March 5, 2013 Project No. 923-1000-002.R273

Mr. Bill Kombol
Palmer Coking Coal Company
31407 Highway 169
PO Box 10
Black Diamond, Washington 98010

RE: LANDSBURG MINE SITE INTERIM GROUNDWATER MONITORING RESULTS – NOVEMBER 2012

Dear Bill:

Golder Associates Inc. (Golder) completed an interim groundwater monitoring event at the Landsburg Mine Site during November, 2012. 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, and LMW-11 (Figure 1). Monitoring wells LMW-2, LMW-4 and LMW-10 are completed to monitor shallow and deeper zones within the Rogers Coal Seam north 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. See Figure 2 for a cross-section along the strike at the coal seam that also depicts the location of the monitoring wells. Monitoring well LMW-8 is receiving groundwater before discharge from Portal 3 and the mine access incline at the south end on the Rogers Coal Mine. These wells lay along the primary pathways for detection of a chemical release from the mine, were one to occur. Groundwater samples were also collected from well LMW-9 and the deep well LMW-11, which monitor groundwater from within the Rogers Coal Mine near its south end. Wells LMW-9 and LMW-11 are receiving groundwater from near the top of the water table and near the bottom of the mine, respectively. 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.

Groundwater sampling was conducted in accordance with the *Draft Interim Groundwater Monitoring Plan, Landsburg Mine Site* (Golder 1997)[1], and included the following activities:

- Measurement of static water levels at monitoring wells.
- Well purging to insure sample representativeness with the currently installed dedicated pumping systems.
- Measurement of field parameters including: pH, specific conductance, temperature, dissolved oxygen, Eh, and turbidity.
- Collection of representative samples in appropriate containers; only the dissolved metals samples were field filtered (total metals were not); however the dissolved metals samples were not analyzed.
- Analyses of groundwater for volatile organic compounds (EPA Method 8260C), semi-volatile organic compounds (EPA Method 8270D), polychlorinated biphenyls (PCBs; EPA 8082A), pesticides (EPA 8081B), priority pollutant metals (EPA Method 6010/200.8/7471A Series), and a petroleum hydrocarbon identification scan (HCID).

The attached Appendix A presents the laboratory analytical reports for all analyses. Sampling activities were documented on Sample Integrity Data Sheets (SIDS). Copies of the completed SIDS are provided

[1] Golder Associates Inc. 1997. *Draft Interim Groundwater Monitoring Plan, Landsburg Mine Site.* Prepared for the Landsburg PLP Steering Committee. Redmond, Washington.

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in Appendix B. Table 1 presents water depth measurements and elevations that were collected from wells prior to sampling activities. Groundwater levels are similar to previous monitoring periods and indicate that groundwater is discharging out both ends of the Rogers Coal Mine.

Following sample collection, all bottles were sealed, labeled, and placed in an iced cooler until delivery to the laboratory. All groundwater samples from monitoring wells were transported under chain-of-custody procedures to Analytical Resources Incorporated (ARI), of Tukwila, Washington, for analyses. Screening levels are based on maximum contaminant levels (MCLs) or State of Washington MTCA Method B Groundwater Cleanup Levels whichever value is less. In cases where an established MCL or Method B Cleanup Level does not exist, a similar (surrogate) compound regulatory screening level is identified for comparison.

The analytical results indicate no significant changes in groundwater conditions from those observed during the remedial investigation (RI) and on-going interim groundwater monitoring. Table 2 presents the field parameter measurements and laboratory analytical results for each groundwater sample. Laboratory analyses did not detect any volatile organic compounds, semi-volatile organic compounds, PCBs, pesticides, or petroleum hydrocarbon (HCID) in any of the groundwater samples.

The primary parameters detected in groundwater samples during this sampling event were metals that are naturally occurring. The method reporting limits (MRLs) and method detection limits (MDLs) for all analytes were at or below acceptable concentrations under the Model Toxics Control Act (MTCA).

Several groundwater samples from site wells contained iron and manganese concentrations above State of Washington Secondary Drinking Water Levels (SMCLs) of 0.3 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 November 2012 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 8.9 µg/L, which is the less than the Washington State primary drinking water MCL of 10 µg/L, but higher than the MTCA groundwater cleanup level of 5 µg/L. Arsenic also 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 REDOX and dissolved oxygen levels. The MTCA Groundwater Cleanup Level is based on typical groundwater background levels in the State. It is probable 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.

Conductivity measurements were not collected for LMW-6, LMW-9, and LMW-11 due to a malfunctioning conductivity meter. Monitoring well stabilization was based on the other field sampling parameters.

Hexachloro-1,3-butadiene was detected in a trip blank sample. Hexachloro-1,3-butadiene was not detected in any groundwater samples. It is suspected that this detection of Hexachloro-1,3-butadiene in the trip blank was caused by the laboratory.

[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: U.S. Geological Survey.
[3] Golder Associates Inc. 1996. *Remedial Investigation and Feasibility Study for the Landsburg Mine Site*. Landsburg PLP Steering Committee.

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

Sincerely,

GOLDER ASSOCIATES INC.

Jill Lamberts
Staff Environmental Scientist

Douglas J. Morell, PhD, LHY
Principal

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JL/DJM/cc

TABLES

Table 1: Groundwater Elevation Data Collection November 12, 2012 Landsburg Mine Site

	UNITS	LMW-1	LMW-1a	LMW-2	LMW-3	LMW-4[1]	LMW-5	LMW-6	LMW-7[1]	LMW-8	LMW-9	LMW-10	LMW-11	P-2	Water Drainage	Seam Tunnel
Water Depths																
Time of data collection	ft bgs	10:25 AM	10:15 AM	9:41 AM	10:47 AM	9:51 AM	10:51 AM	10:01 AM	9:21 AM	10:57 AM	11:05 AM	9:53 AM	11:15 AM	10:55 AM	NA	NA
Measured to Top of PVC	ft bgs	141.65	139.25	7.32	12.89	8.80	12.89	35.76	212.79	4.53	100.20	0.00	158.00	7.48	NA	NA
Measured to Top of Monument	ft bgs	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NA	NA
Surveyed Elevation																
Top of PVC	ft asl	765.16	759.51	617.73	656.75	619.26	658.27	632.33	771.51	646.97	743.99	618.87	801.87	651.37	NA	NA
Top of Monument	ft asl	765.89	NC	618.29	657.48	619.85	658.87	633.00	771.88	NC	NC	NC	802.20	NC	NA	NA
Ground Level	ft asl	762.90	756.59	615.35	654.40	617.09	655.63	629.95	768.79	645.25	741.13	615.75	799.50	648.54	551.38	542.15
Corrected Water Elevation																
Using PVC elevation	ft asl	**623.51**	**620.26**	**610.41**	**643.86**	**610.46**	**645.38**	**596.57**	**558.72**	**642.44**	**643.79**	**618.87**	**643.87**	**643.89**	NA	NA
Using Monument elevation	ft asl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
1 = Data corrected to accomodate well inclination of 20° from vertical
NA = Not applicable.
NC = Data not collected.

Table 2: November 2012 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-5	LMW-6	LMW-7	LMW-7 Duplicate	LMW-8	LMW-9	LMW-10	LMW-11	Equipment Blank	Trip Blank	Trip Blank	Trip Blank
Field Parameter																
pH	stnd	7.07	7.85	7.09	7.02	7	7.27	7.27	7.04	7.11	8.88	7.34	NA	NA	NA	NA
Conductivity	uS/cm	706	352	648	857	*	603	603	790	*	367	*	NA	NA	NA	NA
Dissolved Oxygen	mg/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.53	NA	NA	NA	NA
Temperature	°C	10.7	1038	10.7	11.1	9.8	12.2	12.2	11.9	11.4	10	10.5	NA	NA	NA	NA
E_h	Rel mV	151.6	360.8	117	135.0	156.8	121.5	121.5	149.8	154.0	2.9	127.1	NA	NA	NA	NA
Turbidity	NTU	0.44	0.16	0.37	0.28	0.2	0.28	0.28	0.54	0.2	0.37	0.57	NA	NA	NA	NA
Metals (Total)																
Aluminum	µg/L	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	NA	NA
Antimony	µg/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	NA	NA	NA
Arsenic	µg/L	0.2 U	**0.7**	0.2 U	0.2 U	0.2 U	**1.8**	**1.8**	**2.2**	**0.4**	**0.3**	**8.9**	0.2 U	NA	NA	NA
Barium	µg/L	**332**	**74**	**334**	**252**	**112**	**476**	**455**	**58**	**297**	**33**	**310**	3 U	NA	NA	NA
Beryllium	µg/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	NA	NA	NA
Cadmium	µg/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	NA	NA	NA
Calcium	µg/L	**114000**	**37500**	**110000**	**84800**	**26300**	**52400**	**50300**	**77600**	**82400**	**6370**	**54800**	50 U	NA	NA	NA
Chromium	µg/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	NA	NA	NA
Cobalt	µg/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	NA	NA	NA
Copper	µg/L	2 U	**2**	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	NA	NA	NA
Iron	µg/L	**140**	50 U	**1100**	**110**	**2170**	**1050**	**1010**	**10900**	**1550**	50 U	**2040**	50 U	NA	NA	NA
Lead	µg/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	NA	NA	NA
Magnesium	µg/L	**71000**	**15900**	**67800**	**48700**	**13800**	**24600**	**23700**	**43900**	**46200**	**2800**	**27900**	50 U	NA	NA	NA
Manganese	µg/L	**218**	**57**	**167**	**213**	**31**	**136**	**130**	**533**	**165**	**9**	**128**	1 U	NA	NA	NA
Mercury	µg/L	0.100 U	0.100 U	0.100 U	0.100 U	0.020 U	0.100 U	0.100 U	0.100 U	0.020 U	0.100 U	0.020 U	0.100 U	NA	NA	NA
Nickel	µg/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	NA	NA	NA
Potassium	µg/L	**3630**	**1700**	**3830**	**2620**	**690**	**3000**	**2900**	**2440**	**2550**	**1260**	**2040**	500 U	NA	NA	NA
Selenium	µg/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	NA	NA	NA
Silver	µg/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	NA	NA	NA
Sodium	µg/L	**21200**	**10400**	**28500**	**16300**	**6850**	**42600**	**41500**	**15400**	**16100**	**79600**	**28600**	500 U	NA	NA	NA
Thallium	µg/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	NA	NA	NA
Vanadium	µg/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	NA	NA	NA
Zinc	µg/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	NA	NA	NA
Volatile Organic Compounds																
Acetone	µg/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
Acrolein	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Acrylonitrile	µg/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
Benzene	µg/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
Bromobenzene	µg/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
Bromochloromethane	µg/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
Bromodichloromethane	µg/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
Bromoform	µg/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
Bromomethane	µg/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
2-Butanone	µg/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
n-Butylbenzene	µg/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
sec-Butylbenzene	µg/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
tert-Butylbenzene	µg/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
Carbon disulfide	µg/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
Carbon tetrachloride	µg/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
Chlorobenzene	µg/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
Chloroethane	µg/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

Table 2: November 2012 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-5	LMW-6	LMW-7	LMW-7 Duplicate	LMW-8	LMW-9	LMW-10	LMW-11	Equipment Blank	Trip Blank	Trip Blank	Trip Blank
2-Chloroethyl vinyl ether	µg/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
Chloroform	µg/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
Chloromethane	µg/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
2-Chlorotoluene	µg/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
4-Chlorotoluene	µg/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
Chlorodibromomethane	µg/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
1,2-Dibromo-3-Chloropropane	µg/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
1,2-Dibromoethane	µg/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
Dibromomethane	µg/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
1,2-Dichlorobenzene	µg/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
1,3-Dichlorobenzene	µg/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
1,4-Dichlorobenzene	µg/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
trans-1,4-Dichloro-2-butene	µg/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
1,1-Dichloroethane	µg/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
1,2-Dichloroethane	µg/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
1,1-Dichloroethene	µg/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
cis-1,2-Dichloroethene	µg/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
trans-1,2-Dichloroethene	µg/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
1,2-Dichloropropane	µg/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
1,3-Dichloropropane	µg/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
2,2-Dichloropropane	µg/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
1,1-Dichloropropene	µg/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
cis-1,3-Dichloropropene	µg/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
trans-1,3-Dichloropropene	µg/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
Ethylbenzene	µg/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
Hexachloro-1,3-butadiene	µg/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	**0.23 B**	0.2 U	0.2 U
2-Hexanone	µg/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
Iodomethane	µg/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
Isopropylbenzene	µg/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
4-Isopropyltoluene	µg/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
Methylene Chloride	µg/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
4-Methyl-2-pentanone	µg/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	µg/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
N-Propylbenzene	µg/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
Styrene	µg/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
1,2,3-Trichlorobenzene	µg/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
1,2,4-Trichlorobenzene	µg/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
1,3,5-Trichlorobenzene	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	µg/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
1,1,2,2-Tetrachloroethane	µg/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
Tetrachloroethene	µg/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
Toluene	µg/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
1,1,1-Trichloroethane	µg/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
1,1,2-Trichloroethane	µg/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
Trichloroethene	µg/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
Trichlorofluoromethane	µg/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
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/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
1,2,3-Trichloropropane	µg/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
1,2,4-Trimethylbenzene	µg/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
1,3,5-Trimethylbenzene	µg/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
Vinyl acetate	µg/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
Vinyl chloride	µg/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
m-Xylene & p-Xylene	µg/L	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
o-Xylene	µg/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
Xylenes, Total	µg/L	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U

