

February 18, 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 DECEMBER 2018 SAMPLING

Dear Bill,

Golder Associates Inc. (Golder) completed a quarterly interim groundwater monitoring event at the Landsburg Mine Site during December 2018. Groundwater samples were collected from monitoring wells LMW-2, LMW-3, LMW-4, LMW-5, LMW-6, LMW-7, LMW-8, LMW-9, LMW-10, LMW-11, LMW-12, LMW-13R, and LMW-15 (Figure 1). 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 of the Rogers Coal Mine subsidence trench. Monitoring wells LMW-3 and LMW-5 are completed to monitor the shallow (~40 feet depth) and deeper zone (~250 feet depth), respectively, within the Rogers Coal Seam at the south end of the mine. Monitoring well LMW-8 is receiving groundwater immediately before discharge from Portal 3 and the mine access incline at the south end of the Rogers Coal Mine. Wells LMW-9 and LMW-11 monitor groundwater from within the Rogers Coal Mine near its south end: LMW-9 receives groundwater from near the top of the water table and LMW-11 receives groundwater near the bottom of the mine. LMW-15, a new south sentinel well was installed in October 2018. LMW-15 is located near LMW-11 and monitors shallower groundwater in this portion of the Rogers Coal Mine. Wells LMW-6 and LMW-7 monitor groundwater from the Frasier and Landsburg Coal Mines to the west and east of the Rogers Coal Mine, respectively. Figure 2 presents a cross-section along the strike at the coal seam that also depicts the location of the monitoring wells. Groundwater sampling was conducted in accordance with the *Compliance Monitoring Plan, Landsburg Mine Site* (Ecology 2017)¹, 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.

¹ 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.

- Measurement of field parameters including: pH, specific conductance, temperature, dissolved oxygen, redox potential (Eh), and turbidity.
- Collection of representative samples in appropriate containers provided by the analytical laboratory; dissolved metals samples were field filtered (total metals were not). The dissolved metals samples were not analyzed.
- Analyses of groundwater samples for volatile organic compounds (VOCs; United States Environmental Protection Agency [EPA] Method 8260C), semi-volatile organic compounds including 1,4-Dioxane (SVOCs, EPA Method 8270D), polychlorinated biphenyls (PCBs; EPA 8082A), pesticides (EPA 8081B), priority pollutant metals (EPA Method 6010C/200.8/7470A Series), and a petroleum hydrocarbon identification scan (NWTPH-HCID).

Appendix A presents the laboratory analytical reports for all analyses. Field sampling activities were documented on Sample Integrity Data Sheets (SIDS). Copies of the completed SIDS are provided in Appendix B. Appendix C provides the data validation report with added data qualifiers noted. Table 1 presents depth to groundwater measured on December 3, 2018 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. Laboratory analyses did not detect any PCBs, pesticides, or total petroleum hydrocarbon in any of the groundwater samples.

The laboratory data packages underwent data validation. Items of note are provided in a validation memorandum in Appendix C. In general, data were found to be acceptable with minor qualification. Data qualifiers are defined, and all data qualifiers assigned under the data validation process are presented in the Appendix C data validation memorandum.

The parameters detected in groundwater samples during this sampling event were metals, benzene, carbon disulfide, chloroform, 1,4-dioxane, 1,1-dichloroethane, naphthalene, and toluene.

Metals were detected at concentrations that are naturally occurring and were consistent with historic concentrations detected at the Site. Several groundwater samples from Site wells contained iron and manganese concentrations above State of Washington secondary drinking water levels (SMCLs) of 0.3 milligrams per liter (mg/L) and 0.05 mg/L, respectively, which are not health-based standards, but are protective of aesthetic qualities of water. Iron and manganese have been detected in mine groundwater above MTCA cleanup levels in every monitoring event at the Site and are naturally occurring metals that are typically associated with groundwater from coal mines (Fuste et al. 1983)². The concentrations of iron and manganese detected during the December 2018

² Fuste, L.A., F.A. Packard, M.O. Fretwell, and D.P. Garland. 1983. Data Supplement To: Quality of Coal Mine Drainage in Washington, 1975-77. Open-File Report 83-205. Tacoma, Washington: US Geological Survey.

sampling event are similar to concentrations detected during the RI (Golder 1996)³ and the Interim Groundwater Sampling events previously conducted at the Site.

The groundwater sample from the deep well (LMW-11) contained total arsenic at a concentration of 10.1 µg/L (0.0101 mg/L), which is equivalent to the Washington State primary drinking water MCL (10 µg/L) and greater than the MTCA Method A groundwater cleanup level (5 µg/L). Arsenic has been detected in groundwater from LMW-11 near or above MTCA cleanup levels during every monitoring event since LMW-11 was installed. Arsenic is also a naturally occurring metal commonly detectable in groundwater, especially in older more stagnant groundwater having low reduction-oxidation (REDOX) and dissolved oxygen levels. The MTCA groundwater cleanup level is based on typical groundwater background levels in the State of Washington. It is believed that the arsenic concentrations are naturally occurring deep within the mine where groundwater is more stagnant and its geochemistry may be different than shallow groundwater within the mine. The groundwater sample from the south sentinel well LMW-15 (located near LMW-11) contained total arsenic at a concentration of 3.61 µg/L (0.00361 mg/L), which is less than the MCL (10 µg/L) and less than the MTCA Method A groundwater cleanup level (5 µg/L). Arsenic was not detected in any other Site wells.

Benzene was detected in LMW-13R at an estimated concentration of 0.03 µg/L. The trace detection was less than the laboratory reporting limit of 0.20 µg/L and is J-flagged. The trace benzene detection is also less than the MTCA Method A groundwater cleanup level of 5 µg/L.

Carbon disulfide was detected in LMW-10 (0.24 µg/L), LMW-12 (0.04 µg/L), LMW-13R (0.34 µg/L), and LMW-15 (2.27 µg/L). All detected concentrations of carbon disulfide are orders of magnitude lower than the MTCA Method A groundwater cleanup level for carbon disulfide (800 µg/L). Carbon disulfide has been detected at these low levels in Site groundwater in previous sampling events. The detection of carbon disulfide is attributed to its presence in the coal bed material as a natural constituent.

Chloroform was detected in LMW-15 at a concentration of 1.02 µg/L. LMW-15 was installed in November 2018, and a significant amount of potable water from a public drinking water system was used during drilling to facilitate the removal of drill cores. Chloroform is one of the trihalomethanes produced as a byproduct of drinking water disinfection and is commonly present in public drinking water supplies. The EPA drinking water MCL for total trihalomethanes 80 µg/L. Although LMW-15 was developed after well installation to remove potential influences from the drilling process, additional well development and/or natural displacement by groundwater is expected to eliminate the trace detection of chloroform.

1,1-Dichloroethane was detected in LMW-12 at a concentration of 0.12 µg/L. The trace detection was less than the laboratory reporting limit of 0.20 µg/L and is J-flagged. The LMW-12 concentration is also less than the MTCA Method B groundwater cleanup level of 7.68 µg/L.

Naphthalene was detected in LMW-13R at a concentration of 0.14 µg/L. The trace detection was less than the laboratory reporting limit of 0.50 µg/L and is J-flagged. The LMW-13R concentration is also less than the MTCA Method A groundwater cleanup level of 160 µg/L.

³ Golder Associates Inc. (Golder). 1996. Remedial Investigation and Feasibility Study for the Landsburg Mine Site. Landsburg PLP Steering Committee.

Toluene was detected in LMW-13R (0.06 µg/L) and LMW-15 (0.05 µg/L). The trace detections were less than the laboratory reporting limit of 0.20 µg/L and are J-flagged. The detected toluene concentrations are also less than the MTCA Method B groundwater cleanup level of 640 µg/L.

1,4-Dioxane was detected in LMW-2 (1.7 µg/L), LMW-4 (1.6 µg/L), and LMW-12 (1.2 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. Concentrations detected in LMW-2 and LMW-4 during December 2018 sampling round were lower than concentrations detected in November 2017. 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, August, and December 2018 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. 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

Attachments: Table 1: Groundwater Elevation Data Collection December 3, 2018 Landsburg Mine Site
Table 2: December 2018 Groundwater Analytical Results Landsburg Mine Site
Figure 1: Groundwater Monitoring Locations
Figure 2: Cross-Section along Strike at Coal Seam
Appendix A: Laboratory Analytical Reports
Appendix B: Sample Integrity Data Sheets (SIDS)
Appendix C: December 2018 Landsburg Mine Site Water Quality Monitoring Data
Validation and Quality Assurance / Quality Control Review Memorandum

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Tables

Table 1: Groundwater Elevation Data Collection December 3, 2018 Landsburg Mine Site

| | UNITS | LMW-1 | LMW-2 | LMW-3 | LMW-4 ¹ | LMW-5 | LMW-6 | LMW-7 ¹ | LMW-8 | LMW-9 | LMW-10 | LMW-11 ² | LMW-12 | LMW-13R | LMW-15 |
|----------------------------------|--------|---------------|---------------|---------------|--------------------|---------------|---------------|--------------------|---------------|---------------|---------------|---------------------|---------------|---------------|---------------|
| Water Depths | | | | | | | | | | | | | | | |
| Time of data collection | | 10:50 AM | 12:42 PM | 10:04 AM | 12:36 PM | 10:20 AM | 11:32 AM | 1:19 PM | 10:10 AM | 9:52 AM | 12:58 PM | 9:44 AM | 12:50 PM | 12:47 PM | 9:08 AM |
| Measured to Top of PVC | ft btc | 141.66 | 7.37 | 12.48 | 8.85 | 14.02 | 37.97 | 211.99 | 3.96 | 99.75 | 0.64 | 157.52 | 9.47 | 10.00 | 151.71 |
| Measured to Top of Monument | ft btm | 142.41 | NC | 13.29 | NC | 14.72 | 38.76 | NC | 5.01 | 100.04 | 0.96 | 157.91 | NC | NC | NC |
| Surveyed Elevation | | | | | | | | | | | | | | | |
| Top of PVC | ft asl | 765.36 | 617.79 | 656.75 | 619.27 | 658.27 | 632.33 | 771.51 | 646.97 | 743.99 | 618.98 | 802.15 | 625.35 | 625.86 | 796.21 |
| Top of Monument | ft asl | 766.16 | 618.38 | 657.48 | 619.89 | 658.87 | 633.00 | 771.88 | NC | NC | 619.10 | 802.38 | 625.49 | 625.91 | 796.56 |
| Ground Level | ft asl | 763.02 | 614.92 | 654.40 | 617.37 | 655.63 | 629.95 | 768.79 | 645.25 | 741.13 | 615.78 | 799.82 | 621.90 | 622.07 | 792.47 |
| Corrected Water Elevation | | | | | | | | | | | | | | | |
| Using PVC elevation | ft asl | 623.70 | 610.42 | 644.27 | 610.42 | 644.25 | 594.36 | 559.52 | 643.01 | 644.24 | 618.34 | 644.63 | 615.88 | 615.86 | 644.50 |
| Using Monument elevation | ft asl | 623.75 | NA | 644.19 | NA | 644.15 | 594.24 | NA | NA | NA | NA | NA | NA | NA | NA |

Notes:

¹ Data corrected to accommodate well inclination of 20° from vertical

² Will be resurveyed after LMW-14 is installed due to minor discrepancies with previous surveys (<0.5 feet elevation difference).

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: December 2018 Groundwater Analytical Results Landsburg Mine Site

| ANALYTE | UNITS | LMW-2 | LMW-2 Duplicate | LMW-3 | LMW-4 | LMW-5 | LMW-6 | LMW-7 | LMW-8 | LMW-9 | LMW-10 | LMW-11 | LMW-12 | LMW-13R | LMW-15 | Equipment Blank | Trip Blank |
|--|--------|-----------|-----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------------|------------|
| | | 12/5/2018 | 12/5/2018 | 12/5/2018 | 12/4/2018 | 12/5/2018 | 12/5/2018 | 12/3/2018 | 12/5/2018 | 12/6/2018 | 12/4/2018 | 12/6/2018 | 12/4/2018 | 12/4/2018 | 12/5/2018 | 12/5/2018 | 12/5/2018 |
| Field Parameter | | | | | | | | | | | | | | | | | |
| pH | stnd | 7.10 | - | 7.42 | 7.13 | 6.69 | 6.73 | 6.96 | 6.67 | 6.94 | 9.00 | 7.15 | 6.88 | 7.59 | 7.43 | - | - |
| Conductivity | uS/cm | 687 | - | 243 | 691 | 558 | 198.9 | 433.5 | 480.1 | 538 | 245.3 | 385.3 | 609 | 626 | 343.4 | - | - |
| Dissolved Oxygen | mg/L | 0.55 | - | 0.52 | 0.61 | 0.43 | 0.54 | 0.6 | 0.51 | 0.49 | 0.71 | 0.87 | 0.68 | 0.75 | 0.71 | - | - |
| Temperature | °C | 10.5 | - | 10.6 | 10.2 | 10.5 | 9.6 | 13.2 | 10.7 | 12.5 | 8.7 | 9.6 | 9.8 | 9.5 | 9.3 | - | - |
| E _h | Rel mV | -75.2 | - | 47.6 | -72.2 | -47.5 | -35.0 | -8.2 | -77.5 | -61.9 | -100.7 | -70.9 | -79.2 | -106.1 | -92.0 | - | - |
| Turbidity | NTU | 0.69 | - | 0.46 | 0.58 | 3.06 | 0.85 | 2.09 | 2.76 | 0.23 | 0.53 | 0.98 | 74.5 | 7.01 | 5.54 | - | - |
| Metals (Total) | | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Antimony | mg/L | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | NS |
| Arsenic | mg/L | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | NS |
| Barium | mg/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 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NS |
| Beryllium | mg/L | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | NS |
| Cadmium | mg/L | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | NS |
| Calcium | mg/L | 111 | 109 | 36.9 | 109 | 84.3 | 27.3 | 51.2 | 70.4 | 81.3 | 6.85 | 60.2 | 84.5 | 87.7 | 45.6 | 0.5 U | NS |
| Chromium | mg/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Cobalt | mg/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Copper | mg/L | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | NS |
| Iron | mg/L | 0.2 U | 0.2 U | 0.2 U | 0.656 | 0.268 | 2.21 | 0.929 | 11.2 | 1.5 | 0.2 U | 0.723 | 31.2 | 1.7 | 0.876 | 0.2 U | NS |
| Lead | mg/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Magnesium | mg/L | 68.0 | 68 | 15 | 66.7 | 44.5 | 13.7 | 24.3 | 36.6 | 43.4 | 2.93 | 25.6 | 56 | 41.2 | 20.7 | 1 U | NS |
| Manganese | mg/L | 0.188 | 0.188 | 0.0506 | 0.144 | 0.219 | 0.0323 | 0.105 | 0.47 | 0.18 | 0.02 U | 0.19 | 1.31 | 0.0796 | 0.228 | 0.02 U | NS |
| Mercury | mg/L | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | 0.00002 U | NS |
| Nickel | mg/L | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | 0.02000 U | NS |
| Potassium | mg/L | 3.34 | 3.33 | 1.67 | 3.66 | 2.52 | 0.739 | 3.06 | 1.89 | 2.45 | 1.26 | 2.05 | 4.3 | 3.73 | 3.48 | 0.5 U | NS |
| Selenium | mg/L | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | NS |
| Silver | mg/L | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | NS |
| Sodium | mg/L | 18.1 | 17.9 | 9.6 | 25.5 | 14.2 | 6.91 | 46.1 | 11.4 | 14.7 | 81.5 | 20.6 | 11.4 | 16.5 | 75.5 | 22.9 | NS |
| Thallium | mg/L | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | NS |
| Vanadium | mg/L | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | NS |
| Zinc | mg/L | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | NS |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | | | | | | | | |
| Acetone | ug/L | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| 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 | 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 | 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 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 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 | 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 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| Bromodichloromethane | 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 | 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 | 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 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| 2-Butanone | ug/L | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 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 | 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 | 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 | 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 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| 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 | 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 | 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 | 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-Chlorohexane | ug/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 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 | 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 | 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 | 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 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| Chlorodibromomethane | 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 | 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 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

Table 2: December 2018 Groundwater Analytical Results Landsburg Mine Site

| ANALYTE | UNITS | LMW-2 | LMW-2 Duplicate | LMW-3 | LMW-4 | LMW-5 | LMW-6 | LMW-7 | LMW-8 | LMW-9 | LMW-10 | LMW-11 | LMW-12 | LMW-13R | LMW-15 | Equipment Blank | Trip Blank |
|----------------------------------|-------|-------|-----------------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|---------|--------|-----------------|------------|
| Benzo(a)anthracene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Benzo(a)pyrene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Benzo(b)fluoranthene | ug/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Benzo(k)fluoranthene | ug/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Benzo(ghi)perylene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Benzoic Acid | ug/L | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | NS |
| Benzyl Alcohol | ug/L | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | NS |
| Bis(2-Chloroethoxy)Methane | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| bis(2-chloroethyl)Ether | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Bis(2-chloroisopropyl)ether | ug/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| bis(2-ethylhexyl)phthalate | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| 4-Bromophenyl phenyl ether | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| butyl benzyl phthalate | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Carbazole | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 4-Chloroaniline | ug/L | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | NS |
| 4-Chloro-3-Methylphenol | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| 2-Chloronaphthalene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 2-Chlorophenol | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 4-Chlorophenyl phenyl ether | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 3 & 4-Methylphenol (m,p-Cresols) | ug/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| 2-Methylphenol (o-Cresol) | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Chrysene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Di-n-butyl phthalate | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Dibenz(a,h)anthracene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Dibenzofuran | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 1,2-Dichlorobenzene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 1,3-Dichlorobenzene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 1,4-Dichlorobenzene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 3,3'-Dichlorobenzidine | ug/L | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | NS |
| 2,4-Dichlorophenol | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| Diethyl phthalate | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 2,4-Dimethylphenol | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| Dimethyl phthalate | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 4,6-Dinitro-2-Methylphenol | ug/L | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | NS |
| 2,4-Dinitrophenol | ug/L | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | 20 U | NS |
| 2,4-Dinitrotoluene | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| 2,6-Dinitrotoluene | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| 1,4-Dioxane | ug/L | 1.7 | 1.7 | 0.4 U | 1.6 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 1.2 | 0.4 U | 0.4 U | 0.4 U | NS |
| N-Nitrosodiphenylamine | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Fluoranthene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Fluorene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Hexachlorobenzene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Hexachlorobutadiene | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| Hexachlorocyclopentadiene | ug/L | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | NS |
| Hexachloroethane | ug/L | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | NS |
| Indeno(1,2,3-cd)pyrene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Isophorone | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 1-Methylnaphthalene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 2-Methylnaphthalene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Naphthalene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 2-Nitroaniline | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| 3-Nitroaniline | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| 4-Nitroaniline | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| Nitrobenzene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 2-Nitrophenol | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| 4-Nitrophenol | ug/L | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | NS |
| N-Nitrosodi-n-propylamine | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Di-n-Octyl Phthalate | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |

Table 2: December 2018 Groundwater Analytical Results Landsburg Mine Site

| ANALYTE | UNITS | LMW-2 | LMW-2 Duplicate | LMW-3 | LMW-4 | LMW-5 | LMW-6 | LMW-7 | LMW-8 | LMW-9 | LMW-10 | LMW-11 | LMW-12 | LMW-13R | LMW-15 | Equipment Blank | Trip Blank |
|---|-------|---------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------------|------------|
| Pentachlorophenol | ug/L | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | NS |
| Phenanthrene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 1,3,5-Trimethylbenzene | ug/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Phenol | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Pyrene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 1,2,4-Trichlorobenzene | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| 2,4,5-Trichlorophenol | ug/L | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | NS |
| 2,4,6-Trichlorophenol | ug/L | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | 3 U | NS |
| 4-Methylphenol | ug/L | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | NS |
| 2,2'-Oxybis(1-Chloropropane) | ug/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |
| Polychlorinated Biphenyls (PCBs) | | | | | | | | | | | | | | | | | |
| Aroclor 1016 | ug/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Aroclor 1221 | ug/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Aroclor 1232 | ug/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Aroclor 1242 | ug/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Aroclor 1248 | ug/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Aroclor 1254 | ug/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Aroclor 1260 | ug/L | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NS |
| Aroclor 1262 | ug/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Aroclor 1268 | ug/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Pesticides | | | | | | | | | | | | | | | | | |
| Aldrin (2C) | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| alpha-BHC (2C) | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| beta-BHC (2C) | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| delta-BHC (2C) | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| gamma-BHC (2C) | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| cis-Chlordane | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| trans-Chlordane | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| 4,4'-DDD (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| 4,4'-DDE (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| 4,4'-DDT (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| Dieldrin (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| Endosulfan I (2C) | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| Endosulfan II (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| Endosulfan sulfate (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| Endrin | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| Endrin aldehyde (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| Endrin ketone (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| Heptachlor (2C) | ug/L | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NS |
| Heptachlor epoxide (2C) | ug/L | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NS |
| Methoxychlor (2C) | ug/L | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NS |
| Toxaphene | ug/L | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | 1.25 U | NS |
| Hydrocarbon Identification | | | | | | | | | | | | | | | | | |
| Diesel Range | mg/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 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NS |
| Gas Range | mg/L | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NS |
| Heavy Fuel Oil | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Insulating Oil | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Kerosene Range | mg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NS |
| Lube Oil Range | mg/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NS |

Figures

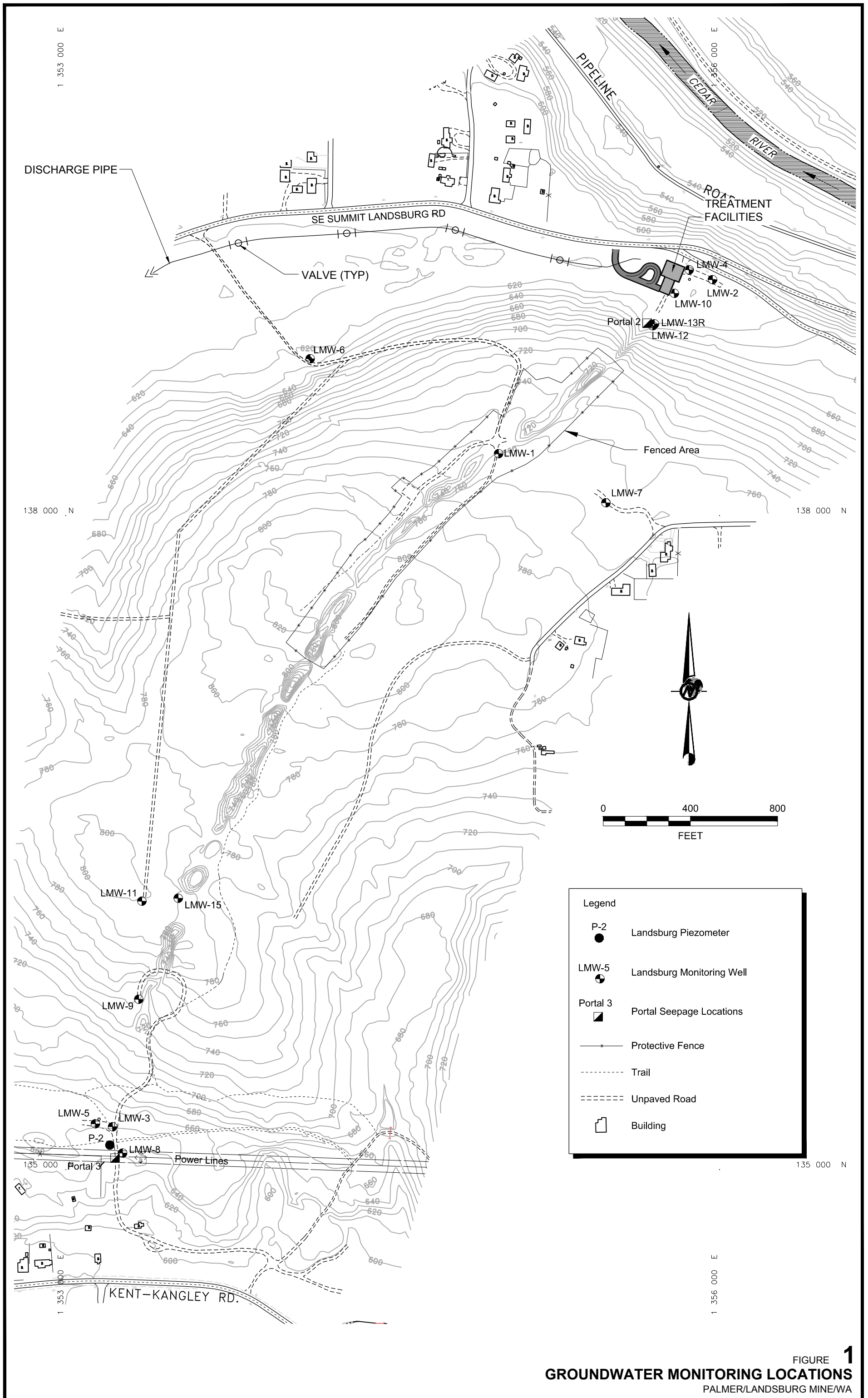
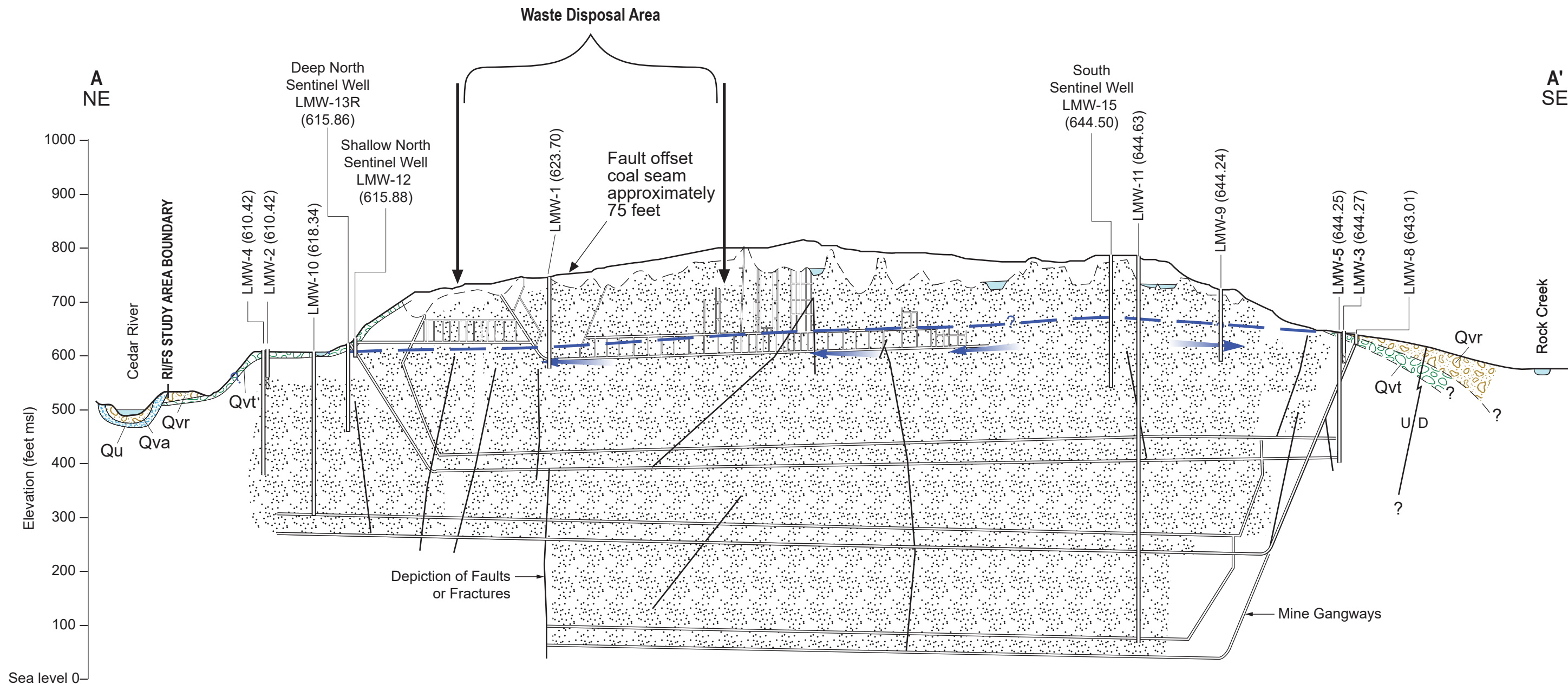


FIGURE 1
GROUNDWATER MONITORING LOCATIONS
 PALMER/LANDBURG MINE/WA



Elevation (feet msl)

Sea level 0

1000

900

800

700

600

500

400

300

200

100

0

EXPLANATION

- Potentiometric surface
- Outline of trench bottom
- LMW-2 (610.42) Well ID (Water Level (ft. amsl) 12/03/19)
- 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

Sources for the Geology and Mine Information:
 J.E. Luzier 1969; surficial geology
 State of Washington, Water Well reports
 Mine Superintendent'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'
 Assuming groundwater discharge at the north and south
 end of mine.



| | | | |
|------------|---------------------|-------------|---|
| CLIENT | LANDSBURG PLP GROUP | PROJECT | LANDSBURG MINE SITE |
| CONSULTANT | GOLDER | TITLE | CROSS-SECTION ALONG STRIKE AT COAL SEAM CROSS-SECTION A-A' |
| DATE | 2019-02-15 | PROJECT No. | 923-1000 |
| PREPARED | REDMOND | PHASE | 005 |
| DESIGN | | | |
| REVIEW | | | |
| APPROVED | | | |

G:\Palmer\Co\kg\Coal\Co\Landburg\Mine\A099_PROJECTS\9231000002_PFI_Remediation\15402_PRODUCTION\INDD\9231000_002_R154_003.mxd

APPENDIX A

Laboratory Analytical Reports



19 December 2018

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.

| | |
|---------------------------------|-----------------------------|
| <u>Associated Work Order(s)</u> | <u>Associated SDG ID(s)</u> |
| 18L0063 | 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.

Kelly Bottem, Client Services Manager



Chain of Custody Record & Laboratory Analysis Request



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

| | | |
|--|---|-----------------------------------|
| ARI Assigned Number: 18L0063 | Turn-around Requested: <i>Standard</i> | Page: 1 of 1 |
| ARI Client Company: <i>Golders</i> | Phone: 425-883-0777 | Date: 12/3/18 - 12/4/18 |
| Client Contact: <i>G. Zimmerman</i> | | Ice Present? Yes |
| Client Project Name: <i>Landsburg</i> | | No. of Coolers: 7 |
| Client Project #: 923 1000 005, 2000 | Samplers: <i>J. Miller / J. X.</i> | Cooler Temps: |

| Sample ID | Date | Time | Matrix | No. Containers | Analysis Requested | | | | | | | Notes/Comments |
|---|---------|------|--------|----------------|---|--|---------------------------------|-----------------------------|----------|-------------------|-------------------|---|
| | | | | | VOC Client List | PCB(LL) | Pesticides | SVOC szFop Client List | TPH-HCID | #Foliarups (Hull) | TAML Metals Total | |
| LMW-7-1218 | 12/3/18 | 1435 | W | 18 | X | X | X | X | X | Hold | X | * Field Filtered w/ 0.45µm filter - Analyze under MS4 w/ Golders |
| LMW-12-1218 | 12/4/18 | 1025 | W | 18 | X | X | X | X | X | | X | |
| LMW-13R-1218 | | 1155 | W | 18 | X | X | X | X | X | | X | |
| LMW-10-1218 | | 1328 | W | 18 | X | X | X | X | X | | X | |
| LMW-4-1218 | | 1445 | W | 18 | X | X | X | X | X | | X | |
| LMW-2-1218 | | 1550 | W | 18 | X | X | X | X | X | | X | |
| LMW-2-1218-D | | 1610 | W | 18 | X | X | X | X | X | | X | |
| Trip Blank 120418 | - | - | W | 3 | X | | | | | | | |
| Comments/Special Instructions - Ecology EIM EDD * Client Specific RLs + analyte list * pls cc: g.zimmerman@golders.com jcmiller@golders.com | | | | | Relinquished by: (Signature) <i>Joe Miller</i> Printed Name: Joe Miller Company: Golders Date & Time: 12/5/18 0725 | Received by: (Signature) <i>Jacob Walte</i> Printed Name: Jacob Walte Company: ARI Date & Time: 12/05/18 1245 | Relinquished by: (Signature) | Received by: (Signature) | | | | |

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, notwithstanding 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
18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|-----------------|---------------|--------|-------------------|-------------------|
| LMW-7-1218 | 18L0063-01 | Water | 03-Dec-2018 14:35 | 05-Dec-2018 12:45 |
| LMW-12-1218 | 18L0063-03 | Water | 04-Dec-2018 10:25 | 05-Dec-2018 12:45 |
| LMW-13R-1218 | 18L0063-05 | Water | 04-Dec-2018 11:55 | 05-Dec-2018 12:45 |
| LMW-10-1218 | 18L0063-07 | Water | 04-Dec-2018 13:28 | 05-Dec-2018 12:45 |
| LMW-4-1218 | 18L0063-09 | Water | 04-Dec-2018 14:45 | 05-Dec-2018 12:45 |
| LMW-2-1218 | 18L0063-11 | Water | 04-Dec-2018 15:50 | 05-Dec-2018 12:45 |
| LMW-2-1218-D | 18L0063-13 | Water | 04-Dec-2018 16:10 | 05-Dec-2018 12:45 |
| TripBlank120418 | 18L0063-15 | Water | 03-Dec-2018 14:35 | 05-Dec-2018 12:45 |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Case Narrative

Pesticides - EPA Method SW8081A

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.

PCB Aroclors - EPA Method SW8082A

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.

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.



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Project: Landsburg
Project Number: Landsburg
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Reported:
19-Dec-2018 17:38

The LCS percent recoveries were within control limits.

Semivolatiles - 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.

Total Metals - EPA Method 200.8 6010C and 7470

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

Initial and continuing calibrations were within method requirements.

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

The LCS percent recoveries were within control limits.

The Matrix Spike/Matrix Spike duplicate recoveries and RPD were within limits with the exception of analytes flagged on the associated forms.

Wet Chemistry

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

Initial and continuing calibrations were within method requirements.

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

The LCS percent recoveries were within control limits.

Hydrocarbon Identification (HCID) - WA-Ecology Method NW-HCID



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

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

Initial and continuing calibrations were within method requirements.

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.

Volatiles - EPA Method SW8260C

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

Initial and continuing calibrations were within method requirements with the exception of all associated "Q" flagged analytes which are out of control low in the CCAL. All associated samples that 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.

The Matrix Spike/Matrix Spike duplicate recoveries and RPD were within limits with the exception of analytes flagged on the associated forms.



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-7-1218
18L0063-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/03/2018 14:35

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 16:36

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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 |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-7-1218
18L0063-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/03/2018 14:35

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 16:36

| Analyte | CAS Number | Dilution | Detection Limit | Reporting Limit | Result | Units | Notes |
|-----------------------------|-------------|----------|-----------------|-----------------|--------|-------|-------|
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |
| 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 |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-7-1218
18L0063-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/03/2018 14:35

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 16:36

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Dibromofluoromethane | | 80-120 % | 100 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | 80-129 % | 105 | % | |
| Surrogate: Toluene-d8 | | 80-120 % | 97.1 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 91.3 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 102 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-7-1218
18L0063-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/03/2018 14:35

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 17:09

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0151 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-7-1218
18L0063-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/03/2018 14:35

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 17:09

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------------------------|------------|----------|-----------------|--------|-------|-------|
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |

| | | |
|-----------------------------------|----------|--------|
| Surrogate: 2-Fluorophenol | 33-120 % | 70.4 % |
| Surrogate: Phenol-d5 | 38-120 % | 74.6 % |
| Surrogate: 2-Chlorophenol-d4 | 41-120 % | 75.1 % |
| Surrogate: 1,2-Dichlorobenzene-d4 | 20-120 % | 66.8 % |
| Surrogate: Nitrobenzene-d5 | 27-120 % | 77.3 % |
| Surrogate: 2-Fluorobiphenyl | 33-120 % | 78.1 % |
| Surrogate: 2,4,6-Tribromophenol | 52-120 % | 90.8 % |



| | | |
|---|--|--------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond, WA 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 19-Dec-2018 17:38 |
|---|--|--------------------------------|

LMW-7-1218
18L0063-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D
Instrument: NT12 Analyst: JZ
Sampled: 12/03/2018 14:35
Analyzed: 07-Dec-2018 17:09

| Analyte | CAS Number | Recovery Limits | Recovery | Units | Notes |
|-----------------------------------|------------|-----------------|----------|-------|-------|
| <i>Surrogate: p-Terphenyl-d14</i> | | 28-120 % | 95.3 % | | |

Instrument: NT6 Analyst: JZ
Analyzed: 14-Dec-2018 15:46

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0152 Sample Size: 500 mL
Prepared: 07-Dec-2018 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 71.2 % | | |



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Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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LMW-7-1218
18L0063-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/03/2018 14:35

Instrument: FID4 Analyst: JGR

Analyzed: 06-Dec-2018 20:08

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0134 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| <i>Surrogate: o-Terphenyl</i> | | | 50-150 % | 102 | % | |
| <i>Surrogate: n-Triacontane</i> | | | 50-150 % | 102 | % | |



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Project Manager: Gary Zimmerman

Reported:
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LMW-7-1218
18L0063-01 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/03/2018 14:35

Instrument: ECD6 Analyst: YZ

Analyzed: 18-Dec-2018 15:53

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0174 Sample Size: 500 mL
Prepared: 07-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|-------------|----------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | <i>11-144 %</i> | <i>92.1</i> | <i>%</i> | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | <i>11-144 %</i> | <i>84.2</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | <i>30-120 %</i> | <i>69.1</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | <i>30-120 %</i> | <i>81.1</i> | <i>%</i> | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-7-1218
18L0063-01 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 12/03/2018 14:35

Instrument: ECD7 Analyst: JGR

Analyzed: 17-Dec-2018 19:26

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 78.9 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 63.4 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 76.2 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 59.0 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-7-1218
18L0063-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/03/2018 14:35

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:36

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-7-1218
18L0063-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/03/2018 14:35

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:36

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project Manager: Gary Zimmerman

Reported:
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LMW-7-1218
18L0063-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/03/2018 14:35

Instrument: ICP2 Analyst: TCH

Analyzed: 13-Dec-2018 17:09

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0359 Sample Size: 25 mL
Prepared: 13-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 51200 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 929 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 24300 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 105 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 3060 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 46100 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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|---|--|---------------------------------------|
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|---|--|---------------------------------------|

LMW-7-1218
18L0063-01 (Water)

Metals and Metallic Compounds

Method: EPA 7470A Sampled: 12/03/2018 14:35
Instrument: CVAA Analyst: SKM Analyzed: 17-Dec-2018 13:08

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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LMW-12-1218
18L0063-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 10:25

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 16:56

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 0.04 | 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 | 0.12 | ug/L | J |
| 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-12-1218
18L0063-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 10:25

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 16:56

| Analyte | CAS Number | Dilution | Detection Limit | Reporting Limit | Result | Units | Notes |
|-----------------------------|-------------|----------|-----------------|-----------------|--------|-------|-------|
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |
| 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 |
| 1,1,1,2-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 |



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Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-12-1218
18L0063-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 10:25

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 16:56

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Dibromofluoromethane | | 80-120 % | 102 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | 80-129 % | 105 | % | |
| Surrogate: Toluene-d8 | | 80-120 % | 97.2 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 94.9 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 100 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-12-1218
18L0063-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 10:25

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 17:42

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0151 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-12-1218
18L0063-03 (Water)

Semivolatiles Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 10:25

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 17:42

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------------------------|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |

| | | |
|-----------------------------------|----------|--------|
| Surrogate: 2-Fluorophenol | 33-120 % | 44.0 % |
| Surrogate: Phenol-d5 | 38-120 % | 46.6 % |
| Surrogate: 2-Chlorophenol-d4 | 41-120 % | 47.0 % |
| Surrogate: 1,2-Dichlorobenzene-d4 | 20-120 % | 41.9 % |
| Surrogate: Nitrobenzene-d5 | 27-120 % | 47.4 % |
| Surrogate: 2-Fluorobiphenyl | 33-120 % | 49.7 % |
| Surrogate: 2,4,6-Tribromophenol | 52-120 % | 58.3 % |
| Surrogate: p-Terphenyl-d14 | 28-120 % | 61.7 % |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-12-1218
18L0063-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/04/2018 10:25
Instrument: NT12 Analyst: JZ Analyzed: 07-Dec-2018 17:42

Instrument: NT6 Analyst: JZ Analyzed: 14-Dec-2018 16:19

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0152 Sample Size: 500 mL
Prepared: 07-Dec-2018 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 | |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 72.7 | % | |



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Project Manager: Gary Zimmerman

Reported:
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LMW-12-1218
18L0063-03 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/04/2018 10:25

Instrument: FID4 Analyst: JGR

Analyzed: 06-Dec-2018 20:28

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0134 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| <i>Surrogate: o-Terphenyl</i> | | | 50-150 % | 101 | % | |
| <i>Surrogate: n-Triacontane</i> | | | 50-150 % | 101 | % | |



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Project: Landsburg
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Reported:
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LMW-12-1218
18L0063-03 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/04/2018 10:25

Instrument: ECD6 Analyst: YZ

Analyzed: 18-Dec-2018 16:11

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0174 Sample Size: 500 mL
Prepared: 07-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|---------------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | <i>11-144 %</i> | <i>48.2 %</i> | | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | <i>11-144 %</i> | <i>47.0 %</i> | | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | <i>30-120 %</i> | <i>81.7 %</i> | | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | <i>30-120 %</i> | <i>87.9 %</i> | | |



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Project: Landsburg
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Reported:
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LMW-12-1218
18L0063-03 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 12/04/2018 10:25

Instrument: ECD7 Analyst: JGR

Analyzed: 17-Dec-2018 19:48

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 47.7 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 54.9 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 46.5 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 51.1 | % | |



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Reported:
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LMW-12-1218
18L0063-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/04/2018 10:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 17:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Reported:
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LMW-12-1218
18L0063-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/04/2018 10:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 17:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Reported:
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LMW-12-1218
18L0063-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/04/2018 10:25

Instrument: ICP2 Analyst: TCH

Analyzed: 13-Dec-2018 17:22

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0359 Sample Size: 25 mL
Prepared: 13-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 84500 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | 3.8 | ug/L | |
| Iron | 7439-89-6 | 1 | 200 | 31200 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 56000 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 1310 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 4300 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 16500 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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Reported:
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LMW-12-1218
18L0063-03 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 12/04/2018 10:25

Instrument: CVAA Analyst: SKM

Analyzed: 17-Dec-2018 13:11

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 11:55

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:16

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 0.34 | 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 | 0.03 | 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 11:55

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:16

| Analyte | CAS Number | Dilution | Detection Limit | Reporting Limit | Result | Units | Notes |
|-----------------------------|-------------|----------|-----------------|-----------------|--------|-------|-------|
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |
| 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 | 0.14 | ug/L | J |
| 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 11:55

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:16

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Dibromofluoromethane | | 80-120 % | 101 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | 80-129 % | 101 | % | |
| Surrogate: Toluene-d8 | | 80-120 % | 98.1 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 91.7 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 99.5 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 11:55

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 18:15

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0151 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Semivolatiles Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 11:55

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 18:15

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------------------------|------------|----------|-----------------|--------|-------|-------|
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |

| | | |
|-----------------------------------|----------|--------|
| Surrogate: 2-Fluorophenol | 33-120 % | 50.3 % |
| Surrogate: Phenol-d5 | 38-120 % | 47.7 % |
| Surrogate: 2-Chlorophenol-d4 | 41-120 % | 58.1 % |
| Surrogate: 1,2-Dichlorobenzene-d4 | 20-120 % | 54.1 % |
| Surrogate: Nitrobenzene-d5 | 27-120 % | 62.3 % |
| Surrogate: 2-Fluorobiphenyl | 33-120 % | 63.1 % |
| Surrogate: 2,4,6-Tribromophenol | 52-120 % | 73.6 % |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 11:55

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 18:15

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| <i>Surrogate: p-Terphenyl-d14</i> | | 28-120 % | 72.6 % | | |

Instrument: NT6 Analyst: JZ

Analyzed: 14-Dec-2018 16:52

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0152 Sample Size: 500 mL
Prepared: 07-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Detection | Reporting | Result | Units | Notes |
|----------------------------------|------------|----------|------------|-----------|--------|-------|-------|
| | | | Limit | Limit | | | |
| 1,4-Dioxane | 123-91-1 | 1 | 0.2 | 0.4 | ND | ug/L | U |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | 33.6-120 % | | 90.9 % | | |



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Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/04/2018 11:55

Instrument: FID4 Analyst: JGR

Analyzed: 06-Dec-2018 20:48

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0134 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| <i>Surrogate: o-Terphenyl</i> | | | 50-150 % | 101 | % | |
| <i>Surrogate: n-Triacontane</i> | | | 50-150 % | 101 | % | |



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Project: Landsburg
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Reported:
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LMW-13R-1218
18L0063-05 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/04/2018 11:55

Instrument: ECD6 Analyst: YZ

Analyzed: 18-Dec-2018 16:29

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0174 Sample Size: 500 mL
Prepared: 07-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|-------------|----------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | <i>11-144 %</i> | <i>84.9</i> | <i>%</i> | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | <i>11-144 %</i> | <i>79.1</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | <i>30-120 %</i> | <i>71.7</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | <i>30-120 %</i> | <i>68.3</i> | <i>%</i> | |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 12/04/2018 11:55

Instrument: ECD7 Analyst: JGR

Analyzed: 17-Dec-2018 20:09

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0213 Sample Size: 1000 mL
Prepared: 10-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CGL0092 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid
Cleanup Batch: CGL0090 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur
Cleanup Batch: CGL0091 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| Surrogate: Decachlorobiphenyl | | | 29-120 % | 70.2 | % | |
| Surrogate: Tetrachlorometaxylene | | | 32-120 % | 57.5 | % | |
| Surrogate: Decachlorobiphenyl [2C] | | | 29-120 % | 68.1 | % | |
| Surrogate: Tetrachlorometaxylene [2C] | | | 32-120 % | 53.5 | % | |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/04/2018 11:55

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Reported:
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LMW-13R-1218
18L0063-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/04/2018 11:55

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/04/2018 11:55

Instrument: ICP2 Analyst: TCH

Analyzed: 13-Dec-2018 17:14

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0359 Sample Size: 25 mL
Prepared: 13-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 87700 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 1700 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 41200 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 79.6 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 3730 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 75500 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-13R-1218
18L0063-05 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 12/04/2018 11:55

Instrument: CVAA Analyst: SKM

Analyzed: 17-Dec-2018 13:23

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 13:28

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:37

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 0.24 | 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 13:28

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:37

| Analyte | CAS Number | Dilution | Detection Limit | Reporting Limit | Result | Units | Notes |
|-----------------------------|-------------|----------|-----------------|-----------------|--------|-------|-------|
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |
| 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 |



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Redmond, WA 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 13:28

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:37

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Dibromofluoromethane | | 80-120 % | 104 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | 80-129 % | 102 | % | |
| Surrogate: Toluene-d8 | | 80-120 % | 97.1 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 94.3 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 103 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 13:28

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 18:49

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0151 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 13:28

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 18:49

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------------------------|------------|----------|-----------------|--------|-------|-------|
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |

| | | |
|-----------------------------------|----------|--------|
| Surrogate: 2-Fluorophenol | 33-120 % | 74.6 % |
| Surrogate: Phenol-d5 | 38-120 % | 78.5 % |
| Surrogate: 2-Chlorophenol-d4 | 41-120 % | 78.9 % |
| Surrogate: 1,2-Dichlorobenzene-d4 | 20-120 % | 71.4 % |
| Surrogate: Nitrobenzene-d5 | 27-120 % | 79.4 % |
| Surrogate: 2-Fluorobiphenyl | 33-120 % | 83.1 % |
| Surrogate: 2,4,6-Tribromophenol | 52-120 % | 90.7 % |

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.



