:23

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	**0.04**	ug/L	J
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane				*80-120 %*	*105*	*%*	
Surrogate: 1,2-Dichloroethane-d4				*80-129 %*	*108*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Field Blank

19C0086-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 15:30
Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 17:23

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		*80-120 %*	*96.7*	*%*	
Surrogate: 4-Bromofluorobenzene		*80-120 %*	*94.6*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*80-120 %*	*104*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Field Blank

19C0086-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D — Sampled: 03/05/2019 15:30
Instrument: NT6 Analyst: JZ — Analyzed: 03/18/2019 21:09

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) — Extract ID: 19C0086-07 D 01
Preparation Batch: BHC0303 — Sample Size: 500 mL
Prepared: 12-Mar-2019 — Final Volume: 1 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.2	0.4	ND	ug/L	U
Surrogate: 1,4-Dioxane-d8				*33.6-120 %*	*71.3*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Trip Blank

19C0086-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 10:00
Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 17:43

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 19C0086-08 A
Preparation Batch: BHC0421 — Sample Size: 10 mL
Prepared: 14-Mar-2019 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	**2.26**	ug/L	J
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.10	**0.04**	ug/L	J
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.05	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Trip Blank

19C0086-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 10:00

Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 17:43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane				*80-120 %*	*104*	*%*	
Surrogate: 1,2-Dichloroethane-d4				*80-129 %*	*106*	*%*	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Trip Blank

19C0086-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C — Sampled: 03/05/2019 10:00
Instrument: NT2 Analyst: LH — Analyzed: 03/14/2019 17:43

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		*80-120 %*	*97.2*	*%*	
Surrogate: 4-Bromofluorobenzene		*80-120 %*	*92.2*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4		*80-120 %*	*102*	*%*	

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Volatile Organic Compounds - Quality Control

Batch BHC0421 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0421-BLK1)				Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 17:02							
Chloromethane	ND	0.09	0.50	ug/L							U
Vinyl Chloride	ND	0.06	0.10	ug/L							U
Bromomethane	ND	0.25	1.00	ug/L							U
Chloroethane	ND	0.09	0.20	ug/L							U
Trichlorofluoromethane	ND	0.04	0.20	ug/L							U
Acrolein	ND	2.48	2.50	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.04	0.20	ug/L							U
Acetone	ND	2.06	5.00	ug/L							U
1,1-Dichloroethene	ND	0.05	0.20	ug/L							U
Bromoethane	ND	0.04	0.20	ug/L							U
Iodomethane	ND	0.23	0.50	ug/L							U
Methylene Chloride	ND	0.49	1.00	ug/L							U
Acrylonitrile	ND	0.60	1.00	ug/L							U
Carbon Disulfide	0.09	0.04	0.10	ug/L							J
trans-1,2-Dichloroethene	ND	0.05	0.20	ug/L							U
Vinyl Acetate	ND	0.07	0.20	ug/L							U
1,1-Dichloroethane	ND	0.05	0.20	ug/L							U
2-Butanone	ND	0.81	5.00	ug/L							U
2,2-Dichloropropane	ND	0.05	0.10	ug/L							U
cis-1,2-Dichloroethene	ND	0.04	0.20	ug/L							U
Chloroform	ND	0.03	0.20	ug/L							U
Bromochloromethane	ND	0.06	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.04	0.20	ug/L							U
1,1-Dichloropropene	ND	0.03	0.10	ug/L							U
Carbon tetrachloride	ND	0.04	0.20	ug/L							U
1,2-Dichloroethane	ND	0.07	0.20	ug/L							U
Benzene	ND	0.03	0.20	ug/L							U
Trichloroethene	ND	0.05	0.20	ug/L							U
1,2-Dichloropropane	ND	0.04	0.20	ug/L							U
Bromodichloromethane	ND	0.05	0.20	ug/L							U
Dibromomethane	ND	0.15	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	0.25	0.50	ug/L							U
4-Methyl-2-Pentanone	ND	0.97	2.50	ug/L							U
cis-1,3-Dichloropropene	ND	0.06	0.20	ug/L							U
Toluene	ND	0.04	0.20	ug/L							U

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Volatile Organic Compounds - Quality Control