Table 2: November 2012 Groundwater Analytical Results Landsburg Mine Site

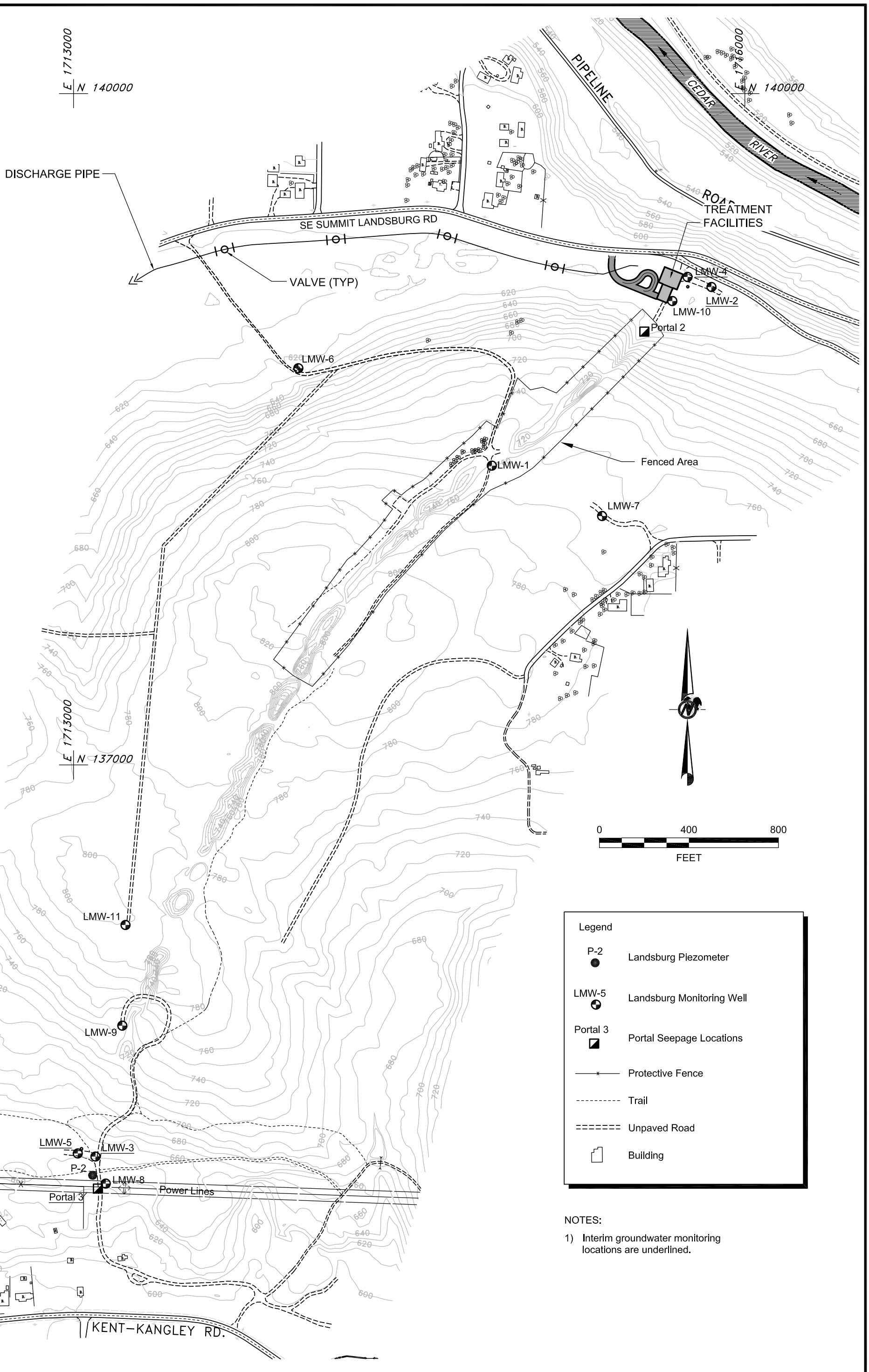
ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-5	LMW-6	LMW-7	LMW-7 Duplicate	LMW-8	LMW-9	LMW-10	LMW-11	Equipment Blank	Trip Blank	Trip Blank	Trip Blank
Semivolatile Organic Compounds																
Acenaphthene	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Acenaphthylene	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Anthracene	µg/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	NA	NA	NA
Benzo(a)anthracene	µg/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	NA	NA	NA
Benzo(a)pyrene	µg/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	NA	NA	NA
Benzo(b)fluoranthene	µg/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	NA	NA	NA
Benzo(ghi)perylene	µg/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	NA	NA	NA
Benzo(k)fluoranthene	µg/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	NA	NA	NA
Benzoic Acid	µg/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	NA	NA	NA
Benzyl Alcohol	µg/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	NA	NA	NA
Bis(2-chloroethoxy)methane	µg/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	NA	NA	NA
Bis(2-chloroethyl)ether	µg/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	NA	NA	NA
Bis(2-chloroisopropyl)ether	µg/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	NA	NA	NA
Bis(2-ethylhexyl)phthalate	µg/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	NA	NA	NA
4-Bromophenyl phenyl ether	µg/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	NA	NA	NA
Butyl benzyl phthalate	µg/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	NA	NA	NA
Carbazole	µg/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	NA	NA	NA
4-Chloroaniline	µg/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	NA	NA	NA
4-Chloro-3-methylphenol	µg/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	NA	NA	NA
2-Chloronaphthalene	µg/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	NA	NA	NA
2-Chlorophenol	µg/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	NA	NA	NA
4-Chlorophenyl phenyl ether	µg/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	NA	NA	NA
3 & 4-Methylphenol (m,p-Cresols)	µg/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	NA	NA	NA
2-Methylphenol (o-Cresol)	µg/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	NA	NA	NA
Chrysene	µg/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	NA	NA	NA
Di-n-butyl phthalate	µg/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	NA	NA	NA
Dibenz(a,h)anthracene	µg/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	NA	NA	NA
Dibenzofuran	µg/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	NA	NA	NA
1,2-Dichlorobenzene	µg/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	NA	NA	NA
1,3-Dichlorobenzene	µg/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	NA	NA	NA
1,4-Dichlorobenzene	µg/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	NA	NA	NA
3,3'-Dichlorobenzidine	µg/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	NA	NA	NA
2,4-Dichlorophenol	µg/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	NA	NA	NA
Diethyl phthalate	µg/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	NA	NA	NA
2,4-Dimethylphenol	µg/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	NA	NA	NA
Dimethyl phthalate	µg/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	NA	NA	NA
4,6-Dinitro-2-methylphenol	µg/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	NA	NA	NA
2,4-Dinitrophenol	µg/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	NA	NA	NA
2,4-Dinitrotoluene	µg/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	NA	NA	NA
2,6-Dinitrotoluene	µg/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	NA	NA	NA
N-Nitrosodiphenylamine	µg/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	NA	NA	NA
Fluoranthene	µg/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	NA	NA	NA
Fluorene	µg/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	NA	NA	NA
Hexachlorobenzene	µg/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	NA	NA	NA
Hexachlorobutadiene	µg/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	NA	NA	NA
Hexachlorocyclopentadiene	µg/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	NA	NA	NA
Hexachloroethane	µg/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	NA	NA	NA
Indeno(1,2,3-cd)pyrene	µg/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	NA	NA	NA
Isophorone	µg/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	NA	NA	NA
1-Methylnaphthalene	µg/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	NA	NA	NA
2-Methylnaphthalene	µg/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	NA	NA	NA

Table 2: November 2012 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-5	LMW-6	LMW-7	LMW-7 Duplicate	LMW-8	LMW-9	LMW-10	LMW-11	Equipment Blank	Trip Blank	Trip Blank	Trip Blank
Naphthalene	µg/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	NA	NA	NA
2-Nitroaniline	µg/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	NA	NA	NA
3-Nitroaniline	µg/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	NA	NA	NA
4-Nitroaniline	µg/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	NA	NA	NA
Nitrobenzene	µg/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	NA	NA	NA
2-Nitrophenol	µg/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	NA	NA	NA
4-Nitrophenol	µg/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	NA	NA	NA
N-Nitrosodi-n-propylamine	µg/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	NA	NA	NA
Di-n-octyl phthalate	µg/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	NA	NA	NA
Pentachlorophenol	µg/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	NA	NA	NA
Phenanthrene	µg/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	NA	NA	NA
Phenol	µg/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	NA	NA	NA
Pyrene	µg/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	NA	NA	NA
1,2,4-Trichlorobenzene	µg/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	NA	NA	NA
2,4,5-Trichlorophenol	µg/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	NA	NA	NA
2,4,6-Trichlorophenol	µg/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	NA	NA	NA
PCBs																
Aroclor 1016 (2C)	µg/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	NA	NA	NA
Aroclor 1221	µg/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	NA	NA	NA
Aroclor 1232	µg/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	NA	NA	NA
Aroclor 1242	µg/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	NA	NA	NA
Aroclor 1248	µg/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	NA	NA	NA
Aroclor 1254	µg/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	NA	NA	NA
Aroclor 1260	µg/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	NA	NA	NA
Pesticides																
Aldrin (2C)	µg/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	NA	NA	NA
alpha-BHC (2C)	µg/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	NA	NA	NA
beta-BHC (2C)	µg/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	NA	NA	NA
delta-BHC (2C)	µg/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	NA	NA	NA
gamma-BHC (2C)	µg/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	NA	NA	NA
alpha-Chloradine (2C)	µg/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	NA	NA	NA
gamma-Chloradine (2C)	µg/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	NA	NA	NA
4,4'-DDD (2C)	µg/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	NA	NA	NA
4,4'-DDE (2C)	µg/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	NA	NA	NA
4,4'-DDT (2C)	µg/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	NA	NA	NA
Dieldrin (2C)	µg/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	NA	NA	NA
Endosulfan I (2C)	µg/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	NA	NA	NA
Endosulfan II (2C)	µg/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	NA	NA	NA
Endosulfan sulfate (2C)	µg/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	NA	NA	NA
Endrin	µg/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	NA	NA	NA
Endrin aldehyde (2C)	µg/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	NA	NA	NA
Endrin ketone (2C)	µg/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	NA	NA	NA
Heptachlor (2C)	µg/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	NA	NA	NA
Heptachlor epoxide (2C)	µg/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	NA	NA	NA
Methoxychlor (2C)	µg/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	NA	NA	NA
Toxaphene	µg/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	NA	NA	NA
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	NA	NA	NA
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	NA	NA	NA
Heavy Fuel Oil	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	NA	NA	NA

Notes:
NA - not analyzed
U - the analyte was not detected above the level of the reporting limit
* Conductivity meter not working. Stabilized based on other parameters.

FIGURES



NOTES:

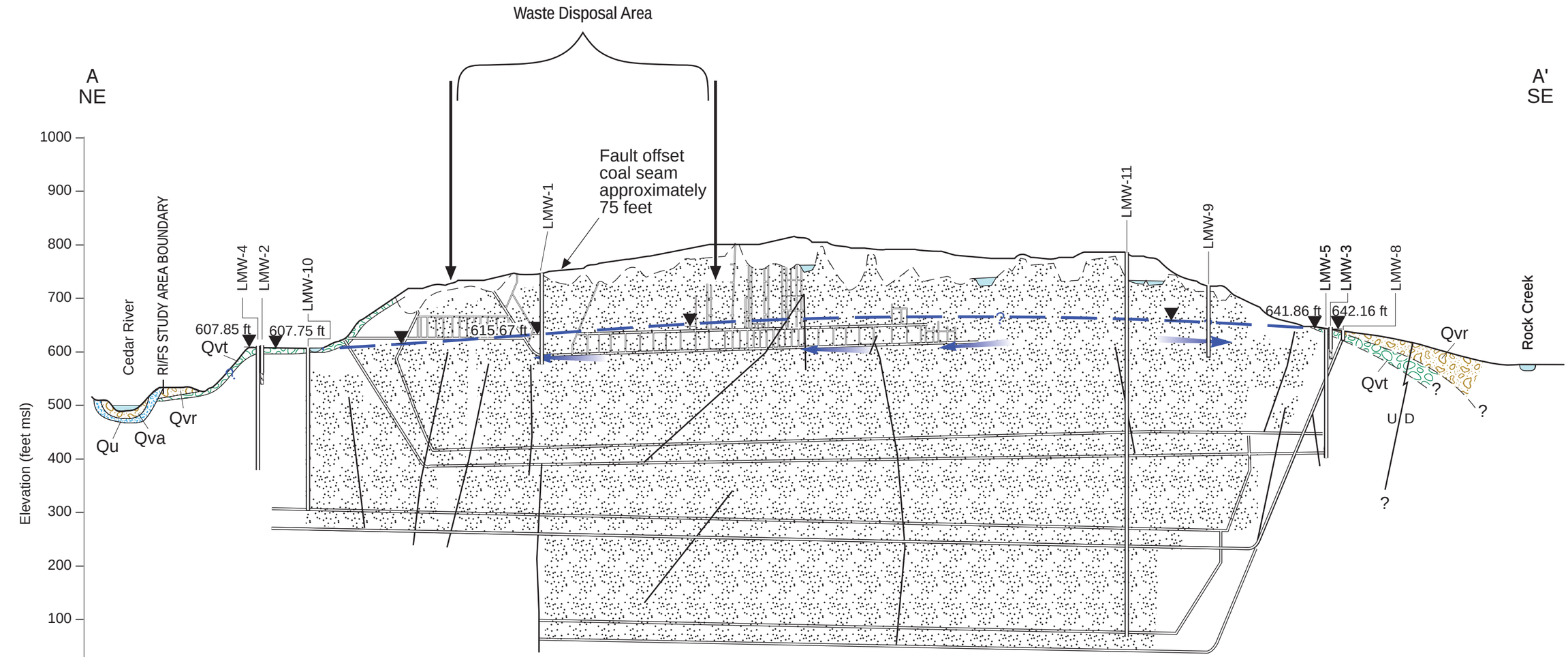
1) Interim groundwater monitoring locations are underlined.

FIGURE **1**

GROUNDWATER MONITORING LOCATIONS

PALMER/LANDSBURG MINE/WA

Golder Associates



EXPLANATION

- Potentiometric surface
- Outline of trench bottom
- Water Level (ft. amsl) 2/23/94
- Qvt Till, compact mixture of gravel occasional boulders in clayey silty sand matrix
- Sandstone
- Surface water feature
- Anticipated collapsed zone within mine
- Qu Drift, till, fluvial sand and gravel, lacustrine sand, silt, clay and peat
- Qvr Recessional outwash, well sorted sand and pebble-cobble
- Qva Advanced outwash pebble-cobble gravel may include very fine sand
- Monitoring Interval
- Groundwater Flow Direction

0 500
SCALE IN FEET

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

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

Assuming groundwater discharge at the north and south end of mine.

FIGURE 2
CROSS-SECTION ALONG STRIKE AT COAL SEAM
PALMER/LANDSBURG MINE/WA

9231000002R273fig02.ai | Mod: 08/19/10 | AMP

Golder Associates

APPENDIX A
LABORATORY ANALTYICAL REPORTS

Table of Contents: ARI Job VS45, VS46

Client: Golder Associates

Project: 923-1000-002.R273 Landsburg Mine

BC

Signature

November-30-2012

Date

Table of Contents: ARI Job VS45, VS46

Client: Golder Associates

Project: 923-1000-002.R273 Landsburg Mine

BC
Signature

November-30-2012
Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 5, 2012

Doug Morell
Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Client Project Name: Landsburg Mine
Client Project Number: 923-1000-002.R273
ARI ID: VS45, VS46

Dear Mr. Morell:

Please find enclosed the original Chain of Custody record, sample receipt documentation, and the final results for the project referenced above.

Sample receipt and analytical details are addressed in the enclosed Case Narrative.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to call me at any time.

Respectfully,
ANALYTICAL RESOURCES, INC.