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18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 13:28

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 18:49

| Analyte | CAS Number | Recovery Limits | Recovery | Units | Notes |
|-----------------------------------|------------|-----------------|----------|-------|-------|
| <i>Surrogate: p-Terphenyl-d14</i> | | 28-120 % | 96.2 % | | |

Instrument: NT6 Analyst: JZ

Analyzed: 17-Dec-2018 14:39

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0152 Sample Size: 500 mL
Prepared: 07-Dec-2018 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 69.3 % | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/04/2018 13:28

Instrument: FID4 Analyst: JGR

Analyzed: 06-Dec-2018 21:07

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0134 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| <i>Surrogate: o-Terphenyl</i> | | | 50-150 % | 97.4 | % | |
| <i>Surrogate: n-Triacontane</i> | | | 50-150 % | 95.8 | % | |



Golder Associates
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/04/2018 13:28

Instrument: ECD6 Analyst: YZ

Analyzed: 18-Dec-2018 16:47

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0174 Sample Size: 500 mL
Prepared: 07-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 11-144 % | 66.6 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 11-144 % | 64.1 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 30-120 % | 104 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 30-120 % | 74.7 | % | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 12/04/2018 13:28

Instrument: ECD7 Analyst: JGR

Analyzed: 17-Dec-2018 20:31

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 71.3 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 57.0 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 68.8 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 52.6 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/04/2018 13:28

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:46

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/04/2018 13:28

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:46

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/04/2018 13:28

Instrument: ICP2 Analyst: TCH

Analyzed: 13-Dec-2018 17:47

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0359 Sample Size: 25 mL
Prepared: 13-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 6850 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | ND | ug/L | U |
| Magnesium | 7439-95-4 | 1 | 1000 | 2930 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | ND | ug/L | U |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 1260 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 81500 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-10-1218
18L0063-07 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 12/04/2018 13:28

Instrument: CVAA Analyst: SKM

Analyzed: 17-Dec-2018 13:25

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 14:45

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:57

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 14:45

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:57

| Analyte | CAS Number | Dilution | Detection Limit | Reporting Limit | Result | Units | Notes |
|-----------------------------|-------------|----------|-----------------|-----------------|--------|-------|-------|
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |
| 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 |
| 1,1,1,2-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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 14:45

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 17:57

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Dibromofluoromethane | | 80-120 % | 102 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | 80-129 % | 103 | % | |
| Surrogate: Toluene-d8 | | 80-120 % | 97.1 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 90.9 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 104 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 14:45

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 19:22

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0151 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 14:45

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 19:22

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------------------------|------------|----------|-----------------|--------|-------|-------|
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |

| | | |
|-----------------------------------|----------|--------|
| Surrogate: 2-Fluorophenol | 33-120 % | 64.7 % |
| Surrogate: Phenol-d5 | 38-120 % | 68.5 % |
| Surrogate: 2-Chlorophenol-d4 | 41-120 % | 69.5 % |
| Surrogate: 1,2-Dichlorobenzene-d4 | 20-120 % | 64.1 % |
| Surrogate: Nitrobenzene-d5 | 27-120 % | 70.7 % |
| Surrogate: 2-Fluorobiphenyl | 33-120 % | 74.3 % |
| Surrogate: 2,4,6-Tribromophenol | 52-120 % | 87.7 % |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 14:45

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 19:22

| Analyte | CAS Number | Recovery Limits | Recovery | Units | Notes |
|-----------------------------------|------------|-----------------|----------|-------|-------|
| <i>Surrogate: p-Terphenyl-d14</i> | | 28-120 % | 94.1 % | | |

Instrument: NT6 Analyst: JZ

Analyzed: 17-Dec-2018 15:12

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0152 Sample Size: 500 mL
Prepared: 07-Dec-2018 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 | |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 70.9 % | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/04/2018 14:45

Instrument: FID4 Analyst: JGR

Analyzed: 06-Dec-2018 21:26

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0134 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| <i>Surrogate: o-Terphenyl</i> | | | 50-150 % | 92.4 | % | |
| <i>Surrogate: n-Triacontane</i> | | | 50-150 % | 91.6 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/04/2018 14:45

Instrument: ECD6 Analyst: YZ

Analyzed: 18-Dec-2018 17:06

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0174 Sample Size: 500 mL
Prepared: 07-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 11-144 % | 92.5 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 11-144 % | 85.1 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 30-120 % | 71.9 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 30-120 % | 73.6 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 12/04/2018 14:45

Instrument: ECD7 Analyst: JGR

Analyzed: 17-Dec-2018 20:52

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| Surrogate: Decachlorobiphenyl | | | 29-120 % | 64.7 | % | |
| Surrogate: Tetrachlorometaxylene | | | 32-120 % | 56.8 | % | |
| Surrogate: Decachlorobiphenyl [2C] | | | 29-120 % | 62.0 | % | |
| Surrogate: Tetrachlorometaxylene [2C] | | | 32-120 % | 53.2 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/04/2018 14:45

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:50

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Reported:
19-Dec-2018 17:38

LMW-4-1218
18L0063-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/04/2018 14:45

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:50

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project Manager: Gary Zimmerman

Reported:
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LMW-4-1218
18L0063-09 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/04/2018 14:45

Instrument: ICP2 Analyst: TCH

Analyzed: 13-Dec-2018 17:52

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0359 Sample Size: 25 mL
Prepared: 13-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|---------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 109000 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 656 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 66700 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 144 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 3660 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 25500 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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Reported:
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LMW-4-1218
18L0063-09 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 12/04/2018 14:45

Instrument: CVAA Analyst: SKM

Analyzed: 17-Dec-2018 13:36

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 15:50

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 18:17

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 15:50

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 18:17

| Analyte | CAS Number | Dilution | Detection Limit | Reporting Limit | Result | Units | Notes |
|-----------------------------|-------------|----------|-----------------|-----------------|--------|-------|-------|
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |
| 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 15:50

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 18:17

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Dibromofluoromethane | | 80-120 % | 103 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | 80-129 % | 107 | % | |
| Surrogate: Toluene-d8 | | 80-120 % | 97.3 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 95.4 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 99.7 | % | |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 15:50

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 19:55

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0151 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 15:50

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 19:55

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------------------------|------------|----------|-----------------|--------|-------|-------|
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |

| | | |
|-----------------------------------|----------|--------|
| Surrogate: 2-Fluorophenol | 33-120 % | 60.0 % |
| Surrogate: Phenol-d5 | 38-120 % | 64.2 % |
| Surrogate: 2-Chlorophenol-d4 | 41-120 % | 66.1 % |
| Surrogate: 1,2-Dichlorobenzene-d4 | 20-120 % | 59.7 % |
| Surrogate: Nitrobenzene-d5 | 27-120 % | 66.3 % |
| Surrogate: 2-Fluorobiphenyl | 33-120 % | 65.9 % |
| Surrogate: 2,4,6-Tribromophenol | 52-120 % | 77.0 % |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Semivolatiles Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 15:50

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 19:55

| Analyte | CAS Number | Recovery Limits | Recovery | Units | Notes |
|-----------------------------------|------------|-----------------|----------|-------|-------|
| <i>Surrogate: p-Terphenyl-d14</i> | | 28-120 % | 91.2 % | | |

Instrument: NT6 Analyst: JZ

Analyzed: 17-Dec-2018 15:45

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0152 Sample Size: 500 mL
Prepared: 07-Dec-2018 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 | |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 72.8 % | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/04/2018 15:50

Instrument: FID4 Analyst: JGR

Analyzed: 06-Dec-2018 21:46

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0134 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| <i>Surrogate: o-Terphenyl</i> | | | 50-150 % | 101 | % | |
| <i>Surrogate: n-Triacontane</i> | | | 50-150 % | 107 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/04/2018 15:50

Instrument: ECD6 Analyst: YZ

Analyzed: 18-Dec-2018 17:24

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0174 Sample Size: 500 mL
Prepared: 07-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|---------------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | <i>11-144 %</i> | <i>90.0 %</i> | | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | <i>11-144 %</i> | <i>87.4 %</i> | | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | <i>30-120 %</i> | <i>75.2 %</i> | | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | <i>30-120 %</i> | <i>80.2 %</i> | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 12/04/2018 15:50

Instrument: ECD7 Analyst: JGR

Analyzed: 17-Dec-2018 21:14

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0213 Sample Size: 1000 mL
Prepared: 10-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CGL0092 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid
Cleanup Batch: CGL0090 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur
Cleanup Batch: CGL0091 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| Surrogate: Decachlorobiphenyl | | | 29-120 % | 75.2 | % | |
| Surrogate: Tetrachlorometaxylene | | | 32-120 % | 62.1 | % | |
| Surrogate: Decachlorobiphenyl [2C] | | | 29-120 % | 74.4 | % | |
| Surrogate: Tetrachlorometaxylene [2C] | | | 32-120 % | 56.6 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/04/2018 15:50

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:55

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/04/2018 15:50

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 20:55

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218
18L0063-11 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/04/2018 15:50

Instrument: ICP2 Analyst: TCH

Analyzed: 13-Dec-2018 17:56

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0359 Sample Size: 25 mL
Prepared: 13-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|---------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 111000 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | ND | ug/L | U |
| Magnesium | 7439-95-4 | 1 | 1000 | 68000 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 188 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 3340 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 18100 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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Reported:
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LMW-2-1218
18L0063-11 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 12/04/2018 15:50

Instrument: CVAA Analyst: SKM

Analyzed: 17-Dec-2018 13:39

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 16:10

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 18:38

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 16:10

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 18:38

| Analyte | CAS Number | Dilution | Detection Limit | Reporting Limit | Result | Units | Notes |
|-----------------------------|-------------|----------|-----------------|-----------------|--------|-------|-------|
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |
| 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 |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/04/2018 16:10

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 18:38

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Dibromofluoromethane | | 80-120 % | 104 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | 80-129 % | 107 | % | |
| Surrogate: Toluene-d8 | | 80-120 % | 98.4 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 91.1 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 101 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 16:10

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 20:28

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0151 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 16:10

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 20:28

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------------------------|------------|----------|-----------------|--------|-------|-------|
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |

| | | |
|-----------------------------------|----------|--------|
| Surrogate: 2-Fluorophenol | 33-120 % | 57.7 % |
| Surrogate: Phenol-d5 | 38-120 % | 61.8 % |
| Surrogate: 2-Chlorophenol-d4 | 41-120 % | 63.0 % |
| Surrogate: 1,2-Dichlorobenzene-d4 | 20-120 % | 55.2 % |
| Surrogate: Nitrobenzene-d5 | 27-120 % | 63.4 % |
| Surrogate: 2-Fluorobiphenyl | 33-120 % | 66.7 % |
| Surrogate: 2,4,6-Tribromophenol | 52-120 % | 77.0 % |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/04/2018 16:10

Instrument: NT12 Analyst: JZ

Analyzed: 07-Dec-2018 20:28

| Analyte | CAS Number | Recovery Limits | Recovery | Units | Notes |
|-----------------------------------|------------|-----------------|----------|-------|-------|
| <i>Surrogate: p-Terphenyl-d14</i> | | 28-120 % | 87.5 % | | |

Instrument: NT6 Analyst: JZ

Analyzed: 17-Dec-2018 16:18

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0152 Sample Size: 500 mL
Prepared: 07-Dec-2018 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 | |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 73.7 % | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/04/2018 16:10

Instrument: FID4 Analyst: JGR

Analyzed: 06-Dec-2018 22:05

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0134 Sample Size: 500 mL
Prepared: 06-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| <i>Surrogate: o-Terphenyl</i> | | | 50-150 % | 104 | % | |
| <i>Surrogate: n-Triacontane</i> | | | 50-150 % | 106 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/04/2018 16:10

Instrument: ECD6 Analyst: YZ

Analyzed: 18-Dec-2018 17:42

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0174 Sample Size: 500 mL
Prepared: 07-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|---------------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | <i>11-144 %</i> | <i>88.9 %</i> | | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | <i>11-144 %</i> | <i>87.0 %</i> | | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | <i>30-120 %</i> | <i>72.2 %</i> | | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | <i>30-120 %</i> | <i>78.9 %</i> | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Aroclor PCB

Method: EPA 8082A

Sampled: 12/04/2018 16:10

Instrument: ECD7 Analyst: JGR

Analyzed: 17-Dec-2018 21:35

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0213 Sample Size: 1000 mL
Prepared: 10-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel
Cleanup Batch: CGL0092 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfuric Acid
Cleanup Batch: CGL0090 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur
Cleanup Batch: CGL0091 Initial Volume: 0.5 mL
Cleaned: 17-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| Surrogate: Decachlorobiphenyl | | | 29-120 % | 70.4 | % | |
| Surrogate: Tetrachlorometaxylene | | | 32-120 % | 58.2 | % | |
| Surrogate: Decachlorobiphenyl [2C] | | | 29-120 % | 68.3 | % | |
| Surrogate: Tetrachlorometaxylene [2C] | | | 32-120 % | 53.9 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/04/2018 16:10

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 21:00

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

LMW-2-1218-D
18L0063-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/04/2018 16:10

Instrument: ICPMS2 Analyst: MCB

Analyzed: 17-Dec-2018 21:00

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0394 Sample Size: 25 mL
Prepared: 14-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project Manager: Gary Zimmerman

Reported:
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LMW-2-1218-D
18L0063-13 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/04/2018 16:10

Instrument: ICP2 Analyst: TCH

Analyzed: 13-Dec-2018 18:00

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0359 Sample Size: 25 mL
Prepared: 13-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|---------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 109000 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | ND | ug/L | U |
| Magnesium | 7439-95-4 | 1 | 1000 | 68000 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 188 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 3330 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 17900 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



| | | |
|---|--|---------------------------------------|
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|---|--|---------------------------------------|

LMW-2-1218-D
18L0063-13 (Water)

Metals and Metallic Compounds

Method: EPA 7470A Sampled: 12/04/2018 16:10
Instrument: CVAA Analyst: SKM Analyzed: 17-Dec-2018 13:42

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

TripBlank120418
18L0063-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/03/2018 14:35

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 15:35

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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 |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

TripBlank120418
18L0063-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/03/2018 14:35

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 15:35

| Analyte | CAS Number | Dilution | Detection Limit | Reporting Limit | Result | Units | Notes |
|-----------------------------|-------------|----------|-----------------|-----------------|--------|-------|-------|
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |
| 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 |



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TripBlank120418
18L0063-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/03/2018 14:35

Instrument: NT2 Analyst: LH

Analyzed: 13-Dec-2018 15:35

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Dibromofluoromethane | | 80-120 % | 103 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | 80-129 % | 105 | % | |
| Surrogate: Toluene-d8 | | 80-120 % | 96.6 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 94.3 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 102 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BLK1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 15:15 | | | | | |
| 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 | ND | 0.04 | 0.10 | ug/L | | | | | | | U |
| 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 |



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Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BLK1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 15:15 | | | | | |
| Toluene | ND | 0.04 | 0.20 | ug/L | | | | | | | U |
| 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 | ND | 0.04 | 0.20 | ug/L | | | | | | | U |
| 1,4-Dichlorobenzene | ND | 0.04 | 0.20 | ug/L | | | | | | | U |
| n-Butylbenzene | ND | 0.02 | 0.20 | ug/L | | | | | | | U |
| 1,2-Dichlorobenzene | ND | 0.04 | 0.20 | ug/L | | | | | | | U |
| 1,2-Dibromo-3-chloropropane | ND | 0.37 | 0.50 | ug/L | | | | | | | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BLK1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 15:15 | | | | | |
| 1,2,4-Trichlorobenzene | ND | 0.11 | 0.50 | ug/L | | | | | | | U |
| Hexachloro-1,3-Butadiene | ND | 0.07 | 0.20 | ug/L | | | | | | | U |
| 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 | 4.96 | | | ug/L | 5.00 | | 99.3 | 80-120 | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 4.99 | | | ug/L | 5.00 | | 99.8 | 80-129 | | | |
| Surrogate: Toluene-d8 | 5.02 | | | ug/L | 5.00 | | 100 | 80-120 | | | |
| Surrogate: 4-Bromofluorobenzene | 4.65 | | | ug/L | 5.00 | | 93.1 | 80-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 5.14 | | | ug/L | 5.00 | | 103 | 80-120 | | | |
| LCS (BGL0376-BS1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:13 | | | | | |
| Chloromethane | 9.81 | 0.09 | 0.50 | ug/L | 10.0 | | 98.1 | 60-138 | | | |
| Vinyl Chloride | 9.28 | 0.06 | 0.10 | ug/L | 10.0 | | 92.8 | 66-133 | | | |
| Bromomethane | 10.3 | 0.25 | 1.00 | ug/L | 10.0 | | 103 | 72-131 | | | |
| Chloroethane | 9.88 | 0.09 | 0.20 | ug/L | 10.0 | | 98.8 | 60-155 | | | |
| Trichlorofluoromethane | 10.9 | 0.04 | 0.20 | ug/L | 10.0 | | 109 | 80-129 | | | |
| Acrolein | 44.2 | 2.48 | 2.50 | ug/L | 50.0 | | 88.4 | 52-144 | | | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 9.65 | 0.04 | 0.20 | ug/L | 10.0 | | 96.5 | 76-129 | | | |
| Acetone | 43.1 | 2.06 | 5.00 | ug/L | 50.0 | | 86.1 | 58-142 | | | |
| 1,1-Dichloroethene | 9.34 | 0.05 | 0.20 | ug/L | 10.0 | | 93.4 | 69-135 | | | |
| Bromoethane | 9.24 | 0.04 | 0.20 | ug/L | 10.0 | | 92.4 | 78-128 | | | |
| Iodomethane | 9.19 | 0.23 | 0.50 | ug/L | 10.0 | | 91.9 | 56-147 | | | |
| Methylene Chloride | 9.05 | 0.49 | 1.00 | ug/L | 10.0 | | 90.5 | 65-135 | | | |
| Acrylonitrile | 8.59 | 0.60 | 1.00 | ug/L | 10.0 | | 85.9 | 64-134 | | | |
| Carbon Disulfide | 9.70 | 0.04 | 0.10 | ug/L | 10.0 | | 97.0 | 78-125 | | | |
| trans-1,2-Dichloroethene | 9.33 | 0.05 | 0.20 | ug/L | 10.0 | | 93.3 | 78-128 | | | |
| Vinyl Acetate | 8.15 | 0.07 | 0.20 | ug/L | 10.0 | | 81.5 | 55-138 | | | |
| 1,1-Dichloroethane | 9.36 | 0.05 | 0.20 | ug/L | 10.0 | | 93.6 | 76-124 | | | |
| 2-Butanone | 42.0 | 0.81 | 5.00 | ug/L | 50.0 | | 84.0 | 61-140 | | | |
| 2,2-Dichloropropane | 9.62 | 0.05 | 0.10 | ug/L | 10.0 | | 96.2 | 78-125 | | | |
| cis-1,2-Dichloroethene | 9.48 | 0.04 | 0.20 | ug/L | 10.0 | | 94.8 | 80-121 | | | |
| Chloroform | 9.46 | 0.03 | 0.20 | ug/L | 10.0 | | 94.6 | 80-122 | | | |
| Bromochloromethane | 9.15 | 0.06 | 0.20 | ug/L | 10.0 | | 91.5 | 80-121 | | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BS1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:13 | | | | | |
| 1,1,1-Trichloroethane | 9.88 | 0.04 | 0.20 | ug/L | 10.0 | | 98.8 | 79-123 | | | |
| 1,1-Dichloropropene | 10.1 | 0.03 | 0.10 | ug/L | 10.0 | | 101 | 80-120 | | | |
| Carbon tetrachloride | 8.58 | 0.04 | 0.20 | ug/L | 10.0 | | 85.8 | 53-137 | | | |
| 1,2-Dichloroethane | 8.79 | 0.07 | 0.20 | ug/L | 10.0 | | 87.9 | 75-123 | | | |
| Benzene | 9.53 | 0.03 | 0.20 | ug/L | 10.0 | | 95.3 | 80-120 | | | |
| Trichloroethene | 9.39 | 0.05 | 0.20 | ug/L | 10.0 | | 93.9 | 80-120 | | | |
| 1,2-Dichloropropane | 9.30 | 0.04 | 0.20 | ug/L | 10.0 | | 93.0 | 80-120 | | | |
| Bromodichloromethane | 8.56 | 0.05 | 0.20 | ug/L | 10.0 | | 85.6 | 80-121 | | | |
| Dibromomethane | 9.27 | 0.15 | 0.20 | ug/L | 10.0 | | 92.7 | 80-120 | | | |
| 2-Chloroethyl vinyl ether | 9.11 | 0.25 | 0.50 | ug/L | 10.0 | | 91.1 | 74-127 | | | |
| 4-Methyl-2-Pentanone | 44.4 | 0.97 | 2.50 | ug/L | 50.0 | | 88.8 | 67-133 | | | |
| cis-1,3-Dichloropropene | 9.12 | 0.06 | 0.20 | ug/L | 10.0 | | 91.2 | 80-124 | | | |
| Toluene | 9.47 | 0.04 | 0.20 | ug/L | 10.0 | | 94.7 | 80-120 | | | |
| trans-1,3-Dichloropropene | 8.86 | 0.08 | 0.20 | ug/L | 10.0 | | 88.6 | 71-127 | | | |
| 2-Hexanone | 44.5 | 0.90 | 5.00 | ug/L | 50.0 | | 89.0 | 69-133 | | | |
| 1,1,2-Trichloroethane | 9.06 | 0.13 | 0.20 | ug/L | 10.0 | | 90.6 | 80-121 | | | |
| 1,3-Dichloropropane | 9.43 | 0.06 | 0.10 | ug/L | 10.0 | | 94.3 | 80-120 | | | |
| Tetrachloroethene | 9.72 | 0.05 | 0.20 | ug/L | 10.0 | | 97.2 | 80-120 | | | |
| Dibromochloromethane | 7.47 | 0.05 | 0.20 | ug/L | 10.0 | | 74.7 | 65-135 | | | Q |
| 1,2-Dibromoethane | 8.83 | 0.07 | 0.10 | ug/L | 10.0 | | 88.3 | 80-121 | | | |
| Chlorobenzene | 9.58 | 0.02 | 0.20 | ug/L | 10.0 | | 95.8 | 80-120 | | | |
| Ethylbenzene | 9.82 | 0.04 | 0.20 | ug/L | 10.0 | | 98.2 | 80-120 | | | |
| 1,1,1,2-Tetrachloroethane | 8.57 | 0.04 | 0.20 | ug/L | 10.0 | | 85.7 | 80-120 | | | |
| m,p-Xylene | 20.3 | 0.05 | 0.40 | ug/L | 20.0 | | 101 | 80-121 | | | |
| o-Xylene | 9.97 | 0.03 | 0.20 | ug/L | 10.0 | | 99.7 | 80-121 | | | |
| Xylenes, total | 30.2 | 0.09 | 0.60 | ug/L | 30.0 | | 101 | 76-127 | | | |
| Styrene | 10.3 | 0.05 | 0.20 | ug/L | 10.0 | | 103 | 80-124 | | | |
| Bromoform | 6.41 | 0.06 | 0.20 | ug/L | 10.0 | | 64.1 | 51-134 | | | Q |
| 1,1,2,2-Tetrachloroethane | 9.03 | 0.06 | 0.10 | ug/L | 10.0 | | 90.3 | 77-123 | | | |
| 1,2,3-Trichloropropane | 9.06 | 0.13 | 0.20 | ug/L | 10.0 | | 90.6 | 76-125 | | | |
| trans-1,4-Dichloro 2-Butene | 6.54 | 0.32 | 1.00 | ug/L | 10.0 | | 65.4 | 55-129 | | | Q |
| n-Propylbenzene | 10.2 | 0.02 | 0.20 | ug/L | 10.0 | | 102 | 78-130 | | | |
| Bromobenzene | 9.45 | 0.06 | 0.20 | ug/L | 10.0 | | 94.5 | 80-120 | | | |
| Isopropyl Benzene | 10.1 | 0.02 | 0.20 | ug/L | 10.0 | | 101 | 80-128 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BS1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:13 | | | | | |
| 2-Chlorotoluene | 9.95 | 0.02 | 0.10 | ug/L | 10.0 | | 99.5 | 78-122 | | | |
| 4-Chlorotoluene | 10.0 | 0.02 | 0.20 | ug/L | 10.0 | | 100 | 80-121 | | | |
| t-Butylbenzene | 10.1 | 0.03 | 0.20 | ug/L | 10.0 | | 101 | 78-125 | | | |
| 1,3,5-Trimethylbenzene | 10.3 | 0.02 | 0.20 | ug/L | 10.0 | | 103 | 80-129 | | | |
| 1,2,4-Trimethylbenzene | 10.4 | 0.02 | 0.20 | ug/L | 10.0 | | 104 | 80-127 | | | |
| s-Butylbenzene | 10.5 | 0.02 | 0.20 | ug/L | 10.0 | | 105 | 78-129 | | | |
| 4-Isopropyl Toluene | 10.7 | 0.03 | 0.20 | ug/L | 10.0 | | 107 | 79-130 | | | |
| 1,3-Dichlorobenzene | 9.59 | 0.04 | 0.20 | ug/L | 10.0 | | 95.9 | 80-120 | | | |
| 1,4-Dichlorobenzene | 9.59 | 0.04 | 0.20 | ug/L | 10.0 | | 95.9 | 80-120 | | | |
| n-Butylbenzene | 10.8 | 0.02 | 0.20 | ug/L | 10.0 | | 108 | 74-129 | | | |
| 1,2-Dichlorobenzene | 9.58 | 0.04 | 0.20 | ug/L | 10.0 | | 95.8 | 80-120 | | | |
| 1,2-Dibromo-3-chloropropane | 6.86 | 0.37 | 0.50 | ug/L | 10.0 | | 68.6 | 62-123 | | | Q |
| 1,2,4-Trichlorobenzene | 10.1 | 0.11 | 0.50 | ug/L | 10.0 | | 101 | 64-124 | | | |
| Hexachloro-1,3-Butadiene | 11.0 | 0.07 | 0.20 | ug/L | 10.0 | | 110 | 58-123 | | | |
| Naphthalene | 8.65 | 0.12 | 0.50 | ug/L | 10.0 | | 86.5 | 50-134 | | | |
| 1,2,3-Trichlorobenzene | 9.73 | 0.11 | 0.20 | ug/L | 10.0 | | 97.3 | 49-133 | | | |
| Dichlorodifluoromethane | 9.29 | 0.05 | 0.20 | ug/L | 10.0 | | 92.9 | 48-147 | | | |
| Surrogate: Dibromofluoromethane | 4.95 | | | ug/L | 5.00 | | 99.0 | 80-120 | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 4.80 | | | ug/L | 5.00 | | 95.9 | 80-129 | | | |
| Surrogate: Toluene-d8 | 5.05 | | | ug/L | 5.00 | | 101 | 80-120 | | | |
| Surrogate: 4-Bromofluorobenzene | 4.93 | | | ug/L | 5.00 | | 98.5 | 80-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 5.02 | | | ug/L | 5.00 | | 100 | 80-120 | | | |

| | | | | | | | | | | | |
|---------------------------------------|------|------|------|------|------|---|------|--------|-------|----|--|
| LCS Dup (BGL0376-BSD1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:34 | | | | | |
| Chloromethane | 10.0 | 0.09 | 0.50 | ug/L | 10.0 | | 100 | 60-138 | 1.94 | 30 | |
| Vinyl Chloride | 10.2 | 0.06 | 0.10 | ug/L | 10.0 | | 102 | 66-133 | 9.55 | 30 | |
| Bromomethane | 10.7 | 0.25 | 1.00 | ug/L | 10.0 | | 107 | 72-131 | 4.18 | 30 | |
| Chloroethane | 11.3 | 0.09 | 0.20 | ug/L | 10.0 | | 113 | 60-155 | 13.20 | 30 | |
| Trichlorofluoromethane | 10.3 | 0.04 | 0.20 | ug/L | 10.0 | | 103 | 80-129 | 5.26 | 30 | |
| Acrolein | 47.2 | 2.48 | 2.50 | ug/L | 50.0 | | 94.4 | 52-144 | 6.59 | 30 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 10.5 | 0.04 | 0.20 | ug/L | 10.0 | | 105 | 76-129 | 8.05 | 30 | |
| Acetone | 48.4 | 2.06 | 5.00 | ug/L | 50.0 | | 96.8 | 58-142 | 11.70 | 30 | |
| 1,1-Dichloroethene | 10.1 | 0.05 | 0.20 | ug/L | 10.0 | | 101 | 69-135 | 7.43 | 30 | |
| Bromoethane | 9.96 | 0.04 | 0.20 | ug/L | 10.0 | | 99.6 | 78-128 | 7.43 | 30 | |



Golder Associates
18300 NE Union Hill Road Suite 200
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BSD1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:34 | | | | | |
| Iodomethane | 10.3 | 0.23 | 0.50 | ug/L | 10.0 | 103 | 56-147 | 11.00 | 30 | | |
| Methylene Chloride | 9.70 | 0.49 | 1.00 | ug/L | 10.0 | 97.0 | 65-135 | 6.98 | 30 | | |
| Acrylonitrile | 10.3 | 0.60 | 1.00 | ug/L | 10.0 | 103 | 64-134 | 18.50 | 30 | | |
| Carbon Disulfide | 10.4 | 0.04 | 0.10 | ug/L | 10.0 | 104 | 78-125 | 6.83 | 30 | | |
| trans-1,2-Dichloroethene | 10.1 | 0.05 | 0.20 | ug/L | 10.0 | 101 | 78-128 | 8.37 | 30 | | |
| Vinyl Acetate | 9.37 | 0.07 | 0.20 | ug/L | 10.0 | 93.7 | 55-138 | 14.00 | 30 | | |
| 1,1-Dichloroethane | 10.3 | 0.05 | 0.20 | ug/L | 10.0 | 103 | 76-124 | 9.19 | 30 | | |
| 2-Butanone | 49.1 | 0.81 | 5.00 | ug/L | 50.0 | 98.2 | 61-140 | 15.50 | 30 | | |
| 2,2-Dichloropropane | 10.7 | 0.05 | 0.10 | ug/L | 10.0 | 107 | 78-125 | 10.70 | 30 | | |
| cis-1,2-Dichloroethene | 10.1 | 0.04 | 0.20 | ug/L | 10.0 | 101 | 80-121 | 6.45 | 30 | | |
| Chloroform | 10.1 | 0.03 | 0.20 | ug/L | 10.0 | 101 | 80-122 | 6.96 | 30 | | |
| Bromochloromethane | 9.90 | 0.06 | 0.20 | ug/L | 10.0 | 99.0 | 80-121 | 7.95 | 30 | | |
| 1,1,1-Trichloroethane | 11.1 | 0.04 | 0.20 | ug/L | 10.0 | 111 | 79-123 | 11.40 | 30 | | |
| 1,1-Dichloropropene | 10.9 | 0.03 | 0.10 | ug/L | 10.0 | 109 | 80-120 | 7.58 | 30 | | |
| Carbon tetrachloride | 9.57 | 0.04 | 0.20 | ug/L | 10.0 | 95.7 | 53-137 | 10.90 | 30 | | |
| 1,2-Dichloroethane | 9.88 | 0.07 | 0.20 | ug/L | 10.0 | 98.8 | 75-123 | 11.60 | 30 | | |
| Benzene | 10.5 | 0.03 | 0.20 | ug/L | 10.0 | 105 | 80-120 | 9.69 | 30 | | |
| Trichloroethene | 10.2 | 0.05 | 0.20 | ug/L | 10.0 | 102 | 80-120 | 8.62 | 30 | | |
| 1,2-Dichloropropane | 10.2 | 0.04 | 0.20 | ug/L | 10.0 | 102 | 80-120 | 9.12 | 30 | | |
| Bromodichloromethane | 9.69 | 0.05 | 0.20 | ug/L | 10.0 | 96.9 | 80-121 | 12.40 | 30 | | |
| Dibromomethane | 10.6 | 0.15 | 0.20 | ug/L | 10.0 | 106 | 80-120 | 13.20 | 30 | | |
| 2-Chloroethyl vinyl ether | 10.4 | 0.25 | 0.50 | ug/L | 10.0 | 104 | 74-127 | 12.90 | 30 | | |
| 4-Methyl-2-Pentanone | 53.8 | 0.97 | 2.50 | ug/L | 50.0 | 108 | 67-133 | 19.20 | 30 | | |
| cis-1,3-Dichloropropene | 10.2 | 0.06 | 0.20 | ug/L | 10.0 | 102 | 80-124 | 11.50 | 30 | | |
| Toluene | 10.4 | 0.04 | 0.20 | ug/L | 10.0 | 104 | 80-120 | 9.14 | 30 | | |
| trans-1,3-Dichloropropene | 10.1 | 0.08 | 0.20 | ug/L | 10.0 | 101 | 71-127 | 13.20 | 30 | | |
| 2-Hexanone | 51.9 | 0.90 | 5.00 | ug/L | 50.0 | 104 | 69-133 | 15.40 | 30 | | |
| 1,1,2-Trichloroethane | 10.2 | 0.13 | 0.20 | ug/L | 10.0 | 102 | 80-121 | 12.00 | 30 | | |
| 1,3-Dichloropropane | 10.3 | 0.06 | 0.10 | ug/L | 10.0 | 103 | 80-120 | 9.24 | 30 | | |
| Tetrachloroethene | 10.4 | 0.05 | 0.20 | ug/L | 10.0 | 104 | 80-120 | 7.20 | 30 | | |
| Dibromochloromethane | 8.26 | 0.05 | 0.20 | ug/L | 10.0 | 82.6 | 65-135 | 10.00 | 30 | Q | |
| 1,2-Dibromoethane | 10.2 | 0.07 | 0.10 | ug/L | 10.0 | 102 | 80-121 | 14.60 | 30 | | |
| Chlorobenzene | 10.3 | 0.02 | 0.20 | ug/L | 10.0 | 103 | 80-120 | 7.68 | 30 | | |
| Ethylbenzene | 10.8 | 0.04 | 0.20 | ug/L | 10.0 | 108 | 80-120 | 9.65 | 30 | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BSD1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:34 | | | | | |
| 1,1,1,2-Tetrachloroethane | 9.66 | 0.04 | 0.20 | ug/L | 10.0 | | 96.6 | 80-120 | 12.00 | 30 | |
| m,p-Xylene | 21.9 | 0.05 | 0.40 | ug/L | 20.0 | | 109 | 80-121 | 7.73 | 30 | |
| o-Xylene | 10.9 | 0.03 | 0.20 | ug/L | 10.0 | | 109 | 80-121 | 9.26 | 30 | |
| Xylenes, total | 32.8 | 0.09 | 0.60 | ug/L | 30.0 | | 109 | 76-127 | 8.23 | 30 | |
| Styrene | 10.9 | 0.05 | 0.20 | ug/L | 10.0 | | 109 | 80-124 | 5.81 | 30 | |
| Bromoform | 7.23 | 0.06 | 0.20 | ug/L | 10.0 | | 72.3 | 51-134 | 12.10 | 30 | Q |
| 1,1,2,2-Tetrachloroethane | 10.4 | 0.06 | 0.10 | ug/L | 10.0 | | 104 | 77-123 | 13.80 | 30 | |
| 1,2,3-Trichloropropane | 10.6 | 0.13 | 0.20 | ug/L | 10.0 | | 106 | 76-125 | 16.00 | 30 | |
| trans-1,4-Dichloro 2-Butene | 7.28 | 0.32 | 1.00 | ug/L | 10.0 | | 72.8 | 55-129 | 10.80 | 30 | Q |
| n-Propylbenzene | 10.9 | 0.02 | 0.20 | ug/L | 10.0 | | 109 | 78-130 | 6.58 | 30 | |
| Bromobenzene | 10.4 | 0.06 | 0.20 | ug/L | 10.0 | | 104 | 80-120 | 9.28 | 30 | |
| Isopropyl Benzene | 11.1 | 0.02 | 0.20 | ug/L | 10.0 | | 111 | 80-128 | 8.51 | 30 | |
| 2-Chlorotoluene | 10.6 | 0.02 | 0.10 | ug/L | 10.0 | | 106 | 78-122 | 6.63 | 30 | |
| 4-Chlorotoluene | 10.7 | 0.02 | 0.20 | ug/L | 10.0 | | 107 | 80-121 | 6.33 | 30 | |
| t-Butylbenzene | 10.9 | 0.03 | 0.20 | ug/L | 10.0 | | 109 | 78-125 | 7.30 | 30 | |
| 1,3,5-Trimethylbenzene | 11.1 | 0.02 | 0.20 | ug/L | 10.0 | | 111 | 80-129 | 7.70 | 30 | |
| 1,2,4-Trimethylbenzene | 11.1 | 0.02 | 0.20 | ug/L | 10.0 | | 111 | 80-127 | 6.45 | 30 | |
| s-Butylbenzene | 11.1 | 0.02 | 0.20 | ug/L | 10.0 | | 111 | 78-129 | 5.31 | 30 | |
| 4-Isopropyl Toluene | 11.4 | 0.03 | 0.20 | ug/L | 10.0 | | 114 | 79-130 | 6.58 | 30 | |
| 1,3-Dichlorobenzene | 10.3 | 0.04 | 0.20 | ug/L | 10.0 | | 103 | 80-120 | 7.25 | 30 | |
| 1,4-Dichlorobenzene | 10.4 | 0.04 | 0.20 | ug/L | 10.0 | | 104 | 80-120 | 8.03 | 30 | |
| n-Butylbenzene | 11.4 | 0.02 | 0.20 | ug/L | 10.0 | | 114 | 74-129 | 5.41 | 30 | |
| 1,2-Dichlorobenzene | 10.5 | 0.04 | 0.20 | ug/L | 10.0 | | 105 | 80-120 | 8.91 | 30 | |
| 1,2-Dibromo-3-chloropropane | 7.74 | 0.37 | 0.50 | ug/L | 10.0 | | 77.4 | 62-123 | 12.10 | 30 | Q |
| 1,2,4-Trichlorobenzene | 10.6 | 0.11 | 0.50 | ug/L | 10.0 | | 106 | 64-124 | 4.07 | 30 | |
| Hexachloro-1,3-Butadiene | 11.5 | 0.07 | 0.20 | ug/L | 10.0 | | 115 | 58-123 | 4.68 | 30 | |
| Naphthalene | 9.73 | 0.12 | 0.50 | ug/L | 10.0 | | 97.3 | 50-134 | 11.80 | 30 | |
| 1,2,3-Trichlorobenzene | 10.5 | 0.11 | 0.20 | ug/L | 10.0 | | 105 | 49-133 | 7.47 | 30 | |
| Dichlorodifluoromethane | 10.2 | 0.05 | 0.20 | ug/L | 10.0 | | 102 | 48-147 | 9.09 | 30 | |
| Surrogate: Dibromofluoromethane | 5.02 | | | ug/L | 5.00 | | 100 | 80-120 | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 4.97 | | | ug/L | 5.00 | | 99.3 | 80-129 | | | |
| Surrogate: Toluene-d8 | 4.98 | | | ug/L | 5.00 | | 99.7 | 80-120 | | | |
| Surrogate: 4-Bromofluorobenzene | 5.14 | | | ug/L | 5.00 | | 103 | 80-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 5.01 | | | ug/L | 5.00 | | 100 | 80-120 | | | |



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18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BSD1) | | | | | | | | | | | |
| | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:34 | | | | | |

| Matrix Spike (BGL0376-MS1) | Source: 18L0063-03 | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 22:43 | | | | | | | |
|---------------------------------------|---------------------------|------|------|------|--|------|------|--------|--|--|-------|--|
| Chloromethane | 9.63 | 0.09 | 0.50 | ug/L | 10.0 | ND | 96.3 | 60-138 | | | | |
| Vinyl Chloride | 8.93 | 0.06 | 0.10 | ug/L | 10.0 | ND | 89.3 | 66-133 | | | | |
| Bromomethane | 9.58 | 0.25 | 1.00 | ug/L | 10.0 | ND | 95.8 | 72-131 | | | | |
| Chloroethane | 10.7 | 0.09 | 0.20 | ug/L | 10.0 | ND | 107 | 60-155 | | | | |
| Trichlorofluoromethane | 10.8 | 0.04 | 0.20 | ug/L | 10.0 | ND | 108 | 80-129 | | | | |
| Acrolein | 45.7 | 2.48 | 2.50 | ug/L | 50.0 | ND | 91.4 | 52-144 | | | | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 10.1 | 0.04 | 0.20 | ug/L | 10.0 | ND | 101 | 76-129 | | | | |
| Acetone | 51.6 | 2.06 | 5.00 | ug/L | 50.0 | ND | 103 | 58-142 | | | | |
| 1,1-Dichloroethene | 9.72 | 0.05 | 0.20 | ug/L | 10.0 | ND | 97.2 | 69-135 | | | | |
| Bromoethane | 9.51 | 0.04 | 0.20 | ug/L | 10.0 | ND | 95.1 | 78-128 | | | | |
| Iodomethane | 10.2 | 0.23 | 0.50 | ug/L | 10.0 | ND | 102 | 56-147 | | | | |
| Methylene Chloride | 9.57 | 0.49 | 1.00 | ug/L | 10.0 | ND | 95.7 | 65-135 | | | | |
| Acrylonitrile | 9.45 | 0.60 | 1.00 | ug/L | 10.0 | ND | 94.5 | 64-134 | | | | |
| Carbon Disulfide | 10.0 | 0.04 | 0.10 | ug/L | 10.0 | 0.04 | 99.9 | 78-125 | | | | |
| trans-1,2-Dichloroethene | 9.76 | 0.05 | 0.20 | ug/L | 10.0 | ND | 97.6 | 78-128 | | | | |
| Vinyl Acetate | 7.65 | 0.07 | 0.20 | ug/L | 10.0 | ND | 76.5 | 55-138 | | | | |
| 1,1-Dichloroethane | 9.90 | 0.05 | 0.20 | ug/L | 10.0 | 0.12 | 97.8 | 76-124 | | | | |
| 2-Butanone | 49.6 | 0.81 | 5.00 | ug/L | 50.0 | ND | 99.1 | 61-140 | | | | |
| 2,2-Dichloropropane | 7.80 | 0.05 | 0.10 | ug/L | 10.0 | ND | 78.0 | 78-125 | | | | |
| cis-1,2-Dichloroethene | 9.60 | 0.04 | 0.20 | ug/L | 10.0 | ND | 96.0 | 80-121 | | | | |
| Chloroform | 9.99 | 0.03 | 0.20 | ug/L | 10.0 | ND | 99.9 | 80-122 | | | | |
| Bromochloromethane | 9.63 | 0.06 | 0.20 | ug/L | 10.0 | ND | 96.3 | 80-121 | | | | |
| 1,1,1-Trichloroethane | 10.4 | 0.04 | 0.20 | ug/L | 10.0 | ND | 104 | 79-123 | | | | |
| 1,1-Dichloropropene | 10.1 | 0.03 | 0.10 | ug/L | 10.0 | ND | 101 | 80-120 | | | | |
| Carbon tetrachloride | 8.58 | 0.04 | 0.20 | ug/L | 10.0 | ND | 85.8 | 53-137 | | | | |
| 1,2-Dichloroethane | 9.69 | 0.07 | 0.20 | ug/L | 10.0 | ND | 96.9 | 75-123 | | | | |
| Benzene | 10.2 | 0.03 | 0.20 | ug/L | 10.0 | ND | 102 | 80-120 | | | | |
| Trichloroethene | 9.89 | 0.05 | 0.20 | ug/L | 10.0 | ND | 98.9 | 80-120 | | | | |
| 1,2-Dichloropropane | 9.72 | 0.04 | 0.20 | ug/L | 10.0 | ND | 97.2 | 80-120 | | | | |
| Bromodichloromethane | 9.00 | 0.05 | 0.20 | ug/L | 10.0 | ND | 90.0 | 80-121 | | | | |
| Dibromomethane | 10.3 | 0.15 | 0.20 | ug/L | 10.0 | ND | 103 | 80-120 | | | | |
| 2-Chloroethyl vinyl ether | ND | 0.25 | 0.50 | ug/L | 10.0 | ND | | 74-127 | | | * , U | |