Batch BHC0421 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0421-BLK1)				Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 17:02							
trans-1,3-Dichloropropene	ND	0.08	0.20	ug/L							U
2-Hexanone	ND	0.90	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.13	0.20	ug/L							U
1,3-Dichloropropane	ND	0.06	0.10	ug/L							U
Tetrachloroethene	ND	0.05	0.20	ug/L							U
Dibromochloromethane	ND	0.05	0.20	ug/L							U
1,2-Dibromoethane	ND	0.07	0.10	ug/L							U
Chlorobenzene	ND	0.02	0.20	ug/L							U
Ethylbenzene	ND	0.04	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.04	0.20	ug/L							U
m,p-Xylene	ND	0.05	0.40	ug/L							U
o-Xylene	ND	0.03	0.20	ug/L							U
Xylenes, total	ND	0.09	0.60	ug/L							U
Styrene	ND	0.05	0.20	ug/L							U
Bromoform	ND	0.06	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.06	0.10	ug/L							U
1,2,3-Trichloropropane	ND	0.13	0.20	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	0.32	1.00	ug/L							U
n-Propylbenzene	ND	0.02	0.20	ug/L							U
Bromobenzene	ND	0.06	0.20	ug/L							U
Isopropyl Benzene	ND	0.02	0.20	ug/L							U
2-Chlorotoluene	ND	0.02	0.10	ug/L							U
4-Chlorotoluene	ND	0.02	0.20	ug/L							U
t-Butylbenzene	ND	0.03	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.02	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.02	0.20	ug/L							U
s-Butylbenzene	ND	0.02	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.03	0.20	ug/L							U
1,3-Dichlorobenzene	0.04	0.04	0.20	ug/L							J
1,4-Dichlorobenzene	0.05	0.04	0.20	ug/L							J
n-Butylbenzene	0.05	0.02	0.20	ug/L							J
1,2-Dichlorobenzene	0.04	0.04	0.20	ug/L							J
1,2-Dibromo-3-chloropropane	ND	0.37	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.11	0.50	ug/L							U
Hexachloro-1,3-Butadiene	0.15	0.07	0.20	ug/L							J

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Volatile Organic Compounds - Quality Control

Batch BHC0421 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0421-BLK1)				Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 17:02							
Naphthalene	ND	0.12	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.11	0.20	ug/L							U
Dichlorodifluoromethane	ND	0.05	0.20	ug/L							U
Surrogate: Dibromofluoromethane	5.24			ug/L	*5.00*		*105*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	5.18			ug/L	*5.00*		*104*	*80-129*			
Surrogate: Toluene-d8	4.85			ug/L	*5.00*		*96.9*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.69			ug/L	*5.00*		*93.8*	*80-120*			
Surrogate: 1,2-Dichlorobenzene-d4	5.27			ug/L	*5.00*		*105*	*80-120*			
LCS (BHC0421-BS1)				Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 16:02							
Chloromethane	10.5	0.09	0.50	ug/L	10.0		105	60-138			
Vinyl Chloride	10.0	0.06	0.10	ug/L	10.0		100	66-133			
Bromomethane	10.8	0.25	1.00	ug/L	10.0		108	72-131			
Chloroethane	10.2	0.09	0.20	ug/L	10.0		102	60-155			
Trichlorofluoromethane	10.5	0.04	0.20	ug/L	10.0		105	80-129			
Acrolein	52.8	2.48	2.50	ug/L	50.0		106	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.6	0.04	0.20	ug/L	10.0		106	76-129			
Acetone	51.4	2.06	5.00	ug/L	50.0		103	58-142			
1,1-Dichloroethene	10.2	0.05	0.20	ug/L	10.0		102	69-135			
Bromoethane	10.2	0.04	0.20	ug/L	10.0		102	78-128			
Iodomethane	9.75	0.23	0.50	ug/L	10.0		97.5	56-147			
Methylene Chloride	9.70	0.49	1.00	ug/L	10.0		97.0	65-135			
Acrylonitrile	10.2	0.60	1.00	ug/L	10.0		102	64-134			
Carbon Disulfide	10.5	0.04	0.10	ug/L	10.0		105	78-125			
trans-1,2-Dichloroethene	10.0	0.05	0.20	ug/L	10.0		100	78-128			
Vinyl Acetate	9.60	0.07	0.20	ug/L	10.0		96.0	55-138			
1,1-Dichloroethane	10.1	0.05	0.20	ug/L	10.0		101	76-124			
2-Butanone	55.3	0.81	5.00	ug/L	50.0		111	61-140			
2,2-Dichloropropane	11.9	0.05	0.10	ug/L	10.0		119	78-125			
cis-1,2-Dichloroethene	10.7	0.04	0.20	ug/L	10.0		107	80-121			
Chloroform	10.2	0.03	0.20	ug/L	10.0		102	80-122			
Bromochloromethane	10.1	0.06	0.20	ug/L	10.0		101	80-121			
1,1,1-Trichloroethane	10.8	0.04	0.20	ug/L	10.0		108	79-123			
1,1-Dichloropropene	10.9	0.03	0.10	ug/L	10.0		109	80-120			
Carbon tetrachloride	11.3	0.04	0.20	ug/L	10.0		113	53-137			