Kelly Bottem FOR

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: VS45, VS46

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: VS45	Turn-around Requested: standard
ARI Client Company: Golder Associates.	Phone: 425 883 0777
Client Contact: Doug Morell / Jill Lamberts	
Client Project Name: Landsburg Mine.	
Client Project #: 923-1000-002.R273	Samplers: J. Lamberts, C. Willder

Page: 1 of 1	
Date: 11/13/2012	Ice Present? Y
No. of Coolers: 7	Cooler Temps: 1.1 - 5.3

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

Sample ID	Date	Time	Matrix	No Containers	VOCs client list	PCBs / Pest.	SVOCs 8270 client list	TPH-HCID	TAML Total metals	TAML * Diss. metals			Notes/Comments
Trip Blank	11/13/12	—	DI	6	X			X					MSA to run Golder + ARI
LMW-3-1112		1030	W	17	X	X	X	X	X	HOLD			
LMW-EB-1112		1020		17	X	X	X	X	X				
LMW-8-1112		1125		17	X	X	X	X	X				
LMW-5-1112		1225		17	X	X	X	X	X				
~~LMW-6-1112~~				17	X	X	X	X	X				JSL 11/13/12
LMW-7-1112		1430	W	17	X	X	X	X	X	HOLD			
LMW-7-1112-D		1435	W	17	X	X	X	X	X				

* Field Filtered w/ 0.45 µm filter. Please analyze under existing

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by: (Signature)	Received by (Signature)
P/s cc. klangley@golder.com jlamberts@golder.com dmorell@golder.com				
Ecology EIM EDD.	Printed Name: J. Lamberts	Printed Name: Jennifer Millsap	Printed Name:	Printed Name.
	Company: Golder	Company: ARI	Company:	Company:
	Date & Time: 11/13/12 1550	Date & Time: 11/13/12 1550	Date & Time.	Date & Time:

VS45:00003

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

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

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder

Project Name: Landshura Mine

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: VS45

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)	5.3 3.0 2.2 1.8 1.3 2.9 1.1	
If cooler temperature is out of compliance fill out form 00070F	Temp Gun ID# 90877952	

Cooler Accepted by: JM Date: 11/13/12 Time: 1550

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	10/30/12	

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

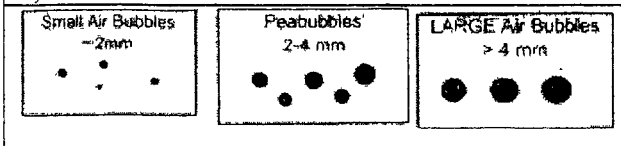
Samples Logged by: AV Date: 11/13/12 Time: 1655

***** 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"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 11/13/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **VS45**

Inquiry Number: NONE
Analysis Requested: 11/14/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: AV
Sample Set Used: Yes-119
Validatable Package: Lv4
Deliverables:

PC: Kelly
VTSR: 11/13/12

Project #: 923-1000-002.R273
Project: Landsburg Mine
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-22812 **VS45A**	LMW-3-1112						TOT P															
12-22813 **VS45B**	LMW-EB-1112						TOT P															
12-22814 **VS45C**	LMW-8-1112						TOT P															
12-22815 **VS45D**	LMW-5-1112						TOT P															
12-22816 **VS45E**	LMW-7-1112						TOT P															
12-22817 **VS45F**	LMW-7-1112-D						TOT P															

P= Pass

VS45 ..0005

Checked By AV Date 11/13/12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client Golder

Project Name Landshura Mine

COC No(s) _____ (NA)

Delivered by Fed-Ex UPS Courier Hand Delivered Other _____

Assigned ARI Job No. VS46

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) 5.3 3.0 2.2 1.8 1.3 2.9 1.1

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID# 90877952

Cooler Accepted by JM Date 11/13/12 Time 1550

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 10/30/12

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

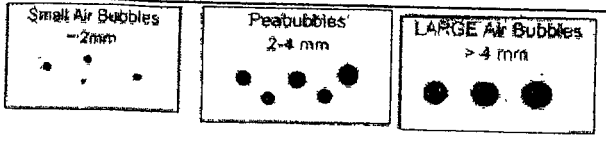
Samples Logged by: AV Date 11/13/12 Time 1655

*** 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"	
Peabubbles → "pb"	
Large → "lg"	
Headspace → "hs"	

PRESERVATION VERIFICATION 11/13/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **VS46**

Inquiry Number: NONE
Analysis Requested: 11/14/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: AV
Sample Set Used: Yes-119
Validatable Package: Lv4
Deliverables:

PC: Kelly
VTSR: 11/13/12

Project #: 923-1000-002.R273
Project: Landsburg Mine
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-22819 **VS46A**	LMW-3-1112						TOT P															
12-22820 **VS46B**	LMW-EB-1112						TOT P															
12-22821 **VS46C**	LMW-8-1112						TOT P															
12-22822 **VS46D**	LMW-5-1112						TOT P															
12-22823 **VS46E**	LMW-7-1112						TOT P															
12-22824 **VS46F**	LMW-7-1112-D						TOT P															

P=Pass

VS46 09907

Checked By AV Date 11/13/12

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: VS45, VS46

Case Narrative
Project: Landsburg Mine
ARI ID: VS45, VS46
December 5, 2012

Sample Receipt:

Analytical Resources, Inc. (ARI) accepted six water samples and a trip blank in good condition on November 13, 2012 under ARI Sample Delivery Groups (SDGs) VS45 and VS46. The samples were received with cooler temperatures between 1.1 and 5.3°C.

For further details regarding sample receipt please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for Volatile Organics, Semivolatile Organics, Pesticides, PCBs, HCID and Total Metals, as requested on the Chain of Custody. The dissolved metals were placed on hold pending further instructions. All HCID samples were non-detect and did not require follow up analyses.

Volatile Organics by Method 8260C:

The samples were analyzed between 11/21/12 and 11/26/12 - within the method recommended holding times. All samples had a pH of <2.0.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The percent differences for several compounds were high for the CCALs that bracketed the analyses of these samples. All positive results for these analytes have been flagged with a "Q" qualifier. No further corrective action was taken.

Surrogates: All surrogates are in control.

Method Blank(s): Small amounts of hexachlorobutadiene, n-Butylbenzene and 1,2,4-Trimethylbenzene were detected in the method and trip blanks associated with these samples. Since these compounds were not detected in any sample associated with these blanks, no corrective actions were taken.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): The percent recoveries for hexechlorobutadiene were high following the analyses of the LCS/LCSD analyzed on 11/21/12. Since this compound was not detected in any sample associated with this LCS/LCSD, except as noted above, the high bias does not compromise any RL. No corrective actions were taken.

Semivolatile Organics by Method 8270D:

The samples were extracted on 11/15/12 and analyzed on 11/20/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Case Narrative
Project: Landsburg Mine
ARI ID: VS45, VS46
December 5, 2012

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

Pesticides by Method 8081B:

The samples were extracted on 11/17/12 and analyzed on 11/20/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The percent difference (%D) for endrin ketone was high for one column for the opening CCAL that bracketed the analyses of these samples. The %D was within acceptance criteria for the secondary column. Only the secondary column was used for quantitation. No further corrective action was taken.

Surrogates: All surrogates are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

PCBs by Method 8082A:

The samples were extracted on 11/19/12 and analyzed on 11/27/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Method Blank(s): The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

Case Narrative
Project: Landsburg Mine
ARI ID: VS45, VS46
December 5, 2012

HCID by NWTPH:

The samples were extracted on 11/15/12 and analyzed between 11/15/12 and 11/16/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): The LCS and LCSD were in control.

Total Metals by EPA Methods 6010C, 200.8, and 7471A

The samples were digested between 11/16/12 and 11/19/12. The digests were analyzed between 11/26/12 and 11/28/12 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Samples: No anomalies were encountered for these samples.

Lab Control(s): The LCS recoveries were within control limits.

Method Blank(s): The method blanks were free of contamination.

Matrix spike(s)/ RPD(s): The percent recovery for calcium was low following the analysis of the MS associated with sample LMW-3-1112. Since the percent recovery for calcium was within acceptable QC limits for the corresponding LCS, it was concluded that the sample matrix was the cause of the low recovery. No corrective actions were taken.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VS45
Client: Golder Associates
Project Event: 923-1000-002.R273
Project Name: Landsburg Mine

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-3-1112	VS45A	12-22812	Water	11/13/12 10:30	11/13/12 15:50
2.	LMW-EB-1112	VS45B	12-22813	Water	11/13/12 10:20	11/13/12 15:50
3.	LMW-8-1112	VS45C	12-22814	Water	11/13/12 11:25	11/13/12 15:50
4.	LMW-5-1112	VS45D	12-22815	Water	11/13/12 12:25	11/13/12 15:50
5.	LMW-7-1112	VS45E	12-22816	Water	11/13/12 14:30	11/13/12 15:50
6.	LMW-7-1112-D	VS45F	12-22817	Water	11/13/12 14:35	11/13/12 15:50
7.	Trip Blanks	VS45G	12-22818	Water	11/13/12	11/13/12 15:50

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VS46
Client: Golder Associates
Project Event: 923-1000-002.R273
Project Name: Landsburg Mine

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-3-1112	VS46A	12-22819	Water	11/13/12 10:30	11/13/12 15:50
2.	LMW-EB-1112	VS46B	12-22820	Water	11/13/12 10:20	11/13/12 15:50
3.	LMW-8-1112	VS46C	12-22821	Water	11/13/12 11:25	11/13/12 15:50
4.	LMW-5-1112	VS46D	12-22822	Water	11/13/12 12:25	11/13/12 15:50
5.	LMW-7-1112	VS46E	12-22823	Water	11/13/12 14:30	11/13/12 15:50
6.	LMW-7-1112-D	VS46F	12-22824	Water	11/13/12 14:35	11/13/12 15:50

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
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).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)					
Analyte	**DL[1] µg/L**	**LOD[1] µg/L**	**LOQ[1] µg/L**	**LCS Recovery[2,4]**	**Replicate RPD[3]**
Chloromethane	0.095	0.25	**0.5**	77 – 122	≤ 40
Vinyl Chloride	0.057	0.1	**0.2**	74 – 123	≤ 40
Bromomethane	0.252	0.5	**1.0**	68 – 130	≤ 40
Chloroethane	0.086	0.1	**0.2**	68 – 133	≤ 40
Trichlorofluoromethane	0.037	0.1	**0.2**	74 – 135	≤ 40
Acrolein	2.476	2.5	**5.0**	60 – 124	≤ 40
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.043	0.1	**0.2**	76 – 124	≤ 40
Acetone	2.057	2.5	**5.0**	64 – 125	≤ 40
1,1-Dichloroethene	0.054	0.1	**0.2**	74 – 120	≤ 40
Bromoethane	0.041	0.1	**0.2**	77 – 122	≤ 40
Iodomethane (Methyl Iodide)	0.227	0.5	**1.0**	76 – 123	≤ 40
Methylene Chloride	0.485	0.5	**1.0**	71 – 125	≤ 40
Acrylonitrile	0.604	1.0	**1.0**	76 – 123	≤ 40
Carbon Disulfide	0.037	0.1	**0.2**	77 – 124	≤ 40
trans-1,2-Dichloroethene	0.048	0.1	**0.2**	75 – 120	≤ 40
Vinyl Acetate	0.069	0.1	**0.2**	74 – **120**	≤ 40
1,1-Dichloroethane	0.053	0.1	**0.2**	80 – 120	≤ 40
2-Butanone	0.814	2.5	**5.0**	73 – 123	≤ 40
2,2-Dichloropropane	0.052	0.1	**0.2**	72 – 133	≤ 40
cis-1,2-Dichloroethene	0.043	0.1	**0.2**	78 – 120	≤ 40
Chloroform	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Bromochloromethane	0.061	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1-Trichloroethane	0.041	0.1	**0.2**	79 – 124	≤ 40
1,1-Dichloropropene	0.034	0.1	**0.2**	**80 – 120**	≤ 40
Carbon Tetrachloride	0.044	0.1	**0.2**	71 – 139	≤ 40
1,2-Dichloroethane	0.072	0.1	**0.2**	**80** – 121	≤ 40
Benzene	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Trichloroethene	0.049	0.1	**0.2**	**80 – 120**	≤ 40
1,2-Dichloropropane	0.035	0.1	**0.2**	**80 – 120**	≤ 40
Bromodichloromethane	0.051	0.1	**0.2**	**80** – 122	≤ 40
Dibromomethane	0.145	0.2	**0.2**	**80 – 120**	≤ 40
2-Chloroethylvinyl Ether	0.250	0.5	**1.0**	62 – 130	≤ 40
4-Methyl-2-Pentanone	0.974	2.5	**5.0**	**80** – 125	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)					
Analyte	**DL[1] µg/L**	**LOD[1] µg/L**	**LOQ[1] µg/L**	**LCS Recovery[2,4]**	**Replicate RPD[3]**
cis 1,3-dichloropropene	0.061	0.1	**0.2**	**80** – 127	≤ 40
Toluene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
trans 1,3-Dichloropropene	0.081	0.1	**0.2**	79 – 132	≤ 40
2-Hexanone	0.902	2.5	**5.0**	80 – 129	≤ 40
1,1,2-Trichloroethane	0.129	0.2	**0.2**	**80 – 120**	≤ 40
1,3-Dichloropropane	0.062	0.1	**0.2**	**80 – 120**	≤ 40
Tetrachloroethene	0.047	0.1	**0.2**	**80 – 120**	≤ 40
Dibromochloromethane	0.048	0.1	**0.2**	**80** – 120	≤ 40
1,2-Dibromoethane (Ethylene Dibromide)	0.075	0.1	**0.2**	**80 – 120**	≤ 40
Chlorobenzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Ethyl Benzene	0.037	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1,2-Tetrachloroethane	0.040	0.1	**0.2**	**80** – 128	≤ 40
m,p-xylene	0.052	0.2	**0.4**	**80 – 120**	≤ 40
o-Xylene	0.035	0.1	**0.2**	**80** – 120	≤ 40
Styrene	0.045	0.1	**0.2**	**80** – 121	≤ 40
Bromoform	0.062	0.1	**0.2**	62 – 149	≤ 40
1,1,2,2-Tetrachloroethane	0.060	0.1	**0.2**	**80 – 120**	≤ 40
1,2,3-Trichloropropane	0.131	0.25	**0.5**	**80 – 120**	≤ 40
trans-1,4-Dichloro 2-Butene	0.324	0.5	**1.0**	47 – 147	≤ 40
n-Propyl Benzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Bromobenzene	0.060	0.1	**0.2**	**80 – 120**	≤ 40
iso-propyl Benzene	0.021	0.1	**0.2**	**80 – 120**	≤ 40
2-Chloro Toluene	0.024	0.1	**0.2**	**80 – 120**	≤ 40
4-Chloro Toluene	0.016	0.1	**0.2**	**80 – 120**	≤ 40
tert-Butyl Benzene	0.026	0.1	**0.2**	**80** – 121	≤ 40
1,3,5-Trimethyl Benzene	0.015	0.1	**0.2**	**80 – 120**	≤ 40
1,2,4-Trimethylbenzene	0.024	0.1	**0.2**	**80** – 122	≤ 40
sec-Butyl Benzene	0.024	0.1	**0.2**	**80** – 121	≤ 40
4-Isopropyl Toluene	0.026	0.1	**0.2**	**80** – 124	≤ 40
1,3-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40
1,4-Dichlorobenzene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
n-Butyl Benzene	0.025	0.1	**0.2**	**80** – 125	≤ 40
1,2-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
1,2-Dibromo 3-Chloropropane	0.366	0.5	**0.5**	79 – 129	≤ 40
1,2,4-Trichlorobenzene	0.107	0.25	**0.5**	77 – 127	≤ 40
Hexachloro-1,3-Butadiene	0.073	0.25	**0.5**	80 – 135	≤ 40
Naphthalene	0.118	0.25	**0.5**	**80** – 128	≤ 40
1,2,3-Trichlorobenzene	0.110	0.25	**0.5**	**80** - 125	≤ 40
Dichlorodifluoromethane	0.052	0.1	**0.2**	68 – 133	≤ 40
Methyl-*tert*-butyl ether	0.073	0.25	**0.5**	79 – 121	≤ 40
Surrogate Standards			**MB / LCS**	**Samples**	**RPD**
1,2-Dichloroethane-d_4			**80 – 120**	**80** – 130	≤ 40
1,2-Dichlorobenzene-d_4			**80 – 120**	**80 – 120**	≤ 40
Toluene-d_8			**80 – 120**	**80 – 120**	≤ 40
4-Bromofluorobenzene			**80 – 120**	**80 – 120**	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Control limits calculated using all data from 1/1/12 through 5/31/12.
(3) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(4) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that:
a. ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit or
b. Control limits for analyzes with no separate preparation procedure are adjusted to reflect the minimum uncertainty in the calibration of the instrument allowed by the referenced analytical method.