Golder Associates
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Reported:
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Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 |
|-----------------------------------|--------|---------------------------|-----------------|-------|-----------------------|---------------|-----------------------------|-------------|-----|-----------|-------|
| Matrix Spike (BGL0376-MS1) | | Source: 18L0063-03 | | | Prepared: 13-Dec-2018 | | Analyzed: 13-Dec-2018 22:43 | | | | |
| 4-Methyl-2-Pentanone | 51.5 | 0.97 | 2.50 | ug/L | 50.0 | ND | 103 | 67-133 | | | |
| cis-1,3-Dichloropropene | 8.80 | 0.06 | 0.20 | ug/L | 10.0 | ND | 88.0 | 80-124 | | | |
| Toluene | 9.95 | 0.04 | 0.20 | ug/L | 10.0 | ND | 99.5 | 80-120 | | | |
| trans-1,3-Dichloropropene | 8.80 | 0.08 | 0.20 | ug/L | 10.0 | ND | 88.0 | 71-127 | | | |
| 2-Hexanone | 50.8 | 0.90 | 5.00 | ug/L | 50.0 | ND | 102 | 69-133 | | | |
| 1,1,2-Trichloroethane | 9.90 | 0.13 | 0.20 | ug/L | 10.0 | ND | 99.0 | 80-121 | | | |
| 1,3-Dichloropropane | 9.89 | 0.06 | 0.10 | ug/L | 10.0 | ND | 98.9 | 80-120 | | | |
| Tetrachloroethene | 9.87 | 0.05 | 0.20 | ug/L | 10.0 | ND | 98.7 | 80-120 | | | |
| Dibromochloromethane | 7.34 | 0.05 | 0.20 | ug/L | 10.0 | ND | 73.4 | 65-135 | | | Q |
| 1,2-Dibromoethane | 9.93 | 0.07 | 0.10 | ug/L | 10.0 | ND | 99.3 | 80-121 | | | |
| Chlorobenzene | 9.94 | 0.02 | 0.20 | ug/L | 10.0 | ND | 99.4 | 80-120 | | | |
| Ethylbenzene | 10.2 | 0.04 | 0.20 | ug/L | 10.0 | ND | 102 | 80-120 | | | |
| 1,1,1,2-Tetrachloroethane | 9.01 | 0.04 | 0.20 | ug/L | 10.0 | ND | 90.1 | 80-120 | | | |
| m,p-Xylene | 20.8 | 0.05 | 0.40 | ug/L | 20.0 | ND | 104 | 80-121 | | | |
| o-Xylene | 10.3 | 0.03 | 0.20 | ug/L | 10.0 | ND | 103 | 80-121 | | | |
| Xylenes, total | 31.1 | 0.09 | 0.60 | ug/L | 30.0 | ND | 104 | 76-127 | | | |
| Styrene | 10.5 | 0.05 | 0.20 | ug/L | 10.0 | ND | 105 | 80-124 | | | |
| Bromoform | 6.42 | 0.06 | 0.20 | ug/L | 10.0 | ND | 64.2 | 51-134 | | | Q |
| 1,1,2,2-Tetrachloroethane | 10.0 | 0.06 | 0.10 | ug/L | 10.0 | ND | 100 | 77-123 | | | |
| 1,2,3-Trichloropropane | 10.5 | 0.13 | 0.20 | ug/L | 10.0 | ND | 105 | 76-125 | | | |
| trans-1,4-Dichloro 2-Butene | 5.32 | 0.32 | 1.00 | ug/L | 10.0 | ND | 53.2 | 55-129 | | | *, Q |
| n-Propylbenzene | 10.2 | 0.02 | 0.20 | ug/L | 10.0 | ND | 102 | 78-130 | | | |
| Bromobenzene | 9.85 | 0.06 | 0.20 | ug/L | 10.0 | ND | 98.5 | 80-120 | | | |
| Isopropyl Benzene | 10.1 | 0.02 | 0.20 | ug/L | 10.0 | ND | 101 | 80-128 | | | |
| 2-Chlorotoluene | 9.35 | 0.02 | 0.10 | ug/L | 10.0 | ND | 93.5 | 78-122 | | | |
| 4-Chlorotoluene | 9.98 | 0.02 | 0.20 | ug/L | 10.0 | ND | 99.8 | 80-121 | | | |
| t-Butylbenzene | 10.2 | 0.03 | 0.20 | ug/L | 10.0 | ND | 102 | 78-125 | | | |
| 1,3,5-Trimethylbenzene | 10.5 | 0.02 | 0.20 | ug/L | 10.0 | ND | 105 | 80-129 | | | |
| 1,2,4-Trimethylbenzene | 10.5 | 0.02 | 0.20 | ug/L | 10.0 | ND | 105 | 80-127 | | | |
| s-Butylbenzene | 10.4 | 0.02 | 0.20 | ug/L | 10.0 | ND | 104 | 78-129 | | | |
| 4-Isopropyl Toluene | 10.7 | 0.03 | 0.20 | ug/L | 10.0 | ND | 107 | 79-130 | | | |
| 1,3-Dichlorobenzene | 10.2 | 0.04 | 0.20 | ug/L | 10.0 | ND | 102 | 80-120 | | | |
| 1,4-Dichlorobenzene | 9.99 | 0.04 | 0.20 | ug/L | 10.0 | ND | 99.9 | 80-120 | | | |
| n-Butylbenzene | 10.5 | 0.02 | 0.20 | ug/L | 10.0 | ND | 105 | 74-129 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 |
|-----------------------------------|--------|---------------------------|-----------------|-------|-----------------------|---------------|-----------------------------|-------------|-----|-----------|-------|
| Matrix Spike (BGL0376-MS1) | | | | | | | | | | | |
| | | Source: 18L0063-03 | | | Prepared: 13-Dec-2018 | | Analyzed: 13-Dec-2018 22:43 | | | | |
| 1,2-Dichlorobenzene | 9.93 | 0.04 | 0.20 | ug/L | 10.0 | ND | 99.3 | 80-120 | | | |
| 1,2-Dibromo-3-chloropropane | 7.36 | 0.37 | 0.50 | ug/L | 10.0 | ND | 73.6 | 62-123 | | | Q |
| 1,2,4-Trichlorobenzene | 10.6 | 0.11 | 0.50 | ug/L | 10.0 | ND | 106 | 64-124 | | | |
| Hexachloro-1,3-Butadiene | 10.8 | 0.07 | 0.20 | ug/L | 10.0 | ND | 108 | 58-123 | | | |
| Naphthalene | 9.51 | 0.12 | 0.50 | ug/L | 10.0 | ND | 95.1 | 50-134 | | | |
| 1,2,3-Trichlorobenzene | 10.2 | 0.11 | 0.20 | ug/L | 10.0 | ND | 102 | 49-133 | | | |
| Dichlorodifluoromethane | 9.63 | 0.05 | 0.20 | ug/L | 10.0 | ND | 96.3 | 48-147 | | | |
| Surrogate: Dibromofluoromethane | 5.20 | | | ug/L | 5.00 | 5.09 | 104 | 80-120 | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 5.03 | | | ug/L | 5.00 | 5.25 | 101 | 80-129 | | | |
| Surrogate: Toluene-d8 | 4.98 | | | ug/L | 5.00 | 4.86 | 99.6 | 80-120 | | | |
| Surrogate: 4-Bromofluorobenzene | 4.91 | | | ug/L | 5.00 | 4.74 | 98.2 | 80-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 5.00 | | | ug/L | 5.00 | 5.01 | 100 | 80-120 | | | |

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

| | | | | | | | | | | | |
|--|------|---------------------------|------|------|-----------------------|------|-----------------------------|--------|-------|----|---|
| Matrix Spike Dup (BGL0376-MSD1) | | | | | | | | | | | |
| | | Source: 18L0063-03 | | | Prepared: 13-Dec-2018 | | Analyzed: 13-Dec-2018 23:03 | | | | |
| Chloromethane | 9.29 | 0.09 | 0.50 | ug/L | 10.0 | ND | 92.9 | 60-138 | 3.57 | 30 | |
| Vinyl Chloride | 9.13 | 0.06 | 0.10 | ug/L | 10.0 | ND | 91.3 | 66-133 | 2.25 | 30 | |
| Bromomethane | 9.12 | 0.25 | 1.00 | ug/L | 10.0 | ND | 91.2 | 72-131 | 4.92 | 30 | |
| Chloroethane | 10.5 | 0.09 | 0.20 | ug/L | 10.0 | ND | 105 | 60-155 | 1.96 | 30 | |
| Trichlorofluoromethane | 9.70 | 0.04 | 0.20 | ug/L | 10.0 | ND | 97.0 | 80-129 | 10.40 | 30 | |
| Acrolein | 43.8 | 2.48 | 2.50 | ug/L | 50.0 | ND | 87.5 | 52-144 | 4.30 | 30 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 9.36 | 0.04 | 0.20 | ug/L | 10.0 | ND | 93.6 | 76-129 | 7.79 | 30 | |
| Acetone | 48.4 | 2.06 | 5.00 | ug/L | 50.0 | ND | 96.8 | 58-142 | 6.38 | 30 | |
| 1,1-Dichloroethene | 9.18 | 0.05 | 0.20 | ug/L | 10.0 | ND | 91.8 | 69-135 | 5.70 | 30 | |
| Bromoethane | 9.05 | 0.04 | 0.20 | ug/L | 10.0 | ND | 90.5 | 78-128 | 5.00 | 30 | |
| Iodomethane | 9.84 | 0.23 | 0.50 | ug/L | 10.0 | ND | 98.4 | 56-147 | 3.47 | 30 | |
| Methylene Chloride | 8.89 | 0.49 | 1.00 | ug/L | 10.0 | ND | 88.9 | 65-135 | 7.39 | 30 | |
| Acrylonitrile | 8.85 | 0.60 | 1.00 | ug/L | 10.0 | ND | 88.5 | 64-134 | 6.58 | 30 | |
| Carbon Disulfide | 9.45 | 0.04 | 0.10 | ug/L | 10.0 | 0.04 | 94.1 | 78-125 | 6.00 | 30 | |
| trans-1,2-Dichloroethene | 8.96 | 0.05 | 0.20 | ug/L | 10.0 | ND | 89.6 | 78-128 | 8.53 | 30 | |
| Vinyl Acetate | 7.32 | 0.07 | 0.20 | ug/L | 10.0 | ND | 73.2 | 55-138 | 4.31 | 30 | |
| 1,1-Dichloroethane | 9.16 | 0.05 | 0.20 | ug/L | 10.0 | 0.12 | 90.4 | 76-124 | 7.76 | 30 | |
| 2-Butanone | 46.2 | 0.81 | 5.00 | ug/L | 50.0 | ND | 92.4 | 61-140 | 7.00 | 30 | |
| 2,2-Dichloropropane | 7.28 | 0.05 | 0.10 | ug/L | 10.0 | ND | 72.8 | 78-125 | 6.95 | 30 | * |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 |
|--|--------|---------------------------|-----------------|-------|-----------------------|---------------|-----------------------------|-------------|-------|-----------|-------|
| Matrix Spike Dup (BGL0376-MSD1) | | | | | | | | | | | |
| | | Source: 18L0063-03 | | | Prepared: 13-Dec-2018 | | Analyzed: 13-Dec-2018 23:03 | | | | |
| cis-1,2-Dichloroethene | 8.97 | 0.04 | 0.20 | ug/L | 10.0 | ND | 89.7 | 80-121 | 6.78 | 30 | |
| Chloroform | 9.29 | 0.03 | 0.20 | ug/L | 10.0 | ND | 92.9 | 80-122 | 7.22 | 30 | |
| Bromochloromethane | 9.28 | 0.06 | 0.20 | ug/L | 10.0 | ND | 92.8 | 80-121 | 3.70 | 30 | |
| 1,1,1-Trichloroethane | 9.68 | 0.04 | 0.20 | ug/L | 10.0 | ND | 96.8 | 79-123 | 6.91 | 30 | |
| 1,1-Dichloropropene | 9.20 | 0.03 | 0.10 | ug/L | 10.0 | ND | 92.0 | 80-120 | 9.21 | 30 | |
| Carbon tetrachloride | 8.25 | 0.04 | 0.20 | ug/L | 10.0 | ND | 82.5 | 53-137 | 3.94 | 30 | |
| 1,2-Dichloroethane | 8.84 | 0.07 | 0.20 | ug/L | 10.0 | ND | 88.4 | 75-123 | 9.12 | 30 | |
| Benzene | 9.30 | 0.03 | 0.20 | ug/L | 10.0 | ND | 93.0 | 80-120 | 8.81 | 30 | |
| Trichloroethene | 9.24 | 0.05 | 0.20 | ug/L | 10.0 | ND | 92.4 | 80-120 | 6.80 | 30 | |
| 1,2-Dichloropropane | 8.97 | 0.04 | 0.20 | ug/L | 10.0 | ND | 89.7 | 80-120 | 8.05 | 30 | |
| Bromodichloromethane | 8.55 | 0.05 | 0.20 | ug/L | 10.0 | ND | 85.5 | 80-121 | 5.06 | 30 | |
| Dibromomethane | 9.14 | 0.15 | 0.20 | ug/L | 10.0 | ND | 91.4 | 80-120 | 11.50 | 30 | |
| 2-Chloroethyl vinyl ether | ND | 0.25 | 0.50 | ug/L | 10.0 | ND | | 74-127 | | | *, U |
| 4-Methyl-2-Pentanone | 47.7 | 0.97 | 2.50 | ug/L | 50.0 | ND | 95.4 | 67-133 | 7.60 | 30 | |
| cis-1,3-Dichloropropene | 8.09 | 0.06 | 0.20 | ug/L | 10.0 | ND | 80.9 | 80-124 | 8.45 | 30 | |
| Toluene | 9.12 | 0.04 | 0.20 | ug/L | 10.0 | ND | 91.2 | 80-120 | 8.76 | 30 | |
| trans-1,3-Dichloropropene | 8.21 | 0.08 | 0.20 | ug/L | 10.0 | ND | 82.1 | 71-127 | 6.90 | 30 | |
| 2-Hexanone | 47.0 | 0.90 | 5.00 | ug/L | 50.0 | ND | 94.0 | 69-133 | 7.71 | 30 | |
| 1,1,2-Trichloroethane | 9.30 | 0.13 | 0.20 | ug/L | 10.0 | ND | 93.0 | 80-121 | 6.22 | 30 | |
| 1,3-Dichloropropane | 9.12 | 0.06 | 0.10 | ug/L | 10.0 | ND | 91.2 | 80-120 | 8.12 | 30 | |
| Tetrachloroethene | 9.40 | 0.05 | 0.20 | ug/L | 10.0 | ND | 94.0 | 80-120 | 4.91 | 30 | |
| Dibromochloromethane | 7.16 | 0.05 | 0.20 | ug/L | 10.0 | ND | 71.6 | 65-135 | 2.38 | 30 | Q |
| 1,2-Dibromoethane | 9.12 | 0.07 | 0.10 | ug/L | 10.0 | ND | 91.2 | 80-121 | 8.48 | 30 | |
| Chlorobenzene | 9.28 | 0.02 | 0.20 | ug/L | 10.0 | ND | 92.8 | 80-120 | 6.90 | 30 | |
| Ethylbenzene | 9.58 | 0.04 | 0.20 | ug/L | 10.0 | ND | 95.8 | 80-120 | 5.83 | 30 | |
| 1,1,1,2-Tetrachloroethane | 8.56 | 0.04 | 0.20 | ug/L | 10.0 | ND | 85.6 | 80-120 | 5.19 | 30 | |
| m,p-Xylene | 19.2 | 0.05 | 0.40 | ug/L | 20.0 | ND | 96.0 | 80-121 | 8.20 | 30 | |
| o-Xylene | 9.61 | 0.03 | 0.20 | ug/L | 10.0 | ND | 96.1 | 80-121 | 6.67 | 30 | |
| Xylenes, total | 28.8 | 0.09 | 0.60 | ug/L | 30.0 | ND | 96.0 | 76-127 | 7.70 | 30 | |
| Styrene | 9.90 | 0.05 | 0.20 | ug/L | 10.0 | ND | 99.0 | 80-124 | 5.52 | 30 | |
| Bromoform | 6.29 | 0.06 | 0.20 | ug/L | 10.0 | ND | 62.9 | 51-134 | 1.98 | 30 | Q |
| 1,1,2,2-Tetrachloroethane | 9.07 | 0.06 | 0.10 | ug/L | 10.0 | ND | 90.7 | 77-123 | 10.10 | 30 | |
| 1,2,3-Trichloropropane | 9.60 | 0.13 | 0.20 | ug/L | 10.0 | ND | 96.0 | 76-125 | 9.06 | 30 | |
| trans-1,4-Dichloro 2-Butene | 4.60 | 0.32 | 1.00 | ug/L | 10.0 | ND | 46.0 | 55-129 | 14.50 | 30 | *, Q |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 |
|--|--------|---------------------------|-----------------|-------|-----------------------|---------------|-----------------------------|-------------|------|-----------|-------|
| Matrix Spike Dup (BGL0376-MSD1) | | | | | | | | | | | |
| | | Source: 18L0063-03 | | | Prepared: 13-Dec-2018 | | Analyzed: 13-Dec-2018 23:03 | | | | |
| n-Propylbenzene | 9.54 | 0.02 | 0.20 | ug/L | 10.0 | ND | 95.4 | 78-130 | 6.79 | 30 | |
| Bromobenzene | 9.09 | 0.06 | 0.20 | ug/L | 10.0 | ND | 90.9 | 80-120 | 8.03 | 30 | |
| Isopropyl Benzene | 9.46 | 0.02 | 0.20 | ug/L | 10.0 | ND | 94.6 | 80-128 | 6.60 | 30 | |
| 2-Chlorotoluene | 9.28 | 0.02 | 0.10 | ug/L | 10.0 | ND | 92.8 | 78-122 | 0.78 | 30 | |
| 4-Chlorotoluene | 9.17 | 0.02 | 0.20 | ug/L | 10.0 | ND | 91.7 | 80-121 | 8.46 | 30 | |
| t-Butylbenzene | 9.38 | 0.03 | 0.20 | ug/L | 10.0 | ND | 93.8 | 78-125 | 8.30 | 30 | |
| 1,3,5-Trimethylbenzene | 9.78 | 0.02 | 0.20 | ug/L | 10.0 | ND | 97.8 | 80-129 | 6.89 | 30 | |
| 1,2,4-Trimethylbenzene | 9.63 | 0.02 | 0.20 | ug/L | 10.0 | ND | 96.3 | 80-127 | 8.95 | 30 | |
| s-Butylbenzene | 9.70 | 0.02 | 0.20 | ug/L | 10.0 | ND | 97.0 | 78-129 | 7.17 | 30 | |
| 4-Isopropyl Toluene | 9.82 | 0.03 | 0.20 | ug/L | 10.0 | ND | 98.2 | 79-130 | 8.81 | 30 | |
| 1,3-Dichlorobenzene | 9.35 | 0.04 | 0.20 | ug/L | 10.0 | ND | 93.5 | 80-120 | 8.18 | 30 | |
| 1,4-Dichlorobenzene | 9.16 | 0.04 | 0.20 | ug/L | 10.0 | ND | 91.6 | 80-120 | 8.61 | 30 | |
| n-Butylbenzene | 9.82 | 0.02 | 0.20 | ug/L | 10.0 | ND | 98.2 | 74-129 | 6.45 | 30 | |
| 1,2-Dichlorobenzene | 9.17 | 0.04 | 0.20 | ug/L | 10.0 | ND | 91.7 | 80-120 | 7.96 | 30 | |
| 1,2-Dibromo-3-chloropropane | 6.91 | 0.37 | 0.50 | ug/L | 10.0 | ND | 69.1 | 62-123 | 6.41 | 30 | Q |
| 1,2,4-Trichlorobenzene | 9.81 | 0.11 | 0.50 | ug/L | 10.0 | ND | 98.1 | 64-124 | 7.48 | 30 | |
| Hexachloro-1,3-Butadiene | 10.1 | 0.07 | 0.20 | ug/L | 10.0 | ND | 101 | 58-123 | 6.59 | 30 | |
| Naphthalene | 8.93 | 0.12 | 0.50 | ug/L | 10.0 | ND | 89.3 | 50-134 | 6.34 | 30 | |
| 1,2,3-Trichlorobenzene | 9.73 | 0.11 | 0.20 | ug/L | 10.0 | ND | 97.3 | 49-133 | 5.14 | 30 | |
| Dichlorodifluoromethane | 9.28 | 0.05 | 0.20 | ug/L | 10.0 | ND | 92.8 | 48-147 | 3.77 | 30 | |
| Surrogate: Dibromofluoromethane | 5.26 | | | ug/L | 5.00 | 5.09 | 105 | 80-120 | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 4.97 | | | ug/L | 5.00 | 5.25 | 99.4 | 80-129 | | | |
| Surrogate: Toluene-d8 | 4.96 | | | ug/L | 5.00 | 4.86 | 99.2 | 80-120 | | | |
| Surrogate: 4-Bromofluorobenzene | 5.01 | | | ug/L | 5.00 | 4.74 | 100 | 80-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 4.85 | | | ug/L | 5.00 | 5.01 | 97.0 | 80-120 | | | |

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



Golder Associates
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Semivolatile Organic Compounds - Quality Control

Batch BGL0151 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|------------------------------|--------|---|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0151-BLK1) | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 14:14 | | | | | | | | |
| Phenol | ND | 1.0 | ug/L | | | | | | | U |
| bis(2-chloroethyl) ether | ND | 1.0 | ug/L | | | | | | | U |
| 2-Chlorophenol | ND | 1.0 | ug/L | | | | | | | U |
| 1,3-Dichlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| 1,4-Dichlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| Benzyl Alcohol | ND | 2.0 | ug/L | | | | | | | U |
| 1,2-Dichlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| 2-Methylphenol | ND | 1.0 | ug/L | | | | | | | U |
| 2,2'-Oxybis(1-chloropropane) | ND | 1.0 | ug/L | | | | | | | U |
| 4-Methylphenol | ND | 2.0 | ug/L | | | | | | | U |
| N-Nitroso-di-n-Propylamine | ND | 1.0 | ug/L | | | | | | | U |
| Hexachloroethane | ND | 2.0 | ug/L | | | | | | | U |
| Nitrobenzene | ND | 1.0 | ug/L | | | | | | | U |
| Isophorone | ND | 1.0 | ug/L | | | | | | | U |
| 2-Nitrophenol | ND | 3.0 | ug/L | | | | | | | U |
| 2,4-Dimethylphenol | ND | 3.0 | ug/L | | | | | | | U |
| Bis(2-Chloroethoxy)methane | ND | 1.0 | ug/L | | | | | | | U |
| Benzoic acid | ND | 20.0 | ug/L | | | | | | | U |
| 2,4-Dichlorophenol | ND | 3.0 | ug/L | | | | | | | U |
| 1,2,4-Trichlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| Naphthalene | ND | 1.0 | ug/L | | | | | | | U |
| 4-Chloroaniline | ND | 5.0 | ug/L | | | | | | | U |
| Hexachlorobutadiene | ND | 3.0 | ug/L | | | | | | | U |
| 4-Chloro-3-Methylphenol | ND | 3.0 | ug/L | | | | | | | U |
| 2-Methylnaphthalene | ND | 1.0 | ug/L | | | | | | | U |
| Hexachlorocyclopentadiene | ND | 5.0 | ug/L | | | | | | | U |
| 2,4,6-Trichlorophenol | ND | 3.0 | ug/L | | | | | | | U |
| 2,4,5-Trichlorophenol | ND | 5.0 | ug/L | | | | | | | U |
| 2-Chloronaphthalene | ND | 1.0 | ug/L | | | | | | | U |
| 2-Nitroaniline | ND | 3.0 | ug/L | | | | | | | U |
| Dimethylphthalate | ND | 1.0 | ug/L | | | | | | | U |
| Acenaphthylene | ND | 1.0 | ug/L | | | | | | | U |
| 2,6-Dinitrotoluene | ND | 3.0 | ug/L | | | | | | | U |
| 3-Nitroaniline | ND | 3.0 | ug/L | | | | | | | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Semivolatile Organic Compounds - Quality Control

Batch BGL0151 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------|--------|-----------------|-------|-------------|---|------|-------------|-----|-----------|-------|
| Blank (BGL0151-BLK1) | | | | | | | | | | |
| | | | | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 14:14 | | | | | |
| Acenaphthene | ND | 1.0 | ug/L | | | | | | | U |
| 2,4-Dinitrophenol | ND | 20.0 | ug/L | | | | | | | U |
| Dibenzofuran | ND | 1.0 | ug/L | | | | | | | U |
| 4-Nitrophenol | ND | 10.0 | ug/L | | | | | | | U |
| 2,4-Dinitrotoluene | ND | 3.0 | ug/L | | | | | | | U |
| Fluorene | ND | 1.0 | ug/L | | | | | | | U |
| Diethyl phthalate | ND | 1.0 | ug/L | | | | | | | U |
| 4-Chlorophenylphenyl ether | ND | 1.0 | ug/L | | | | | | | U |
| 4-Nitroaniline | ND | 3.0 | ug/L | | | | | | | U |
| 4,6-Dinitro-2-methylphenol | ND | 10.0 | ug/L | | | | | | | U |
| N-Nitrosodiphenylamine | ND | 1.0 | ug/L | | | | | | | U |
| 4-Bromophenyl phenyl ether | ND | 1.0 | ug/L | | | | | | | U |
| Hexachlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| Pentachlorophenol | ND | 10.0 | ug/L | | | | | | | U |
| Phenanthrene | ND | 1.0 | ug/L | | | | | | | U |
| Anthracene | ND | 1.0 | ug/L | | | | | | | U |
| Carbazole | ND | 1.0 | ug/L | | | | | | | U |
| Di-n-Butylphthalate | ND | 1.0 | ug/L | | | | | | | U |
| Fluoranthene | ND | 1.0 | ug/L | | | | | | | U |
| Pyrene | ND | 1.0 | ug/L | | | | | | | U |
| Butylbenzylphthalate | ND | 1.0 | ug/L | | | | | | | U |
| Benzo(a)anthracene | ND | 1.0 | ug/L | | | | | | | U |
| 3,3'-Dichlorobenzidine | ND | 5.0 | ug/L | | | | | | | U |
| Chrysene | ND | 1.0 | ug/L | | | | | | | U |
| bis(2-Ethylhexyl)phthalate | ND | 3.0 | ug/L | | | | | | | U |
| Di-n-Octylphthalate | ND | 1.0 | ug/L | | | | | | | U |
| Benzo(a)pyrene | ND | 1.0 | ug/L | | | | | | | U |
| Indeno(1,2,3-cd)pyrene | ND | 1.0 | ug/L | | | | | | | U |
| Dibenzo(a,h)anthracene | ND | 1.0 | ug/L | | | | | | | U |
| Benzo(g,h,i)perylene | ND | 1.0 | ug/L | | | | | | | U |
| Benzo(a)fluoranthene, Total | ND | 2.0 | ug/L | | | | | | | U |
| 1-Methylnaphthalene | ND | 1.0 | ug/L | | | | | | | U |
| Surrogate: 2-Fluorophenol | 25.5 | | ug/L | 37.5 | | 68.1 | 33-120 | | | |
| Surrogate: Phenol-d5 | 25.6 | | ug/L | 37.5 | | 68.2 | 38-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Semivolatile Organic Compounds - Quality Control

Batch BGL0151 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|--------|---|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0151-BLK1) | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 14:14 | | | | | | | | |
| Surrogate: 2-Chlorophenol-d4 | 27.3 | | ug/L | 37.5 | | 72.7 | 41-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 16.8 | | ug/L | 25.0 | | 67.2 | 20-120 | | | |
| Surrogate: Nitrobenzene-d5 | 18.5 | | ug/L | 25.0 | | 73.9 | 27-120 | | | |
| Surrogate: 2-Fluorobiphenyl | 18.0 | | ug/L | 25.0 | | 72.0 | 33-120 | | | |
| Surrogate: 2,4,6-Tribromophenol | 28.8 | | ug/L | 37.5 | | 76.9 | 52-120 | | | |
| Surrogate: p-Terphenyl-d14 | 20.9 | | ug/L | 25.0 | | 83.4 | 28-120 | | | |
| LCS (BGL0151-BS1) | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 14:47 | | | | | | | | |
| Phenol | 16.2 | 1.0 | ug/L | 25.0 | | 65.0 | 35-120 | | | |
| bis(2-chloroethyl) ether | 16.5 | 1.0 | ug/L | 25.0 | | 66.2 | 46.5-120 | | | |
| 2-Chlorophenol | 17.0 | 1.0 | ug/L | 25.0 | | 68.1 | 48-120 | | | |
| 1,3-Dichlorobenzene | 13.2 | 1.0 | ug/L | 25.0 | | 52.8 | 34.2-120 | | | |
| 1,4-Dichlorobenzene | 13.8 | 1.0 | ug/L | 25.0 | | 55.3 | 36-120 | | | |
| Benzyl Alcohol | 17.2 | 2.0 | ug/L | 25.0 | | 68.7 | 27.4-120 | | | |
| 1,2-Dichlorobenzene | 13.8 | 1.0 | ug/L | 25.0 | | 55.1 | 38.4-120 | | | |
| 2-Methylphenol | 16.7 | 1.0 | ug/L | 25.0 | | 66.8 | 47.8-120 | | | |
| 2,2'-Oxybis(1-chloropropane) | 15.6 | 1.0 | ug/L | 25.0 | | 62.4 | 40.4-120 | | | |
| 4-Methylphenol | 17.0 | 2.0 | ug/L | 25.0 | | 67.9 | 52.3-120 | | | |
| N-Nitroso-di-n-Propylamine | 16.4 | 1.0 | ug/L | 25.0 | | 65.6 | 51.4-120 | | | |
| Hexachloroethane | 11.5 | 2.0 | ug/L | 25.0 | | 45.9 | 29.5-120 | | | |
| Nitrobenzene | 16.7 | 1.0 | ug/L | 25.0 | | 66.7 | 51.5-120 | | | |
| Isophorone | 21.3 | 1.0 | ug/L | 25.0 | | 85.4 | 62.3-128 | | | |
| 2-Nitrophenol | 18.9 | 3.0 | ug/L | 25.0 | | 75.5 | 58.6-124 | | | |
| 2,4-Dimethylphenol | 50.8 | 3.0 | ug/L | 75.0 | | 67.7 | 38.5-120 | | | |
| Bis(2-Chloroethoxy)methane | 18.3 | 1.0 | ug/L | 25.0 | | 73.0 | 52.9-120 | | | |
| Benzoic acid | 91.7 | 20.0 | ug/L | 138 | | 66.7 | 38.2-120 | | | |
| 2,4-Dichlorophenol | 56.3 | 3.0 | ug/L | 75.0 | | 75.1 | 43.6-120 | | | |
| 1,2,4-Trichlorobenzene | 14.5 | 1.0 | ug/L | 25.0 | | 57.9 | 38.6-120 | | | |
| Naphthalene | 16.5 | 1.0 | ug/L | 25.0 | | 66.1 | 40.5-120 | | | |
| 4-Chloroaniline | 49.5 | 5.0 | ug/L | 75.0 | | 66.0 | 42.7-120 | | | |
| Hexachlorobutadiene | 12.3 | 3.0 | ug/L | 25.0 | | 49.2 | 32.3-120 | | | |
| 4-Chloro-3-Methylphenol | 57.9 | 3.0 | ug/L | 75.0 | | 77.2 | 51.9-120 | | | |
| 2-Methylnaphthalene | 15.9 | 1.0 | ug/L | 25.0 | | 63.8 | 47.3-120 | | | |
| Hexachlorocyclopentadiene | 41.7 | 5.0 | ug/L | 75.0 | | 55.5 | 23.3-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Semivolatile Organic Compounds - Quality Control

Batch BGL0151 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|----------------------------|--------|-----------------|-------|-------------|---------------|---|-------------|-----|-----------|-------|
| LCS (BGL0151-BS1) | | | | | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 14:47 | | | | |
| 2,4,6-Trichlorophenol | 57.3 | 3.0 | ug/L | 75.0 | | 76.3 | 47-120 | | | |
| 2,4,5-Trichlorophenol | 58.7 | 5.0 | ug/L | 75.0 | | 78.2 | 48.4-120 | | | |
| 2-Chloronaphthalene | 15.8 | 1.0 | ug/L | 25.0 | | 63.3 | 47.7-123 | | | |
| 2-Nitroaniline | 57.8 | 3.0 | ug/L | 75.0 | | 77.0 | 56.8-120 | | | |
| Dimethylphthalate | 19.4 | 1.0 | ug/L | 25.0 | | 77.4 | 65.2-125 | | | |
| Acenaphthylene | 17.6 | 1.0 | ug/L | 25.0 | | 70.4 | 44.1-120 | | | |
| 2,6-Dinitrotoluene | 62.1 | 3.0 | ug/L | 75.0 | | 82.8 | 69.3-140 | | | |
| 3-Nitroaniline | 64.0 | 3.0 | ug/L | 75.0 | | 85.4 | 60.9-120 | | | |
| Acenaphthene | 17.0 | 1.0 | ug/L | 25.0 | | 68.1 | 50.4-120 | | | |
| 2,4-Dinitrophenol | 120 | 20.0 | ug/L | 138 | | 87.2 | 33.7-183 | | | |
| Dibenzofuran | 18.2 | 1.0 | ug/L | 25.0 | | 73.0 | 49.9-120 | | | |
| 4-Nitrophenol | 62.5 | 10.0 | ug/L | 75.0 | | 83.4 | 50.2-136 | | | |
| 2,4-Dinitrotoluene | 60.9 | 3.0 | ug/L | 75.0 | | 81.2 | 66.8-132 | | | |
| Fluorene | 18.3 | 1.0 | ug/L | 25.0 | | 73.3 | 57.8-120 | | | |
| Diethyl phthalate | 19.6 | 1.0 | ug/L | 25.0 | | 78.5 | 68.1-120 | | | |
| 4-Chlorophenylphenyl ether | 18.9 | 1.0 | ug/L | 25.0 | | 75.8 | 59.1-127 | | | |
| 4-Nitroaniline | 65.9 | 3.0 | ug/L | 75.0 | | 87.9 | 56-122 | | | |
| 4,6-Dinitro-2-methylphenol | 118 | 10.0 | ug/L | 138 | | 86.0 | 37.9-162 | | | |
| N-Nitrosodiphenylamine | 18.7 | 1.0 | ug/L | 25.0 | | 74.7 | 59.6-120 | | | |
| 4-Bromophenyl phenyl ether | 19.4 | 1.0 | ug/L | 25.0 | | 77.4 | 59.6-120 | | | |
| Hexachlorobenzene | 18.6 | 1.0 | ug/L | 25.0 | | 74.5 | 53.7-120 | | | |
| Pentachlorophenol | 60.9 | 10.0 | ug/L | 75.0 | | 81.2 | 40.3-128 | | | |
| Phenanthrene | 19.1 | 1.0 | ug/L | 25.0 | | 76.5 | 58.8-120 | | | |
| Anthracene | 18.6 | 1.0 | ug/L | 25.0 | | 74.3 | 60.5-120 | | | |
| Carbazole | 18.8 | 1.0 | ug/L | 25.0 | | 75.0 | 59.7-120 | | | |
| Di-n-Butylphthalate | 20.4 | 1.0 | ug/L | 25.0 | | 81.8 | 71-120 | | | |
| Fluoranthene | 20.5 | 1.0 | ug/L | 25.0 | | 81.9 | 66.7-120 | | | |
| Pyrene | 19.2 | 1.0 | ug/L | 25.0 | | 76.9 | 62.7-127 | | | |
| Butylbenzylphthalate | 18.8 | 1.0 | ug/L | 25.0 | | 75.1 | 67.4-128 | | | |
| Benzo(a)anthracene | 19.9 | 1.0 | ug/L | 25.0 | | 79.7 | 58.3-128 | | | |
| 3,3'-Dichlorobenzidine | 74.6 | 5.0 | ug/L | 75.0 | | 99.4 | 34.1-120 | | | |
| Chrysene | 20.4 | 1.0 | ug/L | 25.0 | | 81.6 | 58.9-120 | | | |
| bis(2-Ethylhexyl)phthalate | 20.1 | 3.0 | ug/L | 25.0 | | 80.6 | 68.3-123 | | | |
| Di-n-Octylphthalate | 19.9 | 1.0 | ug/L | 25.0 | | 79.7 | 61.5-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Semivolatile Organic Compounds - Quality Control

Batch BGL0151 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|--------|-----------------|-------|-------------|---------------|---|-------------|-------|-----------|-------|
| LCS (BGL0151-BS1) | | | | | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 14:47 | | | | |
| Benzo(a)pyrene | 19.4 | 1.0 | ug/L | 25.0 | | 77.8 | 70.6-120 | | | |
| Indeno(1,2,3-cd)pyrene | 18.9 | 1.0 | ug/L | 25.0 | | 75.6 | 46.5-120 | | | |
| Dibenzo(a,h)anthracene | 18.9 | 1.0 | ug/L | 25.0 | | 75.4 | 49.6-120 | | | |
| Benzo(g,h,i)perylene | 18.8 | 1.0 | ug/L | 25.0 | | 75.3 | 37-120 | | | |
| Benzofluoranthenes, Total | 40.9 | 2.0 | ug/L | 50.0 | | 81.9 | 66.5-120 | | | |
| 1-Methylnaphthalene | 17.5 | 1.0 | ug/L | 25.0 | | 70.1 | 46.9-120 | | | |
| Surrogate: 2-Fluorophenol | 26.3 | | ug/L | 37.5 | | 70.0 | 33-120 | | | |
| Surrogate: Phenol-d5 | 28.0 | | ug/L | 37.5 | | 74.7 | 38-120 | | | |
| Surrogate: 2-Chlorophenol-d4 | 28.0 | | ug/L | 37.5 | | 74.8 | 41-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 16.7 | | ug/L | 25.0 | | 66.7 | 20-120 | | | |
| Surrogate: Nitrobenzene-d5 | 19.3 | | ug/L | 25.0 | | 77.2 | 27-120 | | | |
| Surrogate: 2-Fluorobiphenyl | 19.5 | | ug/L | 25.0 | | 77.9 | 33-120 | | | |
| Surrogate: 2,4,6-Tribromophenol | 35.6 | | ug/L | 37.5 | | 95.0 | 52-120 | | | |
| Surrogate: p-Terphenyl-d14 | 23.7 | | ug/L | 25.0 | | 94.8 | 28-120 | | | |
| LCS Dup (BGL0151-bsd1) | | | | | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 15:20 | | | | |
| Phenol | 18.7 | 1.0 | ug/L | 25.0 | | 74.7 | 35-120 | 13.90 | 30 | |
| bis(2-chloroethyl) ether | 18.4 | 1.0 | ug/L | 25.0 | | 73.7 | 46.5-120 | 10.80 | 30 | |
| 2-Chlorophenol | 18.9 | 1.0 | ug/L | 25.0 | | 75.6 | 48-120 | 10.40 | 30 | |
| 1,3-Dichlorobenzene | 14.6 | 1.0 | ug/L | 25.0 | | 58.3 | 34.2-120 | 9.81 | 30 | |
| 1,4-Dichlorobenzene | 15.3 | 1.0 | ug/L | 25.0 | | 61.3 | 36-120 | 10.30 | 30 | |
| Benzyl Alcohol | 19.1 | 2.0 | ug/L | 25.0 | | 76.4 | 27.4-120 | 10.70 | 30 | |
| 1,2-Dichlorobenzene | 15.4 | 1.0 | ug/L | 25.0 | | 61.5 | 38.4-120 | 11.00 | 30 | |
| 2-Methylphenol | 18.9 | 1.0 | ug/L | 25.0 | | 75.5 | 47.8-120 | 12.20 | 30 | |
| 2,2'-Oxybis(1-chloropropane) | 17.6 | 1.0 | ug/L | 25.0 | | 70.4 | 40.4-120 | 12.00 | 30 | |
| 4-Methylphenol | 19.1 | 2.0 | ug/L | 25.0 | | 76.5 | 52.3-120 | 11.90 | 30 | |
| N-Nitroso-di-n-Propylamine | 18.1 | 1.0 | ug/L | 25.0 | | 72.6 | 51.4-120 | 10.10 | 30 | |
| Hexachloroethane | 13.1 | 2.0 | ug/L | 25.0 | | 52.3 | 29.5-120 | 13.00 | 30 | |
| Nitrobenzene | 18.5 | 1.0 | ug/L | 25.0 | | 74.1 | 51.5-120 | 10.40 | 30 | |
| Isophorone | 23.8 | 1.0 | ug/L | 25.0 | | 95.3 | 62.3-128 | 11.00 | 30 | |
| 2-Nitrophenol | 21.3 | 3.0 | ug/L | 25.0 | | 85.2 | 58.6-124 | 12.00 | 30 | |
| 2,4-Dimethylphenol | 55.9 | 3.0 | ug/L | 75.0 | | 74.5 | 38.5-120 | 9.54 | 30 | |
| Bis(2-Chloroethoxy)methane | 20.3 | 1.0 | ug/L | 25.0 | | 81.0 | 52.9-120 | 10.40 | 30 | |
| Benzoic acid | 97.9 | 20.0 | ug/L | 138 | | 71.2 | 38.2-120 | 6.58 | 30 | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Semivolatile Organic Compounds - Quality Control

Batch BGL0151 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-------------------------------|--------|-----------------|-------|---|---------------|------|-------------|-------|-----------|-------|
| LCS Dup (BGL0151-BSD1) | | | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 15:20 | | | | | | |
| 2,4-Dichlorophenol | 62.1 | 3.0 | ug/L | 75.0 | | 82.8 | 43.6-120 | 9.81 | 30 | |
| 1,2,4-Trichlorobenzene | 16.0 | 1.0 | ug/L | 25.0 | | 63.9 | 38.6-120 | 9.84 | 30 | |
| Naphthalene | 18.4 | 1.0 | ug/L | 25.0 | | 73.5 | 40.5-120 | 10.60 | 30 | |
| 4-Chloroaniline | 56.5 | 5.0 | ug/L | 75.0 | | 75.3 | 42.7-120 | 13.20 | 30 | |
| Hexachlorobutadiene | 13.6 | 3.0 | ug/L | 25.0 | | 54.3 | 32.3-120 | 9.84 | 30 | |
| 4-Chloro-3-Methylphenol | 62.7 | 3.0 | ug/L | 75.0 | | 83.6 | 51.9-120 | 8.04 | 30 | |
| 2-Methylnaphthalene | 18.0 | 1.0 | ug/L | 25.0 | | 72.2 | 47.3-120 | 12.40 | 30 | |
| Hexachlorocyclopentadiene | 48.4 | 5.0 | ug/L | 75.0 | | 64.5 | 23.3-120 | 14.90 | 30 | |
| 2,4,6-Trichlorophenol | 63.9 | 3.0 | ug/L | 75.0 | | 85.2 | 47-120 | 11.00 | 30 | |
| 2,4,5-Trichlorophenol | 65.5 | 5.0 | ug/L | 75.0 | | 87.3 | 48.4-120 | 11.00 | 30 | |
| 2-Chloronaphthalene | 17.8 | 1.0 | ug/L | 25.0 | | 71.0 | 47.7-123 | 11.50 | 30 | |
| 2-Nitroaniline | 64.3 | 3.0 | ug/L | 75.0 | | 85.7 | 56.8-120 | 10.70 | 30 | |
| Dimethylphthalate | 21.3 | 1.0 | ug/L | 25.0 | | 85.1 | 65.2-125 | 9.49 | 30 | |
| Acenaphthylene | 19.8 | 1.0 | ug/L | 25.0 | | 79.3 | 44.1-120 | 11.80 | 30 | |
| 2,6-Dinitrotoluene | 68.7 | 3.0 | ug/L | 75.0 | | 91.5 | 69.3-140 | 10.00 | 30 | |
| 3-Nitroaniline | 71.1 | 3.0 | ug/L | 75.0 | | 94.8 | 60.9-120 | 10.50 | 30 | |
| Acenaphthene | 19.0 | 1.0 | ug/L | 25.0 | | 76.0 | 50.4-120 | 10.90 | 30 | |
| 2,4-Dinitrophenol | 133 | 20.0 | ug/L | 138 | | 96.8 | 33.7-183 | 10.40 | 30 | |
| Dibenzofuran | 20.3 | 1.0 | ug/L | 25.0 | | 81.3 | 49.9-120 | 10.80 | 30 | |
| 4-Nitrophenol | 68.1 | 10.0 | ug/L | 75.0 | | 90.8 | 50.2-136 | 8.54 | 30 | |
| 2,4-Dinitrotoluene | 66.8 | 3.0 | ug/L | 75.0 | | 89.0 | 66.8-132 | 9.23 | 30 | |
| Fluorene | 20.5 | 1.0 | ug/L | 25.0 | | 81.9 | 57.8-120 | 11.10 | 30 | |
| Diethyl phthalate | 21.5 | 1.0 | ug/L | 25.0 | | 86.1 | 68.1-120 | 9.22 | 30 | |
| 4-Chlorophenylphenyl ether | 21.0 | 1.0 | ug/L | 25.0 | | 83.9 | 59.1-127 | 10.20 | 30 | |
| 4-Nitroaniline | 73.6 | 3.0 | ug/L | 75.0 | | 98.1 | 56-122 | 11.00 | 30 | |
| 4,6-Dinitro-2-methylphenol | 130 | 10.0 | ug/L | 138 | | 94.7 | 37.9-162 | 9.59 | 30 | |
| N-Nitrosodiphenylamine | 20.4 | 1.0 | ug/L | 25.0 | | 81.6 | 59.6-120 | 8.86 | 30 | |
| 4-Bromophenyl phenyl ether | 20.9 | 1.0 | ug/L | 25.0 | | 83.8 | 59.6-120 | 7.91 | 30 | |
| Hexachlorobenzene | 20.5 | 1.0 | ug/L | 25.0 | | 81.8 | 53.7-120 | 9.39 | 30 | |
| Pentachlorophenol | 66.1 | 10.0 | ug/L | 75.0 | | 88.1 | 40.3-128 | 8.16 | 30 | |
| Phenanthrene | 20.9 | 1.0 | ug/L | 25.0 | | 83.7 | 58.8-120 | 9.02 | 30 | |
| Anthracene | 20.5 | 1.0 | ug/L | 25.0 | | 82.0 | 60.5-120 | 9.89 | 30 | |
| Carbazole | 20.7 | 1.0 | ug/L | 25.0 | | 82.7 | 59.7-120 | 9.74 | 30 | |
| Di-n-Butylphthalate | 22.4 | 1.0 | ug/L | 25.0 | | 89.5 | 71-120 | 9.02 | 30 | |



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Project: Landsburg
Project Number: Landsburg
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Reported:
19-Dec-2018 17:38

Semivolatile Organic Compounds - Quality Control

Batch BGL0151 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|--------|-----------------|-------|-------------|---|------|-------------|-------|-----------|-------|
| LCS Dup (BGL0151-BSD1) | | | | | Prepared: 06-Dec-2018 Analyzed: 07-Dec-2018 15:20 | | | | | |
| Fluoranthene | 22.9 | 1.0 | ug/L | 25.0 | | 91.5 | 66.7-120 | 11.00 | 30 | |
| Pyrene | 20.4 | 1.0 | ug/L | 25.0 | | 81.7 | 62.7-127 | 6.05 | 30 | |
| Butylbenzylphthalate | 20.4 | 1.0 | ug/L | 25.0 | | 81.8 | 67.4-128 | 8.46 | 30 | |
| Benzo(a)anthracene | 21.7 | 1.0 | ug/L | 25.0 | | 86.6 | 58.3-128 | 8.36 | 30 | |
| 3,3'-Dichlorobenzidine | 84.1 | 5.0 | ug/L | 75.0 | | 112 | 34.1-120 | 12.00 | 30 | |
| Chrysene | 22.4 | 1.0 | ug/L | 25.0 | | 89.7 | 58.9-120 | 9.50 | 30 | |
| bis(2-Ethylhexyl)phthalate | 22.0 | 3.0 | ug/L | 25.0 | | 87.8 | 68.3-123 | 8.62 | 30 | |
| Di-n-Octylphthalate | 22.0 | 1.0 | ug/L | 25.0 | | 87.8 | 61.5-120 | 9.78 | 30 | |
| Benzo(a)pyrene | 21.2 | 1.0 | ug/L | 25.0 | | 84.6 | 70.6-120 | 8.49 | 30 | |
| Indeno(1,2,3-cd)pyrene | 20.3 | 1.0 | ug/L | 25.0 | | 81.1 | 46.5-120 | 6.97 | 30 | |
| Dibenzo(a,h)anthracene | 20.2 | 1.0 | ug/L | 25.0 | | 80.7 | 49.6-120 | 6.80 | 30 | |
| Benzo(g,h,i)perylene | 20.1 | 1.0 | ug/L | 25.0 | | 80.3 | 37-120 | 6.44 | 30 | |
| Benzo(a)fluoranthene, Total | 44.7 | 2.0 | ug/L | 50.0 | | 89.3 | 66.5-120 | 8.73 | 30 | |
| 1-Methylnaphthalene | 19.7 | 1.0 | ug/L | 25.0 | | 78.7 | 46.9-120 | 11.60 | 30 | |
| Surrogate: 2-Fluorophenol | 29.2 | | ug/L | 37.5 | | 77.9 | 33-120 | | | |
| Surrogate: Phenol-d5 | 31.6 | | ug/L | 37.5 | | 84.4 | 38-120 | | | |
| Surrogate: 2-Chlorophenol-d4 | 31.5 | | ug/L | 37.5 | | 84.1 | 41-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 19.1 | | ug/L | 25.0 | | 76.4 | 20-120 | | | |
| Surrogate: Nitrobenzene-d5 | 21.6 | | ug/L | 25.0 | | 86.6 | 27-120 | | | |
| Surrogate: 2-Fluorobiphenyl | 22.2 | | ug/L | 25.0 | | 89.0 | 33-120 | | | |
| Surrogate: 2,4,6-Tribromophenol | 39.8 | | ug/L | 37.5 | | 106 | 52-120 | | | |
| Surrogate: p-Terphenyl-d14 | 25.2 | | ug/L | 25.0 | | 101 | 28-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Semivolatile Organic Compounds - Quality Control