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Volatile Organic Compounds - Quality Control

Batch BHC0421 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BHC0421-BS1)					Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 16:02						
1,2-Dichloroethane	9.77	0.07	0.20	ug/L	10.0		97.7	75-123			
Benzene	10.5	0.03	0.20	ug/L	10.0		105	80-120			
Trichloroethene	10.4	0.05	0.20	ug/L	10.0		104	80-120			
1,2-Dichloropropane	9.98	0.04	0.20	ug/L	10.0		99.8	80-120			
Bromodichloromethane	11.0	0.05	0.20	ug/L	10.0		110	80-121			
Dibromomethane	10.3	0.15	0.20	ug/L	10.0		103	80-120			
2-Chloroethyl vinyl ether	9.77	0.25	0.50	ug/L	10.0		97.7	74-127			
4-Methyl-2-Pentanone	60.0	0.97	2.50	ug/L	50.0		120	67-133			
cis-1,3-Dichloropropene	10.0	0.06	0.20	ug/L	10.0		100	80-124			
Toluene	10.2	0.04	0.20	ug/L	10.0		102	80-120			
trans-1,3-Dichloropropene	10.0	0.08	0.20	ug/L	10.0		100	71-127			
2-Hexanone	60.0	0.90	5.00	ug/L	50.0		120	69-133			
1,1,2-Trichloroethane	10.3	0.13	0.20	ug/L	10.0		103	80-121			
1,3-Dichloropropane	10.7	0.06	0.10	ug/L	10.0		107	80-120			
Tetrachloroethene	10.2	0.05	0.20	ug/L	10.0		102	80-120			
Dibromochloromethane	8.96	0.05	0.20	ug/L	10.0		89.6	65-135			
1,2-Dibromoethane	11.4	0.07	0.10	ug/L	10.0		114	80-121			
Chlorobenzene	10.3	0.02	0.20	ug/L	10.0		103	80-120			
Ethylbenzene	10.6	0.04	0.20	ug/L	10.0		106	80-120			
1,1,1,2-Tetrachloroethane	11.0	0.04	0.20	ug/L	10.0		110	80-120			
m,p-Xylene	22.5	0.05	0.40	ug/L	20.0		112	80-121			
o-Xylene	10.4	0.03	0.20	ug/L	10.0		104	80-121			
Xylenes, total	32.9	0.09	0.60	ug/L	30.0		110	76-127			
Styrene	11.0	0.05	0.20	ug/L	10.0		110	80-124			
Bromoform	8.36	0.06	0.20	ug/L	10.0		83.6	51-134			Q
1,1,2,2-Tetrachloroethane	10.7	0.06	0.10	ug/L	10.0		107	77-123			
1,2,3-Trichloropropane	10.7	0.13	0.20	ug/L	10.0		107	76-125			
trans-1,4-Dichloro 2-Butene	9.03	0.32	1.00	ug/L	10.0		90.3	55-129			
n-Propylbenzene	11.2	0.02	0.20	ug/L	10.0		112	78-130			
Bromobenzene	10.5	0.06	0.20	ug/L	10.0		105	80-120			
Isopropyl Benzene	11.9	0.02	0.20	ug/L	10.0		119	80-128			
2-Chlorotoluene	11.6	0.02	0.10	ug/L	10.0		116	78-122			
4-Chlorotoluene	11.0	0.02	0.20	ug/L	10.0		110	80-121			
t-Butylbenzene	11.6	0.03	0.20	ug/L	10.0		116	78-125			
1,3,5-Trimethylbenzene	11.6	0.02	0.20	ug/L	10.0		116	80-129			

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Volatile Organic Compounds - Quality Control