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
Phenol	**0.445**	**0.5**	**1**	26 – 112	≤ 40
Bis(2-Chloroethyl)ether	**0.257**	**0.5**	**1**	51 – **100**	≤ 40
2-Chlorophenol	**0.246**	**0.5**	**1**	50 – **100**	≤ 40
1,3-Dichlorobenzene	**0.499**	**0.5**	**1**	27 – **100**	≤ 40
1,4-Dichlorobenzene	**0.470**	**0.5**	**1**	29 – **100**	≤ 40
1,2-Dichlorobenzene	**0.436**	**0.5**	**1**	32 – **100**	≤ 40
Benzyl alcohol	**0.409**	**1.0**	**2**	**10** - 128	≤ 40
2,2'-oxybis(1-Chloropropane)	**0.221**	**0.5**	**1**	39 - 101	≤ 40
2-Methylphenol	**0.329**	**0.5**	**1**	47 – **100**	≤ 40
Hexachloroethane	**0.610**	**1.0**	**2**	19 – **100**	≤ 40
N-Nitroso-di-n-propylamine	**0.365**	**0.5**	**1**	46 – **100**	≤ 40
4-Methylphenol	**0.536**	**1.0**	**2**	46 – **100**	≤ 40
Nitrobenzene	**0.490**	**0.5**	**1**	46 – 103	≤ 40
Isophorone	**0.258**	**0.5**	**1**	62 – 105	≤ 40
2-Nitrophenol	**0.979**	**1.5**	**3**	32 – 116	≤ 40
2,4-Dimethylphenol	**0.627**	**1.5**	**3**	15 – **100**	≤ 40
Bis(2-Chloroethoxy)methane	**0.252**	**0.5**	**1**	44 – **100**	≤ 40
2,4-Dichlorophenol	**1.109**	**1.5**	**3**	35 – 114	≤ 40
1,2,4-Trichlorobenzene	**0.495**	**0.5**	**1**	34 – **100**	≤ 40
Naphthalene	**0.326**	**0.5**	**1**	48 – **100**	≤ 40
Benzoic acid	**8.647**	**10**	**20**	**10** - 172	≤ 40
4-Chloroaniline	**1.733**	**2.5**	**5**	**10** - 153	≤ 40
2,6-Dinitrotoluene	**1.300**	**1.5**	**3**	32 – 129	≤ 40
Hexachlorobutadiene	**0.604**	**1.5**	**3**	22 – **100**	≤ 40
4-Chloro-3-methylphenol	**0.919**	**1.5**	**3**	33 – 123	≤ 40
Hexachlorocyclopentadiene	**1.862**	**2.5**	**5**	**10** – **100**	≤ 40
2,4,6-Trichlorophenol	**1.235**	**1.5**	**3**	37 – 120	≤ 40
2,4,5-Trichlorophenol	**1.706**	**2.5**	**5**	37 – 124	≤ 40
2-Chloronaphthalene	**0.340**	**0.5**	**1**	49 – **100**	≤ 40
2-Nitroaniline	**0.784**	**1.5**	**3**	18 – 140	≤ 40
Acenaphthylene	**0.274**	**0.5**	**1**	47 – 110	≤ 40
Dimethylphthalate	**0.264**	**0.5**	**1**	60 – 106	≤ 40
Acenaphthene	**0.347**	**0.5**	**1**	55 – 101	≤ 40

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
3-Nitroaniline	**1.140**	**1.5**	**3**	**10** – 208	≤ 40
2-Methylnaphthalene	**0.241**	**0.5**	**1**	38 – **100**	≤ 40
2,4-Dinitrophenol	**5.474**	**10**	**20**	**10** – 224	≤ 40
Dibenzofuran	**0.198**	**0.5**	**1**	46 – 108	≤ 40
4-Nitrophenol	**2.895**	**5.0**	**10**	**10** – 103	≤ 40
2,4-Dinitrotoluene	**1.277**	**1.5**	**3**	33 – 134	≤ 40
Fluorene	**0.266**	**0.5**	**1**	59 – 108	≤ 40
4-Chlorophenyl-phenylether	**0.342**	**0.5**	**1**	54 – 104	≤ 40
Diethylphthalate	**0.407**	**0.5**	**1**	60 - 108	≤ 40
4-Nitroaniline	**1.366**	**1.5**	**3**	13 – 144	≤ 40
4,6-Dinitro-2-methylphenol	**4.928**	**5.0**	**10**	**10** – 190	≤ 40
N-Nitrosodiphenylamine	**0.392**	**0.5**	**1**	39 – 100	≤ 40
4-Bromophenyl-phenylether	**0.262**	**0.5**	**1**	56 – 105	≤ 40
Hexachlorobenzene	**0.335**	**0.5**	**1**	54 – 108	≤ 40
Pentachlorophenol	**2.746**	**5.0**	**10**	25 – 144	≤ 40
Phenanthrene	**0.283**	**0.5**	**1**	64 – 115	≤ 40
Anthracene	**0.303**	**0.5**	**1**	59 – 107	≤ 40
Carbazole	**0.251**	**0.5**	**1**	36 – 123	≤ 40
Di-n-butylphthalate	**0.304**	**0.5**	**1**	62 – 110	≤ 40
Fluoranthene	**0.290**	**0.5**	**1**	63 – 119	≤ 40
Pyrene	**0.379**	**0.5**	**1**	57 – 117	≤ 40
Butylbenzylphthalate	**0.402**	**0.5**	**1**	49 – 118	≤ 40
Benzo(a)anthracene	**0.373**	**0.5**	**1**	61 – 113	≤ 40
3,3'-Dichlorobenzidine	**1.553**	**2.5**	**5**	**10** – 151	≤ 40
Chrysene	**0.397**	**0.5**	**1**	62 – 115	≤ 40
bis(2-Ethylhexyl)phthalate	**1.050**	**1.5**	**3**	47 – 127	≤ 40
Di-n-octylphthalate	**0.331**	**0.5**	**1**	60 – 106	≤ 40
Benzo(b)fluoranthene	**0.298**	**0.5**	**1**	61 – 120	≤ 40
Benzo(k)fluoranthene	**0.487**	**0.5**	**1**	59 – 120	≤ 40
Benzo(a)pyrene	**0.425**	**0.5**	**1**	46 – 105	≤ 40
Indeno(1,2,3-cd)pyrene	**0.435**	**0.5**	**1**	42 – 134	≤ 40
Dibenzo(a,h)anthracene	**0.437**	**0.5**	**1**	46 – 132	≤ 40
Benzo(g,h,i)perylene	**0.464**	**0.5**	**1**	33 – 135	≤ 40
N-Nitrosodimethylamine	**1.209**	**1.5**	**3**	17 - 106	≤ 40

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
Aniline	**0.470**	**0.5**	**1**	**10** – 113	≤ 40
1-methylnaphthalene	**0.199**	**0.5**	**1**	43 – **100**	≤ 40
Azobenzene (1,2-DP-Hydrazine)	**0.214**	**0.5**	**1**	52 – 111	≤ 40
Benzofluoranthenes, Total	**2.317**	**2.5**	**5**	60 – 130[5]	≤ 40
Surrogate Standard Recovery			**MB / LCS**	**Samples**	**RPD**
2-Fluorophenol			33 – 100	23 – **100**	≤ 40
Phenol-d_5			15 - 121	16 – 106	≤ 40
2-Chlorophenol-d_4			46 – 102	33 – 100	≤ 40
1,2-Dichlorobenzene-d_4			40 – **100**	27 – **100**	≤ 40
Nitrobenzene-d_5			50 – **100**	34 – 101	≤ 40
2-Fluorobiphenyl			51 – **100**	38 – **100**	≤ 40
2,4,6-Tribromophenol			46 – 125	31 – 128	≤ 40
p-Terphenyl-d_{14}			54 – 117	27 – 122	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Control limits calculated using all data from 8/1/10 through 7/31/11.
(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(5) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits.

DL[1], LOD[1], LOQ[1] and Control Limits Summary
Analysis of Water Samples for Chlorinated Pesticides
EPA Method 8081B

Separatory Funnel (EPA Method 3510C) Extraction using 500 mL sample with extract concentrated to 5 mL final volume. ARI Bench Sheet 3038F

LOD Spike level = LOQ Concentration

Analyte	DL[1,2] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Control Limit[3,4]	Replicate RPD[5]
alpha-BHC	0.0085	0.025	**0.05**	51 – 120	≤ 40
beta-BHC	0.0098	0.025	**0.05**	44 – 134	≤ 40
gamma-BHC (Lindane)	0.0159	0.025	**0.05**	59 – 131	≤ 40
delta-BHC	0.0087	0.025	**0.05**	44 – 156	≤ 40
Heptachlor	0.0113	0.025	**0.05**	47 – 110	≤ 40
Aldrin	0.0103	0.025	**0.05**	47 – 106	≤ 40
Heptachlor Epoxide	0.0079	0.025	**0.05**	62 – 121	≤ 40
trans-Chlordane (*beta*-Chlordane, *gamma*-Chlordane)	0.0082	0.025	**0.05**	63 – 125	≤ 40
cis-Chlordane (*alpha*-chlordane)	0.0082	0.025	**0.05**	62 – 123	≤ 40
Endosulfan I	0.0089	0.025	**0.05**	**10** – 110	≤ 40
4,4'-DDE	0.0184	0.05	**0.10**	61 – 138	≤ 40
Dieldrin	0.0168	0.05	**0.10**	64 – 123	≤ 40
Endrin	0.0167	0.05	**0.10**	53 – 127	≤ 40
Endosulfan II	0.0139	0.05	**0.10**	23 – 102	≤ 40
4,4'-DDD	0.0186	0.05	**0.10**	53 – 133	≤ 40
Endrin Aldehyde	0.0163	0.05	**0.10**	28 – 107	≤ 40
4,4'-DDT	0.0169	0.05	**0.10**	49 – 127	≤ 40
Endosulfan Sulfate	0.0235	0.05	**0.10**	49 – 121	≤ 40
Endrin Ketone	0.0151	0.05	**0.10**	45 – 126	≤ 40
Methoxychlor	0.0744	0.25	**0.50**	48 – 118	≤ 40
Hexachlorobutadiene	0.0123	0.05	**0.10**	23 – **100**	≤ 40
Hexachlorobenzene	0.0101	0.05	**0.10**	44 – 101	≤ 40
Surrogate Standard Recovery			**MB / LCS**	**Samples**	**RPD**
Tetrachloro-*m*-xylene (TCMX)			38 – 103	30 – 105	≤ 40
Decachlorobiphenyl			37 – 125	11 – 144	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation as defined in ARI SOP 1018S.
(2) MDL study QD48
(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(4) Control limits calculated using all data from 1/1/12 through 7/31/12.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Quality Control Criteria for Analysis of Aqueous and Tissue Samples for Aroclors (Polychlorinated Biphenyls – PCB) EPA Method 8082B

Analysis Code	Extraction	DL[1]	LOD[1]	LOQ[1]	Analyte	Spike Recovery Control Limits (%)[2,3]			RPD[4]
						LCS	MB/LCS Surrogate	Sample Surrogate	
Aqueous Samples (Separatory Funnel Extraction – EPA Method 3510C)									
PCBWSI 01-3018F	500 to 5 mL	0.130 µg/L	0.5 µg/L	1 µg/L	Aroclor 1016	45 – 121	--	--	≤ 40
		0.147 µg/L	0.5 µg/L	1 µg/L	Aroclor 1260	54 – 129	--	--	
		--	--	--	TCMX	--	40 – 118	38 – 118	
		--	--	--	DCBP	--	41 – 111	29 – 118	
PCBWSM 02-3021F	500 to 1 mL	0.0175 µg/L	0.05 µg/L	0.1 µg/L	Aroclor 1016	36 – **100**	--	--	≤ 40
		0.0174 µg/L	0.05 µg/L	0.1 µg/L	Aroclor 1260	41 – 113	--	--	
		--	--	--	TCMX	--	29 – **100**	25 – **100**	
		--	--	--	DCBP	--	39 – 116	**10** – 128	
PCBWLS	1000 to 0.5 mL[5]	0.00248 µg/L	0.005 µg/L	0.01 µg/L	Aroclor 1016	44 – 117	--	--	≤ 40
		0.00276 µg/L	0.005 µg/L	0.01 µg/L	Aroclor 1260	46 – 131	--	--	
		--	--	--	TCMX	--	31 – **100**	21 – **100**	
		--	--	--	DCBP	--	32 – 108	19 – 111	
TCLP Extract (Separatory Funnel Extraction – EPA Method 3510C)									
PCBWST	100 to 10 mL	0.130 µg/L[8]	5 µg/L	10 µg/L	Aroclor 1016	30 – 160	--	--	≤ 40
		0.147 µg/L[8]	5 µg/L	10 µg/L	Aroclor 1260	30 – 160	--	--	
		--	--	--	TCMX	--	30 – 160	30 – 160	
		--	--	--	DCBP	--	30 – 160	30 – 160	
Tissue Samples (Tissuemizer / Blender Extraction – EPA Method 3550C Modified) – Concentrations in µg/kg as received (wet weight)									
PCBUZI 09-3029F	10 g to 5 mL	2.92 µg/kg[6]	25 µg/kg	50 µg/kg	Aroclor 1016	30 – 160			≤ 40
		3.91 µg/kg[6]	25 µg/kg	50 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	
PCBUZM 10-3027F	25 g to 5 mL	2.37 µg/kg[7]	10 µg/kg	20 µg/kg	Aroclor 1016	30 – 160			≤ 40
		1.06 µg/kg[7]	10 µg/kg	20 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	
PCBUZL 11-3030F	25 g to 1 mL	2.37[7] µg/kg	2 µg/kg	4 µg/kg	Aroclor 1016	30 – 160			≤ 40
		1.06[7] µg/kg	2 µg/kg	4 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	

(1) Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) are defined in ARI SOP 1018S.
(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(3) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(5) Low level extraction solvent is hexane instead of Methylene Chloride.
(6) LOD Study SM10
(7) MDL Study QZ25
(8) Based on PCBWSI until sufficient TCLP data is collected to calculate LOD.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Quality Control Criteria
Total Petroleum Hydrocarbons
(Diesel & Motor Oil)

Analysis Code	Analyte[5]	DL[1] ppm	LOD[1] ppm	LOQ[2] ppm	Spike % Recovery Control Limits[3]			RPD[4]
					LCS	MB/LCS Surrogate	Sample Surrogate	
HCIWVX	NWTPH-HCID – Water Samples	--	--	0.50 [7]	--	--	50-150	≤ 40
HCISVX	NWTPH-HCID – Solid Samples	--	--	50 [7]	--	--	50-150	
Aqueous Samples – No Extract Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.022	0.05	0.1	64-112	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.022	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.044	0.1	0.2	60 – 130 [8]	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [9]	0.1	0.2	60-120 [6]	60-120	50-150	
Aqueous Samples – With Acid and/or Silica Gel Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.039	0.05	0.1	61-104	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.042	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.010	0.1	0.2	60 – 130 [8]	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [8]	0.1	0.2	60-120 [6]	60-120	50-150	
Solid Matrix Samples – No Extract Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.35	2.5	5	62-119	50-150	50-150	≤ 40
DIESMI	DRO – NWTPH-Dext Jet A	2.22 [11]	2.5	5	60 – 130 [8]	50-150	50-150	
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.43	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	2.48	5	10	60 – 130 [8]	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [9]	5	10	60-120 [6]	60-120	50-150	
Solid Matrix Samples – With Acid and/or Silica Gel Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.28	2.5	5	60-108	50-150	50-150	≤ 40
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.06	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	1.57	5	10	60 – 130 [8]	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [10]	5	10	60-120 [6]	60-120	50-150	