Batch BGL0152 - 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 (BGL0152-BLK1) | | | | | Prepared: 07-Dec-2018 Analyzed: 14-Dec-2018 14:08 | | | | | | |
| 1,4-Dioxane | ND | 0.2 | 0.4 | ug/L | | | | | | | U |
| Surrogate: 1,4-Dioxane-d8 | 45.6 | | | ug/L | 50.0 | | 91.2 | 33.6-120 | | | |
| LCS (BGL0152-BS1) | | | | | Prepared: 07-Dec-2018 Analyzed: 14-Dec-2018 14:40 | | | | | | |
| 1,4-Dioxane | 42.3 | 0.2 | 0.4 | ug/L | 50.0 | | 84.5 | 39.9-120 | | | |
| Surrogate: 1,4-Dioxane-d8 | 42.6 | | | ug/L | 50.0 | | 85.2 | 33.6-120 | | | |
| LCS Dup (BGL0152-BSD1) | | | | | Prepared: 07-Dec-2018 Analyzed: 14-Dec-2018 15:13 | | | | | | |
| 1,4-Dioxane | 41.2 | 0.2 | 0.4 | ug/L | 50.0 | | 82.5 | 39.9-120 | 2.48 | 30 | |
| Surrogate: 1,4-Dioxane-d8 | 40.6 | | | ug/L | 50.0 | | 81.2 | 33.6-120 | | | |



| | | |
|---|--|--------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond, WA 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 19-Dec-2018 17:38 |
|---|--|--------------------------------|

Petroleum Hydrocarbons - Quality Control

Batch BGL0134 - EPA 3510C SepF

Instrument: FID4 Analyst: JGR

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|------------------------------------|--------|---|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0134-BLK1) | | Prepared: 06-Dec-2018 Analyzed: 06-Dec-2018 19:09 | | | | | | | | |
| Gasoline Range Organics (Tol-C12) | ND | 0.25 | mg/L | | | | | | | U |
| Diesel Range Organics (C12-C24) | ND | 0.50 | mg/L | | | | | | | U |
| Motor Oil Range Organics (C24-C38) | ND | 1.00 | mg/L | | | | | | | U |
| Surrogate: <i>o</i> -Terphenyl | 0.212 | | mg/L | 0.225 | | 94.0 | 50-150 | | | |
| Surrogate: <i>n</i> -Triacontane | 0.178 | | mg/L | 0.225 | | 79.1 | 50-150 | | | |



Golder Associates
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Redmond, WA 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Chlorinated Pesticides - Quality Control

Batch BGL0174 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|--|--------|-----------------|-------|---|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0174-BLK1) | | | | | | | | | | |
| | | | | Prepared: 07-Dec-2018 Analyzed: 18-Dec-2018 14:22 | | | | | | |
| alpha-BHC | ND | 0.025 | ug/L | | | | | | | U |
| beta-BHC | ND | 0.025 | ug/L | | | | | | | U |
| gamma-BHC (Lindane) | ND | 0.025 | ug/L | | | | | | | U |
| delta-BHC | ND | 0.025 | ug/L | | | | | | | U |
| Heptachlor | ND | 0.025 | ug/L | | | | | | | U |
| Aldrin | ND | 0.025 | ug/L | | | | | | | U |
| Heptachlor Epoxide | ND | 0.050 | ug/L | | | | | | | U |
| trans-Chlordane (beta-Chlordane) | ND | 0.025 | ug/L | | | | | | | U |
| cis-Chlordane (alpha-chlordane) | ND | 0.025 | ug/L | | | | | | | U |
| Endosulfan I | ND | 0.025 | ug/L | | | | | | | U |
| 4,4'-DDE | ND | 0.050 | ug/L | | | | | | | U |
| Dieldrin | ND | 0.050 | ug/L | | | | | | | U |
| Endrin | ND | 0.050 | ug/L | | | | | | | U |
| Endosulfan II | ND | 0.050 | ug/L | | | | | | | U |
| 4,4'-DDD | ND | 0.050 | ug/L | | | | | | | U |
| Endrin Aldehyde | ND | 0.050 | ug/L | | | | | | | U |
| 4,4'-DDT | ND | 0.050 | ug/L | | | | | | | U |
| Endosulfan Sulfate | ND | 0.050 | ug/L | | | | | | | U |
| Endrin Ketone | ND | 0.050 | ug/L | | | | | | | U |
| Methoxychlor | ND | 0.250 | ug/L | | | | | | | U |
| Toxaphene | ND | 1.25 | ug/L | | | | | | | U |
| Surrogate: Decachlorobiphenyl | 0.382 | | ug/L | 0.400 | | 95.4 | 11-144 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.347 | | ug/L | 0.400 | | 86.8 | 11-144 | | | |
| Surrogate: Tetrachlorometaxylyene | 0.314 | | ug/L | 0.400 | | 78.5 | 30-120 | | | |
| Surrogate: Tetrachlorometaxylyene [2C] | 0.348 | | ug/L | 0.400 | | 87.0 | 30-120 | | | |

| | | | | | | | | | | |
|--------------------------|-------|-------|------|---|--|------|--------|--|--|--|
| LCS (BGL0174-BS1) | | | | | | | | | | |
| | | | | Prepared: 07-Dec-2018 Analyzed: 18-Dec-2018 14:40 | | | | | | |
| alpha-BHC | 0.157 | 0.025 | ug/L | 0.200 | | 78.7 | 57-120 | | | |
| beta-BHC | 0.148 | 0.025 | ug/L | 0.200 | | 74.2 | 59-120 | | | |
| gamma-BHC (Lindane) | 0.166 | 0.025 | ug/L | 0.200 | | 83.0 | 62-120 | | | |
| delta-BHC | 0.151 | 0.025 | ug/L | 0.200 | | 75.6 | 15-145 | | | |
| Heptachlor | 0.147 | 0.025 | ug/L | 0.200 | | 73.7 | 54-120 | | | |
| Aldrin | 0.156 | 0.025 | ug/L | 0.200 | | 78.2 | 47-120 | | | |
| Heptachlor Epoxide | 0.170 | 0.050 | ug/L | 0.200 | | 85.2 | 63-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Chlorinated Pesticides - Quality Control

Batch BGL0174 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------------------------------------|--------|-----------------|-------|-------------|---------------|---|-------------|------|-----------|-------|
| LCS (BGL0174-BS1) | | | | | | Prepared: 07-Dec-2018 Analyzed: 18-Dec-2018 14:40 | | | | |
| trans-Chlordane (beta-Chlordane) | 0.163 | 0.025 | ug/L | 0.200 | | 81.3 | 63-120 | | | |
| cis-Chlordane (alpha-chlordane) | 0.162 | 0.025 | ug/L | 0.200 | | 81.1 | 60-120 | | | |
| Endosulfan I | 0.161 | 0.025 | ug/L | 0.200 | | 80.7 | 58-121 | | | |
| 4,4'-DDE | 0.365 | 0.050 | ug/L | 0.400 | | 91.3 | 69-128 | | | |
| Dieldrin | 0.341 | 0.050 | ug/L | 0.400 | | 85.2 | 62-120 | | | |
| Endrin | 0.341 | 0.050 | ug/L | 0.400 | | 85.2 | 64-120 | | | |
| Endosulfan II | 0.321 | 0.050 | ug/L | 0.400 | | 80.2 | 64-120 | | | |
| 4,4'-DDD | 0.334 | 0.050 | ug/L | 0.400 | | 83.6 | 63-120 | | | |
| Endrin Aldehyde | 0.300 | 0.050 | ug/L | 0.400 | | 75.0 | 41-120 | | | |
| 4,4'-DDT | 0.330 | 0.050 | ug/L | 0.400 | | 82.4 | 57-124 | | | |
| Endosulfan Sulfate | 0.299 | 0.050 | ug/L | 0.400 | | 74.7 | 47-120 | | | |
| Endrin Ketone | 0.318 | 0.050 | ug/L | 0.400 | | 79.6 | 58-120 | | | |
| Methoxychlor | 1.59 | 0.250 | ug/L | 2.00 | | 79.5 | 56-120 | | | |
| Surrogate: Decachlorobiphenyl | 0.366 | | ug/L | 0.400 | | 91.5 | 11-144 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.334 | | ug/L | 0.400 | | 83.6 | 11-144 | | | |
| Surrogate: Tetrachlorometaxylene | 0.307 | | ug/L | 0.400 | | 76.7 | 30-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.330 | | ug/L | 0.400 | | 82.5 | 30-120 | | | |
| LCS (BGL0174-BS2) | | | | | | Prepared: 07-Dec-2018 Analyzed: 18-Dec-2018 15:17 | | | | |
| Surrogate: Decachlorobiphenyl | 0.447 | | ug/L | 0.400 | | 112 | 11-144 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.398 | | ug/L | 0.400 | | 99.6 | 11-144 | | | |
| Surrogate: Tetrachlorometaxylene | 0.363 | | ug/L | 0.400 | | 90.7 | 30-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.396 | | ug/L | 0.400 | | 99.0 | 30-120 | | | |
| LCS Dup (BGL0174-BSD1) | | | | | | Prepared: 07-Dec-2018 Analyzed: 18-Dec-2018 14:58 | | | | |
| alpha-BHC | 0.166 | 0.025 | ug/L | 0.200 | | 83.2 | 57-120 | 5.47 | 30 | |
| beta-BHC | 0.157 | 0.025 | ug/L | 0.200 | | 78.6 | 59-120 | 5.76 | 30 | |
| gamma-BHC (Lindane) | 0.169 | 0.025 | ug/L | 0.200 | | 84.7 | 62-120 | 4.90 | 30 | |
| delta-BHC | 0.160 | 0.025 | ug/L | 0.200 | | 80.2 | 15-145 | 5.89 | 30 | |
| Heptachlor | 0.159 | 0.025 | ug/L | 0.200 | | 79.4 | 54-120 | 7.44 | 30 | |
| Aldrin | 0.166 | 0.025 | ug/L | 0.200 | | 83.1 | 47-120 | 6.10 | 30 | |
| Heptachlor Epoxide | 0.183 | 0.050 | ug/L | 0.200 | | 91.4 | 63-120 | 7.00 | 30 | |
| trans-Chlordane (beta-Chlordane) | 0.172 | 0.025 | ug/L | 0.200 | | 86.2 | 63-120 | 5.88 | 30 | |
| cis-Chlordane (alpha-chlordane) | 0.170 | 0.025 | ug/L | 0.200 | | 85.1 | 60-120 | 4.80 | 30 | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Chlorinated Pesticides - Quality Control

Batch BGL0174 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------------------------------------|--------|---|-------|-------------|---------------|------|-------------|------|-----------|-------|
| LCS Dup (BGL0174-BSD1) | | Prepared: 07-Dec-2018 Analyzed: 18-Dec-2018 14:58 | | | | | | | | |
| Endosulfan I | 0.171 | 0.025 | ug/L | 0.200 | | 85.4 | 58-121 | 5.60 | 30 | |
| 4,4'-DDE | 0.387 | 0.050 | ug/L | 0.400 | | 96.7 | 69-128 | 5.79 | 30 | |
| Dieldrin | 0.356 | 0.050 | ug/L | 0.400 | | 89.0 | 62-120 | 4.44 | 30 | |
| Endrin | 0.356 | 0.050 | ug/L | 0.400 | | 89.0 | 64-120 | 4.31 | 30 | |
| Endosulfan II | 0.337 | 0.050 | ug/L | 0.400 | | 84.4 | 64-120 | 5.29 | 30 | |
| 4,4'-DDD | 0.355 | 0.050 | ug/L | 0.400 | | 88.6 | 63-120 | 5.87 | 30 | |
| Endrin Aldehyde | 0.319 | 0.050 | ug/L | 0.400 | | 79.9 | 41-120 | 6.35 | 30 | |
| 4,4'-DDT | 0.352 | 0.050 | ug/L | 0.400 | | 88.0 | 57-124 | 6.52 | 30 | |
| Endosulfan Sulfate | 0.317 | 0.050 | ug/L | 0.400 | | 79.2 | 47-120 | 5.89 | 30 | |
| Endrin Ketone | 0.336 | 0.050 | ug/L | 0.400 | | 83.9 | 58-120 | 5.32 | 30 | |
| Methoxychlor | 1.66 | 0.250 | ug/L | 2.00 | | 83.2 | 56-120 | 4.60 | 30 | |
| Surrogate: Decachlorobiphenyl | 0.374 | | ug/L | 0.400 | | 93.6 | 11-144 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.337 | | ug/L | 0.400 | | 84.3 | 11-144 | | | |
| Surrogate: Tetrachlorometaxylene | 0.318 | | ug/L | 0.400 | | 79.5 | 30-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.343 | | ug/L | 0.400 | | 85.7 | 30-120 | | | |
| LCS Dup (BGL0174-BSD2) | | Prepared: 07-Dec-2018 Analyzed: 18-Dec-2018 15:35 | | | | | | | | |
| Surrogate: Decachlorobiphenyl | 0.387 | | ug/L | 0.400 | | 96.8 | 11-144 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.344 | | ug/L | 0.400 | | 86.1 | 11-144 | | | |
| Surrogate: Tetrachlorometaxylene | 0.318 | | ug/L | 0.400 | | 79.4 | 30-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.351 | | ug/L | 0.400 | | 87.7 | 30-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Aroclor PCB - Quality Control

Batch BGL0213 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------------------------------------|---------|-----------------|-------|-------------|---|------|-------------|-------|-----------|-------|
| Blank (BGL0213-BLK1) | | | | | | | | | | |
| | | | | | Prepared: 10-Dec-2018 Analyzed: 17-Dec-2018 18:21 | | | | | |
| Aroclor 1016 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1221 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1232 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1242 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1248 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1254 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1260 | ND | 0.010 | ug/L | | | | | | | U |
| Surrogate: Decachlorobiphenyl | 0.0110 | | ug/L | 0.0200 | | 55.0 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene | 0.0104 | | ug/L | 0.0200 | | 52.1 | 32-120 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.0108 | | ug/L | 0.0200 | | 54.1 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.00976 | | ug/L | 0.0200 | | 48.8 | 32-120 | | | |
| LCS (BGL0213-BS1) | | | | | | | | | | |
| | | | | | Prepared: 10-Dec-2018 Analyzed: 17-Dec-2018 18:43 | | | | | |
| Aroclor 1016 | 0.041 | 0.010 | ug/L | 0.0500 | | 81.6 | 54-120 | | | |
| Aroclor 1260 | 0.036 | 0.010 | ug/L | 0.0500 | | 72.8 | 51-128 | | | |
| Surrogate: Decachlorobiphenyl | 0.0110 | | ug/L | 0.0200 | | 54.8 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene | 0.0114 | | ug/L | 0.0200 | | 56.8 | 32-120 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.0107 | | ug/L | 0.0200 | | 53.4 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.0104 | | ug/L | 0.0200 | | 51.9 | 32-120 | | | |
| LCS Dup (BGL0213-BSD1) | | | | | | | | | | |
| | | | | | Prepared: 10-Dec-2018 Analyzed: 17-Dec-2018 19:04 | | | | | |
| Aroclor 1016 | 0.047 | 0.010 | ug/L | 0.0500 | | 93.8 | 54-120 | 19.20 | 30 | |
| Aroclor 1260 | 0.037 | 0.010 | ug/L | 0.0500 | | 74.9 | 51-128 | 2.89 | 30 | |
| Surrogate: Decachlorobiphenyl | 0.0126 | | ug/L | 0.0200 | | 63.0 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene | 0.0126 | | ug/L | 0.0200 | | 63.0 | 32-120 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.0114 | | ug/L | 0.0200 | | 57.1 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.0106 | | ug/L | 0.0200 | | 53.0 | 32-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Metals and Metallic Compounds - Quality Control

Batch BGL0359 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------|--------|-----------------|-------|---|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0359-BLK1) | | | | | | | | | | |
| | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 16:57 | | | | | | |
| Aluminum | ND | 1000 | ug/L | | | | | | | U |
| Barium | ND | 500 | ug/L | | | | | | | U |
| Beryllium | ND | 2.0 | ug/L | | | | | | | U |
| Cadmium | ND | 2.0 | ug/L | | | | | | | U |
| Calcium | ND | 500 | ug/L | | | | | | | U |
| Chromium | ND | 1000 | ug/L | | | | | | | U |
| Cobalt | ND | 10.0 | ug/L | | | | | | | U |
| Copper | ND | 3.0 | ug/L | | | | | | | U |
| Iron | ND | 200 | ug/L | | | | | | | U |
| Magnesium | ND | 1000 | ug/L | | | | | | | U |
| Manganese | ND | 20.0 | ug/L | | | | | | | U |
| Nickel | ND | 20.0 | ug/L | | | | | | | U |
| Potassium | ND | 500 | ug/L | | | | | | | U |
| Silver | ND | 3.0 | ug/L | | | | | | | U |
| Sodium | ND | 500 | ug/L | | | | | | | U |
| Vanadium | ND | 3.0 | ug/L | | | | | | | U |
| Zinc | ND | 20.0 | ug/L | | | | | | | U |

| | | | | | | | | | | |
|--------------------------|-------|------|------|---|--|------|--------|--|--|---|
| LCS (BGL0359-BS1) | | | | | | | | | | |
| | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 17:34 | | | | | | |
| Aluminum | 2190 | 1000 | ug/L | 2000 | | 110 | 80-120 | | | |
| Barium | 2050 | 500 | ug/L | 2000 | | 102 | 80-120 | | | |
| Beryllium | 503 | 2.0 | ug/L | 500 | | 101 | 80-120 | | | |
| Cadmium | 510 | 2.0 | ug/L | 500 | | 102 | 80-120 | | | |
| Calcium | 10400 | 500 | ug/L | 10000 | | 104 | 80-120 | | | |
| Chromium | ND | 1000 | ug/L | 500 | | 104 | 80-120 | | | U |
| Cobalt | 500 | 10.0 | ug/L | 500 | | 100 | 80-120 | | | |
| Copper | 505 | 3.0 | ug/L | 500 | | 101 | 80-120 | | | |
| Iron | 2110 | 200 | ug/L | 2000 | | 105 | 80-120 | | | |
| Magnesium | 11000 | 1000 | ug/L | 10000 | | 110 | 80-120 | | | |
| Manganese | 492 | 20.0 | ug/L | 500 | | 98.4 | 80-120 | | | |
| Nickel | 502 | 20.0 | ug/L | 500 | | 100 | 80-120 | | | |
| Potassium | 10300 | 500 | ug/L | 10000 | | 103 | 80-120 | | | |
| Silver | 534 | 3.0 | ug/L | 500 | | 107 | 80-120 | | | |
| Sodium | 9920 | 500 | ug/L | 10000 | | 99.2 | 80-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Metals and Metallic Compounds - Quality Control

Batch BGL0359 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|--------------------------|--------|-----------------|-------|---|---------------|------|-------------|-----|-----------|-------|
| LCS (BGL0359-BS1) | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 17:34 | | | | | | |
| Vanadium | 519 | 3.0 | ug/L | 500 | | 104 | 80-120 | | | |
| Zinc | 499 | 20.0 | ug/L | 500 | | 99.8 | 80-120 | | | |

| Duplicate (BGL0359-DUP1) | | Source: 18L0063-03 | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 17:18 | | | | | | |
|---------------------------------|-------|---------------------------|------|---|-------|--|--|-------|----|------|
| Aluminum | ND | 1000 | ug/L | | ND | | | | | U |
| Barium | ND | 500 | ug/L | | ND | | | | | U |
| Beryllium | ND | 2.0 | ug/L | | ND | | | | | U |
| Cadmium | ND | 2.0 | ug/L | | ND | | | | | U |
| Calcium | 83100 | 500 | ug/L | | 84500 | | | 1.60 | 20 | |
| Chromium | ND | 1000 | ug/L | | ND | | | | | U |
| Cobalt | ND | 10.0 | ug/L | | ND | | | | | U |
| Copper | ND | 3.0 | ug/L | | 3.8 | | | 60.80 | 20 | L, U |
| Iron | 31200 | 200 | ug/L | | 31200 | | | 0.13 | 20 | |
| Magnesium | 56500 | 1000 | ug/L | | 56000 | | | 0.84 | 20 | |
| Manganese | 1320 | 20.0 | ug/L | | 1310 | | | 0.44 | 20 | |
| Nickel | ND | 20.0 | ug/L | | ND | | | | | U |
| Potassium | 4270 | 500 | ug/L | | 4300 | | | 0.83 | 20 | |
| Silver | ND | 3.0 | ug/L | | ND | | | | | U |
| Sodium | 16400 | 500 | ug/L | | 16500 | | | 0.41 | 20 | |
| Vanadium | ND | 3.0 | ug/L | | ND | | | | | U |
| Zinc | ND | 20.0 | ug/L | | ND | | | | | L, U |

| Matrix Spike (BGL0359-MS1) | | Source: 18L0063-03 | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 17:26 | | | | | | |
|-----------------------------------|-------|---------------------------|------|---|-------|------|--------|--|--|---|
| Aluminum | 2760 | 1000 | ug/L | 2000 | ND | 116 | 75-125 | | | |
| Barium | 2310 | 500 | ug/L | 2000 | ND | 103 | 75-125 | | | |
| Beryllium | 503 | 2.0 | ug/L | 500 | ND | 101 | 75-125 | | | |
| Cadmium | 512 | 2.0 | ug/L | 500 | ND | 102 | 75-125 | | | |
| Calcium | 93900 | 500 | ug/L | 10000 | 84500 | 94.4 | 75-125 | | | |
| Chromium | ND | 1000 | ug/L | 500 | ND | 105 | 75-125 | | | U |
| Cobalt | 490 | 10.0 | ug/L | 500 | ND | 97.6 | 75-125 | | | |
| Copper | 496 | 3.0 | ug/L | 500 | 3.8 | 98.5 | 75-125 | | | |
| Iron | 33000 | 200 | ug/L | 2000 | 31200 | 89.4 | 75-125 | | | |
| Magnesium | 66000 | 1000 | ug/L | 10000 | 56000 | 99.8 | 75-125 | | | |
| Manganese | 1790 | 20.0 | ug/L | 500 | 1310 | 95.4 | 75-125 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
19-Dec-2018 17:38

Metals and Metallic Compounds - Quality Control

Batch BGL0359 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|--------|---------------------------|-------|-----------------------|---------------|-----------------------------|-------------|-----|-----------|-------|
| Matrix Spike (BGL0359-MS1) | | Source: 18L0063-03 | | Prepared: 13-Dec-2018 | | Analyzed: 13-Dec-2018 17:26 | | | | |
| Nickel | 495 | 20.0 | ug/L | 500 | ND | 98.9 | 75-125 | | | |
| Potassium | 14900 | 500 | ug/L | 10000 | 4300 | 106 | 75-125 | | | |
| Silver | 520 | 3.0 | ug/L | 500 | ND | 104 | 75-125 | | | |
| Sodium | 27100 | 500 | ug/L | 10000 | 16500 | 106 | 75-125 | | | |
| Vanadium | 509 | 3.0 | ug/L | 500 | ND | 102 | 75-125 | | | |
| Zinc | 495 | 20.0 | ug/L | 500 | ND | 97.8 | 75-125 | | | |

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

| Matrix Spike Dup (BGL0359-MSD1) | | Source: 18L0063-03 | | Prepared: 13-Dec-2018 | | Analyzed: 13-Dec-2018 17:30 | | | | |
|--|-------|---------------------------|------|-----------------------|-------|-----------------------------|--------|------|----|---|
| Aluminum | 2880 | 1000 | ug/L | 2000 | ND | 122 | 75-125 | 4.34 | 20 | |
| Barium | 2330 | 500 | ug/L | 2000 | ND | 104 | 75-125 | 0.96 | 20 | |
| Beryllium | 507 | 2.0 | ug/L | 500 | ND | 101 | 75-125 | 0.77 | 20 | |
| Cadmium | 512 | 2.0 | ug/L | 500 | ND | 102 | 75-125 | 0.08 | 20 | |
| Calcium | 93000 | 500 | ug/L | 10000 | 84500 | 84.8 | 75-125 | 1.02 | 20 | |
| Chromium | ND | 1000 | ug/L | 500 | ND | 107 | 75-125 | | | U |
| Cobalt | 488 | 10.0 | ug/L | 500 | ND | 97.3 | 75-125 | 0.31 | 20 | |
| Copper | 494 | 3.0 | ug/L | 500 | 3.8 | 98.0 | 75-125 | 0.52 | 20 | |
| Iron | 32900 | 200 | ug/L | 2000 | 31200 | 83.6 | 75-125 | 0.35 | 20 | |
| Magnesium | 65300 | 1000 | ug/L | 10000 | 56000 | 92.7 | 75-125 | 1.08 | 20 | |
| Manganese | 1770 | 20.0 | ug/L | 500 | 1310 | 92.2 | 75-125 | 0.92 | 20 | |
| Nickel | 502 | 20.0 | ug/L | 500 | ND | 100 | 75-125 | 1.38 | 20 | |
| Potassium | 14900 | 500 | ug/L | 10000 | 4300 | 106 | 75-125 | 0.00 | | |
| Silver | 518 | 3.0 | ug/L | 500 | ND | 104 | 75-125 | 0.47 | 20 | |
| Sodium | 27000 | 500 | ug/L | 10000 | 16500 | 105 | 75-125 | 0.43 | 20 | |
| Vanadium | 508 | 3.0 | ug/L | 500 | ND | 101 | 75-125 | 0.24 | 20 | |
| Zinc | 502 | 20.0 | ug/L | 500 | ND | 99.2 | 75-125 | 1.41 | 20 | |

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



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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Metals and Metallic Compounds - Quality Control

Batch BGL0394 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

| QC Sample/Analyte | Isotope | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---------|--------|-----------------|-------|---|---------------|---|-------------|-----|-----------|-------|
| Blank (BGL0394-BLK1) | | | | | Prepared: 14-Dec-2018 Analyzed: 14-Dec-2018 17:21 | | | | | | |
| Lead | 208 | ND | 10.0 | ug/L | | | | | | | U |
| Arsenic | 75a | ND | 3.00 | ug/L | | | | | | | U |
| Selenium | 78 | ND | 5.00 | ug/L | | | | | | | U |
| Blank (BGL0394-BLK2) | | | | | Prepared: 14-Dec-2018 Analyzed: 18-Dec-2018 20:44 | | | | | | |
| Thallium | 205 | ND | 2.00 | ug/L | | | | | | | U |
| LCS (BGL0394-BS1) | | | | | Prepared: 14-Dec-2018 Analyzed: 14-Dec-2018 16:16 | | | | | | |
| Lead | 208 | 25.6 | 10.0 | ug/L | 25.0 | | 102 | 80-120 | | | |
| Arsenic | 75a | 22.9 | 3.00 | ug/L | 25.0 | | 91.5 | 80-120 | | | |
| Selenium | 78 | 75.0 | 5.00 | ug/L | 80.0 | | 93.7 | 80-120 | | | |
| LCS (BGL0394-BS2) | | | | | Prepared: 14-Dec-2018 Analyzed: 18-Dec-2018 20:48 | | | | | | |
| Thallium | 205 | 25.6 | 2.00 | ug/L | 25.0 | | 102 | 80-120 | | | |
| Duplicate (BGL0394-DUP1) | | | | | Source: 18L0063-03 | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 17:45 | | | | |
| Antimony | 121 | ND | 3.00 | ug/L | | ND | | | | | U |
| Arsenic | 75a | ND | 3.00 | ug/L | | ND | | | | | U |
| Selenium | 78 | ND | 5.00 | ug/L | | ND | | | | | U |
| Duplicate (BGL0394-DUP2) | | | | | Source: 18L0063-03 | | Prepared: 14-Dec-2018 Analyzed: 18-Dec-2018 21:16 | | | | |
| Lead | 208 | ND | 10.0 | ug/L | | ND | | | | | U |
| Thallium | 205 | ND | 2.00 | ug/L | | ND | | | | | U |
| Matrix Spike (BGL0394-MS1) | | | | | Source: 18L0063-03 | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 17:50 | | | | |
| Antimony | 121 | 23.6 | 3.00 | ug/L | 25.0 | ND | 94.5 | 75-125 | | | |
| Arsenic | 75a | 25.3 | 3.00 | ug/L | 25.0 | ND | 96.8 | 75-125 | | | |
| Selenium | 78 | 73.4 | 5.00 | ug/L | 80.0 | ND | 91.7 | 75-125 | | | |
| Recovery limits for target analytes in MS/MSD QC samples are advisory only. | | | | | | | | | | | |
| Matrix Spike (BGL0394-MS2) | | | | | Source: 18L0063-03 | | Prepared: 14-Dec-2018 Analyzed: 18-Dec-2018 21:21 | | | | |
| Lead | 208 | 25.2 | 10.0 | ug/L | 25.0 | ND | 99.5 | 75-125 | | | |
| Thallium | 205 | 26.2 | 2.00 | ug/L | 25.0 | ND | 105 | 75-125 | | | |
| Recovery limits for target analytes in MS/MSD QC samples are advisory only. | | | | | | | | | | | |



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Project Number: Landsburg
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Metals and Metallic Compounds - Quality Control

Batch BGL0394 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

| QC Sample/Analyte | Isotope | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|--|---------|--------|---------------------------|-------|-------------|-----------------------|------|-----------------------------|------|-----------|-------|
| Matrix Spike Dup (BGL0394-MSD1) | | | Source: 18L0063-03 | | | Prepared: 14-Dec-2018 | | Analyzed: 17-Dec-2018 17:55 | | | |
| Antimony | 121 | 24.6 | 3.00 | ug/L | 25.0 | ND | 98.4 | 75-125 | 4.11 | 20 | |
| Arsenic | 75a | 25.4 | 3.00 | ug/L | 25.0 | ND | 96.9 | 75-125 | 0.11 | 20 | |
| Selenium | 78 | 74.6 | 5.00 | ug/L | 80.0 | ND | 93.3 | 75-125 | 1.69 | 20 | |

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

| | | | | | | | | | | | |
|--|-----|------|---------------------------|------|------|-----------------------|------|-----------------------------|------|----|--|
| Matrix Spike Dup (BGL0394-MSD2) | | | Source: 18L0063-03 | | | Prepared: 14-Dec-2018 | | Analyzed: 18-Dec-2018 21:25 | | | |
| Lead | 208 | 24.5 | 10.0 | ug/L | 25.0 | ND | 96.6 | 75-125 | 2.92 | 20 | |
| Thallium | 205 | 25.0 | 2.00 | ug/L | 25.0 | ND | 100 | 75-125 | 4.50 | 20 | |

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



| | | |
|---|--|--------------------------------|
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|---|--|--------------------------------|

Metals and Metallic Compounds - Quality Control

Batch BGL0397 - TLM EPA 7470A low level

Instrument: CVAA Analyst: SKM

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|--------|---|-------|---|---------------|------|-------------|-------|-----------|-------|
| Blank (BGL0397-BLK1) | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 13:02 | | | | | | | | |
| Mercury | ND | 20 | ng/L | | | | | | | U |
| LCS (BGL0397-BS1) | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 13:05 | | | | | | | | |
| Mercury | 228 | 20 | ng/L | 200 | | 114 | 80-120 | | | |
| Duplicate (BGL0397-DUP1) | | Source: 18L0063-03 | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 13:14 | | | | | | |
| Mercury | ND | 20 | ng/L | | ND | | | | | U |
| Matrix Spike (BGL0397-MS1) | | Source: 18L0063-03 | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 13:17 | | | | | | |
| Mercury | 126 | 20 | ng/L | 100 | ND | 126 | 75-125 | | | * |
| Recovery limits for target analytes in MS/MSD QC samples are advisory only. | | | | | | | | | | |
| Matrix Spike Dup (BGL0397-MSD1) | | Source: 18L0063-03 | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 13:20 | | | | | | |
| Mercury | 110 | 20 | ng/L | 100 | ND | 110 | 75-125 | 13.90 | 20 | |

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



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Certified Analyses included in this Report

| Analyte | Certifications |
|-----------------------------------|----------------------------|
| EPA 200.8 in Water | |
| Lead-208 | NELAP,WADOE,WA-DW,DoD-ELAP |
| Antimony-121 | NELAP,WADOE,WA-DW,DoD-ELAP |
| Thallium-205 | NELAP,WADOE,WA-DW,DoD-ELAP |
| EPA 200.8 UCT-KED in Water | |
| Arsenic-75a | NELAP,WADOE,WA-DW,DoD-ELAP |
| Selenium-78 | NELAP,WADOE,WA-DW,DoD-ELAP |
| EPA 6010C in Water | |
| Silver | WADOE,NELAP,DoD-ELAP |
| Aluminum | WADOE,NELAP,DoD-ELAP |
| Barium | WADOE,NELAP,DoD-ELAP,ADEC |
| Beryllium | WADOE,NELAP,DoD-ELAP |
| Calcium | WADOE,NELAP,DoD-ELAP |
| Cadmium | WADOE,NELAP,DoD-ELAP,ADEC |
| Cobalt | WADOE,NELAP,DoD-ELAP |
| Chromium | WADOE,NELAP,DoD-ELAP,ADEC |
| Copper | WADOE,NELAP,DoD-ELAP |
| Iron | WADOE,NELAP,DoD-ELAP |
| Potassium | WADOE,NELAP,DoD-ELAP |
| Magnesium | WADOE,NELAP,DoD-ELAP |
| Manganese | WADOE,NELAP,DoD-ELAP |
| Sodium | WADOE,NELAP,DoD-ELAP |
| Sodium-1 | DoD-ELAP |
| Nickel | WADOE,NELAP,DoD-ELAP,ADEC |
| Vanadium | WADOE,NELAP,DoD-ELAP,ADEC |
| Zinc | WADOE,NELAP,DoD-ELAP |
| EPA 7470A in Water | |
| Mercury | WADOE,NELAP,DoD-ELAP,CALAP |
| EPA 8081B in Water | |
| alpha-BHC | WADOE,DoD-ELAP,NELAP,CALAP |
| alpha-BHC [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| beta-BHC | WADOE,DoD-ELAP,NELAP,CALAP |
| beta-BHC [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| gamma-BHC (Lindane) | WADOE,DoD-ELAP,NELAP,CALAP |



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|---------------------------------------|----------------------------|
| gamma-BHC (Lindane) [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| delta-BHC | WADOE,DoD-ELAP,NELAP,CALAP |
| delta-BHC [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Heptachlor | WADOE,DoD-ELAP,NELAP,CALAP |
| Heptachlor [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Aldrin | WADOE,DoD-ELAP,NELAP,CALAP |
| Aldrin [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Heptachlor Epoxide | WADOE,DoD-ELAP,NELAP,CALAP |
| Heptachlor Epoxide [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| trans-Chlordane (beta-Chlordane) | WADOE,DoD-ELAP,NELAP,CALAP |
| trans-Chlordane (beta-Chlordane) [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| cis-Chlordane (alpha-chlordane) | WADOE,DoD-ELAP,NELAP,CALAP |
| cis-Chlordane (alpha-chlordane) [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan I | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan I [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDE | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDE [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Dieldrin | WADOE,DoD-ELAP,NELAP,CALAP |
| Dieldrin [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan II | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan II [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDD | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDD [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin Aldehyde | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin Aldehyde [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDT | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDT [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan Sulfate | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan Sulfate [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin Ketone | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin Ketone [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Methoxychlor | WADOE,DoD-ELAP,NELAP,CALAP |
| Methoxychlor [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachlorobutadiene | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachlorobutadiene [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachlorobenzene | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachlorobenzene [2C] | WADOE,DoD-ELAP,NELAP,CALAP |



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| | |
|---------------------------|----------------------------|
| 2,4'-DDE | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDE [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDD | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDD [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDT | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDT [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Oxychlorane | WADOE,DoD-ELAP,NELAP,CALAP |
| Oxychlorane [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| cis-Nonachlor | WADOE,DoD-ELAP,NELAP,CALAP |
| cis-Nonachlor [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| trans-Nonachlor | WADOE,DoD-ELAP,NELAP,CALAP |
| trans-Nonachlor [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Mirex | WADOE,DoD-ELAP,NELAP,CALAP |
| Mirex [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachloroethane | DoD-ELAP,NELAP,CALAP |
| Hexachloroethane [2C] | DoD-ELAP,NELAP,CALAP |
| Toxaphene | WADOE,DoD-ELAP,NELAP,CALAP |
| Toxaphene [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Chlordane, technical | WADOE,DoD-ELAP,NELAP,CALAP |
| Chlordane, technical [2C] | WADOE,DoD-ELAP,NELAP,CALAP |

EPA 8082A in Water

| | |
|-------------------|---------------------------------|
| Aroclor 1016 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1016 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1221 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1221 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1232 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1232 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1242 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1242 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1248 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1248 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1254 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1254 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1260 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1260 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1262 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1262 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1268 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1268 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |



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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 |
| 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 |



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Redmond, WA 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

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| | |
|-----------------------------|---------------------------------|
| 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 |

EPA 8270D in Water

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



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| | |
|------------------------------|---------------------------------|
| Phenol | CALAP,WADOE,DoD-ELAP,NELAP |
| bis(2-chloroethyl) ether | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Chlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,3-Dichlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,4-Dichlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzyl Alcohol | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,2-Dichlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Methylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,2'-Oxybis(1-chloropropane) | DoD-ELAP |
| 4-Methylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| N-Nitroso-di-n-Propylamine | CALAP,WADOE,DoD-ELAP,NELAP |
| Hexachloroethane | CALAP,WADOE,DoD-ELAP,NELAP |
| Nitrobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| Isophorone | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Nitrophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4-Dimethylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| Bis(2-Chloroethoxy)methane | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzoic acid | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4-Dichlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,2,4-Trichlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| Naphthalene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 4-Chloroaniline | CALAP,WADOE,DoD-ELAP,NELAP |
| Hexachlorobutadiene | CALAP,WADOE,DoD-ELAP,NELAP |
| 4-Chloro-3-Methylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Methylnaphthalene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Hexachlorocyclopentadiene | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4,6-Trichlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4,5-Trichlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Chloronaphthalene | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Nitroaniline | CALAP,WADOE,DoD-ELAP,NELAP |
| Dimethylphthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Acenaphthylene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 2,6-Dinitrotoluene | CALAP,WADOE,DoD-ELAP,NELAP |
| 3-Nitroaniline | CALAP,WADOE,DoD-ELAP,NELAP |
| Acenaphthene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 2,4-Dinitrophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| Dibenzofuran | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 4-Nitrophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4-Dinitrotoluene | CALAP,WADOE,DoD-ELAP,NELAP |



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|----------------------------|---------------------------------|
| Fluorene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Diethyl phthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| 4-Chlorophenylphenyl ether | CALAP,WADOE,DoD-ELAP,NELAP |
| 4-Nitroaniline | CALAP,WADOE,DoD-ELAP,NELAP |
| 4,6-Dinitro-2-methylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| N-Nitrosodiphenylamine | DoD-ELAP |
| 4-Bromophenyl phenyl ether | CALAP,WADOE,DoD-ELAP,NELAP |
| Hexachlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| Pentachlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| Phenanthrene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Anthracene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Carbazole | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Di-n-Butylphthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Fluoranthene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Pyrene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Butylbenzylphthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzo(a)anthracene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 3,3'-Dichlorobenzidine | DoD-ELAP |
| Chrysene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| bis(2-Ethylhexyl)phthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Di-n-Octylphthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzo(b)fluoranthene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Benzo(k)fluoranthene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Benzo(a)pyrene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Indeno(1,2,3-cd)pyrene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Dibenzo(a,h)anthracene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Benzo(g,h,i)perylene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Benzofluoranthenes, Total | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 1-Methylnaphthalene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| N-Nitrosodimethylamine | CALAP,WADOE,DoD-ELAP,NELAP |
| Aniline | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzidine | CALAP,WADOE,DoD-ELAP,NELAP |
| Retene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Perylene | CALAP,WADOE,ADEC |
| Pyridine | CALAP,WADOE,DoD-ELAP,NELAP |
| N-Nitrosomethylethylamine | CALAP |
| 2,6-Dichlorophenol | CALAP,WADOE |
| alpha-Terpineol | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,4-Dioxane | CALAP,WADOE,DoD-ELAP,NELAP |



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| | |
|-------------------------------|----------------------------|
| 2,3,4,6-Tetrachlorophenol | CALAP,WADOE,DoD-ELAP |
| Triphenyl Phosphate | CALAP,WADOE,DoD-ELAP,NELAP |
| Butyl Diphenyl Phosphate | CALAP,WADOE,DoD-ELAP,NELAP |
| Dibutyl Phenyl Phosphate | CALAP,WADOE,DoD-ELAP,NELAP |
| Tributyl Phosphate | CALAP,WADOE,DoD-ELAP,NELAP |
| Butylated Hydroxytoluene | CALAP,WADOE,DoD-ELAP,NELAP |
| Azobenzene (1,2-DP-Hydrazine) | CALAP,WADOE,DoD-ELAP,NELAP |
| Tetrachloroguaiacol | CALAP,WADOE,DoD-ELAP |
| 3,4,5-Trichloroguaiacol | CALAP,WADOE |
| 3,4,6-Trichloroguaiacol | CALAP,WADOE |
| 4,5,6-Trichloroguaiacol | CALAP,WADOE |
| Guaiacol | CALAP,WADOE |
| 1,2,4,5-Tetrachlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |

NWTPH-HCID in Water

| | |
|------------------------------------|----------------------|
| Gasoline Range Organics (Tol-C12) | NELAP,DoD-ELAP,WADOE |
| Diesel Range Organics (C12-C24) | NELAP,DoD-ELAP,WADOE |
| Motor Oil Range Organics (C24-C38) | NELAP,DoD-ELAP,WADOE |

| Code | Description | Number | Expires |
|-------------|---|--------------|------------|
| ADEC | Alaska Dept of Environmental Conservation | 17-015 | 02/07/2019 |
| CALAP | California Department of Public Health CAELAP | 2748 | 06/30/2019 |
| DoD-ELAP | DoD-Environmental Laboratory Accreditation Program | 66169 | 02/07/2019 |
| DoD-ELAP DW | DoD-Environmental Laboratory Accreditation - Drinking Water | 66169 | 02/07/2019 |
| 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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Project: Landsburg
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Notes and Definitions

- * Flagged value is not within established control limits.
- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- L Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to \pm RL instead of 20% RPD
- P1 The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
- 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).
- Y1 Raised reporting limit due to interference
- 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.



27 December 2018

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)
18L0119

Associated SDG ID(s)
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 enclosed 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.



Chain of Custody Record & Laboratory Analysis Request



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

| | | |
|---|---|---------------------------------|
| ARI Assigned Number: 18L0119 | Turn-around Requested: Standard | Page: 1 of 1 |
| ARI Client Company: Golden | Phone: 425-853-0777 | Date: 12/5/18-12/6/18 |
| Client Contact: Gary Zimmerman | | Ice Present? No |
| Client Project Name: Landsburg | | No. of Coolers: 0 |
| Client Project #: 9231000005.2000 | Samplers: JM/JX | Cooler Temps: 0 |

| Sample ID | Date | Time | Matrix | No. Containers | Analysis Requested | | | | | | | | | | Notes/Comments |
|-------------------|---------|------|--------|----------------|--------------------|---------|------------|------------|-------------|----------|-----------------|------------|-------|-------------|---|
| | | | | | VOC Client List | PCB(LL) | Pesticides | SVOC 8270D | Client List | TPH-HCID | Follow-ups (Hb) | TAMLMetals | total | TAMLMetals* | |
| LMW-3-1218 | 12/5/18 | 0955 | w | 19 | X | X | X | X | X | X | Hold | X | | | * Field Filtered Metals w/0.45um Filter - please analyze under current MST w/ Golden |
| LMW-5-1218 | | 1100 | w | 19 | X | X | X | X | X | | | X | | | |
| LMW-8-1218 | | 1205 | w | 19 | X | X | X | X | X | | | X | | | |
| LMW-6-1218 | | 1338 | w | 19 | X | X | X | X | X | | | X | | | |
| EB-1218 | | 1325 | w | 19 | X | X | X | X | X | | | X | | | |
| LMW-15-1218 | | 1510 | w | 19 | X | X | X | X | X | | | X | | | |
| LMW-11-1218 | 12/6/18 | 1320 | w | 19 | X | X | X | X | X | | | X | | | |
| LMW-9-1218 | | 1505 | w | 19 | X | X | X | X | X | | | X | | | |
| Trip Blank 120518 | - | - | w | 3 | X | | | | | | | | | | |

| | | | | |
|--|--|--|---------------------------------|-----------------------------|
| Comments/Special Instructions - Ecology EIM EDD * Client Specific RLs + analyte list pls cc: g.zimmerman@golden.com jcmiller@golden.com | Relinquished by: (Signature) <i>[Signature]</i> | Received by: (Signature) <i>[Signature]</i> | Relinquished by: (Signature) | Received by: (Signature) |
| | Printed Name: Joe Miller | Printed Name: Stephanie Fishel | Printed Name: | Printed Name: |
| | Company: Golden | Company: ARI | Company: | Company: |
| | Date & Time: 12/7/18 1105 | Date & Time: 12-7-18 1105 | 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, notwithstanding 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
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|-------------------|---------------|--------|-------------------|-------------------|
| LMW-3-1218 | 18L0119-01 | Water | 05-Dec-2018 09:55 | 07-Dec-2018 14:09 |
| LMW-5-1218 | 18L0119-03 | Water | 05-Dec-2018 11:00 | 07-Dec-2018 14:09 |
| LMW-8-1218 | 18L0119-05 | Water | 05-Dec-2018 12:05 | 07-Dec-2018 14:09 |
| LMW-6-1218 | 18L0119-07 | Water | 05-Dec-2018 13:38 | 07-Dec-2018 14:09 |
| EB-1218 | 18L0119-09 | Water | 05-Dec-2018 13:25 | 07-Dec-2018 14:09 |
| LMW-15-1218 | 18L0119-11 | Water | 05-Dec-2018 15:10 | 07-Dec-2018 14:09 |
| LMW-11-1218 | 18L0119-13 | Water | 06-Dec-2018 13:20 | 07-Dec-2018 14:09 |
| LMW-9-1218 | 18L0119-15 | Water | 06-Dec-2018 15:05 | 07-Dec-2018 14:09 |
| Trip Blank 120518 | 18L0119-17 | Water | 05-Dec-2018 00:00 | 07-Dec-2018 14:09 |



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Work Order Case Narrative

Pesticides - EPA Method SW8081A

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.

PCB Aroclors - EPA Method SW8082A

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.

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.

Total Metals - EPA Method 200.8 7470 and 6010



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

Initial and continuing calibrations were within method requirements.

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

The LCS percent recoveries were within control limits.

Hydrocarbon Identification (HCID) - WA-Ecology Method NW-HCID

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

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

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

Semivolatiles - 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.

Volatiles - EPA Method SW8260C

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

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.



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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.