Batch BHC0421 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BHC0421-BS1)					Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 16:02						
1,2,4-Trimethylbenzene	11.9	0.02	0.20	ug/L	10.0		119	80-127			
s-Butylbenzene	11.5	0.02	0.20	ug/L	10.0		115	78-129			
4-Isopropyl Toluene	11.8	0.03	0.20	ug/L	10.0		118	79-130			
1,3-Dichlorobenzene	10.5	0.04	0.20	ug/L	10.0		105	80-120			
1,4-Dichlorobenzene	10.2	0.04	0.20	ug/L	10.0		102	80-120			
n-Butylbenzene	11.8	0.02	0.20	ug/L	10.0		118	74-129			
1,2-Dichlorobenzene	10.3	0.04	0.20	ug/L	10.0		103	80-120			
1,2-Dibromo-3-chloropropane	8.78	0.37	0.50	ug/L	10.0		87.8	62-123			Q
1,2,4-Trichlorobenzene	10.2	0.11	0.50	ug/L	10.0		102	64-124			
Hexachloro-1,3-Butadiene	10.5	0.07	0.20	ug/L	10.0		105	58-123			
Naphthalene	10.0	0.12	0.50	ug/L	10.0		100	50-134			
1,2,3-Trichlorobenzene	10.4	0.11	0.20	ug/L	10.0		104	49-133			
Dichlorodifluoromethane	10.2	0.05	0.20	ug/L	10.0		102	48-147			
Surrogate: Dibromofluoromethane	4.93			ug/L	*5.00*		*98.6*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	4.84			ug/L	*5.00*		*96.7*	*80-129*			
Surrogate: Toluene-d8	5.07			ug/L	*5.00*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5.21			ug/L	*5.00*		*104*	*80-120*			
Surrogate: 1,2-Dichlorobenzene-d4	5.15			ug/L	*5.00*		*103*	*80-120*			
LCS Dup (BHC0421-BSD1)					Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 16:22						
Chloromethane	10.9	0.09	0.50	ug/L	10.0		109	60-138	3.83	30	
Vinyl Chloride	10.6	0.06	0.10	ug/L	10.0		106	66-133	5.74	30	
Bromomethane	11.0	0.25	1.00	ug/L	10.0		110	72-131	1.40	30	
Chloroethane	11.0	0.09	0.20	ug/L	10.0		110	60-155	7.82	30	
Trichlorofluoromethane	10.4	0.04	0.20	ug/L	10.0		104	80-129	0.93	30	
Acrolein	57.7	2.48	2.50	ug/L	50.0		115	52-144	9.03	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	11.0	0.04	0.20	ug/L	10.0		110	76-129	3.62	30	
Acetone	55.6	2.06	5.00	ug/L	50.0		111	58-142	7.94	30	
1,1-Dichloroethene	10.6	0.05	0.20	ug/L	10.0		106	69-135	4.38	30	
Bromoethane	10.9	0.04	0.20	ug/L	10.0		109	78-128	6.36	30	
Iodomethane	10.3	0.23	0.50	ug/L	10.0		103	56-147	5.09	30	
Methylene Chloride	10.0	0.49	1.00	ug/L	10.0		100	65-135	3.04	30	
Acrylonitrile	11.0	0.60	1.00	ug/L	10.0		110	64-134	7.14	30	
Carbon Disulfide	11.0	0.04	0.10	ug/L	10.0		110	78-125	4.99	30	
trans-1,2-Dichloroethene	10.7	0.05	0.20	ug/L	10.0		107	78-128	6.41	30	

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Volatile Organic Compounds - Quality Control