(1) DL (Detection Limit) and LOD (Limit of Detection) as defined in ARI SOP 1018S.
(2) Limit of Quantitation as defined in ARI SOP 1018S. The spike concentration used to determine the DL and the concentration of the lowest standard used to calibrate the GC-FID instrument.
(3) All surrogate recovery limits are specified in the published methods (AK102, AK103 & NWTPH-Dext). The surrogate standard is *o*-Terphenyl.
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$
(5) DRO = Diesel Range Organics and RRO = Residual Range Organics as defined in the methods referenced in footnote 3.
(6) Method specified LCS acceptance limits.
(7) Method specified reporting limits
(8) Default LCS control limits pending calculation of historic limits
(9) MDL study QD55 completed 2/12/10
(10) MDL study QD35 completed 1/29/10
(11) LOD Study UI44 completed 2/28/12

Quality Control Parameters for Metals Analysis-ICP-OES 200.7/6010C

	Aqueous Samples[2]			Spike Recovery		RPD[5]	Solids[3]	Tissue[4]
Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ mg/kg	LOQ mg/kg
Aluminum	7.57	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Antimony	6.28	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Arsenic	3.33	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Barium	1.33	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Beryllium	0.16	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Boron	7.39	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Cadmium	0.18	0.5	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Calcium	11.27	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Chromium	1.24	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Cobalt	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Copper	0.92	1.0	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Iron	7.50	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Lead	1.55	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Magnesium	9.61	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Manganese	0.28	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Molybdenum	0.79	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Nickel	3.86	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Potassium	65.70	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Selenium	4.99	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Silicon	8.17	30	**60**	75 – 125	80 – 120	≤ 20	**(6)**	**(6)**
Silver	0.43	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Sodium	11.35	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Strontium	0.09	1.0	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Thallium	3.10	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Tin	1.41	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Titanium	2.11	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.01**
Vanadium	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Zinc	1.45	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Tissue is reported on an "as received" (wet weight) basis using 2.5 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$
(6) ARI does not analyze for Silicon in solids or tissue samples

Quality Control Parameters for Metals Analysis ICP-MS 200.8/6020A

Analyte	Mass	Aqueous Samples[2]			Spike Recovery		RPD[4]	Solids[3]
		DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ[1] mg/kg
Aluminum	27	1.601	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Antimony	121	0.010	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
	123	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #1	75	0.048	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #2	75	0.092	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Barium	135	0.020	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	137	0.019	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Beryllium	9	0.021	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Cadmium	111	0.010	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
	114	0.005	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Calcium	43	3.983	25	**50.0**	75 – 125	80 – 120	≤ 20	**50.0**
Chromium	52	0.045	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	53	0.118	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Cobalt	59	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Copper	63	0.158	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	65	0.236	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Iron	54	5.753	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
	57	3.876	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Lead	208	0.046	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Magnesium	24	0.297	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Manganese	55	0.022	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Molybdenum	98	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Nickel	60	0.079	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	62	0.089	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Potassium	39	2.944	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Selenium	82	0.127	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	78	0.324	0.25	**2.0**	75 – 125	80 – 120	≤ 20	**2.0**
Silver	107	0.008	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Sodium	23	2.833	50	**100.0**	75 – 125	80 – 120	≤ 20	**100.0**
Thorium[5]	232	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Thallium	205	0.004	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Uranium[5]	238	0.003	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Vanadium	51	0.043	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Zinc	66	0.497	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	67	0.531	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	68	0.524	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(5) ARI has no accreditation for these elements.

Quality Control Parameters for Mercury Analysis using CVAA

	Aqueous Samples[2]			Spike Recovery		RPD[5]
	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS	
Mercury	0.0069	0.05	**0.10**[2]	75 – 125	80 – 120	≤ 20
Mercury (low level)	0.0026	0.01	**0.02**[2]	75 – 125	80 – 120	≤ 20
	Soil / Sediment Samples			**Spike Recovery**		**RPD**[5]
	DL[1] **mg/kg**	**LOD**[1] **mg/kg**	**LOQ**[1] **mg/kg**	**Matrix Spike**	**LCS**	
Mercury	0.0021	0.0125	0.025[3]	75 – 125	80 – 120	≤ 20
	Tissue Samples			**Spike Recovery**		**RPD**[5]
	DL[1] **mg/kg**	**LOD**[1] **mg/kg**	**LOQ**[1] **mg/kg**	**Matrix Spike**	**LCS**	
Mercury	0.0021	0.0125	0.005[4]	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 20 mL sample with 20 mL final volume
(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.
(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

Volatile Analysis
Report and Summary QC Forms

ARI Job ID: VS45, VS46

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-3-1112**
 SAMPLE

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Instrument/Analyst: NT2/PAB
Date Analyzed: 11/21/12 17:05

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-3-1112**

SAMPLE

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Date Analyzed: 11/21/12 17:05

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	100%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	105%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-EB-1112**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS45B
LIMS ID: 12-22813
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Instrument/Analyst: NT2/PAB
Date Analyzed: 11/21/12 17:32

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS45B
LIMS ID: 12-22813
Matrix: Water
Date Analyzed: 11/21/12 17:32

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	100%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	109%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-8-1112**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS45C
LIMS ID: 12-22814
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Instrument/Analyst: NT2/PAB
Date Analyzed: 11/21/12 17:58

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS45C
LIMS ID: 12-22814
Matrix: Water
Date Analyzed: 11/21/12 17:58

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	97.3%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	106%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-5-1112**

SAMPLE

Lab Sample ID: VS45D
LIMS ID: 12-22815
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Instrument/Analyst: NT2/PAB
Date Analyzed: 11/21/12 18:25

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS45D
LIMS ID: 12-22815
Matrix: Water
Date Analyzed: 11/21/12 18:25

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	97.8%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	105%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-7-1112**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS45E
LIMS ID: 12-22816
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Instrument/Analyst: NT2/PAB
Date Analyzed: 11/21/12 18:51

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-7-1112**

SAMPLE

Lab Sample ID: VS45E
LIMS ID: 12-22816
Matrix: Water
Date Analyzed: 11/21/12 18:51

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	109%
d8-Toluene	100%
Bromofluorobenzene	106%
d4-1,2-Dichlorobenzene	110%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-7-1112-D**
 SAMPLE

Lab Sample ID: VS45F
LIMS ID: 12-22817
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Instrument/Analyst: NT2/PAB
Date Analyzed: 11/21/12 19:17

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS45F
LIMS ID: 12-22817
Matrix: Water
Date Analyzed: 11/21/12 19:17

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	112%
d8-Toluene	99.8%
Bromofluorobenzene	108%
d4-1,2-Dichlorobenzene	111%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
 SAMPLE

Lab Sample ID: VS45G
LIMS ID: 12-22818
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/26/12 20:41

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
 SAMPLE

Lab Sample ID: VS45G
LIMS ID: 12-22818
Matrix: Water
Date Analyzed: 11/26/12 20:41

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	**Hexachlorobutadiene**	**0.07**	**0.20**	**0.23 B**
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.0%
d8-Toluene	100%
Bromofluorobenzene	97.0%
d4-1,2-Dichlorobenzene	103%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-112112A	Method Blank	10	104%	99.8%	102%	103%	0
LCS-112112A	Lab Control	10	102%	102%	107%	106%	0
LCSD-112112A	Lab Control Dup	10	105%	99.6%	104%	104%	0
VS45A	LMW-3-1112	10	110%	100%	101%	105%	0
VS45B	LMW-EB-1112	10	110%	100%	104%	109%	0
VS45C	LMW-8-1112	10	110%	97.3%	103%	106%	0
VS45D	LMW-5-1112	10	108%	97.8%	101%	105%	0
VS45E	LMW-7-1112	10	109%	100%	106%	110%	0
VS45F	LMW-7-1112-D	10	112%	99.8%	108%	111%	0
MB-112612A	Method Blank	10	95.9%	98.8%	95.7%	103%	0
LCS-112612A	Lab Control	10	97.1%	102%	100%	99.4%	0
LCSD-112612A	Lab Control Dup	10	96.4%	101%	99.9%	101%	0
VS45G	Trip Blanks	10	98.0%	100%	97.0%	103%	0

SW8260C	LCS/MB LIMITS	QC LIMITS
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-130)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 12-22812 to 12-22818

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-112112A**
Page 1 of 2 **LAB CONTROL SAMPLE**

Lab Sample ID: LCS-112112A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT2/PAB
LCSD: NT2/PAB
Date Analyzed LCS: 11/21/12 10:47
LCSD: 11/21/12 11:13

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	9.58	10.0	95.8%	9.67	10.0	96.7%	0.9%
Bromomethane	10.6	10.0	106%	10.5	10.0	105%	0.9%
Vinyl Chloride	10.2	10.0	102%	10.0	10.0	100%	2.0%
Chloroethane	10.4	10.0	104%	10.0	10.0	100%	3.9%
Methylene Chloride	9.30	10.0	93.0%	9.42	10.0	94.2%	1.3%
Acetone	41.3	50.0	82.6%	45.4	50.0	90.8%	9.5%
Carbon Disulfide	9.98	10.0	99.8%	9.78	10.0	97.8%	2.0%
1,1-Dichloroethene	10.2	10.0	102%	9.77	10.0	97.7%	4.3%
1,1-Dichloroethane	9.76	10.0	97.6%	9.62	10.0	96.2%	1.4%
trans-1,2-Dichloroethene	9.87	10.0	98.7%	9.66	10.0	96.6%	2.2%
cis-1,2-Dichloroethene	9.86	10.0	98.6%	9.67	10.0	96.7%	1.9%
Chloroform	10.0	10.0	100%	9.82	10.0	98.2%	1.8%
1,2-Dichloroethane	10.2	10.0	102%	9.76	10.0	97.6%	4.4%
2-Butanone	42.8	50.0	85.6%	45.8	50.0	91.6%	6.8%
1,1,1-Trichloroethane	10.6	10.0	106%	10.6	10.0	106%	0.0%
Carbon Tetrachloride	11.5	10.0	115%	11.0	10.0	110%	4.4%
Vinyl Acetate	7.54 Q	10.0	75.4%	7.51 Q	10.0	75.1%	0.4%
Bromodichloromethane	10.4	10.0	104%	9.95	10.0	99.5%	4.4%
1,2-Dichloropropane	9.84	10.0	98.4%	9.24	10.0	92.4%	6.3%
cis-1,3-Dichloropropene	10.3	10.0	103%	9.71	10.0	97.1%	5.9%
Trichloroethene	9.99	10.0	99.9%	9.53	10.0	95.3%	4.7%
Dibromochloromethane	8.22	10.0	82.2%	8.07	10.0	80.7%	1.8%
1,1,2-Trichloroethane	9.79	10.0	97.9%	9.45	10.0	94.5%	3.5%
Benzene	9.86	10.0	98.6%	9.42	10.0	94.2%	4.6%
trans-1,3-Dichloropropene	9.21	10.0	92.1%	8.77	10.0	87.7%	4.9%
2-Chloroethylvinylether	7.15 Q	10.0	71.5%	7.05 Q	10.0	70.5%	1.4%
Bromoform	6.78 Q	10.0	67.8%	6.96 Q	10.0	69.6%	2.6%
4-Methyl-2-Pentanone (MIBK)	51.8	50.0	104%	51.9	50.0	104%	0.2%
2-Hexanone	44.8	50.0	89.6%	45.5	50.0	91.0%	1.6%
Tetrachloroethene	10.2	10.0	102%	9.57	10.0	95.7%	6.4%
1,1,2,2-Tetrachloroethane	8.90	10.0	89.0%	8.85	10.0	88.5%	0.6%
Toluene	10.1	10.0	101%	9.51	10.0	95.1%	6.0%
Chlorobenzene	9.86	10.0	98.6%	9.60	10.0	96.0%	2.7%
Ethylbenzene	10.5	10.0	105%	9.81	10.0	98.1%	6.8%
Styrene	11.0	10.0	110%	10.5	10.0	105%	4.7%
Trichlorofluoromethane	11.0	10.0	110%	10.7	10.0	107%	2.8%
1,1,2-Trichloro-1,2,2-trifluoroetha	9.95	10.0	99.5%	10.2	10.0	102%	2.5%
m,p-Xylene	21.3	20.0	106%	20.1	20.0	100%	5.8%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-112112A**

LAB CONTROL SAMPLE

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: LCS-112112A
LIMS ID: 12-22812
Matrix: Water

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
o-Xylene	10.8	10.0	108%	10.3	10.0	103%	4.7%
1,2-Dichlorobenzene	10.4	10.0	104%	9.90	10.0	99.0%	4.9%
1,3-Dichlorobenzene	9.97	10.0	99.7%	9.55	10.0	95.5%	4.3%
1,4-Dichlorobenzene	10.1	10.0	101%	9.56	10.0	95.6%	5.5%
Acrolein	37.7 Q	50.0	75.4%	40.8 Q	50.0	81.6%	7.9%
Iodomethane	9.75	10.0	97.5%	10.6	10.0	106%	8.4%
Acrylonitrile	7.76	10.0	77.6%	8.26	10.0	82.6%	6.2%
1,1-Dichloropropene	10.3	10.0	103%	9.83	10.0	98.3%	4.7%
Dibromomethane	10.1	10.0	101%	9.93	10.0	99.3%	1.7%
1,1,1,2-Tetrachloroethane	11.0	10.0	110%	10.2	10.0	102%	7.5%
1,2-Dibromo-3-chloropropane	8.53 Q	10.0	85.3%	8.03 Q	10.0	80.3%	6.0%
1,2,3-Trichloropropane	8.86	10.0	88.6%	9.37	10.0	93.7%	5.6%
trans-1,4-Dichloro-2-butene	7.80	10.0	78.0%	8.11	10.0	81.1%	3.9%
1,3,5-Trimethylbenzene	10.4	10.0	104%	10.0	10.0	100%	3.9%
1,2,4-Trimethylbenzene	10.5	10.0	105%	10.0	10.0	100%	4.9%
Hexachlorobutadiene	14.8 QB	10.0	148%	12.7 QB	10.0	127%	15.3%
1,2-Dibromoethane	10.5	10.0	105%	10.5	10.0	105%	0.0%
Bromochloromethane	9.95	10.0	99.5%	9.90	10.0	99.0%	0.5%
2,2-Dichloropropane	11.0	10.0	110%	11.0	10.0	110%	0.0%
1,3-Dichloropropane	9.67	10.0	96.7%	9.22	10.0	92.2%	4.8%
Isopropylbenzene	9.45	10.0	94.5%	9.28	10.0	92.8%	1.8%
n-Propylbenzene	9.50	10.0	95.0%	9.26	10.0	92.6%	2.6%
Bromobenzene	8.91	10.0	89.1%	8.91	10.0	89.1%	0.0%
2-Chlorotoluene	9.55	10.0	95.5%	9.31	10.0	93.1%	2.5%
4-Chlorotoluene	9.30	10.0	93.0%	9.14	10.0	91.4%	1.7%
tert-Butylbenzene	10.6	10.0	106%	10.1	10.0	101%	4.8%
sec-Butylbenzene	11.0	10.0	110%	10.3	10.0	103%	6.6%
4-Isopropyltoluene	11.4	10.0	114%	10.8	10.0	108%	5.4%
n-Butylbenzene	11.9	10.0	119%	11.0	10.0	110%	7.9%
1,2,4-Trichlorobenzene	13.0	10.0	130%	11.1	10.0	111%	15.8%
Naphthalene	11.7	10.0	117%	10.2	10.0	102%	13.7%
1,2,3-Trichlorobenzene	14.1 Q	10.0	141%	11.6 Q	10.0	116%	19.5%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	102%	105%
d8-Toluene	102%	99.6%
Bromofluorobenzene	107%	104%
d4-1,2-Dichlorobenzene	106%	104%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-112612A**