WORK ORDER

18L0119

| | |
|----------------------------------|--------------------------------------|
| Client: Golder Associates | Project Manager: Kelly Bottem |
| Project: Landsburg | Project Number: Landsburg |

Preservation Confirmation

| Container ID | Container Type | pH |
|--------------|--------------------------------|---------|
| 18L0119-01 A | Glass NM, Amber, 1000 mL | |
| 18L0119-01 B | Glass NM, Amber, 1000 mL | |
| 18L0119-01 C | Glass NM, Amber, 1000 mL | |
| 18L0119-01 D | Glass NM, Amber, 1000 mL | |
| 18L0119-01 E | Glass NM, Amber, 1000 mL | |
| 18L0119-01 F | Glass NM, Amber, 1000 mL | |
| 18L0119-01 G | Glass NM, Amber, 500 mL | |
| 18L0119-01 H | Glass NM, Amber, 500 mL | |
| 18L0119-01 I | Glass NM, Amber, 500 mL | |
| 18L0119-01 J | Glass NM, Amber, 500 mL | |
| 18L0119-01 K | Glass NM, Amber, 500 mL | |
| 18L0119-01 L | Glass NM, Amber, 500 mL | |
| 18L0119-01 M | HDPE NM, 500 mL, 1:1 HNO3 | 12 pass |
| 18L0119-01 N | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-01 O | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-01 P | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-01 Q | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-01 R | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-02 A | HDPE NM, 500 mL, 1:1 HNO3 (FF) | 12 pass |
| 18L0119-03 A | Glass NM, Amber, 1000 mL | |
| 18L0119-03 B | Glass NM, Amber, 1000 mL | |
| 18L0119-03 C | Glass NM, Amber, 1000 mL | |
| 18L0119-03 D | Glass NM, Amber, 1000 mL | |
| 18L0119-03 E | Glass NM, Amber, 1000 mL | |
| 18L0119-03 F | Glass NM, Amber, 1000 mL | |
| 18L0119-03 G | Glass NM, Amber, 500 mL | |
| 18L0119-03 H | Glass NM, Amber, 500 mL | |
| 18L0119-03 I | Glass NM, Amber, 500 mL | |
| 18L0119-03 J | Glass NM, Amber, 500 mL | |
| 18L0119-03 K | Glass NM, Amber, 500 mL | |
| 18L0119-03 L | Glass NM, Amber, 500 mL | |
| 18L0119-03 M | HDPE NM, 500 mL, 1:1 HNO3 | 12 pass |
| 18L0119-03 N | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-03 O | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-03 P | VOA Vial, Clear, 40 mL, HCL | |



WORK ORDER

18L0119

| | |
|----------------------------------|--------------------------------------|
| Client: Golder Associates | Project Manager: Kelly Bottem |
| Project: Landsburg | Project Number: Landsburg |

| | | |
|--------------|--------------------------------|--------|
| 18L0119-03 Q | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-03 R | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-04 A | HDPE NM, 500 mL, 1:1 HNO3 (FF) | L2 pan |
| 18L0119-05 A | Glass NM, Amber, 1000 mL | |
| 18L0119-05 B | Glass NM, Amber, 1000 mL | |
| 18L0119-05 C | Glass NM, Amber, 1000 mL | |
| 18L0119-05 D | Glass NM, Amber, 1000 mL | |
| 18L0119-05 E | Glass NM, Amber, 1000 mL | |
| 18L0119-05 F | Glass NM, Amber, 1000 mL | |
| 18L0119-05 G | Glass NM, Amber, 500 mL | |
| 18L0119-05 H | Glass NM, Amber, 500 mL | |
| 18L0119-05 I | Glass NM, Amber, 500 mL | |
| 18L0119-05 J | Glass NM, Amber, 500 mL | |
| 18L0119-05 K | Glass NM, Amber, 500 mL | |
| 18L0119-05 L | Glass NM, Amber, 500 mL | |
| 18L0119-05 M | HDPE NM, 500 mL, 1:1 HNO3 | L2 pan |
| 18L0119-05 N | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-05 O | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-05 P | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-05 Q | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-05 R | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-06 A | HDPE NM, 500 mL, 1:1 HNO3 (FF) | L2 pan |
| 18L0119-07 A | Glass NM, Amber, 1000 mL | |
| 18L0119-07 B | Glass NM, Amber, 1000 mL | |
| 18L0119-07 C | Glass NM, Amber, 1000 mL | |
| 18L0119-07 D | Glass NM, Amber, 1000 mL | |
| 18L0119-07 E | Glass NM, Amber, 1000 mL | |
| 18L0119-07 F | Glass NM, Amber, 1000 mL | |
| 18L0119-07 G | Glass NM, Amber, 500 mL | |
| 18L0119-07 H | Glass NM, Amber, 500 mL | |
| 18L0119-07 I | Glass NM, Amber, 500 mL | |
| 18L0119-07 J | Glass NM, Amber, 500 mL | |
| 18L0119-07 K | Glass NM, Amber, 500 mL | |
| 18L0119-07 L | Glass NM, Amber, 500 mL | |
| 18L0119-07 M | HDPE NM, 500 mL, 1:1 HNO3 | L2 pan |
| 18L0119-07 N | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-07 O | VOA Vial, Clear, 40 mL, HCL | |



WORK ORDER

18L0119

| | |
|----------------------------------|--------------------------------------|
| Client: Golder Associates | Project Manager: Kelly Bottem |
| Project: Landsburg | Project Number: Landsburg |

| | | |
|--------------|--------------------------------|---------|
| 18L0119-07 P | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-07 Q | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-07 R | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-08 A | HDPE NM, 500 mL, 1:1 HNO3 (FF) | L2 part |
| 18L0119-09 A | Glass NM, Amber, 1000 mL | |
| 18L0119-09 B | Glass NM, Amber, 1000 mL | |
| 18L0119-09 C | Glass NM, Amber, 1000 mL | |
| 18L0119-09 D | Glass NM, Amber, 1000 mL | |
| 18L0119-09 E | Glass NM, Amber, 1000 mL | |
| 18L0119-09 F | Glass NM, Amber, 1000 mL | |
| 18L0119-09 G | Glass NM, Amber, 500 mL | |
| 18L0119-09 H | Glass NM, Amber, 500 mL | |
| 18L0119-09 I | Glass NM, Amber, 500 mL | |
| 18L0119-09 J | Glass NM, Amber, 500 mL | |
| 18L0119-09 K | Glass NM, Amber, 500 mL | |
| 18L0119-09 L | Glass NM, Amber, 500 mL | |
| 18L0119-09 M | HDPE NM, 500 mL, 1:1 HNO3 | L2 part |
| 18L0119-09 N | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-09 O | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-09 P | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-09 Q | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-09 R | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-10 A | HDPE NM, 500 mL, 1:1 HNO3 (FF) | L2 part |
| 18L0119-11 A | Glass NM, Amber, 1000 mL | |
| 18L0119-11 B | Glass NM, Amber, 1000 mL | |
| 18L0119-11 C | Glass NM, Amber, 1000 mL | |
| 18L0119-11 D | Glass NM, Amber, 1000 mL | |
| 18L0119-11 E | Glass NM, Amber, 1000 mL | |
| 18L0119-11 F | Glass NM, Amber, 1000 mL | |
| 18L0119-11 G | Glass NM, Amber, 500 mL | |
| 18L0119-11 H | Glass NM, Amber, 500 mL | |
| 18L0119-11 I | Glass NM, Amber, 500 mL | |
| 18L0119-11 J | Glass NM, Amber, 500 mL | |
| 18L0119-11 K | Glass NM, Amber, 500 mL | |
| 18L0119-11 L | Glass NM, Amber, 500 mL | |
| 18L0119-11 M | HDPE NM, 500 mL, 1:1 HNO3 | L2 part |
| 18L0119-11 N | VOA Vial, Clear, 40 mL, HCL | |



WORK ORDER

18L0119

| | |
|----------------------------------|--------------------------------------|
| Client: Golder Associates | Project Manager: Kelly Bottem |
| Project: Landsburg | Project Number: Landsburg |

| | | |
|--------------|--------------------------------|---------|
| 18L0119-11 O | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-11 P | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-11 Q | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-11 R | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-12 A | HDPE NM, 500 mL, 1:1 HNO3 (FF) | L2 part |
| 18L0119-13 A | Glass NM, Amber, 1000 mL | |
| 18L0119-13 B | Glass NM, Amber, 1000 mL | |
| 18L0119-13 C | Glass NM, Amber, 1000 mL | |
| 18L0119-13 D | Glass NM, Amber, 1000 mL | |
| 18L0119-13 E | Glass NM, Amber, 1000 mL | |
| 18L0119-13 F | Glass NM, Amber, 1000 mL | |
| 18L0119-13 G | Glass NM, Amber, 500 mL | |
| 18L0119-13 H | Glass NM, Amber, 500 mL | |
| 18L0119-13 I | Glass NM, Amber, 500 mL | |
| 18L0119-13 J | Glass NM, Amber, 500 mL | |
| 18L0119-13 K | Glass NM, Amber, 500 mL | |
| 18L0119-13 L | Glass NM, Amber, 500 mL | |
| 18L0119-13 M | HDPE NM, 500 mL, 1:1 HNO3 | L2 part |
| 18L0119-13 N | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-13 O | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-13 P | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-13 Q | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-13 R | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-14 A | HDPE NM, 500 mL, 1:1 HNO3 (FF) | L2 part |
| 18L0119-15 A | Glass NM, Amber, 1000 mL | |
| 18L0119-15 B | Glass NM, Amber, 1000 mL | |
| 18L0119-15 C | Glass NM, Amber, 1000 mL | |
| 18L0119-15 D | Glass NM, Amber, 1000 mL | |
| 18L0119-15 E | Glass NM, Amber, 1000 mL | |
| 18L0119-15 F | Glass NM, Amber, 1000 mL | |
| 18L0119-15 G | Glass NM, Amber, 500 mL | |
| 18L0119-15 H | Glass NM, Amber, 500 mL | |
| 18L0119-15 I | Glass NM, Amber, 500 mL | |
| 18L0119-15 J | Glass NM, Amber, 500 mL | |
| 18L0119-15 K | Glass NM, Amber, 500 mL | |
| 18L0119-15 L | Glass NM, Amber, 500 mL | |
| 18L0119-15 M | HDPE NM, 500 mL, 1:1 HNO3 | L2 part |



WORK ORDER

18L0119

| | |
|----------------------------------|--------------------------------------|
| Client: Golder Associates | Project Manager: Kelly Bottem |
| Project: Landsburg | Project Number: Landsburg |

| | | |
|--------------|--------------------------------|---------|
| 18L0119-15 N | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-15 O | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-15 P | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-15 Q | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-15 R | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-16 A | HDPE NM, 500 mL, 1:1 HNO3 (FF) | L2 part |
| 18L0119-17 A | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-17 B | VOA Vial, Clear, 40 mL, HCL | |
| 18L0119-17 C | VOA Vial, Clear, 40 mL, HCL | |

Set
Preservation Confirmed By

12-07-18
Date



Cooler Receipt Form

ARI Client: Golder
 COC No(s): _____ NA
 Assigned ARI Job No: 1820119

Project Name: _____
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
 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: 1105 See other page
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 17002565
 Cooler Accepted by: Set Date: 12-7-18 Time: 1105

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
 Was sufficient ice used (if appropriate)? NA YES NO
 Were all bottles sealed in individual plastic bags? YES NO
 Did all bottles arrive in good condition (unbroken)? YES NO
 Were all bottle labels complete and legible? YES NO
 Did the number of containers listed on COC match with the number of containers received? YES NO
 Did all bottle labels and tags agree with custody papers? YES NO
 Were all bottles used correct for the requested analyses? YES NO
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
 Were all VOC vials free of air bubbles? NA YES NO
 Was sufficient amount of sample sent in each bottle? YES NO
 Date VOC Trip Blank was made at ARI NA 11-23-18
 Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

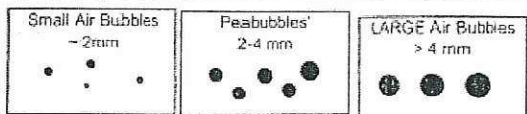
Samples Logged by: Set Date: 12-7-18 Time: 1409

**** 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: _____



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

2.3

1.3

2.7

1.4

5.7

2.4

-2.1

3.4

Landsberg Cedar River 0.4

Ravensdale 0.1



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 09:55

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 18:58

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 09:55

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 18:58

| 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 % | 105 | % | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 09:55

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 18:58

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Toluene-d8 | | 80-120 % | 96.8 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 93.0 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 101 | % | |



Golder Associates
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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 09:55

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 17:52

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0267 Sample Size: 500 mL
Prepared: 11-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 09:55

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 17:52

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |
| <i>Surrogate: 2-Fluorophenol</i> | | | 33-120 % | 66.4 | % | |
| <i>Surrogate: Phenol-d5</i> | | | 38-120 % | 72.8 | % | |
| <i>Surrogate: 2-Chlorophenol-d4</i> | | | 41-120 % | 73.3 | % | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | | | 20-120 % | 64.1 | % | |
| <i>Surrogate: Nitrobenzene-d5</i> | | | 27-120 % | 73.5 | % | |
| <i>Surrogate: 2-Fluorobiphenyl</i> | | | 33-120 % | 73.7 | % | |
| <i>Surrogate: 2,4,6-Tribromophenol</i> | | | 52-120 % | 85.3 | % | |
| <i>Surrogate: p-Terphenyl-d14</i> | | | 28-120 % | 95.4 | % | |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/05/2018 09:55
Instrument: NT6 Analyst: JZ Analyzed: 12/17/2018 17:57

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Sample Size: 500 mL
Preparation Batch: BGL0225 Final Volume: 1 mL
Prepared: 12-Dec-2018

| 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 73.5 | % | |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID Sampled: 12/05/2018 09:55
Instrument: FID4 Analyst: JGR Analyzed: 12/10/2018 18:43

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0197 Sample Size: 500 mL
Prepared: 10-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| Surrogate: <i>o</i> -Terphenyl | | | 50-150 % | 102 | % | |
| Surrogate: <i>n</i> -Triacontane | | | 50-150 % | 109 | % | |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/05/2018 09:55

Instrument: ECD6 Analyst: YZ

Analyzed: 12/19/2018 17:39

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0292 Sample Size: 500 mL
Prepared: 12-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|-------------|----------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | <i>11-144 %</i> | <i>99.5</i> | <i>%</i> | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | <i>11-144 %</i> | <i>88.1</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | <i>30-120 %</i> | <i>76.7</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | <i>30-120 %</i> | <i>83.4</i> | <i>%</i> | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Aroclor PCB

Method: EPA 8082A Sampled: 12/05/2018 09:55
Instrument: ECD7 Analyst: JGR Analyzed: 12/17/2018 21:57

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 59.3 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 48.4 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 57.3 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 44.8 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/05/2018 09:55

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 21:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/05/2018 09:55

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 21:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project Number: Landsburg
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Reported:
27-Dec-2018 14:37

LMW-3-1218
18L0119-01 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/05/2018 09:55

Instrument: ICP2 Analyst: TCH

Analyzed: 12/19/2018 12:01

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0429
Prepared: 17-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 36900 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | ND | ug/L | U |
| Magnesium | 7439-95-4 | 1 | 1000 | 15000 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 50.6 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 1670 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 9600 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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Reported:
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LMW-3-1218
18L0119-01 (Water)

Metals and Metallic Compounds

Method: EPA 7470A Sampled: 12/05/2018 09:55
Instrument: CVAA Analyst: SKM Analyzed: 12/17/2018 13:45

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 11:00

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:18

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 11:00

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:18

| 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 % | 101 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | | | 80-129 % | 105 | % | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 11:00

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:18

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Toluene-d8 | | 80-120 % | 97.5 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 93.9 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 101 | % | |



Golder Associates
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 11:00

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 18:26

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0267 Sample Size: 500 mL
Prepared: 11-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 11:00

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 18:26

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |
| <i>Surrogate: 2-Fluorophenol</i> | | | 33-120 % | 69.7 | % | |
| <i>Surrogate: Phenol-d5</i> | | | 38-120 % | 76.2 | % | |
| <i>Surrogate: 2-Chlorophenol-d4</i> | | | 41-120 % | 74.3 | % | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | | | 20-120 % | 60.6 | % | |
| <i>Surrogate: Nitrobenzene-d5</i> | | | 27-120 % | 72.0 | % | |
| <i>Surrogate: 2-Fluorobiphenyl</i> | | | 33-120 % | 74.0 | % | |
| <i>Surrogate: 2,4,6-Tribromophenol</i> | | | 52-120 % | 93.2 | % | |
| <i>Surrogate: p-Terphenyl-d14</i> | | | 28-120 % | 96.2 | % | |



| | | |
|---|--|--------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|--------------------------------|

LMW-5-1218
18L0119-03 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/05/2018 11:00
Instrument: NT6 Analyst: JZ Analyzed: 12/17/2018 18:30

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0225 Sample Size: 500 mL
Prepared: 12-Dec-2018 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 65.5 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/05/2018 11:00

Instrument: FID4 Analyst: JGR

Analyzed: 12/10/2018 19:03

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0197 Sample Size: 500 mL
Prepared: 10-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| Surrogate: <i>o</i> -Terphenyl | | | 50-150 % | 104 | % | |
| Surrogate: <i>n</i> -Triacontane | | | 50-150 % | 114 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Chlorinated Pesticides

Method: EPA 8081B Sampled: 12/05/2018 11:00
Instrument: ECD6 Analyst: YZ Analyzed: 12/19/2018 17:57

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0292 Sample Size: 500 mL
Prepared: 12-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 11-144 % | 106 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 11-144 % | 93.9 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 30-120 % | 80.0 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 30-120 % | 85.5 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Aroclor PCB

Method: EPA 8082A Sampled: 12/05/2018 11:00
Instrument: ECD7 Analyst: JGR Analyzed: 12/17/2018 22:18

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 66.0 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 51.6 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 63.3 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 48.4 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/05/2018 11:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 21:48

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/05/2018 11:00

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 21:48

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-5-1218
18L0119-03 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/05/2018 11:00

Instrument: ICP2 Analyst: TCH

Analyzed: 12/19/2018 11:16

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0429
Prepared: 17-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 84300 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 268 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 44500 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 219 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 2520 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 14200 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



| | | |
|---|--|---------------------------------------|
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|---|--|---------------------------------------|

LMW-5-1218
18L0119-03 (Water)

Metals and Metallic Compounds

Method: EPA 7470A Sampled: 12/05/2018 11:00
Instrument: CVAA Analyst: SKM Analyzed: 12/17/2018 13:48

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 12:05

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:39

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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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Project: Landsburg
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Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 12:05

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:39

| 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 % | 103 | % | |



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Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 12:05

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:39

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Toluene-d8 | | 80-120 % | 98.4 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 92.6 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 103 | % | |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 12:05

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 18:59

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0267 Sample Size: 500 mL
Prepared: 11-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Project: Landsburg
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Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 12:05

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 18:59

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |
| <i>Surrogate: 2-Fluorophenol</i> | | | 33-120 % | 71.9 | % | |
| <i>Surrogate: Phenol-d5</i> | | | 38-120 % | 77.2 | % | |
| <i>Surrogate: 2-Chlorophenol-d4</i> | | | 41-120 % | 78.1 | % | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | | | 20-120 % | 65.3 | % | |
| <i>Surrogate: Nitrobenzene-d5</i> | | | 27-120 % | 74.1 | % | |
| <i>Surrogate: 2-Fluorobiphenyl</i> | | | 33-120 % | 77.8 | % | |
| <i>Surrogate: 2,4,6-Tribromophenol</i> | | | 52-120 % | 95.6 | % | |
| <i>Surrogate: p-Terphenyl-d14</i> | | | 28-120 % | 93.2 | % | |



| | | |
|---|--|--------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|--------------------------------|

LMW-8-1218
18L0119-05 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/05/2018 12:05
Instrument: NT6 Analyst: JZ Analyzed: 12/17/2018 19:02

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Sample Size: 500 mL
Preparation Batch: BGL0225 Final Volume: 1 mL
Prepared: 12-Dec-2018

| 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 62.5 | % | |



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Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/05/2018 12:05

Instrument: FID4 Analyst: JGR

Analyzed: 12/10/2018 19:23

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0197 Sample Size: 500 mL
Prepared: 10-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| Surrogate: <i>o</i> -Terphenyl | | | 50-150 % | 104 | % | |
| Surrogate: <i>n</i> -Triacontane | | | 50-150 % | 110 | % | |



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Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Chlorinated Pesticides

Method: EPA 8081B Sampled: 12/05/2018 12:05
Instrument: ECD6 Analyst: YZ Analyzed: 12/19/2018 18:15

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0292 Sample Size: 500 mL
Prepared: 12-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 11-144 % | 74.6 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 11-144 % | 67.4 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 30-120 % | 87.6 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 30-120 % | 92.9 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Aroclor PCB

Method: EPA 8082A Sampled: 12/05/2018 12:05
Instrument: ECD7 Analyst: JGR Analyzed: 12/17/2018 23:23

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 65.5 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 54.2 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 62.5 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 49.8 | % | |



Golder Associates
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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/05/2018 12:05

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 21:44

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/05/2018 12:05

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 21:44

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-8-1218
18L0119-05 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/05/2018 12:05

Instrument: ICP2 Analyst: TCH

Analyzed: 12/19/2018 11:33

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0429
Prepared: 17-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 70400 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 11200 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 36600 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 470 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 1890 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 11400 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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|---|--|---------------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|---------------------------------------|

LMW-8-1218
18L0119-05 (Water)

Metals and Metallic Compounds

Method: EPA 7470A Sampled: 12/05/2018 12:05
Instrument: CVAA Analyst: SKM Analyzed: 12/17/2018 13:51

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 13:38

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:59

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 13:38

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:59

| 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 % | 103 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | | | 80-129 % | 107 | % | |



Golder Associates
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 13:38

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 19:59

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Toluene-d8 | | 80-120 % | 97.9 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 92.0 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 101 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 13:38

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 19:32

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0267 Sample Size: 500 mL
Prepared: 11-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 13:38

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 19:32

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |
| <i>Surrogate: 2-Fluorophenol</i> | | | 33-120 % | 69.9 | % | |
| <i>Surrogate: Phenol-d5</i> | | | 38-120 % | 75.4 | % | |
| <i>Surrogate: 2-Chlorophenol-d4</i> | | | 41-120 % | 76.4 | % | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | | | 20-120 % | 64.5 | % | |
| <i>Surrogate: Nitrobenzene-d5</i> | | | 27-120 % | 75.1 | % | |
| <i>Surrogate: 2-Fluorobiphenyl</i> | | | 33-120 % | 80.5 | % | |
| <i>Surrogate: 2,4,6-Tribromophenol</i> | | | 52-120 % | 91.4 | % | |
| <i>Surrogate: p-Terphenyl-d14</i> | | | 28-120 % | 96.4 | % | |



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| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|--------------------------------|

LMW-6-1218
18L0119-07 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/05/2018 13:38
Instrument: NT6 Analyst: JZ Analyzed: 12/17/2018 19:35

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Sample Size: 500 mL
Preparation Batch: BGL0225 Final Volume: 1 mL
Prepared: 12-Dec-2018

| 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 62.9 | % | |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID Sampled: 12/05/2018 13:38
Instrument: FID4 Analyst: JGR Analyzed: 12/10/2018 19:43

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0197 Sample Size: 500 mL
Prepared: 10-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| Surrogate: <i>o</i> -Terphenyl | | | 50-150 % | 101 | % | |
| Surrogate: <i>n</i> -Triacontane | | | 50-150 % | 108 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Chlorinated Pesticides

Method: EPA 8081B Sampled: 12/05/2018 13:38
Instrument: ECD6 Analyst: yz Analyzed: 12/19/2018 18:33

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0292 Sample Size: 500 mL
Prepared: 12-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 11-144 % | 95.5 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 11-144 % | 85.9 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 30-120 % | 77.9 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 30-120 % | 83.1 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Aroclor PCB

Method: EPA 8082A Sampled: 12/05/2018 13:38
Instrument: ECD7 Analyst: JGR Analyzed: 12/17/2018 23:44

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 61.0 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 52.9 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 59.0 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 46.2 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/05/2018 13:38

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:22

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/05/2018 13:38

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:22

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-6-1218
18L0119-07 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/05/2018 13:38

Instrument: ICP2 Analyst: TCH

Analyzed: 12/19/2018 11:37

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0429
Prepared: 17-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 27300 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 2210 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 13700 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 32.3 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 739 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 6910 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



| | | |
|---|--|---------------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|---------------------------------------|

LMW-6-1218
18L0119-07 (Water)

Metals and Metallic Compounds

Method: EPA 7470A Sampled: 12/05/2018 13:38
Instrument: CVAA Analyst: SKM Analyzed: 12/17/2018 13:54

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

EB-1218
18L0119-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 13:25

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 20:20

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

EB-1218
18L0119-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 13:25

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 20:20

| 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 % | 99.5 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | | | 80-129 % | 103 | % | |



Golder Associates
18300 NE Union Hill Road Suite 200
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

EB-1218
18L0119-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 13:25

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 20:20

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Toluene-d8 | | 80-120 % | 95.5 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 92.6 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 106 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

EB-1218
18L0119-09 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 13:25

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 20:05

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0267 Sample Size: 500 mL
Prepared: 11-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

EB-1218
18L0119-09 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 13:25

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 20:05

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzofluoranthenes, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |
| <i>Surrogate: 2-Fluorophenol</i> | | | 33-120 % | 68.6 | % | |
| <i>Surrogate: Phenol-d5</i> | | | 38-120 % | 76.3 | % | |
| <i>Surrogate: 2-Chlorophenol-d4</i> | | | 41-120 % | 74.3 | % | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | | | 20-120 % | 62.4 | % | |
| <i>Surrogate: Nitrobenzene-d5</i> | | | 27-120 % | 72.0 | % | |
| <i>Surrogate: 2-Fluorobiphenyl</i> | | | 33-120 % | 74.6 | % | |
| <i>Surrogate: 2,4,6-Tribromophenol</i> | | | 52-120 % | 95.2 | % | |
| <i>Surrogate: p-Terphenyl-d14</i> | | | 28-120 % | 98.8 | % | |



| | | |
|---|--|---------------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|---------------------------------------|

EB-1218
18L0119-09 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/05/2018 13:25
Instrument: NT6 Analyst: JZ Analyzed: 12/17/2018 20:08

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Sample Size: 500 mL
Preparation Batch: BGL0225 Final Volume: 1 mL
Prepared: 12-Dec-2018

| 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | 33.6-120 % | 64.3 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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EB-1218
18L0119-09 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/05/2018 13:25

Instrument: FID4 Analyst: JGR

Analyzed: 12/10/2018 20:04

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0197 Sample Size: 500 mL
Prepared: 10-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| Surrogate: <i>o</i> -Terphenyl | | | 50-150 % | 103 | % | |
| Surrogate: <i>n</i> -Triacontane | | | 50-150 % | 110 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

EB-1218
18L0119-09 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/05/2018 13:25

Instrument: ECD6 Analyst: YZ

Analyzed: 12/19/2018 18:51

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0292 Sample Size: 500 mL
Prepared: 12-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|-------------|----------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | <i>11-144 %</i> | <i>86.8</i> | <i>%</i> | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | <i>11-144 %</i> | <i>77.6</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | <i>30-120 %</i> | <i>76.7</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | <i>30-120 %</i> | <i>80.1</i> | <i>%</i> | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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EB-1218
18L0119-09 (Water)

Aroclor PCB

Method: EPA 8082A Sampled: 12/05/2018 13:25
Instrument: ECD7 Analyst: JGR Analyzed: 12/18/2018 00:06

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 59.5 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 61.6 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 57.6 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 56.8 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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EB-1218
18L0119-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/05/2018 13:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:27

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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EB-1218
18L0119-09 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/05/2018 13:25

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:27

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Reported:
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EB-1218
18L0119-09 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/05/2018 13:25

Instrument: ICP2 Analyst: TCH

Analyzed: 12/19/2018 11:41

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0429
Prepared: 17-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | ND | ug/L | U |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | 6.3 | ug/L | |
| Iron | 7439-89-6 | 1 | 200 | ND | ug/L | U |
| Magnesium | 7439-95-4 | 1 | 1000 | ND | ug/L | U |
| Manganese | 7439-96-5 | 1 | 20.0 | ND | ug/L | U |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | ND | ug/L | U |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | ND | ug/L | U |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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Reported:
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EB-1218
18L0119-09 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 12/05/2018 13:25

Instrument: CVAA Analyst: SKM

Analyzed: 12/17/2018 13:57

Sample Preparation:

Preparation Method: TLM EPA 7470A low level

Preparation Batch: BGL0397

Sample Size: 20 mL

Prepared: 14-Dec-2018

Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project Manager: Gary Zimmerman

Reported:
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LMW-15-1218
18L0119-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 15:10

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 20:40

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 2.27 | 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 | 1.02 | ug/L | |
| 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 | 0.05 | ug/L | J |
| trans-1,3-Dichloropropene | 10061-02-6 | 1 | 0.08 | 0.20 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 15:10

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 20:40

| 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 % | 103 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | | | 80-129 % | 105 | % | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 15:10

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 20:40

| Analyte | CAS Number | Recovery Limits | Recovery | Units | Notes |
|-----------------------------------|------------|-----------------|----------|-------|-------|
| Surrogate: Toluene-d8 | | 80-120 % | 95.1 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 91.7 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 101 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 15:10

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 20:39

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0267 Sample Size: 500 mL
Prepared: 11-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/05/2018 15:10

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 20:39

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |
| <i>Surrogate: 2-Fluorophenol</i> | | | 33-120 % | 70.8 | % | |
| <i>Surrogate: Phenol-d5</i> | | | 38-120 % | 77.6 | % | |
| <i>Surrogate: 2-Chlorophenol-d4</i> | | | 41-120 % | 77.7 | % | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | | | 20-120 % | 65.8 | % | |
| <i>Surrogate: Nitrobenzene-d5</i> | | | 27-120 % | 77.1 | % | |
| <i>Surrogate: 2-Fluorobiphenyl</i> | | | 33-120 % | 82.0 | % | |
| <i>Surrogate: 2,4,6-Tribromophenol</i> | | | 52-120 % | 101 | % | |
| <i>Surrogate: p-Terphenyl-d14</i> | | | 28-120 % | 97.2 | % | |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/05/2018 15:10
Instrument: NT6 Analyst: JZ Analyzed: 12/17/2018 20:41

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Sample Size: 500 mL
Preparation Batch: BGL0225 Final Volume: 1 mL
Prepared: 12-Dec-2018

| 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | <i>33.6-120 %</i> | <i>65.4</i> | <i>%</i> | |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/05/2018 15:10

Instrument: FID4 Analyst: JGR

Analyzed: 12/10/2018 20:23

Sample Preparation:

Preparation Method: EPA 3510C SepF

Preparation Batch: BGL0197

Sample Size: 500 mL

Prepared: 10-Dec-2018

Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| Surrogate: <i>o</i> -Terphenyl | | | 50-150 % | 98.8 | % | |
| Surrogate: <i>n</i> -Triacontane | | | 50-150 % | 108 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/05/2018 15:10

Instrument: ECD6 Analyst: YZ

Analyzed: 12/19/2018 19:09

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0292 Sample Size: 500 mL
Prepared: 12-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 11-144 % | 88.9 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 11-144 % | 78.1 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 30-120 % | 103 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 30-120 % | 95.3 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Aroclor PCB

Method: EPA 8082A Sampled: 12/05/2018 15:10
Instrument: ECD7 Analyst: JGR Analyzed: 12/18/2018 00:27

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 59.7 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 57.9 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 57.4 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 53.1 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/05/2018 15:10

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/05/2018 15:10

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:32

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|-------------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | 3.61 | ug/L | |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Reported:
27-Dec-2018 14:37

LMW-15-1218
18L0119-11 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/05/2018 15:10

Instrument: ICP2 Analyst: TCH

Analyzed: 12/19/2018 11:45

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0429
Prepared: 17-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 45600 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 876 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 20700 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 228 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 3480 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 22900 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



| | | |
|---|--|---------------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|---------------------------------------|

LMW-15-1218
18L0119-11 (Water)

Metals and Metallic Compounds

Method: EPA 7470A Sampled: 12/05/2018 15:10
Instrument: CVAA Analyst: SKM Analyzed: 12/17/2018 14:00

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/06/2018 13:20

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 21:00

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/06/2018 13:20

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 21:00

| 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 % | 108 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/06/2018 13:20

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 21:00

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Toluene-d8 | | 80-120 % | 95.3 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 90.3 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 103 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/06/2018 13:20

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 21:12

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0267 Sample Size: 500 mL
Prepared: 11-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/06/2018 13:20

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 21:12

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |
| <i>Surrogate: 2-Fluorophenol</i> | | | 33-120 % | 70.1 | % | |
| <i>Surrogate: Phenol-d5</i> | | | 38-120 % | 73.8 | % | |
| <i>Surrogate: 2-Chlorophenol-d4</i> | | | 41-120 % | 76.3 | % | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | | | 20-120 % | 64.3 | % | |
| <i>Surrogate: Nitrobenzene-d5</i> | | | 27-120 % | 75.1 | % | |
| <i>Surrogate: 2-Fluorobiphenyl</i> | | | 33-120 % | 78.6 | % | |
| <i>Surrogate: 2,4,6-Tribromophenol</i> | | | 52-120 % | 93.0 | % | |
| <i>Surrogate: p-Terphenyl-d14</i> | | | 28-120 % | 91.5 | % | |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/06/2018 13:20
Instrument: NT6 Analyst: JZ Analyzed: 12/17/2018 21:14

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Sample Size: 500 mL
Preparation Batch: BGL0225 Final Volume: 1 mL
Prepared: 12-Dec-2018

| 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | <i>33.6-120 %</i> | <i>69.0</i> | <i>%</i> | |



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Project: Landsburg
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Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID Sampled: 12/06/2018 13:20
Instrument: FID4 Analyst: JGR Analyzed: 12/10/2018 20:43

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0197 Sample Size: 500 mL
Prepared: 10-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| <i>Surrogate: o-Terphenyl</i> | | | 50-150 % | 98.6 | % | |
| <i>Surrogate: n-Triacontane</i> | | | 50-150 % | 107 | % | |



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Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 12/06/2018 13:20

Instrument: ECD6 Analyst: YZ

Analyzed: 12/19/2018 19:28

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0292 Sample Size: 500 mL
Prepared: 12-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|-------------|----------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | <i>11-144 %</i> | <i>101</i> | <i>%</i> | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | <i>11-144 %</i> | <i>89.6</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | <i>30-120 %</i> | <i>66.1</i> | <i>%</i> | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | <i>30-120 %</i> | <i>68.4</i> | <i>%</i> | |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Aroclor PCB

Method: EPA 8082A Sampled: 12/06/2018 13:20
Instrument: ECD7 Analyst: JGR Analyzed: 12/18/2018 00:49

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 64.6 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 52.6 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 62.8 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 48.6 | % | |



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Project: Landsburg
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Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/06/2018 13:20

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:37

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/06/2018 13:20

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:37

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|-------------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | 10.1 | ug/L | |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/06/2018 13:20

Instrument: ICP2 Analyst: TCH

Analyzed: 12/19/2018 11:49

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0429
Prepared: 17-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 60200 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 723 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 25600 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 190 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 2050 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 20600 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



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Reported:
27-Dec-2018 14:37

LMW-11-1218
18L0119-13 (Water)

Metals and Metallic Compounds

Method: EPA 7470A

Sampled: 12/06/2018 13:20

Instrument: CVAA Analyst: SKM

Analyzed: 12/17/2018 14:10

Sample Preparation:

Preparation Method: TLM EPA 7470A low level

Preparation Batch: BGL0397

Sample Size: 20 mL

Prepared: 14-Dec-2018

Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
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Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/06/2018 15:05

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 21:21

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/06/2018 15:05

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 21:21

| 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 % | 102 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | | | 80-129 % | 104 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/06/2018 15:05

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 21:21

| Analyte | CAS Number | Recovery | | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | Recovery | | |
| Surrogate: Toluene-d8 | | 80-120 % | 97.5 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 91.8 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 104 | % | |



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/06/2018 15:05

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 21:45

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq)
Preparation Batch: BGL0267 Sample Size: 500 mL
Prepared: 11-Dec-2018 Final Volume: 0.5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------|------------|----------|-----------------|--------|-------|-------|
| Phenol | 108-95-2 | 1 | 1.0 | ND | ug/L | U |
| bis(2-chloroethyl) ether | 111-44-4 | 1 | 1.0 | ND | ug/L | U |
| 2-Chlorophenol | 95-57-8 | 1 | 1.0 | ND | ug/L | U |
| 1,3-Dichlorobenzene | 541-73-1 | 1 | 1.0 | ND | ug/L | U |
| 1,4-Dichlorobenzene | 106-46-7 | 1 | 1.0 | ND | ug/L | U |
| Benzyl Alcohol | 100-51-6 | 1 | 2.0 | ND | ug/L | U |
| 1,2-Dichlorobenzene | 95-50-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Methylphenol | 95-48-7 | 1 | 1.0 | ND | ug/L | U |
| 2,2'-Oxybis(1-chloropropane) | 108-60-1 | 1 | 1.0 | ND | ug/L | U |
| 4-Methylphenol | 106-44-5 | 1 | 2.0 | ND | ug/L | U |
| N-Nitroso-di-n-Propylamine | 621-64-7 | 1 | 1.0 | ND | ug/L | U |
| Hexachloroethane | 67-72-1 | 1 | 2.0 | ND | ug/L | U |
| Nitrobenzene | 98-95-3 | 1 | 1.0 | ND | ug/L | U |
| Isophorone | 78-59-1 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitrophenol | 88-75-5 | 1 | 3.0 | ND | ug/L | U |
| 2,4-Dimethylphenol | 105-67-9 | 1 | 3.0 | ND | ug/L | U |
| Bis(2-Chloroethoxy)methane | 111-91-1 | 1 | 1.0 | ND | ug/L | U |
| Benzoic acid | 65-85-0 | 1 | 20.0 | ND | ug/L | U |
| 2,4-Dichlorophenol | 120-83-2 | 1 | 3.0 | ND | ug/L | U |
| 1,2,4-Trichlorobenzene | 120-82-1 | 1 | 1.0 | ND | ug/L | U |
| Naphthalene | 91-20-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Chloroaniline | 106-47-8 | 1 | 5.0 | ND | ug/L | U |
| Hexachlorobutadiene | 87-68-3 | 1 | 3.0 | ND | ug/L | U |
| 4-Chloro-3-Methylphenol | 59-50-7 | 1 | 3.0 | ND | ug/L | U |
| 2-Methylnaphthalene | 91-57-6 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorocyclopentadiene | 77-47-4 | 1 | 5.0 | ND | ug/L | U |
| 2,4,6-Trichlorophenol | 88-06-2 | 1 | 3.0 | ND | ug/L | U |
| 2,4,5-Trichlorophenol | 95-95-4 | 1 | 5.0 | ND | ug/L | U |
| 2-Chloronaphthalene | 91-58-7 | 1 | 1.0 | ND | ug/L | U |
| 2-Nitroaniline | 88-74-4 | 1 | 3.0 | ND | ug/L | U |
| Dimethylphthalate | 131-11-3 | 1 | 1.0 | ND | ug/L | U |
| Acenaphthylene | 208-96-8 | 1 | 1.0 | ND | ug/L | U |
| 2,6-Dinitrotoluene | 606-20-2 | 1 | 3.0 | ND | ug/L | U |
| 3-Nitroaniline | 99-09-2 | 1 | 3.0 | ND | ug/L | U |
| Acenaphthene | 83-32-9 | 1 | 1.0 | ND | ug/L | U |
| 2,4-Dinitrophenol | 51-28-5 | 1 | 20.0 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D

Sampled: 12/06/2018 15:05

Instrument: NT12 Analyst: VTS

Analyzed: 12/17/2018 21:45

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Dibenzofuran | 132-64-9 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitrophenol | 100-02-7 | 1 | 10.0 | ND | ug/L | U |
| 2,4-Dinitrotoluene | 121-14-2 | 1 | 3.0 | ND | ug/L | U |
| Fluorene | 86-73-7 | 1 | 1.0 | ND | ug/L | U |
| Diethyl phthalate | 84-66-2 | 1 | 1.0 | ND | ug/L | U |
| 4-Chlorophenylphenyl ether | 7005-72-3 | 1 | 1.0 | ND | ug/L | U |
| 4-Nitroaniline | 100-01-6 | 1 | 3.0 | ND | ug/L | U |
| 4,6-Dinitro-2-methylphenol | 534-52-1 | 1 | 10.0 | ND | ug/L | U |
| N-Nitrosodiphenylamine | 86-30-6 | 1 | 1.0 | ND | ug/L | U |
| 4-Bromophenyl phenyl ether | 101-55-3 | 1 | 1.0 | ND | ug/L | U |
| Hexachlorobenzene | 118-74-1 | 1 | 1.0 | ND | ug/L | U |
| Pentachlorophenol | 87-86-5 | 1 | 10.0 | ND | ug/L | U |
| Phenanthrene | 85-01-8 | 1 | 1.0 | ND | ug/L | U |
| Anthracene | 120-12-7 | 1 | 1.0 | ND | ug/L | U |
| Carbazole | 86-74-8 | 1 | 1.0 | ND | ug/L | U |
| Di-n-Butylphthalate | 84-74-2 | 1 | 1.0 | ND | ug/L | U |
| Fluoranthene | 206-44-0 | 1 | 1.0 | ND | ug/L | U |
| Pyrene | 129-00-0 | 1 | 1.0 | ND | ug/L | U |
| Butylbenzylphthalate | 85-68-7 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)anthracene | 56-55-3 | 1 | 1.0 | ND | ug/L | U |
| 3,3'-Dichlorobenzidine | 91-94-1 | 1 | 5.0 | ND | ug/L | U |
| Chrysene | 218-01-9 | 1 | 1.0 | ND | ug/L | U |
| bis(2-Ethylhexyl)phthalate | 117-81-7 | 1 | 3.0 | ND | ug/L | U |
| Di-n-Octylphthalate | 117-84-0 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)pyrene | 50-32-8 | 1 | 1.0 | ND | ug/L | U |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | 1 | 1.0 | ND | ug/L | U |
| Dibenzo(a,h)anthracene | 53-70-3 | 1 | 1.0 | ND | ug/L | U |
| Benzo(g,h,i)perylene | 191-24-2 | 1 | 1.0 | ND | ug/L | U |
| Benzo(a)fluoranthene, Total | | 1 | 2.0 | ND | ug/L | U |
| 1-Methylnaphthalene | 90-12-0 | 1 | 1.0 | ND | ug/L | U |
| <i>Surrogate: 2-Fluorophenol</i> | | | 33-120 % | 68.2 | % | |
| <i>Surrogate: Phenol-d5</i> | | | 38-120 % | 71.0 | % | |
| <i>Surrogate: 2-Chlorophenol-d4</i> | | | 41-120 % | 74.1 | % | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | | | 20-120 % | 63.1 | % | |
| <i>Surrogate: Nitrobenzene-d5</i> | | | 27-120 % | 73.3 | % | |
| <i>Surrogate: 2-Fluorobiphenyl</i> | | | 33-120 % | 74.9 | % | |
| <i>Surrogate: 2,4,6-Tribromophenol</i> | | | 52-120 % | 94.8 | % | |
| <i>Surrogate: p-Terphenyl-d14</i> | | | 28-120 % | 90.9 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Semivolatile Organic Compounds

Method: EPA 8270D Sampled: 12/06/2018 15:05
Instrument: NT6 Analyst: JZ Analyzed: 12/17/2018 21:47

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Sample Size: 500 mL
Preparation Batch: BGL0225 Final Volume: 1 mL
Prepared: 12-Dec-2018

| 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 |
| <i>Surrogate: 1,4-Dioxane-d8</i> | | | | <i>33.6-120 %</i> | <i>58.0</i> | <i>%</i> | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 12/06/2018 15:05

Instrument: FID4 Analyst: JGR

Analyzed: 12/10/2018 21:02

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0197 Sample Size: 500 mL
Prepared: 10-Dec-2018 Final Volume: 1 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|------------------------------------|------------|----------|-----------------|--------|-------|-------|
| Gasoline Range Organics (Tol-C12) | | 1 | 0.25 | ND | mg/L | U |
| Diesel Range Organics (C12-C24) | | 1 | 0.50 | ND | mg/L | U |
| Motor Oil Range Organics (C24-C38) | | 1 | 1.00 | ND | mg/L | U |
| Surrogate: <i>o</i> -Terphenyl | | | 50-150 % | 102 | % | |
| Surrogate: <i>n</i> -Triacontane | | | 50-150 % | 113 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Chlorinated Pesticides

Method: EPA 8081B Sampled: 12/06/2018 15:05
Instrument: ECD6 Analyst: YZ Analyzed: 12/19/2018 19:46

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BGL0292 Sample Size: 500 mL
Prepared: 12-Dec-2018 Final Volume: 5 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| alpha-BHC | 319-84-6 | 1 | 0.025 | ND | ug/L | U |
| beta-BHC | 319-85-7 | 1 | 0.025 | ND | ug/L | U |
| gamma-BHC (Lindane) | 58-89-9 | 1 | 0.025 | ND | ug/L | U |
| delta-BHC | 319-86-8 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor | 76-44-8 | 1 | 0.025 | ND | ug/L | U |
| Aldrin | 309-00-2 | 1 | 0.025 | ND | ug/L | U |
| Heptachlor Epoxide | 1024-57-3 | 1 | 0.050 | ND | ug/L | U |
| trans-Chlordane (beta-Chlordane) | 5103-74-2 | 1 | 0.025 | ND | ug/L | U |
| cis-Chlordane (alpha-chlordane) | 5103-71-9 | 1 | 0.025 | ND | ug/L | U |
| Endosulfan I | 959-98-8 | 1 | 0.025 | ND | ug/L | U |
| 4,4'-DDE | 72-55-9 | 1 | 0.050 | ND | ug/L | U |
| Dieldrin | 60-57-1 | 1 | 0.050 | ND | ug/L | U |
| Endrin | 72-20-8 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan II | 33213-65-9 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDD | 72-54-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Aldehyde | 7421-93-4 | 1 | 0.050 | ND | ug/L | U |
| 4,4'-DDT | 50-29-3 | 1 | 0.050 | ND | ug/L | U |
| Endosulfan Sulfate | 1031-07-8 | 1 | 0.050 | ND | ug/L | U |
| Endrin Ketone | 53494-70-5 | 1 | 0.050 | ND | ug/L | U |
| Methoxychlor | 72-43-5 | 1 | 0.250 | ND | ug/L | U |
| Toxaphene | 8001-35-2 | 1 | 1.25 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 11-144 % | 94.2 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 11-144 % | 83.4 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 30-120 % | 73.6 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 30-120 % | 80.8 | % | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Aroclor PCB

Method: EPA 8082A Sampled: 12/06/2018 15:05
Instrument: ECD7 Analyst: JGR Analyzed: 12/18/2018 01:11

| | | |
|---------------------|---|--|
| Sample Preparation: | Preparation Method: EPA 3510C SepF Preparation Batch: BGL0213 Prepared: 10-Dec-2018 | Sample Size: 1000 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Silica Gel Cleanup Batch: CGL0092 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfuric Acid Cleanup Batch: CGL0090 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |
| Sample Cleanup: | Cleanup Method: Sulfur Cleanup Batch: CGL0091 Cleaned: 17-Dec-2018 | Initial Volume: 0.5 mL Final Volume: 0.5 mL |