Batch BHC0421 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BHC0421-BSD1)					Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 16:22						
Vinyl Acetate	10.1	0.07	0.20	ug/L	10.0		101	55-138	5.17	30	
1,1-Dichloroethane	10.8	0.05	0.20	ug/L	10.0		108	76-124	7.04	30	
2-Butanone	57.9	0.81	5.00	ug/L	50.0		116	61-140	4.66	30	
2,2-Dichloropropane	12.6	0.05	0.10	ug/L	10.0		126	78-125	5.43	30	*
cis-1,2-Dichloroethene	11.3	0.04	0.20	ug/L	10.0		113	80-121	5.63	30	
Chloroform	10.9	0.03	0.20	ug/L	10.0		109	80-122	6.66	30	
Bromochloromethane	10.7	0.06	0.20	ug/L	10.0		107	80-121	5.34	30	
1,1,1-Trichloroethane	11.4	0.04	0.20	ug/L	10.0		114	79-123	5.53	30	
1,1-Dichloropropene	11.6	0.03	0.10	ug/L	10.0		116	80-120	5.73	30	
Carbon tetrachloride	11.6	0.04	0.20	ug/L	10.0		116	53-137	3.15	30	
1,2-Dichloroethane	10.3	0.07	0.20	ug/L	10.0		103	75-123	5.76	30	
Benzene	11.1	0.03	0.20	ug/L	10.0		111	80-120	5.79	30	
Trichloroethene	11.0	0.05	0.20	ug/L	10.0		110	80-120	5.43	30	
1,2-Dichloropropane	10.4	0.04	0.20	ug/L	10.0		104	80-120	4.42	30	
Bromodichloromethane	11.5	0.05	0.20	ug/L	10.0		115	80-121	4.14	30	
Dibromomethane	10.7	0.15	0.20	ug/L	10.0		107	80-120	4.39	30	
2-Chloroethyl vinyl ether	10.1	0.25	0.50	ug/L	10.0		101	74-127	3.37	30	
4-Methyl-2-Pentanone	61.8	0.97	2.50	ug/L	50.0		124	67-133	2.87	30	
cis-1,3-Dichloropropene	10.6	0.06	0.20	ug/L	10.0		106	80-124	5.44	30	
Toluene	10.8	0.04	0.20	ug/L	10.0		108	80-120	5.83	30	
trans-1,3-Dichloropropene	10.5	0.08	0.20	ug/L	10.0		105	71-127	4.92	30	
2-Hexanone	61.6	0.90	5.00	ug/L	50.0		123	69-133	2.72	30	
1,1,2-Trichloroethane	10.7	0.13	0.20	ug/L	10.0		107	80-121	3.86	30	
1,3-Dichloropropane	11.3	0.06	0.10	ug/L	10.0		113	80-120	5.24	30	
Tetrachloroethene	10.8	0.05	0.20	ug/L	10.0		108	80-120	6.15	30	
Dibromochloromethane	9.39	0.05	0.20	ug/L	10.0		93.9	65-135	4.67	30	
1,2-Dibromoethane	11.8	0.07	0.10	ug/L	10.0		118	80-121	2.98	30	
Chlorobenzene	10.8	0.02	0.20	ug/L	10.0		108	80-120	4.94	30	
Ethylbenzene	11.4	0.04	0.20	ug/L	10.0		114	80-120	7.48	30	
1,1,1,2-Tetrachloroethane	11.8	0.04	0.20	ug/L	10.0		118	80-120	6.55	30	
m,p-Xylene	23.6	0.05	0.40	ug/L	20.0		118	80-121	5.10	30	
o-Xylene	11.2	0.03	0.20	ug/L	10.0		112	80-121	7.24	30	
Xylenes, total	34.9	0.09	0.60	ug/L	30.0		116	76-127	5.79	30	
Styrene	11.2	0.05	0.20	ug/L	10.0		112	80-124	2.25	30	
Bromoform	9.07	0.06	0.20	ug/L	10.0		90.7	51-134	8.18	30	Q

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Volatile Organic Compounds - Quality Control

Batch BHC0421 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BHC0421-BSD1)				Prepared: 14-Mar-2019 Analyzed: 14-Mar-2019 16:22							
1,1,2,2-Tetrachloroethane	11.1	0.06	0.10	ug/L	10.0		111	77-123	4.16	30	
1,2,3-Trichloropropane	10.8	0.13	0.20	ug/L	10.0		108	76-125	1.22	30	
trans-1,4-Dichloro 2-Butene	9.70	0.32	1.00	ug/L	10.0		97.0	55-129	7.10	30	
n-Propylbenzene	11.9	0.02	0.20	ug/L	10.0		119	78-130	6.18	30	
Bromobenzene	10.9	0.06	0.20	ug/L	10.0		109	80-120	4.24	30	
Isopropyl Benzene	12.7	0.02	0.20	ug/L	10.0		127	80-128	6.56	30	
2-Chlorotoluene	12.2	0.02	0.10	ug/L	10.0		122	78-122	5.44	30	
4-Chlorotoluene	11.6	0.02	0.20	ug/L	10.0		116	80-121	5.23	30	
t-Butylbenzene	12.2	0.03	0.20	ug/L	10.0		122	78-125	5.65	30	
1,3,5-Trimethylbenzene	12.2	0.02	0.20	ug/L	10.0		122	80-129	5.13	30	
1,2,4-Trimethylbenzene	12.5	0.02	0.20	ug/L	10.0		125	80-127	5.04	30	
s-Butylbenzene	12.2	0.02	0.20	ug/L	10.0		122	78-129	5.95	30	
4-Isopropyl Toluene	12.4	0.03	0.20	ug/L	10.0		124	79-130	4.44	30	
1,3-Dichlorobenzene	11.2	0.04	0.20	ug/L	10.0		112	80-120	6.72	30	
1,4-Dichlorobenzene	10.7	0.04	0.20	ug/L	10.0		107	80-120	4.64	30	
n-Butylbenzene	12.3	0.02	0.20	ug/L	10.0		123	74-129	4.23	30	
1,2-Dichlorobenzene	10.7	0.04	0.20	ug/L	10.0		107	80-120	4.59	30	
1,2-Dibromo-3-chloropropane	9.42	0.37	0.50	ug/L	10.0		94.2	62-123	7.05	30	Q
1,2,4-Trichlorobenzene	10.8	0.11	0.50	ug/L	10.0		108	64-124	5.39	30	
Hexachloro-1,3-Butadiene	11.2	0.07	0.20	ug/L	10.0		112	58-123	5.76	30	
Naphthalene	10.7	0.12	0.50	ug/L	10.0		107	50-134	6.51	30	
1,2,3-Trichlorobenzene	11.1	0.11	0.20	ug/L	10.0		111	49-133	6.06	30	
Dichlorodifluoromethane	10.7	0.05	0.20	ug/L	10.0		107	48-147	4.87	30	
Surrogate: Dibromofluoromethane	4.97			ug/L	*5.00*		*99.3*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	4.89			ug/L	*5.00*		*97.9*	*80-129*			
Surrogate: Toluene-d8	5.07			ug/L	*5.00*		*101*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5.14			ug/L	*5.00*		*103*	*80-120*			
Surrogate: 1,2-Dichlorobenzene-d4	5.06			ug/L	*5.00*		*101*	*80-120*			