LAB CONTROL SAMPLE

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: LCS-112612A
LIMS ID: 12-22818
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT2/PKC
LCSD: NT2/PKC
Date Analyzed LCS: 11/26/12 18:02
LCSD: 11/26/12 18:29

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	10.0	10.0	100%	10.6	10.0	106%	5.8%
Bromomethane	10.1	10.0	101%	11.2	10.0	112%	10.3%
Vinyl Chloride	10.3	10.0	103%	11.2	10.0	112%	8.4%
Chloroethane	9.84	10.0	98.4%	10.5	10.0	105%	6.5%
Methylene Chloride	10.0	10.0	100%	10.5	10.0	105%	4.9%
Acetone	51.5	50.0	103%	51.8	50.0	104%	0.6%
Carbon Disulfide	10.8	10.0	108%	11.4	10.0	114%	5.4%
1,1-Dichloroethene	10.9	10.0	109%	11.2	10.0	112%	2.7%
1,1-Dichloroethane	10.2	10.0	102%	10.4	10.0	104%	1.9%
trans-1,2-Dichloroethene	10.3	10.0	103%	10.8	10.0	108%	4.7%
cis-1,2-Dichloroethene	10.4	10.0	104%	10.6	10.0	106%	1.9%
Chloroform	10.2	10.0	102%	10.5	10.0	105%	2.9%
1,2-Dichloroethane	9.99	10.0	99.9%	9.78	10.0	97.8%	2.1%
2-Butanone	54.3	50.0	109%	55.0	50.0	110%	1.3%
1,1,1-Trichloroethane	10.0	10.0	100%	10.7	10.0	107%	6.8%
Carbon Tetrachloride	9.75	10.0	97.5%	10.3	10.0	103%	5.5%
Vinyl Acetate	9.19	10.0	91.9%	9.29	10.0	92.9%	1.1%
Bromodichloromethane	10.3	10.0	103%	10.6	10.0	106%	2.9%
1,2-Dichloropropane	10.5	10.0	105%	10.7	10.0	107%	1.9%
cis-1,3-Dichloropropene	11.1	10.0	111%	11.2	10.0	112%	0.9%
Trichloroethene	10.4	10.0	104%	10.8	10.0	108%	3.8%
Dibromochloromethane	10.9	10.0	109%	10.7	10.0	107%	1.9%
1,1,2-Trichloroethane	10.8	10.0	108%	11.2	10.0	112%	3.6%
Benzene	10.5	10.0	105%	10.8	10.0	108%	2.8%
trans-1,3-Dichloropropene	11.2	10.0	112%	11.1	10.0	111%	0.9%
2-Chloroethylvinylether	11.1	10.0	111%	11.0	10.0	110%	0.9%
Bromoform	8.97	10.0	89.7%	8.81	10.0	88.1%	1.8%
4-Methyl-2-Pentanone (MIBK)	58.3	50.0	117%	58.8	50.0	118%	0.9%
2-Hexanone	56.1	50.0	112%	55.6	50.0	111%	0.9%
Tetrachloroethene	10.0	10.0	100%	10.2	10.0	102%	2.0%
1,1,2,2-Tetrachloroethane	11.1	10.0	111%	11.2	10.0	112%	0.9%
Toluene	10.6	10.0	106%	10.8	10.0	108%	1.9%
Chlorobenzene	10.4	10.0	104%	10.5	10.0	105%	1.0%
Ethylbenzene	10.6	10.0	106%	10.7	10.0	107%	0.9%
Styrene	11.6	10.0	116%	11.5	10.0	115%	0.9%
Trichlorofluoromethane	9.46	10.0	94.6%	10.3	10.0	103%	8.5%
1,1,2-Trichloro-1,2,2-trifluoroetha	10.6	10.0	106%	11.2	10.0	112%	5.5%
m,p-Xylene	21.6	20.0	108%	21.9	20.0	110%	1.4%

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-112612A**

LAB CONTROL SAMPLE

ANALYTICAL RESOURCES INCORPORATED

Lab Sample ID: LCS-112612A
LIMS ID: 12-22818
Matrix: Water

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
o-Xylene	10.8	10.0	108%	11.2	10.0	112%	3.6%
1,2-Dichlorobenzene	10.2	10.0	102%	10.4	10.0	104%	1.9%
1,3-Dichlorobenzene	10.4	10.0	104%	10.8	10.0	108%	3.8%
1,4-Dichlorobenzene	10.2	10.0	102%	10.5	10.0	105%	2.9%
Acrolein	63.9	50.0	128%	65.3	50.0	131%	2.2%
Iodomethane	10.7	10.0	107%	11.3	10.0	113%	5.5%
Acrylonitrile	10.9	10.0	109%	11.5	10.0	115%	5.4%
1,1-Dichloropropene	10.6	10.0	106%	10.9	10.0	109%	2.8%
Dibromomethane	10.6	10.0	106%	10.7	10.0	107%	0.9%
1,1,1,2-Tetrachloroethane	10.2	10.0	102%	10.4	10.0	104%	1.9%
1,2-Dibromo-3-chloropropane	9.77	10.0	97.7%	10.4	10.0	104%	6.2%
1,2,3-Trichloropropane	11.2	10.0	112%	11.1	10.0	111%	0.9%
trans-1,4-Dichloro-2-butene	11.2	10.0	112%	10.2	10.0	102%	9.3%
1,3,5-Trimethylbenzene	11.1	10.0	111%	11.2	10.0	112%	0.9%
1,2,4-Trimethylbenzene	11.0	10.0	110%	11.3	10.0	113%	2.7%
Hexachlorobutadiene	11.7 B	10.0	117%	13.0 B	10.0	130%	10.5%
1,2-Dibromoethane	10.9	10.0	109%	10.8	10.0	108%	0.9%
Bromochloromethane	10.3	10.0	103%	10.4	10.0	104%	1.0%
2,2-Dichloropropane	9.96	10.0	99.6%	10.7	10.0	107%	7.2%
1,3-Dichloropropane	10.8	10.0	108%	10.8	10.0	108%	0.0%
Isopropylbenzene	11.1	10.0	111%	11.2	10.0	112%	0.9%
n-Propylbenzene	10.9	10.0	109%	10.8	10.0	108%	0.9%
Bromobenzene	10.3	10.0	103%	10.5	10.0	105%	1.9%
2-Chlorotoluene	10.5	10.0	105%	10.6	10.0	106%	0.9%
4-Chlorotoluene	10.7	10.0	107%	10.8	10.0	108%	0.9%
tert-Butylbenzene	11.3	10.0	113%	11.6	10.0	116%	2.6%
sec-Butylbenzene	11.1	10.0	111%	11.3	10.0	113%	1.8%
4-Isopropyltoluene	11.0	10.0	110%	11.1	10.0	111%	0.9%
n-Butylbenzene	10.7 B	10.0	107%	11.1 B	10.0	111%	3.7%
1,2,4-Trichlorobenzene	9.96 B	10.0	99.6%	11.4 B	10.0	114%	13.5%
Naphthalene	10.2	10.0	102%	11.8	10.0	118%	14.5%
1,2,3-Trichlorobenzene	10.2	10.0	102%	12.1	10.0	121%	17.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	97.1%	96.4%
d8-Toluene	102%	101%
Bromofluorobenzene	100%	99.9%
d4-1,2-Dichlorobenzene	99.4%	101%

4A
VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB1121

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS45

Project: LANDSBURG MINE

Lab File ID: MB1121A

Lab Sample ID: MB1121

Date Analyzed: 11/21/12

Time Analyzed: 1210

Instrument ID: NT2

Heated Purge: (Y/N) N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS1121	LCS1121	LCS1121	1047
02	LCS1121	LCS1121	LCS1121A	1113
03	LMW-3-1112	VS45A	VS45A	1705
04	LMW-EB-1112	VS45B	VS45B	1732
05	LMW-8-1112	VS45C	VS45C	1758
06	LMW-5-1112	VS45D	VS45D	1825
07	LMW-7-1112	VS45E	VS45E	1851
08	LMW-7-1112-D	VS45F	VS45F	1917
09				
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COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-112112A**

METHOD BLANK

Lab Sample ID: MB-112112A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT2/PAB
Date Analyzed: 11/21/12 12:10

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-112112A**

METHOD BLANK

Lab Sample ID: MB-112112A
LIMS ID: 12-22812
Matrix: Water
Date Analyzed: 11/21/12 12:10

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	**Hexachlorobutadiene**	**0.07**	**0.20**	**0.51**
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	104%
d8-Toluene	99.8%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	103%

4A

VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB1126

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS45

Project: LANDSBURG MINE

Lab File ID: MB1126Y

Lab Sample ID: MB1126

Date Analyzed: 11/26/12

Time Analyzed: 1922

Instrument ID: NT2

Heated Purge: (Y/N) N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS1126	LCS1126	LCS1126X	1802
02	LCS1126	LCS1126	LCS1126Y	1829
03	TRIP BLANKS	VS45G	VS45G	2041
04				
05				
06				
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COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-112612A**
METHOD BLANK

Lab Sample ID: MB-112612A
LIMS ID: 12-22818
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/26/12 19:22

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-112612A**
METHOD BLANK

Lab Sample ID: MB-112612A
LIMS ID: 12-22818
Matrix: Water
Date Analyzed: 11/26/12 19:22

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	**Hexachlorobutadiene**	**0.07**	**0.20**	**0.58**
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	**n-Butylbenzene**	**0.02**	**0.20**	**0.10 J**
120-82-1	**1,2,4-Trichlorobenzene**	**0.11**	**0.50**	**0.12 J**
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	95.9%
d8-Toluene	98.8%
Bromofluorobenzene	95.7%
d4-1,2-Dichlorobenzene	103%

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: ARI Case No.: LANDSBURG MINE SDG No.: VS45

Lab File ID: BFB1116 BFB Injection Date: 11/16/12

Instrument ID: NT2 BFB Injection Time: 0714

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.9
75	30.0 - 60.0% of mass 95	48.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.6 (0.7)1
174	50.0 - 100.0% of mass 95	83.5
175	5.0 - 9.0% of mass 174	6.3 (7.5)1
176	95.0 - 101.0% of mass 174	80.3 (96.1)1
177	5.0 - 9.0% of mass 176	6.0 (7.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD1	IC1116	0011116	11/16/12	0822
02	VSTD2	IC1116	0021116	11/16/12	0849
03	VSTD5	IC1116	0051116	11/16/12	0915
04	VSTD10	IC1116	0101116	11/16/12	0942
05	VSTD2	IC1116	0201116	11/16/12	1008
06	VSTD10	IC1116	1001116	11/16/12	1034
07	VSTD20	IC1116	2001116	11/16/12	1101
08	VSTD40	IC1116	4001116	11/16/12	1128
09	VSTD60	IC1116	6001116	11/16/12	1155
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5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: ARI Case No.: LANDSBURG MINE SDG No.: VS45

Lab File ID: BFB1121 BFB Injection Date: 11/21/12

Instrument ID: NT2 BFB Injection Time: 0741

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.7
75	30.0 - 60.0% of mass 95	49.5
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.8 (0.9)1
174	50.0 - 100.0% of mass 95	89.3
175	5.0 - 9.0% of mass 174	6.6 (7.4)1
176	95.0 - 101.0% of mass 174	85.7 (95.9)1
177	5.0 - 9.0% of mass 176	5.5 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD10	CC1121	CC1121	11/21/12	1014
02	LCS1121	LCS1121	LCS1121	11/21/12	1047
03	LCS1121	LCS1121	LCS1121A	11/21/12	1113
04	MB1121	MB1121	MB1121A	11/21/12	1210
05	LMW-3-1112	VS45A	VS45A	11/21/12	1705
06	LMW-EB-1112	VS45B	VS45B	11/21/12	1732
07	LMW-8-1112	VS45C	VS45C	11/21/12	1758
08	LMW-5-1112	VS45D	VS45D	11/21/12	1825
09	LMW-7-1112	VS45E	VS45E	11/21/12	1851
10	LMW-7-1112-D	VS45F	VS45F	11/21/12	1917
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5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: ARI Case No.: LANDSBURG MINE SDG No.: VS45

Lab File ID: BFB1126 BFB Injection Date: 11/26/12

Instrument ID: NT2 BFB Injection Time: 0901

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.6
75	30.0 - 60.0% of mass 95	49.1
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	89.9
175	5.0 - 9.0% of mass 174	6.0 (6.7)1
176	95.0 - 101.0% of mass 174	86.4 (96.1)1
177	5.0 - 9.0% of mass 176	5.8 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD0.2	VSTD0.2	0021126	11/26/12	1148
02	VSTD0.5	VSTD0.5	0051126	11/26/12	1215
03	VSTD1.0	VSTD1.0	0101126	11/26/12	1242
04	VSTD2.0	VSTD2.0	0201126	11/26/12	1308
05	VSTD0.1	VSTD0.1	0011126	11/26/12	1338
06	VSTD10	VSTD10	1001126	11/26/12	1405
07	VSTD20	VSTD20	2001126	11/26/12	1432
08	VSTD40	VSTD40	4001126	11/26/12	1459
09	VSTD60	VSTD60	6001126	11/26/12	1525
10	ICV10	ICV10	ICV1126	11/26/12	1619
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5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: ARI Case No.: LANDSBURG MINE SDG No.: VS45

Lab File ID: BFB1126X BFB Injection Date: 11/26/12

Instrument ID: NT2 BFB Injection Time: 1645

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.1
75	30.0 - 60.0% of mass 95	48.2
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.0
173	Less than 2.0% of mass 174	0.2 (0.3)1
174	50.0 - 100.0% of mass 95	86.6
175	5.0 - 9.0% of mass 174	6.2 (7.1)1
176	95.0 - 101.0% of mass 174	85.9 (99.1)1
177	5.0 - 9.0% of mass 176	5.7 (6.6)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1126	CC1126	CC1126X	11/26/12	1735
02	LCS1126	LCS1126	LCS1126X	11/26/12	1802
03	LCS1126	LCS1126	LCS1126Y	11/26/12	1829
04	MB1126	MB1126	MB1126Y	11/26/12	1922
05	TRIP BLANKS	VS45G	VS45G	11/26/12	2041
06					
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FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
Chloromethane		0.496	0.568	0.583	0.483
Vinyl Chloride	0.463	0.363	0.531	0.502	0.410
Bromomethane		0.216	0.289	0.278	0.214
Chloroethane		0.270	0.332	0.310	0.238
Trichlorofluoromethane		0.506	0.700	0.624	0.507
Acrolein			0.034	0.036	0.029
112Trichloro122Trifluoroetha		0.351	0.415	0.466	0.332
Acetone			0.052	0.056	0.041
1,1-Dichloroethene		0.377	0.423	0.437	0.376
Bromoethane		0.298	0.326	0.324	0.287
Iodomethane		0.664	0.672	0.809	0.638
Methylene Chloride		0.496	0.522	0.527	0.404
Acrylonitrile			0.065	0.076	0.055
Carbon Disulfide		1.199	1.260	1.355	1.128
Trans-1,2-Dichloroethene		0.426	0.505	0.544	0.416
Vinyl Acetate		0.223	0.323	0.364	0.271
1,1-Dichloroethane		0.696	0.872	0.884	0.665
2-Butanone		0.077	0.086	0.093	0.069
2,2-Dichloropropane	0.456	0.476	0.537	0.568	0.440
Cis-1,2-Dichloroethene		0.372	0.515	0.552	0.417
Chloroform		0.686	0.800	0.901	0.684
Bromochloromethane		0.147	0.216	0.225	0.180
1,1,1-Trichloroethane		0.611	0.747	0.751	0.570
1,1-Dichloropropene	0.392	0.377	0.423	0.480	0.333
Carbon Tetrachloride		0.350	0.387	0.436	0.322
1,2-Dichloroethane		0.298	0.322	0.378	0.282
Benzene		1.072	1.262	1.335	1.006
Trichloroethene		0.271	0.349	0.368	0.279
1,2-Dichloropropane		0.220	0.241	0.299	0.216
Bromodichloromethane		0.240	0.342	0.359	0.279
Dibromomethane		0.084	0.137	0.138	0.107
2-Chloroethyl Vinyl Ether			0.081	0.089	0.076
4-Methyl-2-Pentanone		0.040	0.051	0.056	0.049
Cis 1,3-dichloropropene		0.304	0.329	0.378	0.289
Toluene		0.591	0.688	0.778	0.584
Trans 1,3-Dichloropropene		0.202	0.273	0.320	0.248
2-Hexanone			0.090	0.104	0.081