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|--|------------|----------|-----------------|--------|-------|-------|
| Aroclor 1016 | 12674-11-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1221 | 11104-28-2 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1232 | 11141-16-5 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1242 | 53469-21-9 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1248 | 12672-29-6 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1254 | 11097-69-1 | 1 | 0.010 | ND | ug/L | U |
| Aroclor 1260 | 11096-82-5 | 1 | 0.010 | ND | ug/L | U |
| <i>Surrogate: Decachlorobiphenyl</i> | | | 29-120 % | 68.0 | % | |
| <i>Surrogate: Tetrachlorometaxylene</i> | | | 32-120 % | 58.5 | % | |
| <i>Surrogate: Decachlorobiphenyl [2C]</i> | | | 29-120 % | 66.0 | % | |
| <i>Surrogate: Tetrachlorometaxylene [2C]</i> | | | 32-120 % | 53.5 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Metals and Metallic Compounds

Method: EPA 200.8

Sampled: 12/06/2018 15:05

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Antimony | 7440-36-0 | 1 | 3.00 | ND | ug/L | U |
| Lead | 7439-92-1 | 1 | 10.0 | ND | ug/L | U |
| Thallium | 7440-28-0 | 1 | 2.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED

Sampled: 12/06/2018 15:05

Instrument: ICPMS2 Analyst: MCB

Analyzed: 12/17/2018 22:41

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGL0430 Sample Size: 25 mL
Prepared: 17-Dec-2018 Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|----------|------------|----------|-----------------|--------|-------|-------|
| Arsenic | 7440-38-2 | 1 | 3.00 | ND | ug/L | U |
| Selenium | 7782-49-2 | 1 | 5.00 | ND | ug/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

LMW-9-1218
18L0119-15 (Water)

Metals and Metallic Compounds

Method: EPA 6010C

Sampled: 12/06/2018 15:05

Instrument: ICP2 Analyst: TCH

Analyzed: 12/19/2018 11:53

Sample Preparation: Preparation Method: TWC EPA 3010A
Preparation Batch: BGL0429
Prepared: 17-Dec-2018

Sample Size: 25 mL
Final Volume: 25 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|-----------|------------|----------|-----------------|--------------|-------|-------|
| Aluminum | 7429-90-5 | 1 | 1000 | ND | ug/L | U |
| Barium | 7440-39-3 | 1 | 500 | ND | ug/L | U |
| Beryllium | 7440-41-7 | 1 | 2.0 | ND | ug/L | U |
| Cadmium | 7440-43-9 | 1 | 2.0 | ND | ug/L | U |
| Calcium | 7440-70-2 | 1 | 500 | 81300 | ug/L | |
| Chromium | 7440-47-3 | 1 | 1000 | ND | ug/L | U |
| Cobalt | 7440-48-4 | 1 | 10.0 | ND | ug/L | U |
| Copper | 7440-50-8 | 1 | 3.0 | ND | ug/L | U |
| Iron | 7439-89-6 | 1 | 200 | 1500 | ug/L | |
| Magnesium | 7439-95-4 | 1 | 1000 | 43400 | ug/L | |
| Manganese | 7439-96-5 | 1 | 20.0 | 180 | ug/L | |
| Nickel | 7440-02-0 | 1 | 20.0 | ND | ug/L | U |
| Potassium | 7440-09-7 | 1 | 500 | 2450 | ug/L | |
| Silver | 7440-22-4 | 1 | 3.0 | ND | ug/L | U |
| Sodium | 7440-23-5 | 1 | 500 | 14700 | ug/L | |
| Vanadium | 7440-62-2 | 1 | 3.0 | ND | ug/L | U |
| Zinc | 7440-66-6 | 1 | 20.0 | ND | ug/L | U |



| | | |
|---|--|---------------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|---------------------------------------|

LMW-9-1218
18L0119-15 (Water)

Metals and Metallic Compounds

Method: EPA 7470A Sampled: 12/06/2018 15:05
Instrument: CVAA Analyst: SKM Analyzed: 12/17/2018 14:13

Sample Preparation: Preparation Method: TLM EPA 7470A low level
Preparation Batch: BGL0397 Sample Size: 20 mL
Prepared: 14-Dec-2018 Final Volume: 20 mL

| Analyte | CAS Number | Dilution | Reporting Limit | Result | Units | Notes |
|---------|------------|----------|-----------------|--------|-------|-------|
| Mercury | 7439-97-6 | 1 | 20 | ND | ng/L | U |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Trip Blank 120518
18L0119-17 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 00:00

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 15:55

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BGL0376 Sample Size: 10 mL
Prepared: 13-Dec-2018 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 | 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 | 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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18300 NE Union Hill Road Suite 200
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Trip Blank 120518
18L0119-17 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 00:00

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 15:55

| 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 % | 101 | % | |
| Surrogate: 1,2-Dichloroethane-d4 | | | | 80-129 % | 103 | % | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Trip Blank 120518
18L0119-17 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 12/05/2018 00:00

Instrument: NT2 Analyst: LH

Analyzed: 12/13/2018 15:55

| Analyte | CAS Number | Recovery | Recovery | Units | Notes |
|-----------------------------------|------------|----------|----------|-------|-------|
| | | Limits | | | |
| Surrogate: Toluene-d8 | | 80-120 % | 101 | % | |
| Surrogate: 4-Bromofluorobenzene | | 80-120 % | 93.5 | % | |
| Surrogate: 1,2-Dichlorobenzene-d4 | | 80-120 % | 103 | % | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BLK1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 15:15 | | | | | |
| 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 | ND | 0.04 | 0.10 | ug/L | | | | | | | U |
| 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
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BLK1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 15:15 | | | | | |
| 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 | ND | 0.04 | 0.20 | ug/L | | | | | | | U |
| 1,4-Dichlorobenzene | ND | 0.04 | 0.20 | ug/L | | | | | | | U |
| n-Butylbenzene | ND | 0.02 | 0.20 | ug/L | | | | | | | U |
| 1,2-Dichlorobenzene | ND | 0.04 | 0.20 | ug/L | | | | | | | U |
| 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 | ND | 0.07 | 0.20 | ug/L | | | | | | | U |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BLK1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 15:15 | | | | | |
| 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 | 4.96 | | | ug/L | 5.00 | | 99.3 | 80-120 | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 4.99 | | | ug/L | 5.00 | | 99.8 | 80-129 | | | |
| Surrogate: Toluene-d8 | 5.02 | | | ug/L | 5.00 | | 100 | 80-120 | | | |
| Surrogate: 4-Bromofluorobenzene | 4.65 | | | ug/L | 5.00 | | 93.1 | 80-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 5.14 | | | ug/L | 5.00 | | 103 | 80-120 | | | |
| LCS (BGL0376-BS1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:13 | | | | | |
| Chloromethane | 9.81 | 0.09 | 0.50 | ug/L | 10.0 | | 98.1 | 60-138 | | | |
| Vinyl Chloride | 9.28 | 0.06 | 0.10 | ug/L | 10.0 | | 92.8 | 66-133 | | | |
| Bromomethane | 10.3 | 0.25 | 1.00 | ug/L | 10.0 | | 103 | 72-131 | | | |
| Chloroethane | 9.88 | 0.09 | 0.20 | ug/L | 10.0 | | 98.8 | 60-155 | | | |
| Trichlorofluoromethane | 10.9 | 0.04 | 0.20 | ug/L | 10.0 | | 109 | 80-129 | | | |
| Acrolein | 44.2 | 2.48 | 2.50 | ug/L | 50.0 | | 88.4 | 52-144 | | | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 9.65 | 0.04 | 0.20 | ug/L | 10.0 | | 96.5 | 76-129 | | | |
| Acetone | 43.1 | 2.06 | 5.00 | ug/L | 50.0 | | 86.1 | 58-142 | | | |
| 1,1-Dichloroethene | 9.34 | 0.05 | 0.20 | ug/L | 10.0 | | 93.4 | 69-135 | | | |
| Bromoethane | 9.24 | 0.04 | 0.20 | ug/L | 10.0 | | 92.4 | 78-128 | | | |
| Iodomethane | 9.19 | 0.23 | 0.50 | ug/L | 10.0 | | 91.9 | 56-147 | | | |
| Methylene Chloride | 9.05 | 0.49 | 1.00 | ug/L | 10.0 | | 90.5 | 65-135 | | | |
| Acrylonitrile | 8.59 | 0.60 | 1.00 | ug/L | 10.0 | | 85.9 | 64-134 | | | |
| Carbon Disulfide | 9.70 | 0.04 | 0.10 | ug/L | 10.0 | | 97.0 | 78-125 | | | |
| trans-1,2-Dichloroethene | 9.33 | 0.05 | 0.20 | ug/L | 10.0 | | 93.3 | 78-128 | | | |
| Vinyl Acetate | 8.15 | 0.07 | 0.20 | ug/L | 10.0 | | 81.5 | 55-138 | | | |
| 1,1-Dichloroethane | 9.36 | 0.05 | 0.20 | ug/L | 10.0 | | 93.6 | 76-124 | | | |
| 2-Butanone | 42.0 | 0.81 | 5.00 | ug/L | 50.0 | | 84.0 | 61-140 | | | |
| 2,2-Dichloropropane | 9.62 | 0.05 | 0.10 | ug/L | 10.0 | | 96.2 | 78-125 | | | |
| cis-1,2-Dichloroethene | 9.48 | 0.04 | 0.20 | ug/L | 10.0 | | 94.8 | 80-121 | | | |
| Chloroform | 9.46 | 0.03 | 0.20 | ug/L | 10.0 | | 94.6 | 80-122 | | | |
| Bromochloromethane | 9.15 | 0.06 | 0.20 | ug/L | 10.0 | | 91.5 | 80-121 | | | |
| 1,1,1-Trichloroethane | 9.88 | 0.04 | 0.20 | ug/L | 10.0 | | 98.8 | 79-123 | | | |
| 1,1-Dichloropropene | 10.1 | 0.03 | 0.10 | ug/L | 10.0 | | 101 | 80-120 | | | |
| Carbon tetrachloride | 8.58 | 0.04 | 0.20 | ug/L | 10.0 | | 85.8 | 53-137 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BS1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:13 | | | | | |
| 1,2-Dichloroethane | 8.79 | 0.07 | 0.20 | ug/L | 10.0 | | 87.9 | 75-123 | | | |
| Benzene | 9.53 | 0.03 | 0.20 | ug/L | 10.0 | | 95.3 | 80-120 | | | |
| Trichloroethene | 9.39 | 0.05 | 0.20 | ug/L | 10.0 | | 93.9 | 80-120 | | | |
| 1,2-Dichloropropane | 9.30 | 0.04 | 0.20 | ug/L | 10.0 | | 93.0 | 80-120 | | | |
| Bromodichloromethane | 8.56 | 0.05 | 0.20 | ug/L | 10.0 | | 85.6 | 80-121 | | | |
| Dibromomethane | 9.27 | 0.15 | 0.20 | ug/L | 10.0 | | 92.7 | 80-120 | | | |
| 2-Chloroethyl vinyl ether | 9.11 | 0.25 | 0.50 | ug/L | 10.0 | | 91.1 | 74-127 | | | |
| 4-Methyl-2-Pentanone | 44.4 | 0.97 | 2.50 | ug/L | 50.0 | | 88.8 | 67-133 | | | |
| cis-1,3-Dichloropropene | 9.12 | 0.06 | 0.20 | ug/L | 10.0 | | 91.2 | 80-124 | | | |
| Toluene | 9.47 | 0.04 | 0.20 | ug/L | 10.0 | | 94.7 | 80-120 | | | |
| trans-1,3-Dichloropropene | 8.86 | 0.08 | 0.20 | ug/L | 10.0 | | 88.6 | 71-127 | | | |
| 2-Hexanone | 44.5 | 0.90 | 5.00 | ug/L | 50.0 | | 89.0 | 69-133 | | | |
| 1,1,2-Trichloroethane | 9.06 | 0.13 | 0.20 | ug/L | 10.0 | | 90.6 | 80-121 | | | |
| 1,3-Dichloropropane | 9.43 | 0.06 | 0.10 | ug/L | 10.0 | | 94.3 | 80-120 | | | |
| Tetrachloroethene | 9.72 | 0.05 | 0.20 | ug/L | 10.0 | | 97.2 | 80-120 | | | |
| Dibromochloromethane | 7.47 | 0.05 | 0.20 | ug/L | 10.0 | | 74.7 | 65-135 | | | Q |
| 1,2-Dibromoethane | 8.83 | 0.07 | 0.10 | ug/L | 10.0 | | 88.3 | 80-121 | | | |
| Chlorobenzene | 9.58 | 0.02 | 0.20 | ug/L | 10.0 | | 95.8 | 80-120 | | | |
| Ethylbenzene | 9.82 | 0.04 | 0.20 | ug/L | 10.0 | | 98.2 | 80-120 | | | |
| 1,1,1,2-Tetrachloroethane | 8.57 | 0.04 | 0.20 | ug/L | 10.0 | | 85.7 | 80-120 | | | |
| m,p-Xylene | 20.3 | 0.05 | 0.40 | ug/L | 20.0 | | 101 | 80-121 | | | |
| o-Xylene | 9.97 | 0.03 | 0.20 | ug/L | 10.0 | | 99.7 | 80-121 | | | |
| Xylenes, total | 30.2 | 0.09 | 0.60 | ug/L | 30.0 | | 101 | 76-127 | | | |
| Styrene | 10.3 | 0.05 | 0.20 | ug/L | 10.0 | | 103 | 80-124 | | | |
| Bromoform | 6.41 | 0.06 | 0.20 | ug/L | 10.0 | | 64.1 | 51-134 | | | Q |
| 1,1,2,2-Tetrachloroethane | 9.03 | 0.06 | 0.10 | ug/L | 10.0 | | 90.3 | 77-123 | | | |
| 1,2,3-Trichloropropane | 9.06 | 0.13 | 0.20 | ug/L | 10.0 | | 90.6 | 76-125 | | | |
| trans-1,4-Dichloro 2-Butene | 6.54 | 0.32 | 1.00 | ug/L | 10.0 | | 65.4 | 55-129 | | | Q |
| n-Propylbenzene | 10.2 | 0.02 | 0.20 | ug/L | 10.0 | | 102 | 78-130 | | | |
| Bromobenzene | 9.45 | 0.06 | 0.20 | ug/L | 10.0 | | 94.5 | 80-120 | | | |
| Isopropyl Benzene | 10.1 | 0.02 | 0.20 | ug/L | 10.0 | | 101 | 80-128 | | | |
| 2-Chlorotoluene | 9.95 | 0.02 | 0.10 | ug/L | 10.0 | | 99.5 | 78-122 | | | |
| 4-Chlorotoluene | 10.0 | 0.02 | 0.20 | ug/L | 10.0 | | 100 | 80-121 | | | |
| t-Butylbenzene | 10.1 | 0.03 | 0.20 | ug/L | 10.0 | | 101 | 78-125 | | | |
| 1,3,5-Trimethylbenzene | 10.3 | 0.02 | 0.20 | ug/L | 10.0 | | 103 | 80-129 | | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BS1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:13 | | | | | |
| 1,2,4-Trimethylbenzene | 10.4 | 0.02 | 0.20 | ug/L | 10.0 | | 104 | 80-127 | | | |
| s-Butylbenzene | 10.5 | 0.02 | 0.20 | ug/L | 10.0 | | 105 | 78-129 | | | |
| 4-Isopropyl Toluene | 10.7 | 0.03 | 0.20 | ug/L | 10.0 | | 107 | 79-130 | | | |
| 1,3-Dichlorobenzene | 9.59 | 0.04 | 0.20 | ug/L | 10.0 | | 95.9 | 80-120 | | | |
| 1,4-Dichlorobenzene | 9.59 | 0.04 | 0.20 | ug/L | 10.0 | | 95.9 | 80-120 | | | |
| n-Butylbenzene | 10.8 | 0.02 | 0.20 | ug/L | 10.0 | | 108 | 74-129 | | | |
| 1,2-Dichlorobenzene | 9.58 | 0.04 | 0.20 | ug/L | 10.0 | | 95.8 | 80-120 | | | |
| 1,2-Dibromo-3-chloropropane | 6.86 | 0.37 | 0.50 | ug/L | 10.0 | | 68.6 | 62-123 | | | Q |
| 1,2,4-Trichlorobenzene | 10.1 | 0.11 | 0.50 | ug/L | 10.0 | | 101 | 64-124 | | | |
| Hexachloro-1,3-Butadiene | 11.0 | 0.07 | 0.20 | ug/L | 10.0 | | 110 | 58-123 | | | |
| Naphthalene | 8.65 | 0.12 | 0.50 | ug/L | 10.0 | | 86.5 | 50-134 | | | |
| 1,2,3-Trichlorobenzene | 9.73 | 0.11 | 0.20 | ug/L | 10.0 | | 97.3 | 49-133 | | | |
| Dichlorodifluoromethane | 9.29 | 0.05 | 0.20 | ug/L | 10.0 | | 92.9 | 48-147 | | | |
| <hr/> | | | | | | | | | | | |
| <i>Surrogate: Dibromofluoromethane</i> | 4.95 | | | ug/L | 5.00 | | 99.0 | 80-120 | | | |
| <i>Surrogate: 1,2-Dichloroethane-d4</i> | 4.80 | | | ug/L | 5.00 | | 95.9 | 80-129 | | | |
| <i>Surrogate: Toluene-d8</i> | 5.05 | | | ug/L | 5.00 | | 101 | 80-120 | | | |
| <i>Surrogate: 4-Bromofluorobenzene</i> | 4.93 | | | ug/L | 5.00 | | 98.5 | 80-120 | | | |
| <i>Surrogate: 1,2-Dichlorobenzene-d4</i> | 5.02 | | | ug/L | 5.00 | | 100 | 80-120 | | | |
| <hr/> | | | | | | | | | | | |
| LCS Dup (BGL0376-BS1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:34 | | | | | |
| Chloromethane | 10.0 | 0.09 | 0.50 | ug/L | 10.0 | | 100 | 60-138 | 1.94 | 30 | |
| Vinyl Chloride | 10.2 | 0.06 | 0.10 | ug/L | 10.0 | | 102 | 66-133 | 9.55 | 30 | |
| Bromomethane | 10.7 | 0.25 | 1.00 | ug/L | 10.0 | | 107 | 72-131 | 4.18 | 30 | |
| Chloroethane | 11.3 | 0.09 | 0.20 | ug/L | 10.0 | | 113 | 60-155 | 13.20 | 30 | |
| Trichlorofluoromethane | 10.3 | 0.04 | 0.20 | ug/L | 10.0 | | 103 | 80-129 | 5.26 | 30 | |
| Acrolein | 47.2 | 2.48 | 2.50 | ug/L | 50.0 | | 94.4 | 52-144 | 6.59 | 30 | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | 10.5 | 0.04 | 0.20 | ug/L | 10.0 | | 105 | 76-129 | 8.05 | 30 | |
| Acetone | 48.4 | 2.06 | 5.00 | ug/L | 50.0 | | 96.8 | 58-142 | 11.70 | 30 | |
| 1,1-Dichloroethene | 10.1 | 0.05 | 0.20 | ug/L | 10.0 | | 101 | 69-135 | 7.43 | 30 | |
| Bromoethane | 9.96 | 0.04 | 0.20 | ug/L | 10.0 | | 99.6 | 78-128 | 7.43 | 30 | |
| Iodomethane | 10.3 | 0.23 | 0.50 | ug/L | 10.0 | | 103 | 56-147 | 11.00 | 30 | |
| Methylene Chloride | 9.70 | 0.49 | 1.00 | ug/L | 10.0 | | 97.0 | 65-135 | 6.98 | 30 | |
| Acrylonitrile | 10.3 | 0.60 | 1.00 | ug/L | 10.0 | | 103 | 64-134 | 18.50 | 30 | |
| Carbon Disulfide | 10.4 | 0.04 | 0.10 | ug/L | 10.0 | | 104 | 78-125 | 6.83 | 30 | |
| trans-1,2-Dichloroethene | 10.1 | 0.05 | 0.20 | ug/L | 10.0 | | 101 | 78-128 | 8.37 | 30 | |



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18300 NE Union Hill Road Suite 200
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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BSD1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:34 | | | | | |
| Vinyl Acetate | 9.37 | 0.07 | 0.20 | ug/L | 10.0 | | 93.7 | 55-138 | 14.00 | 30 | |
| 1,1-Dichloroethane | 10.3 | 0.05 | 0.20 | ug/L | 10.0 | | 103 | 76-124 | 9.19 | 30 | |
| 2-Butanone | 49.1 | 0.81 | 5.00 | ug/L | 50.0 | | 98.2 | 61-140 | 15.50 | 30 | |
| 2,2-Dichloropropane | 10.7 | 0.05 | 0.10 | ug/L | 10.0 | | 107 | 78-125 | 10.70 | 30 | |
| cis-1,2-Dichloroethene | 10.1 | 0.04 | 0.20 | ug/L | 10.0 | | 101 | 80-121 | 6.45 | 30 | |
| Chloroform | 10.1 | 0.03 | 0.20 | ug/L | 10.0 | | 101 | 80-122 | 6.96 | 30 | |
| Bromochloromethane | 9.90 | 0.06 | 0.20 | ug/L | 10.0 | | 99.0 | 80-121 | 7.95 | 30 | |
| 1,1,1-Trichloroethane | 11.1 | 0.04 | 0.20 | ug/L | 10.0 | | 111 | 79-123 | 11.40 | 30 | |
| 1,1-Dichloropropene | 10.9 | 0.03 | 0.10 | ug/L | 10.0 | | 109 | 80-120 | 7.58 | 30 | |
| Carbon tetrachloride | 9.57 | 0.04 | 0.20 | ug/L | 10.0 | | 95.7 | 53-137 | 10.90 | 30 | |
| 1,2-Dichloroethane | 9.88 | 0.07 | 0.20 | ug/L | 10.0 | | 98.8 | 75-123 | 11.60 | 30 | |
| Benzene | 10.5 | 0.03 | 0.20 | ug/L | 10.0 | | 105 | 80-120 | 9.69 | 30 | |
| Trichloroethene | 10.2 | 0.05 | 0.20 | ug/L | 10.0 | | 102 | 80-120 | 8.62 | 30 | |
| 1,2-Dichloropropane | 10.2 | 0.04 | 0.20 | ug/L | 10.0 | | 102 | 80-120 | 9.12 | 30 | |
| Bromodichloromethane | 9.69 | 0.05 | 0.20 | ug/L | 10.0 | | 96.9 | 80-121 | 12.40 | 30 | |
| Dibromomethane | 10.6 | 0.15 | 0.20 | ug/L | 10.0 | | 106 | 80-120 | 13.20 | 30 | |
| 2-Chloroethyl vinyl ether | 10.4 | 0.25 | 0.50 | ug/L | 10.0 | | 104 | 74-127 | 12.90 | 30 | |
| 4-Methyl-2-Pentanone | 53.8 | 0.97 | 2.50 | ug/L | 50.0 | | 108 | 67-133 | 19.20 | 30 | |
| cis-1,3-Dichloropropene | 10.2 | 0.06 | 0.20 | ug/L | 10.0 | | 102 | 80-124 | 11.50 | 30 | |
| Toluene | 10.4 | 0.04 | 0.20 | ug/L | 10.0 | | 104 | 80-120 | 9.14 | 30 | |
| trans-1,3-Dichloropropene | 10.1 | 0.08 | 0.20 | ug/L | 10.0 | | 101 | 71-127 | 13.20 | 30 | |
| 2-Hexanone | 51.9 | 0.90 | 5.00 | ug/L | 50.0 | | 104 | 69-133 | 15.40 | 30 | |
| 1,1,2-Trichloroethane | 10.2 | 0.13 | 0.20 | ug/L | 10.0 | | 102 | 80-121 | 12.00 | 30 | |
| 1,3-Dichloropropane | 10.3 | 0.06 | 0.10 | ug/L | 10.0 | | 103 | 80-120 | 9.24 | 30 | |
| Tetrachloroethene | 10.4 | 0.05 | 0.20 | ug/L | 10.0 | | 104 | 80-120 | 7.20 | 30 | |
| Dibromochloromethane | 8.26 | 0.05 | 0.20 | ug/L | 10.0 | | 82.6 | 65-135 | 10.00 | 30 | Q |
| 1,2-Dibromoethane | 10.2 | 0.07 | 0.10 | ug/L | 10.0 | | 102 | 80-121 | 14.60 | 30 | |
| Chlorobenzene | 10.3 | 0.02 | 0.20 | ug/L | 10.0 | | 103 | 80-120 | 7.68 | 30 | |
| Ethylbenzene | 10.8 | 0.04 | 0.20 | ug/L | 10.0 | | 108 | 80-120 | 9.65 | 30 | |
| 1,1,1,2-Tetrachloroethane | 9.66 | 0.04 | 0.20 | ug/L | 10.0 | | 96.6 | 80-120 | 12.00 | 30 | |
| m,p-Xylene | 21.9 | 0.05 | 0.40 | ug/L | 20.0 | | 109 | 80-121 | 7.73 | 30 | |
| o-Xylene | 10.9 | 0.03 | 0.20 | ug/L | 10.0 | | 109 | 80-121 | 9.26 | 30 | |
| Xylenes, total | 32.8 | 0.09 | 0.60 | ug/L | 30.0 | | 109 | 76-127 | 8.23 | 30 | |
| Styrene | 10.9 | 0.05 | 0.20 | ug/L | 10.0 | | 109 | 80-124 | 5.81 | 30 | |
| Bromoform | 7.23 | 0.06 | 0.20 | ug/L | 10.0 | | 72.3 | 51-134 | 12.10 | 30 | Q |



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Project: Landsburg
Project Number: Landsburg
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Reported:
27-Dec-2018 14:37

Volatile Organic Compounds - Quality Control

Batch BGL0376 - 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 (BGL0376-BSD1) | | | | | | Prepared: 13-Dec-2018 Analyzed: 13-Dec-2018 13:34 | | | | | |
| 1,1,2,2-Tetrachloroethane | 10.4 | 0.06 | 0.10 | ug/L | 10.0 | 104 | 77-123 | 13.80 | 30 | | |
| 1,2,3-Trichloropropane | 10.6 | 0.13 | 0.20 | ug/L | 10.0 | 106 | 76-125 | 16.00 | 30 | | |
| trans-1,4-Dichloro 2-Butene | 7.28 | 0.32 | 1.00 | ug/L | 10.0 | 72.8 | 55-129 | 10.80 | 30 | Q | |
| n-Propylbenzene | 10.9 | 0.02 | 0.20 | ug/L | 10.0 | 109 | 78-130 | 6.58 | 30 | | |
| Bromobenzene | 10.4 | 0.06 | 0.20 | ug/L | 10.0 | 104 | 80-120 | 9.28 | 30 | | |
| Isopropyl Benzene | 11.1 | 0.02 | 0.20 | ug/L | 10.0 | 111 | 80-128 | 8.51 | 30 | | |
| 2-Chlorotoluene | 10.6 | 0.02 | 0.10 | ug/L | 10.0 | 106 | 78-122 | 6.63 | 30 | | |
| 4-Chlorotoluene | 10.7 | 0.02 | 0.20 | ug/L | 10.0 | 107 | 80-121 | 6.33 | 30 | | |
| t-Butylbenzene | 10.9 | 0.03 | 0.20 | ug/L | 10.0 | 109 | 78-125 | 7.30 | 30 | | |
| 1,3,5-Trimethylbenzene | 11.1 | 0.02 | 0.20 | ug/L | 10.0 | 111 | 80-129 | 7.70 | 30 | | |
| 1,2,4-Trimethylbenzene | 11.1 | 0.02 | 0.20 | ug/L | 10.0 | 111 | 80-127 | 6.45 | 30 | | |
| s-Butylbenzene | 11.1 | 0.02 | 0.20 | ug/L | 10.0 | 111 | 78-129 | 5.31 | 30 | | |
| 4-Isopropyl Toluene | 11.4 | 0.03 | 0.20 | ug/L | 10.0 | 114 | 79-130 | 6.58 | 30 | | |
| 1,3-Dichlorobenzene | 10.3 | 0.04 | 0.20 | ug/L | 10.0 | 103 | 80-120 | 7.25 | 30 | | |
| 1,4-Dichlorobenzene | 10.4 | 0.04 | 0.20 | ug/L | 10.0 | 104 | 80-120 | 8.03 | 30 | | |
| n-Butylbenzene | 11.4 | 0.02 | 0.20 | ug/L | 10.0 | 114 | 74-129 | 5.41 | 30 | | |
| 1,2-Dichlorobenzene | 10.5 | 0.04 | 0.20 | ug/L | 10.0 | 105 | 80-120 | 8.91 | 30 | | |
| 1,2-Dibromo-3-chloropropane | 7.74 | 0.37 | 0.50 | ug/L | 10.0 | 77.4 | 62-123 | 12.10 | 30 | Q | |
| 1,2,4-Trichlorobenzene | 10.6 | 0.11 | 0.50 | ug/L | 10.0 | 106 | 64-124 | 4.07 | 30 | | |
| Hexachloro-1,3-Butadiene | 11.5 | 0.07 | 0.20 | ug/L | 10.0 | 115 | 58-123 | 4.68 | 30 | | |
| Naphthalene | 9.73 | 0.12 | 0.50 | ug/L | 10.0 | 97.3 | 50-134 | 11.80 | 30 | | |
| 1,2,3-Trichlorobenzene | 10.5 | 0.11 | 0.20 | ug/L | 10.0 | 105 | 49-133 | 7.47 | 30 | | |
| Dichlorodifluoromethane | 10.2 | 0.05 | 0.20 | ug/L | 10.0 | 102 | 48-147 | 9.09 | 30 | | |
| Surrogate: Dibromofluoromethane | 5.02 | | | ug/L | 5.00 | 100 | 80-120 | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | 4.97 | | | ug/L | 5.00 | 99.3 | 80-129 | | | | |
| Surrogate: Toluene-d8 | 4.98 | | | ug/L | 5.00 | 99.7 | 80-120 | | | | |
| Surrogate: 4-Bromofluorobenzene | 5.14 | | | ug/L | 5.00 | 103 | 80-120 | | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 5.01 | | | ug/L | 5.00 | 100 | 80-120 | | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Semivolatile Organic Compounds - Quality Control

Batch BGL0225 - 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 (BGL0225-BLK1) | | | | | Prepared: 12-Dec-2018 Analyzed: 17-Dec-2018 13:01 | | | | | | |
| 1,4-Dioxane | ND | 0.2 | 0.4 | ug/L | | | | | | | U |
| Surrogate: 1,4-Dioxane-d8 | 41.3 | | | ug/L | 50.0 | | 82.6 | 33.6-120 | | | |
| LCS (BGL0225-BS1) | | | | | Prepared: 12-Dec-2018 Analyzed: 17-Dec-2018 13:34 | | | | | | |
| 1,4-Dioxane | 37.9 | 0.2 | 0.4 | ug/L | 50.0 | | 75.8 | 39.9-120 | | | |
| Surrogate: 1,4-Dioxane-d8 | 38.2 | | | ug/L | 50.0 | | 76.4 | 33.6-120 | | | |
| LCS Dup (BGL0225-BSD1) | | | | | Prepared: 12-Dec-2018 Analyzed: 17-Dec-2018 14:06 | | | | | | |
| 1,4-Dioxane | 37.8 | 0.2 | 0.4 | ug/L | 50.0 | | 75.7 | 39.9-120 | 0.19 | 30 | |
| Surrogate: 1,4-Dioxane-d8 | 36.4 | | | ug/L | 50.0 | | 72.7 | 33.6-120 | | | |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Semivolatle Organic Compounds - Quality Control

Batch BGL0267 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: VTS

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|------------------------------|--------|-----------------|-------|-------------|---------------|---|-------------|-----|-----------|-------|
| Blank (BGL0267-BLK1) | | | | | | | | | | |
| | | | | | | Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 15:39 | | | | |
| Phenol | ND | 1.0 | ug/L | | | | | | | U |
| bis(2-chloroethyl) ether | ND | 1.0 | ug/L | | | | | | | U |
| 2-Chlorophenol | ND | 1.0 | ug/L | | | | | | | U |
| 1,3-Dichlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| 1,4-Dichlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| Benzyl Alcohol | ND | 2.0 | ug/L | | | | | | | U |
| 1,2-Dichlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| 2-Methylphenol | ND | 1.0 | ug/L | | | | | | | U |
| 2,2'-Oxybis(1-chloropropane) | ND | 1.0 | ug/L | | | | | | | U |
| 4-Methylphenol | ND | 2.0 | ug/L | | | | | | | U |
| N-Nitroso-di-n-Propylamine | ND | 1.0 | ug/L | | | | | | | U |
| Hexachloroethane | ND | 2.0 | ug/L | | | | | | | U |
| Nitrobenzene | ND | 1.0 | ug/L | | | | | | | U |
| Isophorone | ND | 1.0 | ug/L | | | | | | | U |
| 2-Nitrophenol | ND | 3.0 | ug/L | | | | | | | U |
| 2,4-Dimethylphenol | ND | 3.0 | ug/L | | | | | | | U |
| Bis(2-Chloroethoxy)methane | ND | 1.0 | ug/L | | | | | | | U |
| Benzoic acid | ND | 20.0 | ug/L | | | | | | | U |
| 2,4-Dichlorophenol | ND | 3.0 | ug/L | | | | | | | U |
| 1,2,4-Trichlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| Naphthalene | ND | 1.0 | ug/L | | | | | | | U |
| 4-Chloroaniline | ND | 5.0 | ug/L | | | | | | | U |
| Hexachlorobutadiene | ND | 3.0 | ug/L | | | | | | | U |
| 4-Chloro-3-Methylphenol | ND | 3.0 | ug/L | | | | | | | U |
| 2-Methylnaphthalene | ND | 1.0 | ug/L | | | | | | | U |
| Hexachlorocyclopentadiene | ND | 5.0 | ug/L | | | | | | | U |
| 2,4,6-Trichlorophenol | ND | 3.0 | ug/L | | | | | | | U |
| 2,4,5-Trichlorophenol | ND | 5.0 | ug/L | | | | | | | U |
| 2-Chloronaphthalene | ND | 1.0 | ug/L | | | | | | | U |
| 2-Nitroaniline | ND | 3.0 | ug/L | | | | | | | U |
| Dimethylphthalate | ND | 1.0 | ug/L | | | | | | | U |
| Acenaphthylene | ND | 1.0 | ug/L | | | | | | | U |
| 2,6-Dinitrotoluene | ND | 3.0 | ug/L | | | | | | | U |
| 3-Nitroaniline | ND | 3.0 | ug/L | | | | | | | U |
| Acenaphthene | ND | 1.0 | ug/L | | | | | | | U |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Semivolatile Organic Compounds - Quality Control

Batch BGL0267 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: VTS

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0267-BLK1) | | | | | | | | | | |
| Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 15:39 | | | | | | | | | | |
| 2,4-Dinitrophenol | ND | 20.0 | ug/L | | | | | | | U |
| Dibenzofuran | ND | 1.0 | ug/L | | | | | | | U |
| 4-Nitrophenol | ND | 10.0 | ug/L | | | | | | | U |
| 2,4-Dinitrotoluene | ND | 3.0 | ug/L | | | | | | | U |
| Fluorene | ND | 1.0 | ug/L | | | | | | | U |
| Diethyl phthalate | ND | 1.0 | ug/L | | | | | | | U |
| 4-Chlorophenylphenyl ether | ND | 1.0 | ug/L | | | | | | | U |
| 4-Nitroaniline | ND | 3.0 | ug/L | | | | | | | U |
| 4,6-Dinitro-2-methylphenol | ND | 10.0 | ug/L | | | | | | | U |
| N-Nitrosodiphenylamine | ND | 1.0 | ug/L | | | | | | | U |
| 4-Bromophenyl phenyl ether | ND | 1.0 | ug/L | | | | | | | U |
| Hexachlorobenzene | ND | 1.0 | ug/L | | | | | | | U |
| Pentachlorophenol | ND | 10.0 | ug/L | | | | | | | U |
| Phenanthrene | ND | 1.0 | ug/L | | | | | | | U |
| Anthracene | ND | 1.0 | ug/L | | | | | | | U |
| Carbazole | ND | 1.0 | ug/L | | | | | | | U |
| Di-n-Butylphthalate | ND | 1.0 | ug/L | | | | | | | U |
| Fluoranthene | ND | 1.0 | ug/L | | | | | | | U |
| Pyrene | ND | 1.0 | ug/L | | | | | | | U |
| Butylbenzylphthalate | ND | 1.0 | ug/L | | | | | | | U |
| Benzo(a)anthracene | ND | 1.0 | ug/L | | | | | | | U |
| 3,3'-Dichlorobenzidine | ND | 5.0 | ug/L | | | | | | | U |
| Chrysene | ND | 1.0 | ug/L | | | | | | | U |
| bis(2-Ethylhexyl)phthalate | ND | 3.0 | ug/L | | | | | | | U |
| Di-n-Octylphthalate | ND | 1.0 | ug/L | | | | | | | U |
| Benzo(a)pyrene | ND | 1.0 | ug/L | | | | | | | U |
| Indeno(1,2,3-cd)pyrene | ND | 1.0 | ug/L | | | | | | | U |
| Dibenzo(a,h)anthracene | ND | 1.0 | ug/L | | | | | | | U |
| Benzo(g,h,i)perylene | ND | 1.0 | ug/L | | | | | | | U |
| Benzo(a)fluoranthene, Total | ND | 2.0 | ug/L | | | | | | | U |
| 1-Methylnaphthalene | ND | 1.0 | ug/L | | | | | | | U |
| Surrogate: 2-Fluorophenol | 28.4 | | ug/L | 37.5 | | 75.7 | 33-120 | | | |
| Surrogate: Phenol-d5 | 30.8 | | ug/L | 37.5 | | 82.0 | 38-120 | | | |
| Surrogate: 2-Chlorophenol-d4 | 29.9 | | ug/L | 37.5 | | 79.8 | 41-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 16.2 | | ug/L | 25.0 | | 64.7 | 20-120 | | | |



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Semivolatile Organic Compounds - Quality Control

Batch BGL0267 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: VTS

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------------------------------|--------|-----------------|-------|---|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0267-BLK1) | | | | Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 15:39 | | | | | | |
| Surrogate: Nitrobenzene-d5 | 19.2 | | ug/L | 25.0 | | 77.0 | 27-120 | | | |
| Surrogate: 2-Fluorobiphenyl | 18.8 | | ug/L | 25.0 | | 75.2 | 33-120 | | | |
| Surrogate: 2,4,6-Tribromophenol | 36.0 | | ug/L | 37.5 | | 96.1 | 52-120 | | | |
| Surrogate: p-Terphenyl-d14 | 24.8 | | ug/L | 25.0 | | 99.3 | 28-120 | | | |
| LCS (BGL0267-BS1) | | | | Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 16:12 | | | | | | |
| Phenol | 19.2 | 1.0 | ug/L | 25.0 | | 76.6 | 35-120 | | | |
| bis(2-chloroethyl) ether | 17.8 | 1.0 | ug/L | 25.0 | | 71.2 | 46.5-120 | | | |
| 2-Chlorophenol | 18.4 | 1.0 | ug/L | 25.0 | | 73.5 | 48-120 | | | |
| 1,3-Dichlorobenzene | 12.9 | 1.0 | ug/L | 25.0 | | 51.6 | 34.2-120 | | | |
| 1,4-Dichlorobenzene | 13.6 | 1.0 | ug/L | 25.0 | | 54.4 | 36-120 | | | |
| Benzyl Alcohol | 19.3 | 2.0 | ug/L | 25.0 | | 77.1 | 27.4-120 | | | |
| 1,2-Dichlorobenzene | 13.6 | 1.0 | ug/L | 25.0 | | 54.6 | 38.4-120 | | | |
| 2-Methylphenol | 18.6 | 1.0 | ug/L | 25.0 | | 74.4 | 47.8-120 | | | |
| 2,2'-Oxybis(1-chloropropane) | 16.5 | 1.0 | ug/L | 25.0 | | 66.1 | 40.4-120 | | | |
| 4-Methylphenol | 19.4 | 2.0 | ug/L | 25.0 | | 77.6 | 52.3-120 | | | |
| N-Nitroso-di-n-Propylamine | 17.7 | 1.0 | ug/L | 25.0 | | 70.7 | 51.4-120 | | | |
| Hexachloroethane | 10.8 | 2.0 | ug/L | 25.0 | | 43.1 | 29.5-120 | | | |
| Nitrobenzene | 17.7 | 1.0 | ug/L | 25.0 | | 70.8 | 51.5-120 | | | |
| Isophorone | 22.9 | 1.0 | ug/L | 25.0 | | 91.4 | 62.3-128 | | | |
| 2-Nitrophenol | 21.3 | 3.0 | ug/L | 25.0 | | 85.2 | 58.6-124 | | | |
| 2,4-Dimethylphenol | 53.7 | 3.0 | ug/L | 75.0 | | 71.6 | 38.5-120 | | | |
| Bis(2-Chloroethoxy)methane | 19.9 | 1.0 | ug/L | 25.0 | | 79.6 | 52.9-120 | | | |
| Benzoic acid | 99.3 | 20.0 | ug/L | 138 | | 72.2 | 38.2-120 | | | |
| 2,4-Dichlorophenol | 62.7 | 3.0 | ug/L | 75.0 | | 83.6 | 43.6-120 | | | |
| 1,2,4-Trichlorobenzene | 14.2 | 1.0 | ug/L | 25.0 | | 56.7 | 38.6-120 | | | |
| Naphthalene | 17.3 | 1.0 | ug/L | 25.0 | | 69.2 | 40.5-120 | | | |
| 4-Chloroaniline | 55.7 | 5.0 | ug/L | 75.0 | | 74.2 | 42.7-120 | | | |
| Hexachlorobutadiene | 11.1 | 3.0 | ug/L | 25.0 | | 44.3 | 32.3-120 | | | |
| 4-Chloro-3-Methylphenol | 63.8 | 3.0 | ug/L | 75.0 | | 85.0 | 51.9-120 | | | |
| 2-Methylnaphthalene | 17.3 | 1.0 | ug/L | 25.0 | | 69.3 | 47.3-120 | | | |
| Hexachlorocyclopentadiene | 39.1 | 5.0 | ug/L | 75.0 | | 52.1 | 23.3-120 | | | |
| 2,4,6-Trichlorophenol | 64.8 | 3.0 | ug/L | 75.0 | | 86.4 | 47-120 | | | |
| 2,4,5-Trichlorophenol | 66.4 | 5.0 | ug/L | 75.0 | | 88.6 | 48.4-120 | | | |
| 2-Chloronaphthalene | 17.3 | 1.0 | ug/L | 25.0 | | 69.3 | 47.7-123 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Semivolatile Organic Compounds - Quality Control

Batch BGL0267 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: VTS

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|----------------------------|--------|---|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| LCS (BGL0267-BS1) | | Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 16:12 | | | | | | | | |
| 2-Nitroaniline | 60.8 | 3.0 | ug/L | 75.0 | | 81.0 | 56.8-120 | | | |
| Dimethylphthalate | 20.2 | 1.0 | ug/L | 25.0 | | 81.0 | 65.2-125 | | | |
| Acenaphthylene | 19.1 | 1.0 | ug/L | 25.0 | | 76.5 | 44.1-120 | | | |
| 2,6-Dinitrotoluene | 66.8 | 3.0 | ug/L | 75.0 | | 89.1 | 69.3-140 | | | |
| 3-Nitroaniline | 67.6 | 3.0 | ug/L | 75.0 | | 90.2 | 60.9-120 | | | |
| Acenaphthene | 18.3 | 1.0 | ug/L | 25.0 | | 73.2 | 50.4-120 | | | |
| 2,4-Dinitrophenol | 123 | 20.0 | ug/L | 138 | | 89.2 | 33.7-183 | | | |
| Dibenzofuran | 20.1 | 1.0 | ug/L | 25.0 | | 80.5 | 49.9-120 | | | |
| 4-Nitrophenol | 64.0 | 10.0 | ug/L | 75.0 | | 85.4 | 50.2-136 | | | |
| 2,4-Dinitrotoluene | 64.7 | 3.0 | ug/L | 75.0 | | 86.3 | 66.8-132 | | | |
| Fluorene | 19.8 | 1.0 | ug/L | 25.0 | | 79.3 | 57.8-120 | | | |
| Diethyl phthalate | 20.1 | 1.0 | ug/L | 25.0 | | 80.4 | 68.1-120 | | | |
| 4-Chlorophenylphenyl ether | 20.4 | 1.0 | ug/L | 25.0 | | 81.8 | 59.1-127 | | | |
| 4-Nitroaniline | 68.4 | 3.0 | ug/L | 75.0 | | 91.3 | 56-122 | | | |
| 4,6-Dinitro-2-methylphenol | 119 | 10.0 | ug/L | 138 | | 86.7 | 37.9-162 | | | |
| N-Nitrosodiphenylamine | 18.3 | 1.0 | ug/L | 25.0 | | 73.1 | 59.6-120 | | | |
| 4-Bromophenyl phenyl ether | 20.3 | 1.0 | ug/L | 25.0 | | 81.2 | 59.6-120 | | | |
| Hexachlorobenzene | 19.5 | 1.0 | ug/L | 25.0 | | 78.2 | 53.7-120 | | | |
| Pentachlorophenol | 63.1 | 10.0 | ug/L | 75.0 | | 84.1 | 40.3-128 | | | |
| Phenanthrene | 19.5 | 1.0 | ug/L | 25.0 | | 78.0 | 58.8-120 | | | |
| Anthracene | 18.8 | 1.0 | ug/L | 25.0 | | 75.0 | 60.5-120 | | | |
| Carbazole | 18.7 | 1.0 | ug/L | 25.0 | | 74.6 | 59.7-120 | | | |
| Di-n-Butylphthalate | 20.4 | 1.0 | ug/L | 25.0 | | 81.6 | 71-120 | | | |
| Fluoranthene | 21.1 | 1.0 | ug/L | 25.0 | | 84.3 | 66.7-120 | | | |
| Pyrene | 19.6 | 1.0 | ug/L | 25.0 | | 78.3 | 62.7-127 | | | |
| Butylbenzylphthalate | 19.6 | 1.0 | ug/L | 25.0 | | 78.3 | 67.4-128 | | | |
| Benzo(a)anthracene | 19.9 | 1.0 | ug/L | 25.0 | | 79.6 | 58.3-128 | | | |
| 3,3'-Dichlorobenzidine | 70.6 | 5.0 | ug/L | 75.0 | | 94.1 | 34.1-120 | | | |
| Chrysene | 21.0 | 1.0 | ug/L | 25.0 | | 83.9 | 58.9-120 | | | |
| bis(2-Ethylhexyl)phthalate | 20.7 | 3.0 | ug/L | 25.0 | | 82.7 | 68.3-123 | | | |
| Di-n-Octylphthalate | 20.0 | 1.0 | ug/L | 25.0 | | 79.9 | 61.5-120 | | | |
| Benzo(a)pyrene | 19.5 | 1.0 | ug/L | 25.0 | | 78.0 | 70.6-120 | | | |
| Indeno(1,2,3-cd)pyrene | 16.9 | 1.0 | ug/L | 25.0 | | 67.7 | 46.5-120 | | | |
| Dibenzo(a,h)anthracene | 17.1 | 1.0 | ug/L | 25.0 | | 68.3 | 49.6-120 | | | |
| Benzo(g,h,i)perylene | 15.3 | 1.0 | ug/L | 25.0 | | 61.1 | 37-120 | | | Q |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Semivolatile Organic Compounds - Quality Control