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Semivolatile Organic Compounds - Quality Control

Batch BHC0303 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0303-BLK1)				Prepared: 12-Mar-2019 Analyzed: 18-Mar-2019 16:06							
1,4-Dioxane	ND	0.2	0.4	ug/L							U
Surrogate: 1,4-Dioxane-d8	35.7			ug/L	*50.0*		*71.4*	*33.6-120*			
LCS (BHC0303-BS1)				Prepared: 12-Mar-2019 Analyzed: 18-Mar-2019 16:40							
1,4-Dioxane	36.1	0.2	0.4	ug/L	50.0		72.3	39.9-120			
Surrogate: 1,4-Dioxane-d8	32.1			ug/L	*50.0*		*64.3*	*33.6-120*			
LCS Dup (BHC0303-BSD1)				Prepared: 12-Mar-2019 Analyzed: 18-Mar-2019 17:14							
1,4-Dioxane	36.9	0.2	0.4	ug/L	50.0		73.8	39.9-120	2.09	30	
Surrogate: 1,4-Dioxane-d8	32.8			ug/L	*50.0*		*65.6*	*33.6-120*			

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Semivolatile Organic Compounds - Quality Control

Batch BHC0610 - EPA 3520C (Liq Liq)

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0610-BLK1)				Prepared: 25-Mar-2019 Analyzed: 26-Mar-2019 12:13							
1,4-Dioxane	ND	0.2	0.4	ug/L							U
Surrogate: 1,4-Dioxane-d8	35.1			ug/L	*50.0*		*70.2*	*33.6-120*			
LCS (BHC0610-BS1)				Prepared: 25-Mar-2019 Analyzed: 26-Mar-2019 12:46							
1,4-Dioxane	33.2	0.2	0.4	ug/L	50.0		66.4	39.9-120			
Surrogate: 1,4-Dioxane-d8	30.9			ug/L	*50.0*		*61.9*	*33.6-120*			
LCS Dup (BHC0610-BSD1)				Prepared: 25-Mar-2019 Analyzed: 26-Mar-2019 13:19							
1,4-Dioxane	32.1	0.2	0.4	ug/L	50.0		64.1	39.9-120	3.52	30	
Surrogate: 1,4-Dioxane-d8	29.1			ug/L	*50.0*		*58.3*	*33.6-120*			

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Certified Analyses included in this Report

Analyte	Certifications
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

EPA 8270D in Water

1,4-Dioxane WADOE,NELAP,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019

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Golder Associates	Project: Landsburg	
18300 NE Union Hill Road Suite 200	Project Number: 9231000005.2000	**Reported:**
Redmond WA, 98052-3333	Project Manager: Gary Zimmerman	26-Mar-2019 15:29

Notes and Definitions

*	Flagged value is not within established control limits.
H	Hold time violation - Hold time was exceeded.
J	Estimated concentration value detected below the reporting limit.
M	Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

APPENDIX B

Sample Integrity Data Sheets (SIDS)

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-005

Site Location Ravensdale, WA **Sample ID** LMW-2-03/9

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) 2017 COMPLIANCE MONITORING PLAN

Type of Sampler Dedicated Pump Grundfos

Date 3/5/19 **Time** 1600

Media Water **Station** LMW-2

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 6.48 ft below TOC (inner PVC at elev. X) (bottom at 38.1 ft bgs, 4-in casing) 0904

Screen Interval – 27.9-38.1 ft bgs Monument: 2.94 ags Inner PVC: 2.38 ags

Sand Pack Interval – 24.8-38.1 ft bgs (8-in hole) (~7.8 gal/sand pack vol)

Packer Depth – NA (~22.3 gal/casing vol) (~30.1 gal/total well vol)

Sample Description Sulfur Odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
2 – 500 mL	1,4-Dioxane	Glass Amber	none