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
1,1,2-Trichloroethane		0.139	0.168	0.192	0.143
1,3-Dichloropropane	0.298	0.304	0.353	0.391	0.297
Tetrachloroethene		0.333	0.374	0.406	0.306
Chlorodibromomethane		0.167	0.207	0.233	0.179
1,2-Dibromoethane	0.120	0.130	0.163	0.194	0.145
Chlorobenzene		0.711	0.859	0.881	0.697
Ethyl Benzene		0.388	0.446	0.497	0.382
1,1,1,2-Tetrachloroethane		0.242	0.271	0.317	0.256
m,p-xylene		0.447	0.562	0.630	0.481
o-Xylene		0.452	0.543	0.580	0.472
Styrene		0.589	0.799	0.841	0.702
Bromoform		0.217	0.247	0.286	0.217
1,1,2,2-Tetrachloroethane	0.318	0.386	0.456	0.492	0.365
1,2,3-Trichloropropane		0.101	0.165	0.162	0.131
Trans-1,4-Dichloro 2-Butene			0.107	0.148	0.101
N-Propyl Benzene		2.403	2.942	3.342	2.388
Bromobenzene		0.615	0.753	0.802	0.596
Isopropyl Benzene		2.159	2.708	3.093	2.322
2-Chloro Toluene	2.070	1.748	2.208	2.358	1.746
4-Chloro Toluene		1.671	2.022	2.223	1.640
T-Butyl Benzene		1.338	1.732	1.963	1.488
1,3,5-Trimethyl Benzene		1.665	2.088	2.347	1.776
1,2,4-Trimethylbenzene		1.565	2.156	2.330	1.704
S-Butyl Benzene		1.938	2.442	2.697	2.033
4-Isopropyl Toluene	1.736	1.530	1.855	2.073	1.619
1,3-Dichlorobenzene		1.127	1.219	1.289	1.039
1,4-Dichlorobenzene		1.124	1.281	1.345	1.017
N-Butyl Benzene		1.331	1.451	1.655	1.283
1,2-Dichlorobenzene		0.856	1.037	1.086	0.832
1,2-Dibromo 3-Chloropropane			0.070	0.045	0.032
1,2,4-Trichlorobenzene			0.394	0.413	0.332
Hexachloro 1,3-Butadiene		0.192	0.245	0.223	0.173
Naphthalene			0.577	0.576	0.449
1,2,3-Trichlorobenzene		0.160	0.272	0.242	0.224
Dichlorodifluoromethane		0.329	0.440	0.429	0.376
Methyl tert butyl ether		0.973	1.124	1.204	0.944

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
d4-1,2-Dichloroethane	0.465	0.483	0.473	0.474	0.486
d8-Toluene	1.095	1.113	1.093	1.125	1.126
4-Bromofluorobenzene	0.497	0.500	0.480	0.493	0.497
d4-1,2-Dichlorobenzene	0.793	0.782	0.789	0.791	0.784
Dibromofluoromethane	0.460	0.456	0.460	0.460	0.457

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
Chloromethane	0.598	0.570	0.609	0.556
Vinyl Chloride	0.560	0.532	0.565	0.517
Bromomethane	0.300	0.267	0.269	0.251
Chloroethane	0.322	0.289	0.298	0.254
Trichlorofluoromethane	0.726	0.672	0.700	0.627
Acrolein	0.038	0.042	0.047	0.049
112Trichloro122Trifluoroetha	0.429	0.391	0.446	0.371
Acetone	0.055	0.058	0.060	0.062
1,1-Dichloroethene	0.446	0.420	0.430	0.395
Bromoethane	0.332	0.364	0.393	0.357
Iodomethane	0.726	0.690	0.805	0.641
Methylene Chloride	0.498	0.501	0.530	0.493
Acrylonitrile	0.085	0.093	0.096	0.099
Carbon Disulfide	1.341	1.247	1.283	1.151
Trans-1,2-Dichloroethene	0.542	0.528	0.561	0.522
Vinyl Acetate	0.388	0.432	0.453	0.472
1,1-Dichloroethane	0.883	0.871	0.920	0.864
2-Butanone	0.095	0.105	0.103	0.107
2,2-Dichloropropane	0.567	0.529	0.579	0.492
Cis-1,2-Dichloroethene	0.542	0.539	0.564	0.529
Chloroform	0.877	0.868	0.897	0.838
Bromochloromethane	0.236	0.235	0.244	0.232
1,1,1-Trichloroethane	0.794	0.764	0.788	0.722
1,1-Dichloropropene	0.456	0.456	0.462	0.431
Carbon Tetrachloride	0.427	0.421	0.436	0.397
1,2-Dichloroethane	0.359	0.370	0.359	0.348
Benzene	1.314	1.291	1.300	1.215
Trichloroethene	0.348	0.351	0.355	0.338
1,2-Dichloropropane	0.279	0.282	0.289	0.281
Bromodichloromethane	0.374	0.393	0.400	0.391
Dibromomethane	0.142	0.149	0.147	0.147
2-Chloroethyl Vinyl Ether	0.100	0.121	0.123	0.131
4-Methyl-2-Pentanone	0.068	0.071	0.068	0.066
Cis 1,3-dichloropropene	0.408	0.437	0.450	0.446
Toluene	0.734	0.764	0.766	0.740
Trans 1,3-Dichloropropene	0.344	0.368	0.361	0.368
2-Hexanone	0.113	0.122	0.121	0.119

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
1,1,2-Trichloroethane	0.182	0.198	0.196	0.199
1,3-Dichloropropane	0.389	0.410	0.428	0.422
Tetrachloroethene	0.394	0.390	0.397	0.361
Chlorodibromomethane	0.274	0.292	0.304	0.299
1,2-Dibromoethane	0.194	0.205	0.202	0.207
Chlorobenzene	0.896	0.890	0.913	0.857
Ethyl Benzene	0.522	0.511	0.514	0.483
1,1,1,2-Tetrachloroethane	0.351	0.349	0.355	0.336
m,p-xylene	0.635	0.618	0.613	0.557
o-Xylene	0.633	0.622	0.623	0.588
Styrene	1.020	1.038	1.038	0.985
Bromoform	0.301	0.346	0.382	0.374
1,1,2,2-Tetrachloroethane	0.467	0.494	0.509	0.506
1,2,3-Trichloropropane	0.163	0.166	0.173	0.163
Trans-1,4-Dichloro 2-Butene	0.139	0.151	0.166	0.159
N-Propyl Benzene	3.137	3.267	3.327	3.155
Bromobenzene	0.750	0.785	0.829	0.784
Isopropyl Benzene	3.021	3.164	3.256	3.084
2-Chloro Toluene	2.253	2.299	2.360	2.278
4-Chloro Toluene	2.089	2.212	2.289	2.184
T-Butyl Benzene	1.881	1.944	1.881	1.871
1,3,5-Trimethyl Benzene	2.317	2.365	2.337	2.276
1,2,4-Trimethylbenzene	2.303	2.337	2.337	2.288
S-Butyl Benzene	2.605	2.662	2.571	2.560
4-Isopropyl Toluene	2.133	2.151	2.093	2.116
1,3-Dichlorobenzene	1.293	1.316	1.360	1.308
1,4-Dichlorobenzene	1.304	1.326	1.360	1.316
N-Butyl Benzene	1.737	1.757	1.774	1.770
1,2-Dichlorobenzene	1.084	1.073	1.117	1.100
1,2-Dibromo 3-Chloropropane	0.049	0.048	0.054	0.058
1,2,4-Trichlorobenzene	0.454	0.446	0.501	0.511
Hexachloro 1,3-Butadiene	0.229	0.209	0.196	0.201
Naphthalene	0.675	0.669	0.781	0.818
1,2,3-Trichlorobenzene	0.294	0.273	0.284	0.290
Dichlorodifluoromethane	0.554	0.526	0.551	0.497
Methyl tert butyl ether	1.211	1.220	1.266	1.212

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
d4-1,2-Dichloroethane	0.479	0.479	0.468	0.470
d8-Toluene	1.107	1.131	1.135	1.148
4-Bromofluorobenzene	0.511	0.499	0.497	0.489
d4-1,2-Dichlorobenzene	0.783	0.779	0.782	0.806
Dibromofluoromethane	0.473	0.468	0.467	0.455

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	0.558	8.2
Vinyl Chloride	AVRG	0.494	14.0
Bromomethane	AVRG	0.260	12.1
Chloroethane	AVRG	0.289	11.5
Trichlorofluoromethane	AVRG	0.633	13.5
Acrolein	AVRG	0.039	18.7
112Trichloro122Trifluoroetha	AVRG	0.400	11.7
Acetone	AVRG	0.055	12.3
1,1-Dichloroethene	AVRG	0.413	6.6
Bromoethane	AVRG	0.335	10.4
Iodomethane	AVRG	0.706	9.7
Methylene Chloride	AVRG	0.496	8.1
Acrylonitrile	LINR		0.9988
Carbon Disulfide	AVRG	1.246	6.6
Trans-1,2-Dichloroethene	AVRG	0.505	10.8
Vinyl Acetate	LINR		0.9979
1,1-Dichloroethane	AVRG	0.832	11.5
2-Butanone	AVRG	0.092	14.8
2,2-Dichloropropane	AVRG	0.516	10.0
Cis-1,2-Dichloroethene	AVRG	0.504	13.9
Chloroform	AVRG	0.819	10.8
Bromochloromethane	AVRG	0.214	15.8
1,1,1-Trichloroethane	AVRG	0.718	11.6
1,1-Dichloropropene	AVRG	0.423	11.2
Carbon Tetrachloride	AVRG	0.397	10.6
1,2-Dichloroethane	AVRG	0.340	10.3
Benzene	AVRG	1.224	9.9
Trichloroethene	AVRG	0.332	11.0
1,2-Dichloropropane	AVRG	0.263	12.4
Bromodichloromethane	AVRG	0.347	16.8
Dibromomethane	AVRG	0.131	17.9
2-Chloroethyl Vinyl Ether	LINR		0.9964
4-Methyl-2-Pentanone	AVRG	0.058	19.2
Cis 1,3-dichloropropene	AVRG	0.380	17.2
Toluene	AVRG	0.706	11.0
Trans 1,3-Dichloropropene	LINR		0.9996
2-Hexanone	AVRG	0.107	15.3

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.177	13.9
1,3-Dichloropropane	AVRG	0.366	14.8
Tetrachloroethene	AVRG	0.370	9.4
Chlorodibromomethane	LINR		0.9994
1,2-Dibromoethane	AVRG	0.173	19.8
Chlorobenzene	AVRG	0.838	10.1
Ethyl Benzene	AVRG	0.468	12.0
1,1,1,2-Tetrachloroethane	AVRG	0.310	14.9
m,p-xylene	AVRG	0.568	12.5
o-Xylene	AVRG	0.564	12.3
Styrene	AVRG	0.877	19.5
Bromoform	LINR		0.9979
1,1,2,2-Tetrachloroethane	AVRG	0.444	15.7
1,2,3-Trichloropropane	AVRG	0.153	15.9
Trans-1,4-Dichloro 2-Butene	AVRG	0.139	18.2
N-Propyl Benzene	AVRG	2.995	13.1
Bromobenzene	AVRG	0.739	11.7
Isopropyl Benzene	AVRG	2.851	14.4
2-Chloro Toluene	AVRG	2.147	11.3
4-Chloro Toluene	AVRG	2.041	12.3
T-Butyl Benzene	AVRG	1.762	13.0
1,3,5-Trimethyl Benzene	AVRG	2.146	13.0
1,2,4-Trimethylbenzene	AVRG	2.128	14.7
S-Butyl Benzene	AVRG	2.439	11.9
4-Isopropyl Toluene	AVRG	1.923	12.6
1,3-Dichlorobenzene	AVRG	1.244	8.8
1,4-Dichlorobenzene	AVRG	1.259	9.7
N-Butyl Benzene	AVRG	1.595	13.0
1,2-Dichlorobenzene	AVRG	1.023	11.0
1,2-Dibromo 3-Chloropropane	LINR		0.9936
1,2,4-Trichlorobenzene	AVRG	0.436	14.3
Hexachloro 1,3-Butadiene	AVRG	0.208	11.0
Naphthalene	AVRG	0.649	19.6
1,2,3-Trichlorobenzene	AVRG	0.255	17.8
Dichlorodifluoromethane	AVRG	0.463	17.9
Methyl tert butyl ether	AVRG	1.144	10.6

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.475	1.5
d8-Toluene	AVRG	1.119	1.6
4-Bromofluorobenzene	AVRG	0.496	1.7
d4-1,2-Dichlorobenzene	AVRG	0.788	1.0
Dibromofluoromethane	AVRG	0.462	1.3

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

LAB FILE ID: RF0.1: 0011126 RF0.2: 0021126 RF0.5: 0051126
RF1: 0101126 RF2: 0201126

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
Chloromethane			0.686	0.636	0.547
Vinyl Chloride	0.509	0.526	0.629	0.600	0.495
Bromomethane				0.321	0.270
Chloroethane		0.325	0.368	0.371	0.305
Trichlorofluoromethane		0.822	0.824	0.775	0.695
Acrolein			0.032	0.036	0.029
112Trichloro122Trifluoroetha		0.447	0.465	0.490	0.445
Acetone				0.080	0.062
1,1-Dichloroethene		0.492	0.518	0.499	0.441
Bromoethane		0.324	0.400	0.383	0.340
Iodomethane			0.764	0.788	0.749
Methylene Chloride				0.610	0.491
Acrylonitrile			0.082	0.080	0.068
Carbon Disulfide		1.694	1.376	1.369	1.280
Trans-1,2-Dichloroethene		0.565	0.577	0.568	0.470
Vinyl Acetate		0.275	0.325	0.352	0.302
1,1-Dichloroethane		0.953	0.940	0.961	0.833
2-Butanone				0.104	0.080
2,2-Dichloropropane	0.581	0.563	0.692	0.636	0.563
Cis-1,2-Dichloroethene		0.590	0.580	0.551	0.474
Chloroform		0.945	0.934	0.989	0.812
Bromochloromethane		0.248	0.257	0.258	0.217
1,1,1-Trichloroethane		0.776	0.874	0.903	0.735
1,1-Dichloropropene	0.426	0.464	0.490	0.488	0.412
Carbon Tetrachloride		0.479	0.554	0.525	0.476
1,2-Dichloroethane		0.442	0.443	0.435	0.356
Benzene		1.303	1.337	1.381	1.226
Trichloroethene		0.329	0.371	0.389	0.328
1,2-Dichloropropane		0.275	0.289	0.286	0.247
Bromodichloromethane		0.371	0.386	0.406	0.355
Dibromomethane		0.128	0.148	0.160	0.133
2-Chloroethyl Vinyl Ether			0.091	0.086	0.088
4-Methyl-2-Pentanone			0.055	0.064	0.056
Cis 1,3-dichloropropene		0.341	0.370	0.405	0.340
Toluene		0.762	0.798	0.836	0.669
Trans 1,3-Dichloropropene		0.317	0.333	0.353	0.312
2-Hexanone				0.103	0.091