Batch BGL0267 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: VTS

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|--------|-----------------|-------|-------------|---|------|-------------|-----|-----------|-------|
| LCS (BGL0267-BS1) | | | | | | | | | | |
| | | | | | Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 16:12 | | | | | |
| Benzofluoranthenes, Total | 43.9 | 2.0 | ug/L | 50.0 | | 87.8 | 66.5-120 | | | |
| 1-Methylnaphthalene | 19.2 | 1.0 | ug/L | 25.0 | | 76.9 | 46.9-120 | | | |
| Surrogate: 2-Fluorophenol | 28.7 | | ug/L | 37.5 | | 76.6 | 33-120 | | | |
| Surrogate: Phenol-d5 | 31.4 | | ug/L | 37.5 | | 83.7 | 38-120 | | | |
| Surrogate: 2-Chlorophenol-d4 | 30.8 | | ug/L | 37.5 | | 82.1 | 41-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 16.4 | | ug/L | 25.0 | | 65.6 | 20-120 | | | |
| Surrogate: Nitrobenzene-d5 | 20.2 | | ug/L | 25.0 | | 80.9 | 27-120 | | | |
| Surrogate: 2-Fluorobiphenyl | 21.2 | | ug/L | 25.0 | | 84.6 | 33-120 | | | |
| Surrogate: 2,4,6-Tribromophenol | 39.8 | | ug/L | 37.5 | | 106 | 52-120 | | | |
| Surrogate: p-Terphenyl-d14 | 25.0 | | ug/L | 25.0 | | 99.8 | 28-120 | | | |

| | | | | | | | | | | |
|-------------------------------|------|------|------|------|---|------|----------|------|----|--|
| LCS Dup (BGL0267-BSD1) | | | | | | | | | | |
| | | | | | Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 16:46 | | | | | |
| Phenol | 19.3 | 1.0 | ug/L | 25.0 | | 77.3 | 35-120 | 0.90 | 30 | |
| bis(2-chloroethyl) ether | 19.3 | 1.0 | ug/L | 25.0 | | 77.1 | 46.5-120 | 7.87 | 30 | |
| 2-Chlorophenol | 19.8 | 1.0 | ug/L | 25.0 | | 79.0 | 48-120 | 7.20 | 30 | |
| 1,3-Dichlorobenzene | 12.7 | 1.0 | ug/L | 25.0 | | 50.6 | 34.2-120 | 1.90 | 30 | |
| 1,4-Dichlorobenzene | 13.6 | 1.0 | ug/L | 25.0 | | 54.3 | 36-120 | 0.15 | 30 | |
| Benzyl Alcohol | 20.1 | 2.0 | ug/L | 25.0 | | 80.3 | 27.4-120 | 4.08 | 30 | |
| 1,2-Dichlorobenzene | 13.9 | 1.0 | ug/L | 25.0 | | 55.4 | 38.4-120 | 1.52 | 30 | |
| 2-Methylphenol | 19.9 | 1.0 | ug/L | 25.0 | | 79.7 | 47.8-120 | 6.86 | 30 | |
| 2,2'-Oxybis(1-chloropropane) | 17.6 | 1.0 | ug/L | 25.0 | | 70.5 | 40.4-120 | 6.48 | 30 | |
| 4-Methylphenol | 20.1 | 2.0 | ug/L | 25.0 | | 80.4 | 52.3-120 | 3.61 | 30 | |
| N-Nitroso-di-n-Propylamine | 18.4 | 1.0 | ug/L | 25.0 | | 73.5 | 51.4-120 | 4.02 | 30 | |
| Hexachloroethane | 10.3 | 2.0 | ug/L | 25.0 | | 41.3 | 29.5-120 | 4.27 | 30 | |
| Nitrobenzene | 19.1 | 1.0 | ug/L | 25.0 | | 76.4 | 51.5-120 | 7.58 | 30 | |
| Isophorone | 23.8 | 1.0 | ug/L | 25.0 | | 95.1 | 62.3-128 | 3.94 | 30 | |
| 2-Nitrophenol | 22.8 | 3.0 | ug/L | 25.0 | | 91.0 | 58.6-124 | 6.59 | 30 | |
| 2,4-Dimethylphenol | 57.5 | 3.0 | ug/L | 75.0 | | 76.6 | 38.5-120 | 6.87 | 30 | |
| Bis(2-Chloroethoxy)methane | 20.8 | 1.0 | ug/L | 25.0 | | 83.3 | 52.9-120 | 4.56 | 30 | |
| Benzoic acid | 106 | 20.0 | ug/L | 138 | | 76.8 | 38.2-120 | 6.15 | 30 | |
| 2,4-Dichlorophenol | 66.8 | 3.0 | ug/L | 75.0 | | 89.0 | 43.6-120 | 6.26 | 30 | |
| 1,2,4-Trichlorobenzene | 14.5 | 1.0 | ug/L | 25.0 | | 57.9 | 38.6-120 | 2.09 | 30 | |
| Naphthalene | 17.7 | 1.0 | ug/L | 25.0 | | 70.8 | 40.5-120 | 2.32 | 30 | |
| 4-Chloroaniline | 57.2 | 5.0 | ug/L | 75.0 | | 76.2 | 42.7-120 | 2.62 | 30 | |
| Hexachlorobutadiene | 11.5 | 3.0 | ug/L | 25.0 | | 46.0 | 32.3-120 | 3.81 | 30 | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Semivolatile Organic Compounds - Quality Control

Batch BGL0267 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: VTS

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-------------------------------|--------|---|-------|-------------|---------------|------|-------------|------|-----------|-------|
| LCS Dup (BGL0267-BSD1) | | Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 16:46 | | | | | | | | |
| 4-Chloro-3-Methylphenol | 66.8 | 3.0 | ug/L | 75.0 | | 89.0 | 51.9-120 | 4.56 | 30 | |
| 2-Methylnaphthalene | 17.8 | 1.0 | ug/L | 25.0 | | 71.3 | 47.3-120 | 2.79 | 30 | |
| Hexachlorocyclopentadiene | 41.6 | 5.0 | ug/L | 75.0 | | 55.4 | 23.3-120 | 6.21 | 30 | |
| 2,4,6-Trichlorophenol | 67.1 | 3.0 | ug/L | 75.0 | | 89.5 | 47-120 | 3.53 | 30 | |
| 2,4,5-Trichlorophenol | 68.4 | 5.0 | ug/L | 75.0 | | 91.2 | 48.4-120 | 2.93 | 30 | |
| 2-Chloronaphthalene | 17.8 | 1.0 | ug/L | 25.0 | | 71.3 | 47.7-123 | 2.84 | 30 | |
| 2-Nitroaniline | 63.2 | 3.0 | ug/L | 75.0 | | 84.3 | 56.8-120 | 3.90 | 30 | |
| Dimethylphthalate | 21.0 | 1.0 | ug/L | 25.0 | | 83.9 | 65.2-125 | 3.58 | 30 | |
| Acenaphthylene | 19.5 | 1.0 | ug/L | 25.0 | | 78.0 | 44.1-120 | 1.98 | 30 | |
| 2,6-Dinitrotoluene | 69.3 | 3.0 | ug/L | 75.0 | | 92.3 | 69.3-140 | 3.59 | 30 | |
| 3-Nitroaniline | 69.8 | 3.0 | ug/L | 75.0 | | 93.0 | 60.9-120 | 3.12 | 30 | |
| Acenaphthene | 18.9 | 1.0 | ug/L | 25.0 | | 75.8 | 50.4-120 | 3.49 | 30 | |
| 2,4-Dinitrophenol | 130 | 20.0 | ug/L | 138 | | 94.6 | 33.7-183 | 5.88 | 30 | |
| Dibenzofuran | 20.8 | 1.0 | ug/L | 25.0 | | 83.3 | 49.9-120 | 3.48 | 30 | |
| 4-Nitrophenol | 70.3 | 10.0 | ug/L | 75.0 | | 93.8 | 50.2-136 | 9.37 | 30 | |
| 2,4-Dinitrotoluene | 67.6 | 3.0 | ug/L | 75.0 | | 90.2 | 66.8-132 | 4.40 | 30 | |
| Fluorene | 20.5 | 1.0 | ug/L | 25.0 | | 82.2 | 57.8-120 | 3.55 | 30 | |
| Diethyl phthalate | 21.2 | 1.0 | ug/L | 25.0 | | 84.8 | 68.1-120 | 5.29 | 30 | |
| 4-Chlorophenylphenyl ether | 21.6 | 1.0 | ug/L | 25.0 | | 86.6 | 59.1-127 | 5.66 | 30 | |
| 4-Nitroaniline | 72.1 | 3.0 | ug/L | 75.0 | | 96.1 | 56-122 | 5.20 | 30 | |
| 4,6-Dinitro-2-methylphenol | 127 | 10.0 | ug/L | 138 | | 92.2 | 37.9-162 | 6.09 | 30 | |
| N-Nitrosodiphenylamine | 18.8 | 1.0 | ug/L | 25.0 | | 75.1 | 59.6-120 | 2.70 | 30 | |
| 4-Bromophenyl phenyl ether | 21.2 | 1.0 | ug/L | 25.0 | | 85.0 | 59.6-120 | 4.50 | 30 | |
| Hexachlorobenzene | 20.7 | 1.0 | ug/L | 25.0 | | 82.9 | 53.7-120 | 5.84 | 30 | |
| Pentachlorophenol | 66.6 | 10.0 | ug/L | 75.0 | | 88.8 | 40.3-128 | 5.40 | 30 | |
| Phenanthrene | 20.5 | 1.0 | ug/L | 25.0 | | 81.9 | 58.8-120 | 4.93 | 30 | |
| Anthracene | 19.7 | 1.0 | ug/L | 25.0 | | 79.0 | 60.5-120 | 5.13 | 30 | |
| Carbazole | 19.4 | 1.0 | ug/L | 25.0 | | 77.7 | 59.7-120 | 4.03 | 30 | |
| Di-n-Butylphthalate | 21.5 | 1.0 | ug/L | 25.0 | | 86.0 | 71-120 | 5.32 | 30 | |
| Fluoranthene | 22.3 | 1.0 | ug/L | 25.0 | | 89.1 | 66.7-120 | 5.59 | 30 | |
| Pyrene | 20.4 | 1.0 | ug/L | 25.0 | | 81.4 | 62.7-127 | 3.87 | 30 | |
| Butylbenzylphthalate | 20.2 | 1.0 | ug/L | 25.0 | | 80.8 | 67.4-128 | 3.16 | 30 | |
| Benzo(a)anthracene | 20.9 | 1.0 | ug/L | 25.0 | | 83.6 | 58.3-128 | 4.88 | 30 | |
| 3,3'-Dichlorobenzidine | 71.5 | 5.0 | ug/L | 75.0 | | 95.4 | 34.1-120 | 1.36 | 30 | |
| Chrysene | 22.0 | 1.0 | ug/L | 25.0 | | 88.1 | 58.9-120 | 4.90 | 30 | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Semivolatile Organic Compounds - Quality Control

Batch BGL0267 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: VTS

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|--------|-----------------|-------|---|---------------|------|-------------|------|-----------|-------|
| LCS Dup (BGL0267-BSD1) | | | | Prepared: 11-Dec-2018 Analyzed: 17-Dec-2018 16:46 | | | | | | |
| bis(2-Ethylhexyl)phthalate | 21.5 | 3.0 | ug/L | 25.0 | | 85.9 | 68.3-123 | 3.84 | 30 | |
| Di-n-Octylphthalate | 21.4 | 1.0 | ug/L | 25.0 | | 85.4 | 61.5-120 | 6.64 | 30 | |
| Benzo(a)pyrene | 20.6 | 1.0 | ug/L | 25.0 | | 82.6 | 70.6-120 | 5.69 | 30 | |
| Indeno(1,2,3-cd)pyrene | 17.5 | 1.0 | ug/L | 25.0 | | 69.9 | 46.5-120 | 3.23 | 30 | |
| Dibenzo(a,h)anthracene | 17.6 | 1.0 | ug/L | 25.0 | | 70.3 | 49.6-120 | 2.75 | 30 | |
| Benzo(g,h,i)perylene | 15.6 | 1.0 | ug/L | 25.0 | | 62.4 | 37-120 | 2.00 | 30 | Q |
| Benzo(a)fluoranthene, Total | 45.8 | 2.0 | ug/L | 50.0 | | 91.6 | 66.5-120 | 4.27 | 30 | |
| 1-Methylnaphthalene | 19.8 | 1.0 | ug/L | 25.0 | | 79.0 | 46.9-120 | 2.69 | 30 | |
| Surrogate: 2-Fluorophenol | 29.7 | | ug/L | 37.5 | | 79.1 | 33-120 | | | |
| Surrogate: Phenol-d5 | 32.2 | | ug/L | 37.5 | | 86.0 | 38-120 | | | |
| Surrogate: 2-Chlorophenol-d4 | 32.2 | | ug/L | 37.5 | | 85.8 | 41-120 | | | |
| Surrogate: 1,2-Dichlorobenzene-d4 | 17.0 | | ug/L | 25.0 | | 67.9 | 20-120 | | | |
| Surrogate: Nitrobenzene-d5 | 21.1 | | ug/L | 25.0 | | 84.5 | 27-120 | | | |
| Surrogate: 2-Fluorobiphenyl | 21.2 | | ug/L | 25.0 | | 84.7 | 33-120 | | | |
| Surrogate: 2,4,6-Tribromophenol | 40.0 | | ug/L | 37.5 | | 107 | 52-120 | | | |
| Surrogate: p-Terphenyl-d14 | 24.7 | | ug/L | 25.0 | | 98.8 | 28-120 | | | |



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|---|--|--------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|--------------------------------|

Petroleum Hydrocarbons - Quality Control

Batch BGL0197 - EPA 3510C SepF

Instrument: FID4 Analyst: JGR

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|------------------------------------|--------|---|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0197-BLK1) | | Prepared: 09-Dec-2018 Analyzed: 10-Dec-2018 17:45 | | | | | | | | |
| Gasoline Range Organics (Tol-C12) | ND | 0.25 | mg/L | | | | | | | U |
| Diesel Range Organics (C12-C24) | ND | 0.50 | mg/L | | | | | | | U |
| Motor Oil Range Organics (C24-C38) | ND | 1.00 | mg/L | | | | | | | U |
| Surrogate: <i>o</i> -Terphenyl | 0.223 | | mg/L | 0.225 | 99.0 | | 50-150 | | | |
| Surrogate: <i>n</i> -Triacontane | 0.240 | | mg/L | 0.225 | 106 | | 50-150 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Chlorinated Pesticides - Quality Control

Batch BGL0292 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0292-BLK1) | | | | | | | | | | |
| Prepared: 12-Dec-2018 Analyzed: 19-Dec-2018 16:44 | | | | | | | | | | |
| alpha-BHC | ND | 0.025 | ug/L | | | | | | | U |
| beta-BHC | ND | 0.025 | ug/L | | | | | | | U |
| gamma-BHC (Lindane) | ND | 0.025 | ug/L | | | | | | | U |
| delta-BHC | ND | 0.025 | ug/L | | | | | | | U |
| Heptachlor | ND | 0.025 | ug/L | | | | | | | U |
| Aldrin | ND | 0.025 | ug/L | | | | | | | U |
| Heptachlor Epoxide | ND | 0.050 | ug/L | | | | | | | U |
| trans-Chlordane (beta-Chlordane) | ND | 0.025 | ug/L | | | | | | | U |
| cis-Chlordane (alpha-chlordane) | ND | 0.025 | ug/L | | | | | | | U |
| Endosulfan I | ND | 0.025 | ug/L | | | | | | | U |
| 4,4'-DDE | ND | 0.050 | ug/L | | | | | | | U |
| Dieldrin | ND | 0.050 | ug/L | | | | | | | U |
| Endrin | ND | 0.050 | ug/L | | | | | | | U |
| Endosulfan II | ND | 0.050 | ug/L | | | | | | | U |
| 4,4'-DDD | ND | 0.050 | ug/L | | | | | | | U |
| Endrin Aldehyde | ND | 0.050 | ug/L | | | | | | | U |
| 4,4'-DDT | ND | 0.050 | ug/L | | | | | | | U |
| Endosulfan Sulfate | ND | 0.050 | ug/L | | | | | | | U |
| Endrin Ketone | ND | 0.050 | ug/L | | | | | | | U |
| Methoxychlor | ND | 0.250 | ug/L | | | | | | | U |
| Toxaphene | ND | 1.25 | ug/L | | | | | | | U |
| Surrogate: Decachlorobiphenyl | 0.323 | | ug/L | 0.400 | | 80.7 | 11-144 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.284 | | ug/L | 0.400 | | 71.1 | 11-144 | | | |
| Surrogate: Tetrachlorometaxylenes | 0.329 | | ug/L | 0.400 | | 82.2 | 30-120 | | | |
| Surrogate: Tetrachlorometaxylenes [2C] | 0.350 | | ug/L | 0.400 | | 87.4 | 30-120 | | | |

| | | | | | | | | | | |
|---|-------|-------|------|-------|--|------|--------|--|--|--|
| LCS (BGL0292-BS1) | | | | | | | | | | |
| Prepared: 12-Dec-2018 Analyzed: 19-Dec-2018 17:02 | | | | | | | | | | |
| alpha-BHC | 0.173 | 0.025 | ug/L | 0.200 | | 86.6 | 57-120 | | | |
| beta-BHC | 0.164 | 0.025 | ug/L | 0.200 | | 82.0 | 59-120 | | | |
| gamma-BHC (Lindane) | 0.185 | 0.025 | ug/L | 0.200 | | 92.5 | 62-120 | | | |
| delta-BHC | 0.164 | 0.025 | ug/L | 0.200 | | 82.1 | 15-145 | | | |
| Heptachlor | 0.173 | 0.025 | ug/L | 0.200 | | 86.7 | 54-120 | | | |
| Aldrin | 0.176 | 0.025 | ug/L | 0.200 | | 88.1 | 47-120 | | | |
| Heptachlor Epoxide | 0.182 | 0.050 | ug/L | 0.200 | | 91.0 | 63-120 | | | |
| trans-Chlordane (beta-Chlordane) | 0.180 | 0.025 | ug/L | 0.200 | | 90.1 | 63-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Chlorinated Pesticides - Quality Control

Batch BGL0292 - EPA 3510C SepF

Instrument: ECD6 Analyst: yz

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------------------------------------|--------|-----------------|-------|-------------|---|------|-------------|------|-----------|-------|
| LCS (BGL0292-BS1) | | | | | | | | | | |
| | | | | | Prepared: 12-Dec-2018 Analyzed: 19-Dec-2018 17:02 | | | | | |
| cis-Chlordane (alpha-chlordane) | 0.182 | 0.025 | ug/L | 0.200 | | 91.2 | 60-120 | | | |
| Endosulfan I | 0.176 | 0.025 | ug/L | 0.200 | | 88.1 | 58-121 | | | |
| 4,4'-DDE | 0.408 | 0.050 | ug/L | 0.400 | | 102 | 69-128 | | | |
| Dieldrin | 0.378 | 0.050 | ug/L | 0.400 | | 94.4 | 62-120 | | | |
| Endrin | 0.376 | 0.050 | ug/L | 0.400 | | 94.1 | 64-120 | | | |
| Endosulfan II | 0.354 | 0.050 | ug/L | 0.400 | | 88.4 | 64-120 | | | |
| 4,4'-DDD | 0.367 | 0.050 | ug/L | 0.400 | | 91.8 | 63-120 | | | |
| Endrin Aldehyde | 0.327 | 0.050 | ug/L | 0.400 | | 81.7 | 41-120 | | | |
| 4,4'-DDT | 0.377 | 0.050 | ug/L | 0.400 | | 94.4 | 57-124 | | | |
| Endosulfan Sulfate | 0.335 | 0.050 | ug/L | 0.400 | | 83.7 | 47-120 | | | |
| Endrin Ketone | 0.359 | 0.050 | ug/L | 0.400 | | 89.6 | 58-120 | | | |
| Methoxychlor | 1.84 | 0.250 | ug/L | 2.00 | | 92.2 | 56-120 | | | |
| Surrogate: Decachlorobiphenyl | 0.376 | | ug/L | 0.400 | | 94.0 | 11-144 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.338 | | ug/L | 0.400 | | 84.5 | 11-144 | | | |
| Surrogate: Tetrachlorometaxylene | 0.338 | | ug/L | 0.400 | | 84.6 | 30-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.347 | | ug/L | 0.400 | | 86.7 | 30-120 | | | |
| LCS Dup (BGL0292-BSD1) | | | | | | | | | | |
| | | | | | Prepared: 12-Dec-2018 Analyzed: 19-Dec-2018 17:20 | | | | | |
| alpha-BHC | 0.163 | 0.025 | ug/L | 0.200 | | 81.5 | 57-120 | 6.13 | 30 | |
| beta-BHC | 0.160 | 0.025 | ug/L | 0.200 | | 79.9 | 59-120 | 2.61 | 30 | |
| gamma-BHC (Lindane) | 0.178 | 0.025 | ug/L | 0.200 | | 89.1 | 62-120 | 3.73 | 30 | |
| delta-BHC | 0.162 | 0.025 | ug/L | 0.200 | | 80.8 | 15-145 | 3.70 | 30 | |
| Heptachlor | 0.162 | 0.025 | ug/L | 0.200 | | 81.0 | 54-120 | 5.47 | 30 | |
| Aldrin | 0.167 | 0.025 | ug/L | 0.200 | | 83.3 | 47-120 | 5.65 | 30 | |
| Heptachlor Epoxide | 0.181 | 0.050 | ug/L | 0.200 | | 90.5 | 63-120 | 0.95 | 30 | |
| trans-Chlordane (beta-Chlordane) | 0.175 | 0.025 | ug/L | 0.200 | | 87.5 | 63-120 | 2.84 | 30 | |
| cis-Chlordane (alpha-chlordane) | 0.177 | 0.025 | ug/L | 0.200 | | 88.4 | 60-120 | 3.14 | 30 | |
| Endosulfan I | 0.175 | 0.025 | ug/L | 0.200 | | 87.5 | 58-121 | 0.78 | 30 | |
| 4,4'-DDE | 0.394 | 0.050 | ug/L | 0.400 | | 98.4 | 69-128 | 3.66 | 30 | |
| Dieldrin | 0.371 | 0.050 | ug/L | 0.400 | | 92.7 | 62-120 | 1.86 | 30 | |
| Endrin | 0.369 | 0.050 | ug/L | 0.400 | | 92.1 | 64-120 | 1.32 | 30 | |
| Endosulfan II | 0.354 | 0.050 | ug/L | 0.400 | | 88.5 | 64-120 | 0.49 | 30 | |
| 4,4'-DDD | 0.361 | 0.050 | ug/L | 0.400 | | 90.4 | 63-120 | 1.57 | 30 | |
| Endrin Aldehyde | 0.342 | 0.050 | ug/L | 0.400 | | 85.5 | 41-120 | 4.58 | 30 | |
| 4,4'-DDT | 0.375 | 0.050 | ug/L | 0.400 | | 93.8 | 57-124 | 0.61 | 30 | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Chlorinated Pesticides - Quality Control

Batch BGL0292 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------------------------------------|--------|---|-------|-------------|---------------|------|-------------|------|-----------|-------|
| LCS Dup (BGL0292-BSD1) | | Prepared: 12-Dec-2018 Analyzed: 19-Dec-2018 17:20 | | | | | | | | |
| Endosulfan Sulfate | 0.338 | 0.050 | ug/L | 0.400 | | 84.4 | 47-120 | 0.83 | 30 | |
| Endrin Ketone | 0.358 | 0.050 | ug/L | 0.400 | | 89.6 | 58-120 | 0.06 | 30 | |
| Methoxychlor | 1.83 | 0.250 | ug/L | 2.00 | | 91.4 | 56-120 | 0.87 | 30 | |
| Surrogate: Decachlorobiphenyl | 0.394 | | ug/L | 0.400 | | 98.5 | 11-144 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.349 | | ug/L | 0.400 | | 87.1 | 11-144 | | | |
| Surrogate: Tetrachlorometaxylene | 0.284 | | ug/L | 0.400 | | 71.0 | 30-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.293 | | ug/L | 0.400 | | 73.2 | 30-120 | | | |



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

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Dec-2018 14:37

Aroclor PCB - Quality Control

Batch BGL0213 - EPA 3510C SepF

Instrument: ECD7 Analyst: JGR

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---------------------------------------|---------|-----------------|-------|-------------|---|------|-------------|-------|-----------|-------|
| Blank (BGL0213-BLK1) | | | | | | | | | | |
| | | | | | Prepared: 10-Dec-2018 Analyzed: 17-Dec-2018 18:21 | | | | | |
| Aroclor 1016 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1221 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1232 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1242 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1248 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1254 | ND | 0.010 | ug/L | | | | | | | U |
| Aroclor 1260 | ND | 0.010 | ug/L | | | | | | | U |
| Surrogate: Decachlorobiphenyl | 0.0110 | | ug/L | 0.0200 | | 55.0 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene | 0.0104 | | ug/L | 0.0200 | | 52.1 | 32-120 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.0108 | | ug/L | 0.0200 | | 54.1 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.00976 | | ug/L | 0.0200 | | 48.8 | 32-120 | | | |
| LCS (BGL0213-BS1) | | | | | | | | | | |
| | | | | | Prepared: 10-Dec-2018 Analyzed: 17-Dec-2018 18:43 | | | | | |
| Aroclor 1016 | 0.041 | 0.010 | ug/L | 0.0500 | | 81.6 | 54-120 | | | |
| Aroclor 1260 | 0.036 | 0.010 | ug/L | 0.0500 | | 72.8 | 51-128 | | | |
| Surrogate: Decachlorobiphenyl | 0.0110 | | ug/L | 0.0200 | | 54.8 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene | 0.0114 | | ug/L | 0.0200 | | 56.8 | 32-120 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.0107 | | ug/L | 0.0200 | | 53.4 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.0104 | | ug/L | 0.0200 | | 51.9 | 32-120 | | | |
| LCS Dup (BGL0213-BSD1) | | | | | | | | | | |
| | | | | | Prepared: 10-Dec-2018 Analyzed: 17-Dec-2018 19:04 | | | | | |
| Aroclor 1016 | 0.047 | 0.010 | ug/L | 0.0500 | | 93.8 | 54-120 | 19.20 | 30 | |
| Aroclor 1260 | 0.037 | 0.010 | ug/L | 0.0500 | | 74.9 | 51-128 | 2.89 | 30 | |
| Surrogate: Decachlorobiphenyl | 0.0126 | | ug/L | 0.0200 | | 63.0 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene | 0.0126 | | ug/L | 0.0200 | | 63.0 | 32-120 | | | |
| Surrogate: Decachlorobiphenyl [2C] | 0.0114 | | ug/L | 0.0200 | | 57.1 | 29-120 | | | |
| Surrogate: Tetrachlorometaxylene [2C] | 0.0106 | | ug/L | 0.0200 | | 53.0 | 32-120 | | | |



| | | |
|---|--|---------------------------------------|
| Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333 | Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman | Reported: 27-Dec-2018 14:37 |
|---|--|---------------------------------------|

Metals and Metallic Compounds - Quality Control

Batch BGL0397 - TLM EPA 7470A low level

Instrument: CVAA Analyst: SKM

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------|--------|-----------------|-------|-------------|---|------|-------------|-----|-----------|-------|
| Blank (BGL0397-BLK1) | | | | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 13:02 | | | | | |
| Mercury | ND | 20 | ng/L | | | | | | | U |
| LCS (BGL0397-BS1) | | | | | Prepared: 14-Dec-2018 Analyzed: 17-Dec-2018 13:05 | | | | | |
| Mercury | 228 | 20 | ng/L | 200 | | 114 | 80-120 | | | |



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Project Number: Landsburg
Project Manager: Gary Zimmerman

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Metals and Metallic Compounds - Quality Control

Batch BGL0429 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|--------|-----------------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| Blank (BGL0429-BLK1) | | | | | | | | | | |
| Prepared: 17-Dec-2018 Analyzed: 19-Dec-2018 10:44 | | | | | | | | | | |
| Aluminum | ND | 1000 | ug/L | | | | | | | U |
| Barium | ND | 500 | ug/L | | | | | | | U |
| Beryllium | ND | 2.0 | ug/L | | | | | | | U |
| Cadmium | ND | 2.0 | ug/L | | | | | | | U |
| Calcium | ND | 500 | ug/L | | | | | | | U |
| Chromium | ND | 1000 | ug/L | | | | | | | U |
| Cobalt | ND | 10.0 | ug/L | | | | | | | U |
| Copper | ND | 3.0 | ug/L | | | | | | | U |
| Iron | ND | 200 | ug/L | | | | | | | U |
| Magnesium | ND | 1000 | ug/L | | | | | | | U |
| Manganese | ND | 20.0 | ug/L | | | | | | | U |
| Nickel | ND | 20.0 | ug/L | | | | | | | U |
| Potassium | ND | 500 | ug/L | | | | | | | U |
| Silver | ND | 3.0 | ug/L | | | | | | | U |
| Sodium | ND | 500 | ug/L | | | | | | | U |
| Sodium | ND | 50000 | ug/L | | | | | | | U |
| Vanadium | ND | 3.0 | ug/L | | | | | | | U |
| Zinc | ND | 20.0 | ug/L | | | | | | | U |

| | | | | | | | | | | |
|---|-------|------|------|-------|--|------|--------|--|--|---|
| LCS (BGL0429-BS1) | | | | | | | | | | |
| Prepared: 17-Dec-2018 Analyzed: 19-Dec-2018 11:20 | | | | | | | | | | |
| Aluminum | 2030 | 1000 | ug/L | 2000 | | 102 | 80-120 | | | |
| Barium | 2010 | 500 | ug/L | 2000 | | 100 | 80-120 | | | |
| Beryllium | 499 | 2.0 | ug/L | 500 | | 99.8 | 80-120 | | | |
| Cadmium | 492 | 2.0 | ug/L | 500 | | 98.4 | 80-120 | | | |
| Calcium | 9790 | 500 | ug/L | 10000 | | 97.9 | 80-120 | | | |
| Chromium | ND | 1000 | ug/L | 500 | | 104 | 80-120 | | | U |
| Cobalt | 498 | 10.0 | ug/L | 500 | | 99.5 | 80-120 | | | |
| Copper | 499 | 3.0 | ug/L | 500 | | 99.7 | 80-120 | | | |
| Iron | 2010 | 200 | ug/L | 2000 | | 101 | 80-120 | | | |
| Magnesium | 10100 | 1000 | ug/L | 10000 | | 101 | 80-120 | | | |
| Manganese | 496 | 20.0 | ug/L | 500 | | 99.1 | 80-120 | | | |
| Nickel | 502 | 20.0 | ug/L | 500 | | 100 | 80-120 | | | |
| Potassium | 9870 | 500 | ug/L | 10000 | | 98.7 | 80-120 | | | |
| Silver | 541 | 3.0 | ug/L | 500 | | 108 | 80-120 | | | |
| Sodium | 9530 | 500 | ug/L | 10000 | | 95.3 | 80-120 | | | |



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Metals and Metallic Compounds - Quality Control

Batch BGL0429 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|--------|--|-------|-------------|---------------|------|-------------|------|-----------|-------|
| LCS (BGL0429-BS1) | | Prepared: 17-Dec-2018 Analyzed: 19-Dec-2018 11:20 | | | | | | | | |
| Sodium | ND | 50000 | ug/L | 10000 | | 99.3 | 80-120 | | | U |
| Vanadium | 520 | 3.0 | ug/L | 500 | | 104 | 80-120 | | | |
| Zinc | 487 | 20.0 | ug/L | 500 | | 97.3 | 80-120 | | | |
| Duplicate (BGL0429-DUP1) | | Source: 18L0119-01 Prepared: 17-Dec-2018 Analyzed: 19-Dec-2018 11:57 | | | | | | | | |
| Aluminum | ND | 1000 | ug/L | | ND | | | | | U |
| Barium | ND | 500 | ug/L | | ND | | | | | U |
| Beryllium | ND | 2.0 | ug/L | | ND | | | | | U |
| Cadmium | ND | 2.0 | ug/L | | ND | | | | | U |
| Calcium | 37900 | 500 | ug/L | | 36900 | | | 2.69 | 20 | |
| Chromium | ND | 1000 | ug/L | | ND | | | | | U |
| Cobalt | ND | 10.0 | ug/L | | ND | | | | | U |
| Copper | ND | 3.0 | ug/L | | ND | | | | | U |
| Iron | ND | 200 | ug/L | | ND | | | | | U |
| Magnesium | 15300 | 1000 | ug/L | | 15000 | | | 2.45 | 20 | |
| Manganese | 51.6 | 20.0 | ug/L | | 50.6 | | | 2.11 | 20 | |
| Nickel | ND | 20.0 | ug/L | | ND | | | | | U |
| Potassium | 1720 | 500 | ug/L | | 1670 | | | 3.07 | 20 | |
| Silver | ND | 3.0 | ug/L | | ND | | | | | U |
| Sodium | 9810 | 500 | ug/L | | 9600 | | | 2.21 | 20 | |
| Vanadium | ND | 3.0 | ug/L | | ND | | | | | U |
| Zinc | ND | 20.0 | ug/L | | ND | | | | | U |
| Matrix Spike (BGL0429-MS1) | | Source: 18L0119-01 Prepared: 17-Dec-2018 Analyzed: 19-Dec-2018 12:05 | | | | | | | | |
| Aluminum | 2120 | 1000 | ug/L | 2000 | ND | 105 | 75-125 | | | |
| Barium | 2180 | 500 | ug/L | 2000 | ND | 105 | 75-125 | | | |
| Beryllium | 530 | 2.0 | ug/L | 500 | ND | 106 | 75-125 | | | |
| Cadmium | 522 | 2.0 | ug/L | 500 | ND | 104 | 75-125 | | | |
| Calcium | 48200 | 500 | ug/L | 10000 | 36900 | 113 | 75-125 | | | |
| Chromium | ND | 1000 | ug/L | 500 | ND | 109 | 75-125 | | | U |
| Cobalt | 520 | 10.0 | ug/L | 500 | ND | 104 | 75-125 | | | |
| Copper | 514 | 3.0 | ug/L | 500 | ND | 103 | 75-125 | | | |
| Iron | 2180 | 200 | ug/L | 2000 | ND | 106 | 75-125 | | | |
| Magnesium | 25300 | 1000 | ug/L | 10000 | 15000 | 103 | 75-125 | | | |
| Manganese | 565 | 20.0 | ug/L | 500 | 50.6 | 103 | 75-125 | | | |



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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Metals and Metallic Compounds - Quality Control

Batch BGL0429 - TWC EPA 3010A

Instrument: ICP2 Analyst: TCH

| QC Sample/Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|--------|---------------------------|-------|-----------------------|---------------|-----------------------------|-------------|-----|-----------|-------|
| Matrix Spike (BGL0429-MS1) | | Source: 18L0119-01 | | Prepared: 17-Dec-2018 | | Analyzed: 19-Dec-2018 12:05 | | | | |
| Nickel | 519 | 20.0 | ug/L | 500 | ND | 104 | 75-125 | | | |
| Potassium | 12000 | 500 | ug/L | 10000 | 1670 | 103 | 75-125 | | | |
| Silver | 543 | 3.0 | ug/L | 500 | ND | 109 | 75-125 | | | |
| Sodium | 20100 | 500 | ug/L | 10000 | 9600 | 105 | 75-125 | | | |
| Vanadium | 538 | 3.0 | ug/L | 500 | ND | 108 | 75-125 | | | |
| Zinc | 505 | 20.0 | ug/L | 500 | ND | 98.9 | 75-125 | | | |

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

| | | | | | | | | | | |
|--|-------|---------------------------|------|-----------------------|-------|-----------------------------|--------|------|----|---|
| Matrix Spike Dup (BGL0429-MSD1) | | Source: 18L0119-01 | | Prepared: 17-Dec-2018 | | Analyzed: 19-Dec-2018 12:09 | | | | |
| Aluminum | 2070 | 1000 | ug/L | 2000 | ND | 102 | 75-125 | 2.46 | 20 | |
| Barium | 2120 | 500 | ug/L | 2000 | ND | 102 | 75-125 | 2.97 | 20 | |
| Beryllium | 514 | 2.0 | ug/L | 500 | ND | 103 | 75-125 | 3.12 | 20 | |
| Cadmium | 518 | 2.0 | ug/L | 500 | ND | 104 | 75-125 | 0.62 | 20 | |
| Calcium | 46300 | 500 | ug/L | 10000 | 36900 | 93.5 | 75-125 | 4.08 | 20 | |
| Chromium | ND | 1000 | ug/L | 500 | ND | 106 | 75-125 | | | U |
| Cobalt | 513 | 10.0 | ug/L | 500 | ND | 103 | 75-125 | 1.30 | 20 | |
| Copper | 504 | 3.0 | ug/L | 500 | ND | 101 | 75-125 | 1.89 | 20 | |
| Iron | 2110 | 200 | ug/L | 2000 | ND | 103 | 75-125 | 2.92 | 20 | |
| Magnesium | 24400 | 1000 | ug/L | 10000 | 15000 | 93.8 | 75-125 | 3.76 | 20 | |
| Manganese | 548 | 20.0 | ug/L | 500 | 50.6 | 99.6 | 75-125 | 3.00 | 20 | |
| Nickel | 501 | 20.0 | ug/L | 500 | ND | 100 | 75-125 | 3.40 | 20 | |
| Potassium | 11700 | 500 | ug/L | 10000 | 1670 | 100 | 75-125 | 2.44 | 20 | |
| Silver | 538 | 3.0 | ug/L | 500 | ND | 108 | 75-125 | 0.84 | 20 | |
| Sodium | 19500 | 500 | ug/L | 10000 | 9600 | 99.0 | 75-125 | 2.92 | 20 | |
| Vanadium | 525 | 3.0 | ug/L | 500 | ND | 105 | 75-125 | 2.43 | 20 | |
| Zinc | 493 | 20.0 | ug/L | 500 | ND | 96.6 | 75-125 | 2.31 | 20 | |

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



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
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Metals and Metallic Compounds - Quality Control

Batch BGL0430 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

| QC Sample/Analyte | Isotope | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---------|--------|---|-------|-------------|---|------|-------------|-----|-----------|-------|
| Blank (BGL0430-BLK1) | | | Prepared: 17-Dec-2018 Analyzed: 17-Dec-2018 20:17 | | | | | | | | |
| Antimony | 121 | ND | 3.00 | ug/L | | | | | | | U |
| Antimony | 123 | ND | 3.00 | ug/L | | | | | | | U |
| Arsenic | 75a | ND | 3.00 | ug/L | | | | | | | U |
| Selenium | 78 | ND | 5.00 | ug/L | | | | | | | U |
| Blank (BGL0430-BLK2) | | | Prepared: 17-Dec-2018 Analyzed: 18-Dec-2018 19:44 | | | | | | | | |
| Lead | 208 | ND | 10.0 | ug/L | | | | | | | U |
| Thallium | 205 | ND | 2.00 | ug/L | | | | | | | U |
| LCS (BGL0430-BS1) | | | Prepared: 17-Dec-2018 Analyzed: 17-Dec-2018 20:22 | | | | | | | | |
| Antimony | 121 | 26.8 | 3.00 | ug/L | 25.0 | | 107 | 80-120 | | | |
| Antimony | 123 | 26.2 | 3.00 | ug/L | 25.0 | | 105 | 80-120 | | | |
| Arsenic | 75a | 25.5 | 3.00 | ug/L | 25.0 | | 102 | 80-120 | | | |
| Selenium | 78 | 80.9 | 5.00 | ug/L | 80.0 | | 101 | 80-120 | | | |
| LCS (BGL0430-BS2) | | | Prepared: 17-Dec-2018 Analyzed: 18-Dec-2018 19:49 | | | | | | | | |
| Lead | 208 | 27.0 | 10.0 | ug/L | 25.0 | | 108 | 80-120 | | | |
| Thallium | 205 | 27.5 | 2.00 | ug/L | 25.0 | | 110 | 80-120 | | | |
| Duplicate (BGL0430-DUP1) | | | Source: 18L0119-03 | | | Prepared: 17-Dec-2018 Analyzed: 17-Dec-2018 21:53 | | | | | |
| Antimony | 121 | ND | 3.00 | ug/L | | ND | | | | | U |
| Arsenic | 75a | ND | 3.00 | ug/L | | ND | | | | | L, U |
| Selenium | 78 | ND | 5.00 | ug/L | | ND | | | | | U |
| Duplicate (BGL0430-DUP2) | | | Source: 18L0119-03 | | | Prepared: 17-Dec-2018 Analyzed: 18-Dec-2018 20:17 | | | | | |
| Lead | 208 | ND | 10.0 | ug/L | | ND | | | | | U |
| Thallium | 205 | ND | 2.00 | ug/L | | ND | | | | | U |
| Matrix Spike (BGL0430-MS1) | | | Source: 18L0119-03 | | | Prepared: 17-Dec-2018 Analyzed: 17-Dec-2018 21:58 | | | | | |
| Antimony | 121 | 25.4 | 3.00 | ug/L | 25.0 | ND | 102 | 75-125 | | | |
| Arsenic | 75a | 25.9 | 3.00 | ug/L | 25.0 | ND | 103 | 75-125 | | | |
| Selenium | 78 | 77.4 | 5.00 | ug/L | 80.0 | ND | 96.8 | 75-125 | | | |
| Recovery limits for target analytes in MS/MSD QC samples are advisory only. | | | | | | | | | | | |
| Matrix Spike (BGL0430-MS2) | | | Source: 18L0119-03 | | | Prepared: 17-Dec-2018 Analyzed: 18-Dec-2018 20:21 | | | | | |
| Lead | 208 | 24.9 | 10.0 | ug/L | 25.0 | ND | 99.7 | 75-125 | | | |



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Metals and Metallic Compounds - Quality Control

Batch BGL0430 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

| QC Sample/Analyte | Isotope | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|-----------------------------------|---------|--------|---------------------------|-------|-----------------------|---------------|-----------------------------|-------------|-----|-----------|-------|
| Matrix Spike (BGL0430-MS2) | | | Source: 18L0119-03 | | Prepared: 17-Dec-2018 | | Analyzed: 18-Dec-2018 20:21 | | | | |
| Thallium | 205 | 25.7 | 2.00 | ug/L | 25.0 | ND | 103 | 75-125 | | | |

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

| | | | | | | | | | | | |
|--|-----|------|---------------------------|------|-----------------------|----|-----------------------------|--------|------|----|--|
| Matrix Spike Dup (BGL0430-MSD1) | | | Source: 18L0119-03 | | Prepared: 17-Dec-2018 | | Analyzed: 17-Dec-2018 22:02 | | | | |
| Antimony | 121 | 26.6 | 3.00 | ug/L | 25.0 | ND | 106 | 75-125 | 4.64 | 20 | |
| Arsenic | 75a | 26.1 | 3.00 | ug/L | 25.0 | ND | 104 | 75-125 | 0.88 | 20 | |
| Selenium | 78 | 77.9 | 5.00 | ug/L | 80.0 | ND | 97.4 | 75-125 | 0.61 | 20 | |

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

| | | | | | | | | | | | |
|--|-----|------|---------------------------|------|-----------------------|----|-----------------------------|--------|------|----|--|
| Matrix Spike Dup (BGL0430-MSD2) | | | Source: 18L0119-03 | | Prepared: 17-Dec-2018 | | Analyzed: 18-Dec-2018 20:26 | | | | |
| Lead | 208 | 24.4 | 10.0 | ug/L | 25.0 | ND | 97.4 | 75-125 | 2.28 | 20 | |
| Thallium | 205 | 25.5 | 2.00 | ug/L | 25.0 | ND | 102 | 75-125 | 0.98 | 20 | |

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



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Certified Analyses included in this Report

| Analyte | Certifications |
|-----------------------------------|----------------------------|
| EPA 200.8 in Water | |
| Lead-208 | NELAP,WADOE,WA-DW,DoD-ELAP |
| Antimony-121 | NELAP,WADOE,WA-DW,DoD-ELAP |
| Thallium-205 | NELAP,WADOE,WA-DW,DoD-ELAP |
| EPA 200.8 UCT-KED in Water | |
| Arsenic-75a | NELAP,WADOE,WA-DW,DoD-ELAP |
| Selenium-78 | NELAP,WADOE,WA-DW,DoD-ELAP |
| EPA 6010C in Water | |
| Silver | WADOE,NELAP,DoD-ELAP |
| Aluminum | WADOE,NELAP,DoD-ELAP |
| Barium | WADOE,NELAP,DoD-ELAP,ADEC |
| Beryllium | WADOE,NELAP,DoD-ELAP |
| Calcium | WADOE,NELAP,DoD-ELAP |
| Cadmium | WADOE,NELAP,DoD-ELAP,ADEC |
| Cobalt | WADOE,NELAP,DoD-ELAP |
| Chromium | WADOE,NELAP,DoD-ELAP,ADEC |
| Copper | WADOE,NELAP,DoD-ELAP |
| Iron | WADOE,NELAP,DoD-ELAP |
| Potassium | WADOE,NELAP,DoD-ELAP |
| Magnesium | WADOE,NELAP,DoD-ELAP |
| Manganese | WADOE,NELAP,DoD-ELAP |
| Sodium | WADOE,NELAP,DoD-ELAP |
| Sodium-1 | DoD-ELAP |
| Nickel | WADOE,NELAP,DoD-ELAP,ADEC |
| Vanadium | WADOE,NELAP,DoD-ELAP,ADEC |
| Zinc | WADOE,NELAP,DoD-ELAP |
| EPA 7470A in Water | |
| Mercury | WADOE,NELAP,DoD-ELAP,CALAP |
| EPA 8081B in Water | |
| alpha-BHC | WADOE,DoD-ELAP,NELAP,CALAP |
| alpha-BHC [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| beta-BHC | WADOE,DoD-ELAP,NELAP,CALAP |
| beta-BHC [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| gamma-BHC (Lindane) | WADOE,DoD-ELAP,NELAP,CALAP |
| gamma-BHC (Lindane) [2C] | WADOE,DoD-ELAP,NELAP,CALAP |



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| | |
|---------------------------------------|----------------------------|
| delta-BHC | WADOE,DoD-ELAP,NELAP,CALAP |
| delta-BHC [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Heptachlor | WADOE,DoD-ELAP,NELAP,CALAP |
| Heptachlor [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Aldrin | WADOE,DoD-ELAP,NELAP,CALAP |
| Aldrin [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Heptachlor Epoxide | WADOE,DoD-ELAP,NELAP,CALAP |
| Heptachlor Epoxide [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| trans-Chlordane (beta-Chlordane) | WADOE,DoD-ELAP,NELAP,CALAP |
| trans-Chlordane (beta-Chlordane) [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| cis-Chlordane (alpha-chlordane) | WADOE,DoD-ELAP,NELAP,CALAP |
| cis-Chlordane (alpha-chlordane) [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan I | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan I [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDE | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDE [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Dieldrin | WADOE,DoD-ELAP,NELAP,CALAP |
| Dieldrin [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan II | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan II [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDD | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDD [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin Aldehyde | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin Aldehyde [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDT | WADOE,DoD-ELAP,NELAP,CALAP |
| 4,4'-DDT [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan Sulfate | WADOE,DoD-ELAP,NELAP,CALAP |
| Endosulfan Sulfate [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin Ketone | WADOE,DoD-ELAP,NELAP,CALAP |
| Endrin Ketone [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Methoxychlor | WADOE,DoD-ELAP,NELAP,CALAP |
| Methoxychlor [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachlorobutadiene | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachlorobutadiene [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachlorobenzene | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachlorobenzene [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDE | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDE [2C] | WADOE,DoD-ELAP,NELAP,CALAP |