Sampler (signature) [signature] **Date** 3/5/19

Supervisor (signature) [signature] **Date** 3/6/19

FIELD PARAMETERS SHEET

Well ID LMW-2
Date 5/5/19
Time Begin Purge 0918
Time Collect Sample 1000

Water Level feet bmp	Time	Temp. °C	pH	Conductivity uS/cm	DO mg/L	Eh Rel mV	Turbidity NTU
6.49	0928	10.1	6.93	713	1.01	-204.9	0.58
6.50	0933	10.1	6.94	771	0.73	-203.4	0.28
6.50	0938	10.1	6.93	715	0.63	-227.7	0.67
6.50	0943	10.1	6.93	714	0.56	-254.2	0.30
6.50	0948	10.1	6.94	712	0.54	-295.6	0.43
6.50	0953	10.1	6.94	715	0.51	-285.1	0.88
6.50	0958	10.1	6.95	712	0.49	-280.0	0.30

Comments:

Grundfos: 70Hz
PID well 0.0ppm
PID discharge 0.1ppm
Sulfur odor

5gal/6min = 0.83 gpm

Sampler's Initials

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-005

Site Location Ravensdale, WA **Sample ID** LMW-4-03/9

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) 2017 COMPLIANCE MONITORING PLAN

Type of Sampler Dedicated Pump Grundfos

Date 3/5/19 **Time** 1120

Media Water **Station** LMW-4

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 8.41 ft below TOC (inner PVC at elev. X) (bottom at 209.7 ft bgs, 4-in casing)

Screen Interval – 195-209.7 ft bgs Monument: 2.76 ags Inner PVC: 2.17 ags

Sand Pack Interval – 189-209.7 ft bgs (8-in hole) (~12.3 gal/sand pack)

Packer Depth – 187.3 ft bgs (~133.3 gal/casing vol) (~14.6 gal/packer casing volume)

(~26.9 gal/total well vol below packer)

** Depths corrected for 70° inclination

Sample Description Sulfur Odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
2 – 500 mL	1,4-Dioxane	Glass Amber	none

Sampler (signature) _____ **Date** 3/5/19

Supervisor (signature) _____ **Date** 3-6-19

FIELD PARAMETERS SHEET

Well ID LMW4
Date 3/5/19
Time Begin Purge 1040
Time Collect Sample 1120

Water Level feet bmp	Time	Temp. °C	pH	Conductivity uS/cm	DO mg/L	Eh Rel mV	Turbidity NTU
8.41	1050	9.8	6.99	717	1.59	-143.4	0.16
8.41	1055	9.9	6.99	717	0.94	-177.7	0.09
8.41	1100	9.9	6.99	716	0.71	-200.8	0.12
8.41	1105	9.9	6.98	712	0.61	-226.9	0.27
8.41	1110	9.9	6.98	711	0.56	-238.2	0.32
8.41	1115	9.9	6.98	710	0.53	-250.4	0.10

Comments:

well - 0.0 ppm Discharge 0.1 ppm
Packer - 135 5 gal / 8.5 min = 0.59 gpm

Sampler's Initials JBL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-005

Site Location Ravensdale, WA **Sample ID** LMW-10-0319

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) 2017 COMPLIANCE MONITORING PLAN

Type of Sampler QED Bladder

Date 3/5/19 **Time** 1320

Media Water **Station** LMW-10

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 0.2 ft below TOC (PVC) (bottom at 289 ft bgs, 4-in casing)

Screen Interval – 267-289 ft bgs PVC stickup: 3.12 ags

Sand Pack Interval – 258-289 ft bgs (9-in hole) (~18.2 gal/sand pack)

Packer Depth – NA (~191 gal/casing vol) (~209 gal/total well vol)

Sample Description Air Hose fitting cracked, Needs Replaced

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
2 – 500 mL	1,4-Dioxane	Glass Amber	none

Sampler (signature) _____ **Date** 3/5/19

Supervisor (signature) _____ **Date** 3-6-19

FIELD PARAMETERS SHEET

Well ID LMW-10-0315
Date 3/5/17
Time Begin Purge 1235
Time Collect Sample 1320

Water Level feet bmp	Time	Temp. °C	pH	Conductivity uS/cm	DO mg/L	Eh Rel mV	Turbidity NTU
1.72	1245	8.6	8.77	250.4	1.32	-103.7	0.67
2.42	1250	8.7	8.77	251.0	0.83	-183.4	1.02
3.15	1255	8.7	8.76	256.1	0.68	-201.2	0.98
3.47	1300	8.8	8.67	251.8	0.63	-204.0	1.24
4.04	1305	8.8	8.76	252.2	0.58	-210.5	0.94
4.50	1310	8.9	8.76	252.6	0.54	-213.9	0.96
5.02	1315	8.9	8.76	253.1	0.52	-217.3	0.67

Comments:
PID well 0.0ppm 300 mV/min
Tank: 110psi
Throttle: 40psi
CID 50
CPM 2

Sampler's Initials

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-005

Site Location Ravensdale, WA **Sample ID** LMW-12-0319 + LMW-12-0319-D

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) 2017 COMPLIANCE MONITORING PLAN

Type of Sampler QED Bladder

Date 3/5/2019 **Time** 1420/1430

Media Water **Station** LMW-12

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 5.02 at 1345

Screen Interval – 15-25

Sand Pack Interval – 11-25

Packer Depth – NA

Sample Description Turbid/Purge cloudy No Odor, some orange/Brown staining on discharge tube

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Duplicate

	Aliquot Amount	Analysis	Container	Preservation / Amount
6	3 – 40 mL	VOA	VOA Vial	HCl
4	2 – 500 mL	1,4-Dioxane	Glass Amber	none

Sampler (signature) _____ **Date** 3/5/19

Supervisor (signature) _____ **Date** 3-6-19

FIELD PARAMETERS SHEET

Well ID LMW12
Date 3/5/19
Time Begin Purge 1345
Time Collect Sample 1420 - 1430

Water Level feet bmp	Time	Temp. °C	pH	Conductivity uS/cm	DO mg/L	Eh Rel mV	Turbidity NTU
5.02	1355	8.9	6.91	671	0.78	-41.2	40.0
5.04	1400	8.9	6.91	672	0.64	-51.4	39.4
5.02	1405	9.0	6.92	684	0.57	-74.8	31.4
5.02	1410	9.1	6.92	694	0.53	-92.9	20.0
5.02	1415	9.1	6.91	960	0.54	-95.5	26.1

Comments:

500 mL/min

No odor

Some orange/Brown Staining on Discharge Tube

Tank 110

Throttle 20

CID 47

CPM 2

Sampler's Initials

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-005

Site Location Ravensdale, WA **Sample ID** LMW-13R-0319

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) 2017 COMPLIANCE MONITORING PLAN

Type of Sampler QED Bladder

Date 3/5/19 **Time** 1510

Media Water **Station** LMW-13R

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 5.52

Screen Interval – 115 – 140

Sand Pack Interval – 110 -150

Packer Depth – NA

Sample Description Clear No Odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
2 – 500 mL	1,4-Dioxane	Glass Amber	none

Sampler (signature) [signature] **Date** 3/5/19

Supervisor (signature) [signature] **Date** 3-6-19

FIELD PARAMETERS SHEET

Well ID MW 13-R
Date 1 3/5/19
Time Begin Purge 1438
Time Collect Sample 1510

Water Level feet bmp	Time	Temp. °C	pH	Conductivity uS/cm	DO mg/L	Eh Rel mV	Turbidity NTU
5.78	1448	9.4	7.50	649	0.78	-140.5	3.39
5.86	1453	9.5	7.50	651	0.58	-162.6	0.31
5.84	1458	9.5	7.50	650	0.53	-168.5	0.32
5.83	1503	9.4	7.50	650	0.49	-174.9	0.24
5.84	1508	9.4	7.5	649	0.46	-179.7	0.23

Comments: PID well 0.0ppm
CPM2 450 mL/min
CID 48
Tank 110
Throttle 35

Sampler's Initials

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-005

Site Location Ravensdale, WA **Sample ID** ~~EB~~ Field Blank-0319

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) 2017 COMPLIANCE MONITORING PLAN

Type of Sampler ~~Pump Grundfos and QED Bladder~~ NA

Date 3/5/19 **Time** 1530

Media Water VOC Free DI **Station** LMW-~~1K~~ 13R

Sample Type: **grab** time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – NA

Screen Interval – NA

Sand Pack Interval – NA

Packer Depth – NA

Sample Description Field Blank Collected @ LMW-13R after sampling LMW-13R-0319

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
2 – 500 mL	1,4-Dioxane	Glass Amber	none

Sampler (signature) [signature] **Date** 3/5/19

Supervisor (signature) [signature] **Date** 3-6-19

FIELD PARAMETERS SHEET

Well ID LMW-13R
Date 3/5/19
Time Begin Purge —
Time Collect Sample 1530

Water Level feet bmp	Time	Temp. °C	pH	Conductivity uS/cm	DO mg/L	Eh Rel mV	Turbidity NTU

Comments:

No Parameters Collected for Blank

Sampler's Initials