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|---------------------------|----------------------------|
| 2,4'-DDD | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDD [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDT | WADOE,DoD-ELAP,NELAP,CALAP |
| 2,4'-DDT [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Oxychlorane | WADOE,DoD-ELAP,NELAP,CALAP |
| Oxychlorane [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| cis-Nonachlor | WADOE,DoD-ELAP,NELAP,CALAP |
| cis-Nonachlor [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| trans-Nonachlor | WADOE,DoD-ELAP,NELAP,CALAP |
| trans-Nonachlor [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Mirex | WADOE,DoD-ELAP,NELAP,CALAP |
| Mirex [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Hexachloroethane | DoD-ELAP,NELAP,CALAP |
| Hexachloroethane [2C] | DoD-ELAP,NELAP,CALAP |
| Toxaphene | WADOE,DoD-ELAP,NELAP,CALAP |
| Toxaphene [2C] | WADOE,DoD-ELAP,NELAP,CALAP |
| Chlordane, technical | WADOE,DoD-ELAP,NELAP,CALAP |
| Chlordane, technical [2C] | WADOE,DoD-ELAP,NELAP,CALAP |

EPA 8082A in Water

| | |
|-------------------|---------------------------------|
| Aroclor 1016 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1016 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1221 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1221 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1232 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1232 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1242 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1242 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1248 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1248 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1254 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1254 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1260 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1260 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1262 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1262 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1268 | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |
| Aroclor 1268 [2C] | WADOE,DoD-ELAP,NELAP,CALAP,ADEC |

EPA 8260C in Water

| | |
|---------------|---------------------------------|
| Chloromethane | DoD-ELAP,ADEC,NELAP,CALAP,WADOE |
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|---------------------------------------|---------------------------------|
| 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 |
| 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 |



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|-----------------------------|---------------------------------|
| 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 |

EPA 8270D in Water

| | |
|--------------------------|----------------------------|
| 1,4-Dioxane | WADOE,NELAP,DoD-ELAP |
| Phenol | CALAP,WADOE,DoD-ELAP,NELAP |
| bis(2-chloroethyl) ether | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Chlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |



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|------------------------------|---------------------------------|
| 1,3-Dichlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,4-Dichlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzyl Alcohol | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,2-Dichlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Methylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,2'-Oxybis(1-chloropropane) | DoD-ELAP |
| 4-Methylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| N-Nitroso-di-n-Propylamine | CALAP,WADOE,DoD-ELAP,NELAP |
| Hexachloroethane | CALAP,WADOE,DoD-ELAP,NELAP |
| Nitrobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| Isophorone | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Nitrophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4-Dimethylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| Bis(2-Chloroethoxy)methane | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzoic acid | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4-Dichlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,2,4-Trichlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| Naphthalene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 4-Chloroaniline | CALAP,WADOE,DoD-ELAP,NELAP |
| Hexachlorobutadiene | CALAP,WADOE,DoD-ELAP,NELAP |
| 4-Chloro-3-Methylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Methylnaphthalene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Hexachlorocyclopentadiene | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4,6-Trichlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4,5-Trichlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Chloronaphthalene | CALAP,WADOE,DoD-ELAP,NELAP |
| 2-Nitroaniline | CALAP,WADOE,DoD-ELAP,NELAP |
| Dimethylphthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Acenaphthylene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 2,6-Dinitrotoluene | CALAP,WADOE,DoD-ELAP,NELAP |
| 3-Nitroaniline | CALAP,WADOE,DoD-ELAP,NELAP |
| Acenaphthene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 2,4-Dinitrophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| Dibenzofuran | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 4-Nitrophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,4-Dinitrotoluene | CALAP,WADOE,DoD-ELAP,NELAP |
| Fluorene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Diethyl phthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| 4-Chlorophenylphenyl ether | CALAP,WADOE,DoD-ELAP,NELAP |
| 4-Nitroaniline | CALAP,WADOE,DoD-ELAP,NELAP |



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| 4,6-Dinitro-2-methylphenol | CALAP,WADOE,DoD-ELAP,NELAP |
| N-Nitrosodiphenylamine | DoD-ELAP |
| 4-Bromophenyl phenyl ether | CALAP,WADOE,DoD-ELAP,NELAP |
| Hexachlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |
| Pentachlorophenol | CALAP,WADOE,DoD-ELAP,NELAP |
| Phenanthrene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Anthracene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Carbazole | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Di-n-Butylphthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Fluoranthene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Pyrene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Butylbenzylphthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzo(a)anthracene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 3,3'-Dichlorobenzidine | DoD-ELAP |
| Chrysene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| bis(2-Ethylhexyl)phthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Di-n-Octylphthalate | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzo(b)fluoranthene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Benzo(k)fluoranthene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Benzo(a)pyrene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Indeno(1,2,3-cd)pyrene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Dibenzo(a,h)anthracene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Benzo(g,h,i)perylene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Benzofluoranthenes, Total | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| 1-Methylnaphthalene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| N-Nitrosodimethylamine | CALAP,WADOE,DoD-ELAP,NELAP |
| Aniline | CALAP,WADOE,DoD-ELAP,NELAP |
| Benzidine | CALAP,WADOE,DoD-ELAP,NELAP |
| Retene | CALAP,WADOE,ADEC,DoD-ELAP,NELAP |
| Perylene | CALAP,WADOE,ADEC |
| Pyridine | CALAP,WADOE,DoD-ELAP,NELAP |
| N-Nitrosomethylethylamine | CALAP |
| 2,6-Dichlorophenol | CALAP,WADOE |
| alpha-Terpineol | CALAP,WADOE,DoD-ELAP,NELAP |
| 1,4-Dioxane | CALAP,WADOE,DoD-ELAP,NELAP |
| 2,3,4,6-Tetrachlorophenol | CALAP,WADOE,DoD-ELAP |
| Triphenyl Phosphate | CALAP,WADOE,DoD-ELAP,NELAP |
| Butyl Diphenyl Phosphate | CALAP,WADOE,DoD-ELAP,NELAP |
| Dibutyl Phenyl Phosphate | CALAP,WADOE,DoD-ELAP,NELAP |
| Tributyl Phosphate | CALAP,WADOE,DoD-ELAP,NELAP |



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|-------------------------------|----------------------------|
| Butylated Hydroxytoluene | CALAP,WADOE,DoD-ELAP,NELAP |
| Azobenzene (1,2-DP-Hydrazine) | CALAP,WADOE,DoD-ELAP,NELAP |
| Tetrachloroguaiacol | CALAP,WADOE,DoD-ELAP |
| 3,4,5-Trichloroguaiacol | CALAP,WADOE |
| 3,4,6-Trichloroguaiacol | CALAP,WADOE |
| 4,5,6-Trichloroguaiacol | CALAP,WADOE |
| Guaiacol | CALAP,WADOE |
| 1,2,4,5-Tetrachlorobenzene | CALAP,WADOE,DoD-ELAP,NELAP |

NWTPH-HCID in Water

| | |
|------------------------------------|----------------------|
| Gasoline Range Organics (Tol-C12) | NELAP,DoD-ELAP,WADOE |
| Diesel Range Organics (C12-C24) | NELAP,DoD-ELAP,WADOE |
| Motor Oil Range Organics (C24-C38) | NELAP,DoD-ELAP,WADOE |

| Code | Description | Number | Expires |
|----------|--|--------------|------------|
| ADEC | Alaska Dept of Environmental Conservation | 17-015 | 02/07/2019 |
| CALAP | California Department of Public Health CAELAP | 2748 | 06/30/2019 |
| 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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Notes and Definitions

- * Flagged value is not within established control limits.
- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- L Analyte concentration is ≤ 5 times the reporting limit and the replicate control limit defaults to \pm RL instead of 20% RPD
- P1 The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
- 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. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-2-1218, LMW-2-1218-D
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 12/4/18 Time 1550/1610

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 - 7.4 ft below TOC (monument at elev. X) (bottom at 38.1 ft bgs, 4-in casing) e/S/4

Screen Interval - 27.9-38.1 ft bgs Monument: 2.94 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 Ocb-

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 6 - 40 mL | VOA | VOA Vial | HCl |
| 2 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 2 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 8 - 500 ml, 4 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 4 - 1 Liter, 4 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 4 - 1 Liter | SVOCs | Glass Amber | none |
| 4 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/4/18

Supervisor (signature) [Signature] Date 12-16-18

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-3-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 12/5/18 Time 0955

Media Water Station LMW-3

Sample Type: grab time composite space composite

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

SWL - 1252 ft below TOC (monument at elev. X) (bottom at 64.8 ft bgs, 4-in casing) 0962

Screen Interval - 49.8-64.8 ft bgs Monument: 3.08 ags

Sand Pack Interval - 47.1-64.8 ft bgs (8-in hole) (~10.4 gal/sand pack)

Packer Depth - 39.33 ft bgs (~36.1 gal/casing vol) (~16.6 gal/packer casing volume)

(~27.0 gal/total well vol below packer)

Sample Description clear

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/5/18

Supervisor (signature) [Signature] Date 12-10-18

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-4-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 12/4/18 Time 1445

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 - 0.49 ft below TOC (monument at elev. X) (bottom at 209.7 ft bgs, 4-in casing) 1408 12/4/18

Screen Interval - 195-209.7 ft bgs Monument: 2.76 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 clear 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 |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/4/18

Supervisor (signature) [Signature] Date 12-10-18

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-5-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 12/5/18 Time 1100

Media Water Station LMW-5

Sample Type: grab time composite space composite

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

SWL - 1404 ft below TOC (monument at elev. X) (bottom at 241.8 ft bgs, 4-in casing) @1018

Screen Interval - 231.8-241.8 ft bgs Monument: 3.24 ags

Sand Pack Interval - 231.8-241.8 ft bgs (8-in hole) (~5.9 gal/sand pack)

Packer Depth - 222.11 ft bgs (~150.8 gal/casing vol) (~12.9 gal/packer casing volume)

(~18.7 gal/total well vol below packer)

Sample Description _____

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/5/18

Supervisor (signature) [Signature] Date 12-16-18

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-6-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 12/5/18 Time 1338

Media Water Station LMW-6

Sample Type: grab time composite space composite

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

SWL - 36.87 ft below TOC (monument at elev. X) (bottom at 105.9 ft bgs, 4-in casing) 1302 11/5

Screen Interval - 90.9-105.9 ft bgs Monument: 3.05 ags

Sand Pack Interval - 82.5-105.9 ft bgs (8-in hole) (~13.7 gal/sand pack)

Packer Depth - 81.22 ft bgs (~53 gal/casing vol) (~16.1 gal/packer casing volume)

(~29.9 gal/total well vol below packer)

Sample Description Clear

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/5/18

Supervisor (signature) [Signature] Date 12-10-18

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-EB-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Peristaltic Pump with new tubing

Date 12/5/18 Time 1325

Media Water Station LMW-6

Sample Type: grab time composite space composite

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

SWL - NA ft below TOC (PVC)

Sample Description Lab Provided VOC free and regular DT

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/5/18

Supervisor (signature) [Signature] Date 12-10-18

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-7-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 12/3/18 Time 1435

Media Water Station LMW-7

Sample Type: grab time composite space composite

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

SWL -225.59ft below TOC (monument at elev. X) (bottom at 253.7 ft bgs, 4-in casing) @ 1319

Screen Interval - 239.6-253.7 ft bgs Monument: 3.09 ags

Sand Pack Interval - NA

Packer Depth - NA (~28.3 gal/casing vol) ** Depths corrected for 70° inclination

Sample Description clear

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/3/18

Supervisor (signature) [Signature] Date 12-10-18

FIELD PARAMETERS SHEET

Well ID LMW-7
 Date 12/5/18
 Time Begin Purge 1342
 Time Collect Sample 1435

| Water Level feet bmp | Time | Volume Purged | pH | Conductivity uS/cm | Temp. °C | DO mg/L | Turbidity NTU | Eh Rel mV |
|-------------------------|------|------------------|--------------|-----------------------|-------------|------------|------------------|--------------|
| - | 1356 | - | 7.61 | 379.5 | 12.8 | 1.75 | 1.75 | 144.1 |
| - | 1401 | - | 7.17 | 377.4 | 12.9 | 0.99 | 1.56 | 119.2 |
| - | 1406 | - | 7.13 | 382.1 | 13.0 | 0.82 | 1.64 | 93.3 |
| - | 1411 | - | 7.10 | 374.7 | 13.0 | 0.78 | 2.28 | 77.5 |
| - | 1416 | - | 7.01 | 420.1 | 13.1 | 0.72 | 2.35 | 46.5 |
| - | 1421 | - | 6.97 | 427.6 | 13.2 | 0.66 | 2.26 | 17.3 |
| - | 1426 | - | 6.96 | 433.3 | 13.2 | 0.63 | 1.94 | 3.9 |
| - | 1431 | - | 6.96 | 433.5 | 13.2 | 0.60 | 2.09 | -8.2 |
| | | | Sampled 1435 | | | | | |
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Comments: ~ 2L/min
 Cond. Pos 333 Hz
 Sampled 1435 - clear, no odor water.

Sampler's Initials jm

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000

Site Location Ravensdale, WA Sample ID LMW-8-1218

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Tubing and Peristaltic Pump, Bailor for VOC samples

Date 12/5/18 Time 1705

Media Water Station LMW-8

Sample Type: grab time composite space composite

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

SWL - 4.18 ft below TOC (PVC at black notch) (bottom at 13 ft bgs, 2-in casing) 1125

Screen Interval - 8-13 ft bgs PVC stickup: 1.72 ags

Sand Pack Interval - 6-13 ft bgs (8-in hole) (~5.1 gal/sand pack)

Packer Depth - NA (~1.9 gal/casing vol) (~7.0 gal/total well vol)

Sample Description clear

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/5/18

Supervisor (signature) [Signature] Date 12-10-18

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000

Site Location Ravensdale, WA Sample ID LMW-9-1218

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Pump Grundfos and Dedicated Tubing

Date 12/6/18 Time 1505

Media Water Station LMW-9

Sample Type: grab time composite space composite

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

SWL - 90.80 ft below TOC (PVC at black notch) (bottom at 159 ft bgs, 2-in casing) 0554 gm

Screen Interval - 149-159 ft bgs PVC stickup: 2.86 ags

Sand Pack Interval - 143.5-159 ft bgs (8-in hole) (~11.4 gal/sand pack)

Packer Depth - NA (~10.2 gal/casing vol) (~21.6 gal/total well vol)

Sample Description Slight 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 |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/6/18

Supervisor (signature) [Signature] Date 12-10-18

FIELD PARAMETERS SHEET

Well ID LMW-9
 Date 12/6/18
 Time Begin Purge 1426
 Time Collect Sample 1505

| Water Level feet bmp | Time | Volume Purged | pH | Conductivity uS/cm | Temp. °C | DO mg/L | Turbidity NTU | Eh Rel mV |
|-------------------------|-----------------|------------------|--------|-----------------------|-------------|------------|------------------|--------------|
| - | 1436 | - | 6.95 | 537 | 12.4 | 0.93 | 0.60 | -43.1 |
| - | 1441 | - | 6.94 | 538 | 12.4 | 0.71 | 0.37 | -51.3 |
| - | 1446 | - | 6.94 | 538 | 12.4 | 0.62 | 0.30 | -54.8 |
| - | 1451 | - | - | - | - | - | - | - |
| - | 1451 | - | 6.94 | 538 | 12.4 | 0.55 | 0.37 | -57.9 |
| - | 1456 | - | 6.94 | 538 | 12.4 | 0.52 | 0.31 | -60.2 |
| - | 1501 | - | 6.94 | 538 | 12.5 | 0.49 | 0.23 | -61.9 |
| <hr/> | | | Sample | 1505 | <hr/> | | | |
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Comments:
 Grundfos 35C Hz
 ~1.5 gpm

Sampler's Initials JM

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-10-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler QED Bladder

Date 12/4/18 Time 1250

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 - 0.65 ft below TOC (PVC) (bottom at 289 ft bgs, 4-in casing) @ 1250 12/4/18

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 clean

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/4/18

Supervisor (signature) [Signature] Date 12-10-18

FIELD PARAMETERS SHEET

Well ID LMW-10
 Date 12/14/18
 Time Begin Purge 1252
 Time Collect Sample 1325

| Water Level feet bmp | Time | Volume Purged | pH | Conductivity uS/cm | Temp. °C | DO mg/L | Turbidity NTU | Eh Rel mV |
|-------------------------|------|------------------|--------------|-----------------------|-------------|------------|------------------|--------------|
| 1.25' | 1258 | - | 8.80 | 240.1 | 8.4 | 2.28 | 0.43 | 24.3 |
| 1.66' | 1303 | - | 8.92 | 243.4 | 8.6 | 1.36 | 0.29 | -10.7 |
| 2.00' | 1308 | - | 8.96 | 244.4 | 8.7 | 1.07 | 0.54 | -34.3 |
| 2.35' | 1313 | - | 8.98 | 244.1 | 8.6 | 0.91 | 0.73 | -60.5 |
| 2.74' | 1318 | - | 9.00 | 245.5 | 8.8 | 0.79 | 0.47 | -84.5 |
| 2.96' | 1321 | - | 9.00 | 245.5 | 8.7 | 0.75 | 0.50 | -93.8 |
| 3.16' | 1324 | - | 9.00 | 245.3 | 8.7 | 0.71 | 0.53 | -100.7 |
| <hr/> | | | Sampled 1328 | | <hr/> | | | |
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Comments: ~ 300 mL/min
 Toric 110 psi
 Throttle 40 psi
 cpm 2
 CID 50

Sampler's Initials JLR

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-11-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Pump Grundfos and OED Bladder Pump

Date 12/6/18 Time 1320

Media Water Station LMW-11

Sample Type: grab time composite space composite

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

SWL - 151.63 ft below TOC (PVC) (bottom at 707 ft bgs, 4-in casing) @ 1236 12/6/18

Screen Interval - 696-707 ft bgs PVC stickup: 2.70 ags

Sand Pack Interval - 688-707 ft bgs (8-in hole) (~11.2 gal/sand pack)

Packer Depth - NA (~360.4 gal/casing vol) (~371.6 gal/total well vol)

Sample Description clear

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/6/18

Supervisor (signature) [Signature] Date 12-10-18

FIELD PARAMETERS SHEET

Well ID LM4-11
 Date 12/6/18
 Time Begin Purge 1240
 Time Collect Sample 1320

| Water Level feet bmp | Time | Volume Purged | pH | Conductivity uS/cm | Temp. °C | DO mg/L | Turbidity NTU | Eh Rel mV |
|-------------------------|------|------------------|---------|-----------------------|-------------|------------|------------------|--------------|
| 157.62' | 1240 | - | 7.28 | 406.1 | 9.6 | 2.37 | 1.02 | -57.5 |
| 157.63' | 1255 | - | 7.21 | 401.9 | 9.6 | 1.51 | 0.95 | -71.6 |
| 157.59' | 1300 | - | 7.18 | 391.4 | 9.6 | 1.16 | 1.08 | -69.4 |
| 157.65' | 1305 | - | 7.16 | 387.9 | 9.6 | 1.02 | 0.93 | -69.5 |
| 157.62' | 1310 | - | 7.16 | 386.6 | 9.6 | 0.94 | 0.73 | -69.9 |
| 157.60 | 1315 | - | 7.15 | 385.3 | 9.6 | 0.87 | 0.98 | -70.9 |
| ————— | | | Sampled | 1320 | ————— | | | |
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Comments:
 ~400 mL/min purge rate
 Tank 130 psi
 throttle 110 psi
 CID 40
 CFM 1

Sampler's Initials Jhu

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-12-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler OED Bladder

Date 12/4/18 Time 1025

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 - 9.46' BTM

Screen Interval - 15-25

Sand Pack Interval - 11-25

Packer Depth - NA

Sample Description clearly

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

SEE FIELD PARAMETERS SHEET

| Aliquot Amount | Analysis | Container | Preservation / Amount |
|--------------------------|------------------|-----------------------|-----------------------|
| 3 - 40 mL | VOA | VOA Vial | HCl |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) Joe Min Date 12/4/18

Supervisor (signature) Randy Date 12-10-18

FIELD PARAMETERS SHEET

Well ID LMW-12
 Date 12/18/18
 Time Begin Purge 0947
 Time Collect Sample 1025

| Water Level feet bmp | Time | Volume Purged | pH | Conductivity uS/cm | Temp. °C | DO mg/L | Turbidity NTU | Eh Rel mV |
|----------------------|------|---------------|------|--------------------|----------|---------|---------------|-----------|
| 9.46 | 0957 | — | 6.81 | 625 | 10.0 | 1.40 | 432 | -51.7 |
| 7.46 | 1002 | — | 6.76 | 623 | 9.9 | 1.02 | 415 | -48.7 |
| 0.46 | 1007 | — | 6.78 | 621 | 9.9 | 0.89 | 58.3 | -58.8 |
| 9.46 | 1012 | — | 6.83 | 611 | 9.9 | 0.77 | 89.0 | -69.8 |
| 9.48 | 1017 | — | 6.86 | 609 | 9.9 | 0.76 | 82.1 | -75.0 |
| 7.42 | 1022 | — | 6.80 | 609 | 9.8 | 0.68 | 74.5 | -79.2 |
| Sample | | | | | 1025 | — | — | — |
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Comments: Discharge tube frozen on arrival, Defrosted by hand.
 Pulled pump likely stirring seal in bottom of well, High turb from
 Thru the 20psi: Purge 450ml/min Pump deployment
 Tank 110 psi
 CID47
 CPM2

Sampler's Initials JCH

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-13R-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler QED Bladder

Date 12/4/18 Time 1155

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 JM 9.47 4.47 1117

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 |
| 1 – 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 – 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 – 500 ml, 2 – 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 – 1 Liter, 2 – 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 – 1 Liter | SVOCs | Glass Amber | none |
| 2 – 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/4/18

Supervisor (signature) [Signature] Date 12-10-18

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2000
 Site Location Ravensdale, WA Sample ID LMW-15-1218
 Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler OED Bladder

Date 12/5/18 Time 1510

Media Water Station LMW-15

Sample Type: grab time composite space composite

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

SWL - 151.74 BTDC 1416

Screen Interval -235-245 bgs

Sand Pack Interval -231-245 bgs

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 |
| 1 - 500 ml | Total Metals | HDPE | HNO3 (non) |
| 1 - 500 ml | Dissolved Metals | HDPE | HNO3 (filter) |
| 4 - 500 ml, 2 - 40 ml | TPH-HCID | Glass Amber, VOA Vial | HCl |
| 2 - 1 Liter, 2 - 1 Liter | PCBs/Pest | Glass Amber | none |
| 2 - 1 Liter | SVOCs | Glass Amber | none |
| 2 - 500 mL | 1,4-Dioxane | Glass Amber | none |

Sampler (signature) [Signature] Date 12/5/18

Supervisor (signature) [Signature] Date 12-10-18

FIELD PARAMETERS SHEET

Well ID LMW-15
 Date 12/5/18
 Time Begin Purge 1422
 Time Collect Sample 1511

| Water Level feet bmp | Time | Volume Purged | pH | Conductivity uS/cm | Temp. °C | DO mg/L | Turbidity NTU | Eh Rel mV |
|----------------------|------|---------------|------|--------------------|----------|---------|---------------|-----------|
| 151.91 | 1432 | — | 7.26 | 340.5 | 9.3 | 1.70 | 2.52 | -44.2 |
| 151.87 | 1437 | — | 7.32 | 342.3 | 9.3 | 1.13 | 2.81 | -64.2 |
| 151.72 | 1442 | — | 7.37 | 341.9 | 9.2 | 1.13 | 2.24 | -73.8 |
| 151.74 | 1447 | — | 7.38 | 337.8 | 9.1 | 1.18 | 2.60 | -76.1 |
| 151.75 | 1452 | — | 7.39 | 345.3 | 9.3 | 1.17 | 2.68 | -79.1 |
| 151.79 | 1457 | — | 7.41 | 343.4 | 9.3 | 0.85 | 4.17 | -85.9 |
| 151.74 | 1502 | — | 7.42 | 343.3 | 9.3 | 0.76 | 4.79 | -88.6 |
| 151.80 | 1507 | — | 7.43 | 343.4 | 9.3 | 0.71 | 5.54 | -92.0 |
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Comments:

Tank 130psi: 400ml/min
 Throttle 110psi
 CID 51
 CPM2

Sampler's Initials JM

APPENDIX C

December 2018 Landsburg Mine
Site Water Quality Monitoring Data
Validation and Quality Assurance /
Quality Control Review
Memorandum

TECHNICAL MEMORANDUM**DATE** January 10th, 2019**Project No.** 9231000.005.2000**TO** Bill Kombol, Palmer Coking Coal Company**FROM** Youki Sato / Carol Lovett**EMAIL** youki_sato@golder.com**RE: LANDSBURG MINE SITE DECEMBER 2018 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 from December 3, 2018 through December 6, 2018 at the 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.

Thirteen water samples, 1 field duplicate sample, 2 trip blanks, and 1 equipment blank were collected by Golder Associates, Inc. (Golder). 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-846¹ Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), August 2006;
- 1,4-Dioxane following USEPA SW-846 Method 8270D, Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), January 1998;
- Low-Level Polychlorinated Biphenyls (PCBs) following USEPA SW-846 Method 8082A, Polychlorinated Biphenyls (PCBs) by Gas Chromatography, February 2007;
- Organochlorine Pesticides following USEPA SW-846 Method 8081A, Organochlorine Pesticides by Gas Chromatography, December 1996;
- Northwest Total Petroleum Hydrocarbons – Hydrocarbon Identification Scan by NWTPH-HCID;
- Total Metals by USEPA SW-846 Method 200.8 and SW-846 6010C; and
- Total Mercury by USEPA SW-846 Method 7470A.

Quality assurance / quality control (QA/QC) reviews of laboratory data were performed in the laboratory in accordance with the laboratory quality assurance program plan (QAPP). 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.

¹USEPA, 1996, Test methods for evaluating solid waste, physical/chemical methods (SW-846): 3rd edition, and subsequent updates, Environmental Protection Agency, National Center for Environmental Publications, Cincinnati, Ohio, accessed at URL <http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm>

Data validation was conducted in accordance with the criteria outlined in the National Functional Guidelines for Organic Review (USEPA 2017) and the National Functional Guidelines for Inorganic Review (USEPA 2017), modified to include method specific requirements of the laboratory and laboratory standard operating procedures. 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 based on professional judgment. The following definitions provide brief explanations of the qualifiers which may have been assigned to data during the data validation process.

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 analyte was analyzed for but was not detected.
- UJ The analyte was analyzed for but was not detected. The reporting limit is approximate and may be inaccurate or imprecise.

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 QC elements for surrogates, matrix spike samples, laboratory control samples, method blanks, field blanks, trip blanks, and field duplicate samples
- Evaluation of detection limits

Raw data and calibration elements, including GC instrument tuning and performance check, initial and continuing calibration, internal standard performance, and analyte identification, were not provided by the lab. Data review and validation was performed by an experienced QA 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 Checklists

References

- 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)

USEPA. 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 September 11, 2018).

ATTACHMENT A

Tables

**Table 1:
Sample Collection and Analysis Summary
Landsburg Groundwater Monitoring - December 2018**

| SDG | Field Identification | Collection Date | Lab Identification | Matrix | QC Samples | Analyses | | | | |
|---------|----------------------|-----------------|--------------------|--------|-----------------|--------------|---|----------------------------|-----------------------|---------------------------------------|
| | | | | | | VOCs (8260C) | Low-Level PCBs / Pesticides (8082A / 8081A) | SVOCs; 1,4-Dioxane (8270D) | TPH-HCID (NWTPH-HCID) | Total TAML Metals (200.8/6010C/7470A) |
| 18L0063 | LMW-7-1218 | 12/3/2018 | 18L0063-01 | GW | -- | X | X | X | X | X |
| 18L0063 | LMW-12-1218 | 12/4/2018 | 18L0063-03 | GW | -- | X | X | X | X | X |
| 18L0063 | LMW-13R-1218 | 12/4/2018 | 18L0063-05 | GW | -- | X | X | X | X | X |
| 18L0063 | LMW-10-1218 | 12/4/2018 | 18L0063-07 | GW | -- | X | X | X | X | X |
| 18L0063 | LMW-4-1218 | 12/4/2018 | 18L0063-09 | GW | -- | X | X | X | X | X |
| 18L0063 | LMW-2-1218 | 12/4/2018 | 18L0063-11 | GW | -- | X | X | X | X | X |
| 18L0063 | LMW-2-1218-D | 12/4/2018 | 18L0063-13 | GW | FD (LMW-2-1218) | X | X | X | X | X |
| 18L0063 | TripBlank120418 | 12/3/2018 | 18L0063-15 | WQ | TB | X | -- | -- | -- | -- |
| 18L0119 | LMW-3-1218 | 12/5/2018 | 18L0119-01 | GW | -- | X | X | X | X | X |
| 18L0119 | LMW-5-1218 | 12/5/2018 | 18L0119-03 | GW | -- | X | X | X | X | X |
| 18L0119 | LMW-8-1218 | 12/5/2018 | 18L0119-05 | GW | -- | X | X | X | X | X |
| 18L0119 | LMW-6-1218 | 12/5/2018 | 18L0119-07 | GW | -- | X | X | X | X | X |
| 18L0119 | EB-1218 | 12/5/2018 | 18L0119-09 | WQ | EB | X | X | X | X | X |
| 18L0119 | LMW-15-1218 | 12/5/2018 | 18L0119-11 | GW | -- | X | X | X | X | X |
| 18L0119 | LMW-11-1218 | 12/6/2018 | 18L0119-13 | GW | -- | X | X | X | X | X |
| 18L0119 | LMW-9-1218 | 12/6/2018 | 18L0119-15 | GW | -- | X | X | X | X | X |
| 18L0119 | Trip Blank 120518 | 12/5/2018 | 18L0119-17 | WQ | TB | X | -- | -- | -- | -- |

Notes:

All analyses performed by ARI Laboratories

Abbreviations:

EB - Equipment Blank
 FD - Field Duplicate
 GW - Groundwater
 NWTPH - Northwest Total Petroleum Hydrocarbon
 PCBs - Polychlorinated Biphenyls
 QC - Quality Control
 SDG - Sample Delivery Group

SVOCs - Semivolatile Organic Compounds
 TAML - Target Analyte Metals List
 TB - Trip Blank
 TPH-HCID - Total Petroleum Hydrocarbons - Hydrocarbon Identification Method
 VOCs - Volatile Organic Compounds
 WQ - Water Quality

**Table 2:
Qualifier Summary Table
Landsburg Groundwater Monitoring - December 2018**

| SDG | Sample Name | Constituent | New Result | New RL | Qualifier | Reason |
|------------------|-------------|-----------------------------|------------|--------|-----------|--|
| 18L0063 | LMW-12-1218 | trans-1,4-Dichloro 2-butene | -- | -- | UJ | MS/MSD recovery below QC Criteria |
| 18L0063 | LMW-12-1218 | 2,2-Dichloropropane | -- | -- | UJ | MS/MSD recovery below QC Criteria |
| 18L0063; 18L0119 | All Samples | All Results | - | - | - | Laboratory applied U-qualifiers indicating non-detect results and J-qualifiers indicating results below the reporting limit are retained unless other qualifications are indicated in this table. All other laboratory qualifiers are removed. |

Abbreviations

QC - Quality Control
 RL - Reporting Limit
 SDG - Sample Delivery Group
 MS/MSD - Matrix Spike / Matrix Spike Duplicate

Qualifier Definitions

J - Estimated Result
 U - Non-detect Result
 UJ - Non-detect Result; RL is Estimated

ATTACHMENT B

**Level 2A Data Validation
Checklist**

DATA REVIEW CHECKLIST - QA LEVEL II

Reviewing Company: Golder Associates
 Project Name: Landsburg Groundwater 2018-12
 Reviewer: Youki Sato
 Reviewed by: Carol Lovett
 Laboratory: Analytical Resources, Inc (Tukwila, WA)

Project Manager: Gary Zimmerman
 Project Number: 923-1000-005.2000
 Validation Date: January 4, 2019
 Review Date: 1/10/2019
 SDG #: 18L0063; 18L0119

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? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Sampling team indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Sample location noted? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | By Project Name |
| d) Sample type indicated (grab/composite)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Not indicated on COC |
| e) Field QC noted? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | See Table 1 |
| f) Field parameters collected (note types)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| g) Was the COC signed by both field and laboratory personnel? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| h) Were samples received in good condition? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | See Note 1 |
| i) Were the correct preservatives used? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| j) Was the sample cooler temperature within QC limits? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Laboratory Case Narrative

a) Does the laboratory narrative indicate deficiencies?

Note Deficiencies:

- Certain MS/MSD recoveries and precision were outside QC criteria.
- Certain CCV recoveries were outside QC criteria.

These issues are addressed in the appropriate sections below.

| General (reference QAPP or Method) | YES | NO | NA | COMMENTS |
|---|-------------------------------------|-------------------------------------|--------------------------|----------|
| a) Was the correct method used? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Were hold times met for sample pretreatment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Were hold times met for sample analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| d) Were appropriate reporting limits achieved? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| e) Were any sample dilutions noted? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| f) Were any matrix problems noted? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |

DATA REVIEW CHECKLIST - QA LEVEL II

| Blanks | YES | NO | NA | COMMENTS |
|--|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------------|
| a) Were analytes detected in the method blank(s)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Were analytes detected in the field blank(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| c) Were analytes detected in the equipment blank(s)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | See Note 2 |
| d) Were analytes detected in the trip blank(s)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| e) Were analytes detected in the storage blank(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| Surrogate (System Monitoring) Compounds | YES | NO | NA | COMMENTS |
| a) Were surrogate compounds added to all samples? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Were recoveries within control limits? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Were surrogate recoveries not calculated due to dilutions? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| d) Were recoveries not calculated due to interference? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| Laboratory Control Sample | YES | NO | NA | COMMENTS |
| a) Was a LCS analyzed at the appropriate frequency? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Were the proper compounds included in the LCS? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Was the LCS accuracy criteria met? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Matrix Spike/Matrix Spike Duplicate | YES | NO | NA | COMMENTS |
| a) Was MS accuracy criteria met? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | See Note 3 |
| Recovery could not be calculated since sample contained high concentration of analyte? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Was MSD accuracy criteria met? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| Recovery could not be calculated since sample contained high concentration of analyte? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Were MS/MSD precision criteria met? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Duplicates | YES | NO | NA | COMMENTS |
| a) Were field duplicates collected (note original and duplicate sample names)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | LMW-2-1218 / LMW-12-1218-D |
| b) Were field dup. precision criteria met (20%)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Were lab duplicates analyzed (note original and duplicate samples)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| d) Were lab dup. precision criteria met (Note RPD)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | See Note 4 |
| ICP Serial Dilution (SD) | YES | NO | NA | COMMENTS |
| a) Was an ICP SD analyzed once per SDG? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | Not provided in Lvl II reports |
| b) Was the ICP SD criteria met? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| Overall Evaluation | YES | NO | NA | COMMENTS |
| a) Were there any other technical problems not previously addressed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | See Note 5 and 6 |
| b) Checked for transcription errors? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Do target analytes fall within calibration ranges? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| d) Data are acceptable and usable except as noted? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

DATA REVIEW CHECKLIST - QA LEVEL II

Comments/Notes:

- As shown in the table below, the laboratory noted in their Cooler Receipt forms and Preservation Confirmation forms for both SDG 18L0063 and 18L0119 that several samples vials for the VOC analysis were received with headspace. The laboratory was consulted, confirmed that no VOC vials containing air bubbles or headspace were used in the analyses. Therefore, no further action was required other than to note.

| Lab ID | Sample Name | # Bottles Affected (out of 5) |
|------------|--------------|-------------------------------|
| 18L0063-07 | LMW-10-1218 | 2; Vials N and O |
| 18L0063-09 | LMW-4-1218 | 2; Vials N and O |
| 18L0063-11 | LMW-2-1218 | 2; Vials N and O |
| 18L0063-13 | LMW-2-1218-D | 1; Vial N |
| 18L0119-01 | LMW-3-1218 | 1; Vial R |
| 18L0119-05 | LMW-8-1218 | 1; Vial R |
| 18L0119-13 | LMW-11-1218 | 2; Vials Q and R |

- Analytes were detected in the equipment blank, as shown in the table below. Following Inorganic Guidelines, when the blank result was greater than the RL, associated non-detect results did not require qualification.

| Sample Name | Parameter | Analyte | Blank Result | Reporting Limit | Units |
|-------------|-----------|--------------|--------------|-----------------|-------|
| EB-1218 | EPA 6010C | Total Copper | 6.3 | 3.0 | ug/L |

- Matrix Spike recoveries were outside of acceptance criteria for select analytes, as summarized in the table below for project-specific samples. No sample qualifications were required when the initial sample concentration was 4 times greater than the matrix spike added or when the spiked sample did not come from the project site.

Following Organic Guidelines, when a MS/MSD recovery was below the lower acceptance limit, all associated results were qualified as estimated (J/UJ). Using professional judgment, no qualifications were necessary for the recovery of analytes such as 2-Chloroethyl vinyl ether, which are difficult to recover from preserved water samples and thus whose recovery is not calculated.

Following Inorganic Guidelines for mercury, when the MS/MSD recovery was greater than 125%, associated non-detect results did not require qualification.

| Primary Sample Name | Parameter | Analyte | MS/MSD % Recovery | RPD | %Recovery / RPD Criteria |
|---------------------|-----------|-----------------------------|-------------------|-------|--------------------------|
| LMW-12-1218 | SW 8260C | trans-1,4-Dichloro 2-butene | 53.2 / 46.0 | 14.50 | 55-129 / 30 |
| LMW-12-1218 | SW 8260C | 2,2-Dichloropropane | 78.0 / 72.8 | 6.95 | 78-125 / 30 |
| LMW-12-1218 | EPA 7470A | Total Mercury | 126 / 110 | 13.9 | 75-125 / 20 |

- The laboratory duplicate RPDs were outside QC criteria, as shown in the table below. The lab noted that the duplicate results of copper and zinc from sample LMW-12-1218 and the duplicate arsenic result from sample LMW-5-1218 have concentrations that are less than 5x the RL, which means that the duplicate control limit defaults to +/- the RL. The results were flagged as "L" by the lab to indicate this. No qualifications were required when both the original and laboratory duplicate sample results were non-detect. Following Inorganic Guidelines, when either the original or laboratory duplicate sample result was less than 5x the RL and the difference between the sample and duplicate was less than the RL, no qualifications were required.

| Sample Name | Method | Analyte | Sample / Duplicate Results (ug/L) | RL (ug/L) | RPD (%) | RPD Limit |
|-------------|-----------|--------------|-----------------------------------|-----------|---------|-----------|
| LMW-12-1218 | EPA 6010C | Total Copper | 3.8 / - | 3.0 | 23.5 | 20 |

- The laboratory case narrative indicated that certain CCV standard recoveries were outside of QC criteria. Review of calibration data is outside the scope of a level II validation, and the calibration summaries were not provided by the laboratory

DATA REVIEW CHECKLIST - QA LEVEL II

as part of this data package. Using professional judgment, the CCV information provided was reviewed only to determine if serious deficiencies warranting data rejection were present. The laboratory indicated that sample results associated with the failing CCVs were qualified with a "Q" qualifier, which were removed as part of this data validation. Using professional judgment, no further action is necessary as the guidelines do not require rejection of data based on the CCV %D.

- Per Golder's request, the RLs of the metals analysis via method 6010C are elevated to meet client needs. As a result, the spiking concentration for Chromium in the associated LCS and MS/MSD recoveries is below the RL, and the reported result is listed as non-detect (U). As the laboratory's conventional reporting limit for metals analysis via method 6010C is much lower and the chromium concentration would be otherwise quantifiable, the laboratory reported the % recovery of the chromium in these QC samples despite the result being reported as ND. Following historical project practice and using professional judgment, no further action was required other than to note.

Data Qualification: See Table 2.

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 |
| CCV: Continuing Calibration Verification | |

TECHNICAL MEMORANDUM

DATE January 10th, 2019

Project No. 9231000.005.1250

TO Bill Kombol, Palmer Coking Coal Company

FROM Youki Sato / Carol Lovett

EMAIL youki_sato@golder.com

RE: LANDSBURG MINE SITE DECEMBER 2018 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 on December 6, 2018 at the 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.

Three water samples and one trip blank for were collected by Golder Associates, Inc. (Golder) in December. 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-846¹ 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 (QAPP). 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 (USEPA 2017), modified to include method specific requirements of the laboratory and laboratory standard operating procedures. 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 based on professional judgment. The following definitions provide brief explanations of the qualifiers which may have been assigned to data during the data validation process.

¹USEPA, 1996, Test methods for evaluating solid waste, physical/chemical methods (SW-846): 3rd edition, and subsequent updates, Environmental Protection Agency, National Center for Environmental Publications, Cincinnati, Ohio, accessed at URL <http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm>

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 analyte was analyzed for but was not detected.

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 QC elements for surrogates, matrix spike samples, laboratory control samples, method blanks, field blanks, trip blanks, and field duplicate samples.
- Evaluation of detection limits

Raw data and calibration elements, including GC instrument tuning and performance check, initial and continuing calibration, internal standard performance, and analyte identification, were not provided by the lab. Data review and validation was performed by an experienced QA 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. 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 Checklists

References

- 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)
- USEPA. 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 September 11, 2018).

ATTACHMENT A

Tables

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

| SDG | Field Identification | Collection Date | Lab Identification | Matrix | QC Samples | Analyses | |
|---------|----------------------|-----------------|--------------------|--------|------------|-----------------|------------------------|
| | | | | | | VOCs by SW8260C | 1,4-Dioxane by SW8270D |
| 18L0120 | LMW-22-1218 | 12/6/2018 | 18L0120-01 | GW | -- | X | X |
| 18L0120 | LMW-20-1218 | 12/6/2018 | 18L0120-02 | GW | -- | X | X |
| 18L0120 | LMW-21-1218 | 12/6/2018 | 18L0120-03 | GW | -- | X | X |
| 18L0120 | TripBlank120618 | 12/6/2018 | 18L0120-04 | WQ | TB | X | -- |

Notes:

All analyses performed by ARI Laboratories

Abbreviations:

- GW - Groundwater
- QC - Quality Control
- SDG - Sample Delivery Group
- TB - Trip Blank
- VOCs - Volatile Organic Compounds
- WQ - Water Quality

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

| SDG | Sample Name | Constituent | New Result | New RL | Qualifier | Reason |
|---------|-------------|-------------|------------|--------|-----------|--|
| 18L0120 | All Samples | All Results | - | - | - | Laboratory applied U-qualifiers indicating non-detect results and J-qualifiers indicating results below the reporting limit are retained unless other qualifications are indicated in this table. All other laboratory qualifiers are removed. |

Abbreviations

RL - Reporting Limit
 SDG - Sample Delivery Group

Qualifier Definitions

J - Estimated Result
 U - Non-detect Result

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 2018-12

Project Number: 923-1000-005.2000

Reviewer: Youki Sato

Validation Date: January 7, 2019

Reviewed by: Carol Lovett

Review Date: 01/09/2019

Laboratory: Analytical Resources, Inc (Tukwila, WA)

SDG #: 18L0120

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? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Sampling team indicated? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Sample location noted? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | By client project name |
| d) Sample type indicated (grab/composite)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Not indicated on COC |
| e) Field QC noted? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Trip Blank See Note 1 |
| f) Field parameters collected (note types)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| g) Was the COC signed by both field and laboratory personnel? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| h) Were samples received in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| i) Were the correct preservatives used? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| j) Was the sample cooler temperature within QC limits? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

Laboratory Case Narrative

- a) Does the laboratory narrative indicate deficiencies? YES NO NA

Note Deficiencies:

- Certain CCV recoveries were outside QC criteria.

These issues are addressed in the appropriate sections below.

| General (reference QAPP or Method) | YES | NO | NA | COMMENTS |
|---|-------------------------------------|-------------------------------------|--------------------------|----------|
| a) Was the correct method used? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Were hold times met for sample pretreatment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Were hold times met for sample analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| d) Were appropriate reporting limits achieved? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| e) Were any sample dilutions noted? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| f) Were any matrix problems noted? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |

DATA REVIEW CHECKLIST - QA LEVEL II

| Blanks | YES | NO | NA | COMMENTS |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------|
| a) Were analytes detected in the method blank(s)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Were analytes detected in the field blank(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| c) Were analytes detected in the equipment blank(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| d) Were analytes detected in the trip blank(s)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| e) Were analytes detected in the storage blank(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| Surrogate (System Monitoring) Compounds | YES | NO | NA | COMMENTS |
| a) Were surrogate compounds added to all samples? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Were recoveries within control limits? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Were surrogate recoveries not calculated due to dilutions? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| d) Were recoveries not calculated due to interference? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| Laboratory Control Sample | YES | NO | NA | COMMENTS |
| a) Was a LCS analyzed at the appropriate frequency? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | LCS Duplicate analyzed. _____ |
| b) Were the proper compounds included in the LCS? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Was the LCS accuracy criteria met? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| Matrix Spike/Matrix Spike Duplicate | YES | NO | NA | COMMENTS |
| a) Was MS accuracy criteria met? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | No client MS/MSDs analyzed. |
| Recovery could not be calculated since sample contained high concentration of analyte? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| b) Was MSD accuracy criteria met? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| Recovery could not be calculated since sample contained high concentration of analyte? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| c) Were MS/MSD precision criteria met? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| Duplicates | YES | NO | NA | COMMENTS |
| a) Were field duplicates collected (note original and duplicate sample names)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| b) Were field dup. precision criteria met (20%)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| c) Were lab duplicates analyzed (note original and duplicate samples)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | _____ |
| d) Were lab dup. precision criteria met (Note RPD)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| ICP Serial Dilution (SD) | YES | NO | NA | COMMENTS |
| a) Was an ICP SD analyzed once per SDG? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| b) Was the ICP SD criteria met? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | _____ |
| Overall Evaluation | YES | NO | NA | COMMENTS |
| a) Were there any other technical problems not previously addressed? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | See Note 2 |
| b) Checked for transcription errors? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| c) Do target analytes fall within calibration ranges? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| d) Data are acceptable and usable except as noted? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

DATA REVIEW CHECKLIST - QA LEVEL II

Comments/Notes:

1. The laboratory sample login and cooler receipt form noted that there were no trip blank sample containers received upon receipt at the lab. The laboratory reported results for sample Trip Blank 120618, which is the trip blank associated with this sample set. Therefore, no further action was required other than to note.
2. The laboratory case narrative indicated that certain CCV recoveries were outside of QC criteria. Review of calibration data is outside the scope of a level II validation, and the calibration summaries were not provided by the laboratory as part of this data package. Using professional judgment, the CCV information provided was reviewed only to determine if serious deficiencies warranting data rejection were present. The laboratory indicated that sample results associated with the failing CCVs were qualified with a "Q" qualifier, which were removed as part of this data validation. Using professional judgment, no further action is necessary as the guidelines do not require rejection of data based on the CCV %D.

Data Qualification: See Table 2.

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 |
| CCV: Continuing Calibration Verification | SPCC: System Performance Check Compound |
| RRF: Relative Response Factor | RT: Retention Time |
| TCLP: Toxicity Characteristic Leaching Procedure | LOQ: Limit of Quantitation |