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

LAB FILE ID: RF0.1: 0011126 RF0.2: 0021126 RF0.5: 0051126
RF1: 0101126 RF2: 0201126

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
1,1,2-Trichloroethane		0.174	0.190	0.198	0.170
1,3-Dichloropropane	0.374	0.349	0.386	0.391	0.337
Tetrachloroethene		0.410	0.454	0.443	0.373
Chlorodibromomethane		0.256	0.247	0.270	0.211
1,2-Dibromoethane	0.195	0.224	0.192	0.214	0.179
Chlorobenzene		0.982	0.939	0.973	0.821
Ethyl Benzene		0.511	0.528	0.536	0.456
1,1,1,2-Tetrachloroethane		0.364	0.381	0.395	0.317
m,p-xylene		0.644	0.610	0.656	0.558
o-Xylene		0.574	0.608	0.648	0.545
Styrene		0.721	0.824	0.958	0.846
Bromoform		0.214	0.273	0.255	0.250
1,1,2,2-Tetrachloroethane	0.332	0.508	0.458	0.455	0.398
1,2,3-Trichloropropane		0.135	0.152	0.170	0.145
Trans-1,4-Dichloro 2-Butene			0.106	0.120	0.106
N-Propyl Benzene		3.106	3.079	3.067	2.716
Bromobenzene		0.782	0.755	0.750	0.681
Isopropyl Benzene		2.539	2.768	2.833	2.481
2-Chloro Toluene	2.453	2.166	2.310	2.271	1.983
4-Chloro Toluene		1.974	2.025	2.079	1.805
T-Butyl Benzene		1.598	1.789	1.864	1.685
1,3,5-Trimethyl Benzene		2.052	2.312	2.323	2.044
1,2,4-Trimethylbenzene		1.971	2.242	2.389	2.019
S-Butyl Benzene		2.403	2.623	2.700	2.322
4-Isopropyl Toluene	2.506	2.009	2.034	2.167	1.873
1,3-Dichlorobenzene		1.301	1.323	1.440	1.173
1,4-Dichlorobenzene		1.400	1.436	1.449	1.207
N-Butyl Benzene		1.831	1.698	1.900	1.492
1,2-Dichlorobenzene		1.206	1.168	1.290	1.012
1,2-Dibromo 3-Chloropropane			0.051	0.058	0.042
1,2,4-Trichlorobenzene			0.514	0.582	0.393
Hexachloro 1,3-Butadiene		0.497	0.332	0.370	0.244
Naphthalene			0.623	0.725	0.526
1,2,3-Trichlorobenzene		0.250	0.284	0.372	0.268
Dichlorodifluoromethane		0.492	0.615	0.570	0.497
Methyl tert butyl ether		1.199	1.382	1.321	1.117

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

LAB FILE ID: RF0.1: 0011126 RF0.2: 0021126 RF0.5: 0051126
RF1: 0101126 RF2: 0201126

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
d4-1,2-Dichloroethane	0.539	0.519	0.518	0.539	0.514
d8-Toluene	1.100	1.106	1.084	1.112	1.119
4-Bromofluorobenzene	0.504	0.513	0.519	0.544	0.520
d4-1,2-Dichlorobenzene	0.814	0.825	0.815	0.846	0.813
Dibromofluoromethane	0.487	0.473	0.480	0.475	0.468

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

LAB FILE ID: RF10: 1001126 RF20: 2001126 RF40: 4001126
RF60: 6001126

COMPOUND	RF10	RF20	RF40	RF60
Chloromethane	0.622	0.615	0.624	0.594
Vinyl Chloride	0.588	0.591	0.576	0.564
Bromomethane	0.323	0.310	0.295	0.266
Chloroethane	0.346	0.342	0.333	0.318
Trichlorofluoromethane	0.840	0.823	0.802	0.766
Acrolein	0.038	0.038	0.044	0.047
112Trichloro122Trifluoroetha	0.525	0.445	0.471	0.434
Acetone	0.076	0.071	0.071	0.069
1,1-Dichloroethene	0.531	0.475	0.475	0.479
Bromoethane	0.400	0.384	0.398	0.369
Iodomethane	0.908	0.773	0.847	0.754
Methylene Chloride	0.572	0.538	0.544	0.542
Acrylonitrile	0.101	0.101	0.111	0.106
Carbon Disulfide	1.576	1.374	1.339	1.326
Trans-1,2-Dichloroethene	0.581	0.567	0.582	0.570
Vinyl Acetate	0.412	0.427	0.482	0.488
1,1-Dichloroethane	0.967	0.948	0.969	0.942
2-Butanone	0.111	0.110	0.118	0.113
2,2-Dichloropropane	0.662	0.637	0.618	0.579
Cis-1,2-Dichloroethene	0.578	0.574	0.590	0.574
Chloroform	0.973	0.964	0.969	0.938
Bromochloromethane	0.260	0.253	0.260	0.252
1,1,1-Trichloroethane	0.920	0.905	0.887	0.823
1,1-Dichloropropene	0.503	0.494	0.487	0.478
Carbon Tetrachloride	0.556	0.537	0.527	0.501
1,2-Dichloroethane	0.434	0.411	0.414	0.389
Benzene	1.402	1.368	1.348	1.306
Trichloroethene	0.377	0.382	0.373	0.363
1,2-Dichloropropane	0.290	0.292	0.301	0.296
Bromodichloromethane	0.440	0.440	0.448	0.432
Dibromomethane	0.165	0.162	0.160	0.154
2-Chloroethyl Vinyl Ether	0.112	0.115	0.134	0.134
4-Methyl-2-Pentanone	0.076	0.075	0.075	0.070
Cis 1,3-dichloropropene	0.443	0.462	0.488	0.472
Toluene	0.798	0.809	0.814	0.781
Trans 1,3-Dichloropropene	0.391	0.397	0.409	0.393
2-Hexanone	0.125	0.126	0.126	0.130

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

LAB FILE ID: RF10: 1001126 RF20: 2001126 RF40: 4001126
RF60: 6001126

COMPOUND	RF10	RF20	RF40	RF60
1,1,2-Trichloroethane	0.212	0.206	0.215	0.205
1,3-Dichloropropane	0.422	0.424	0.435	0.454
Tetrachloroethene	0.428	0.424	0.403	0.405
Chlorodibromomethane	0.310	0.318	0.326	0.336
1,2-Dibromoethane	0.218	0.219	0.226	0.216
Chlorobenzene	0.960	0.952	0.940	0.930
Ethyl Benzene	0.556	0.543	0.533	0.524
1,1,1,2-Tetrachloroethane	0.412	0.398	0.393	0.376
m,p-xylene	0.689	0.666	0.637	0.612
o-Xylene	0.698	0.681	0.675	0.636
Styrene	1.082	1.073	1.084	1.074
Bromoform	0.329	0.357	0.368	0.397
1,1,2,2-Tetrachloroethane	0.493	0.483	0.488	0.509
1,2,3-Trichloropropane	0.169	0.168	0.164	0.170
Trans-1,4-Dichloro 2-Butene	0.149	0.151	0.154	0.163
N-Propyl Benzene	3.209	3.258	3.216	3.277
Bromobenzene	0.783	0.786	0.787	0.818
Isopropyl Benzene	3.164	3.174	3.135	3.199
2-Chloro Toluene	2.367	2.345	2.372	2.403
4-Chloro Toluene	2.181	2.233	2.242	2.299
T-Butyl Benzene	2.053	1.995	2.054	2.033
1,3,5-Trimethyl Benzene	2.518	2.449	2.472	2.441
1,2,4-Trimethylbenzene	2.498	2.436	2.494	2.483
S-Butyl Benzene	2.814	2.697	2.822	2.806
4-Isopropyl Toluene	2.304	2.226	2.343	2.348
1,3-Dichlorobenzene	1.380	1.361	1.408	1.395
1,4-Dichlorobenzene	1.413	1.378	1.430	1.402
N-Butyl Benzene	1.862	1.815	1.951	1.941
1,2-Dichlorobenzene	1.195	1.146	1.207	1.198
1,2-Dibromo 3-Chloropropane	0.055	0.048	0.056	0.064
1,2,4-Trichlorobenzene	0.496	0.426	0.487	0.560
Hexachloro 1,3-Butadiene	0.262	0.218	0.213	0.225
Naphthalene	0.712	0.599	0.696	0.894
1,2,3-Trichlorobenzene	0.314	0.237	0.254	0.316
Dichlorodifluoromethane	0.612	0.584	0.575	0.549
Methyl tert butyl ether	1.410	1.376	1.409	1.352

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

LAB FILE ID: RF10: 1001126 RF20: 2001126 RF40: 4001126
RF60: 6001126

COMPOUND	RF10	RF20	RF40	RF60
d4-1,2-Dichloroethane	0.523	0.505	0.509	0.480
d8-Toluene	1.122	1.147	1.132	1.147
4-Bromofluorobenzene	0.537	0.523	0.522	0.500
d4-1,2-Dichlorobenzene	0.816	0.781	0.796	0.798
Dibromofluoromethane	0.488	0.477	0.478	0.464

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	0.618	6.8
Vinyl Chloride	AVRG	0.564	7.9
Bromomethane	AVRG	0.298	8.3
Chloroethane	AVRG	0.339	6.8
Trichlorofluoromethane	AVRG	0.793	5.9
Acrolein	AVRG	0.038	16.6
112Trichloro122Trifluoroetha	AVRG	0.465	6.5
Acetone	AVRG	0.072	8.9
1,1-Dichloroethene	AVRG	0.489	5.8
Bromoethane	AVRG	0.375	7.7
Iodomethane	AVRG	0.798	7.4
Methylene Chloride	AVRG	0.550	7.2
Acrylonitrile	AVRG	0.093	17.2
Carbon Disulfide	AVRG	1.417	10.0
Trans-1,2-Dichloroethene	AVRG	0.560	6.6
Vinyl Acetate	LINR		0.9975
1,1-Dichloroethane	AVRG	0.939	4.7
2-Butanone	AVRG	0.106	12.7
2,2-Dichloropropane	AVRG	0.614	7.5
Cis-1,2-Dichloroethene	AVRG	0.564	6.8
Chloroform	AVRG	0.940	5.9
Bromochloromethane	AVRG	0.251	5.7
1,1,1-Trichloroethane	AVRG	0.853	7.9
1,1-Dichloropropene	AVRG	0.472	6.7
Carbon Tetrachloride	AVRG	0.519	6.0
1,2-Dichloroethane	AVRG	0.415	7.3
Benzene	AVRG	1.334	4.2
Trichloroethene	AVRG	0.364	6.4
1,2-Dichloropropane	AVRG	0.284	6.0
Bromodichloromethane	AVRG	0.410	8.6
Dibromomethane	AVRG	0.151	9.0
2-Chloroethyl Vinyl Ether	AVRG	0.109	19.1
4-Methyl-2-Pentanone	AVRG	0.067	13.9
Cis 1,3-dichloropropene	AVRG	0.415	14.3
Toluene	AVRG	0.784	6.5
Trans 1,3-Dichloropropene	AVRG	0.363	10.8
2-Hexanone	AVRG	0.117	13.6

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.196	8.6
1,3-Dichloropropane	AVRG	0.397	10.0
Tetrachloroethene	AVRG	0.417	6.1
Chlorodibromomethane	AVRG	0.284	15.7
1,2-Dibromoethane	AVRG	0.209	7.8
Chlorobenzene	AVRG	0.937	5.3
Ethyl Benzene	AVRG	0.523	5.8
1,1,1,2-Tetrachloroethane	AVRG	0.379	7.7
m,p-xylene	AVRG	0.634	6.4
o-Xylene	AVRG	0.633	8.5
Styrene	AVRG	0.958	15.0
Bromoform	LINR		0.9968
1,1,2,2-Tetrachloroethane	AVRG	0.458	12.7
1,2,3-Trichloropropane	AVRG	0.159	8.4
Trans-1,4-Dichloro 2-Butene	AVRG	0.136	17.9
N-Propyl Benzene	AVRG	3.116	5.8
Bromobenzene	AVRG	0.768	5.3
Isopropyl Benzene	AVRG	2.912	10.2
2-Chloro Toluene	AVRG	2.297	6.2
4-Chloro Toluene	AVRG	2.105	7.9
T-Butyl Benzene	AVRG	1.884	9.4
1,3,5-Trimethyl Benzene	AVRG	2.326	8.0
1,2,4-Trimethylbenzene	AVRG	2.317	9.3
S-Butyl Benzene	AVRG	2.649	7.2
4-Isopropyl Toluene	AVRG	2.201	9.1
1,3-Dichlorobenzene	AVRG	1.348	6.2
1,4-Dichlorobenzene	AVRG	1.389	5.5
N-Butyl Benzene	AVRG	1.811	8.4
1,2-Dichlorobenzene	AVRG	1.178	6.7
1,2-Dibromo 3-Chloropropane	AVRG	0.054	13.5
1,2,4-Trichlorobenzene	AVRG	0.494	13.7
Hexachloro 1,3-Butadiene	LINR		0.9979
Naphthalene	AVRG	0.682	17.2
1,2,3-Trichlorobenzene	AVRG	0.287	15.6
Dichlorodifluoromethane	AVRG	0.562	8.4
Methyl tert butyl ether	AVRG	1.321	8.1

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/26/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.516	3.5
d8-Toluene	AVRG	1.119	1.9
4-Bromofluorobenzene	AVRG	0.520	2.7
d4-1,2-Dichlorobenzene	AVRG	0.812	2.3
Dibromofluoromethane	AVRG	0.477	1.7

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Cont. Calib. Date: 11/21/12

Init. Calib. Date: 11/16/12 Cont. Calib. Time: 1014

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	0.558	0.5453	0.100	AVRG	-2.3	
Vinyl Chloride	0.494	0.5289	0.010	AVRG	7.1	
Bromomethane	0.260	0.2829	0.010	AVRG	8.8	
Chloroethane	0.289	0.3025	0.010	AVRG	4.7	
Trichlorofluoromethane	0.633	0.7089	0.010	AVRG	12.0	
Acrolein	0.039	0.0297	0.010	AVRG	-23.8	<-
112Trichloro122Trifluoroetha	0.400	0.4124	0.010	AVRG	3.1	
Acetone	0.055	0.0493	0.010	AVRG	-10.4	
1,1-Dichloroethene	0.413	0.4248	0.010	AVRG	2.8	
Bromoethane	0.335	0.3599	0.010	AVRG	7.4	
Iodomethane	0.706	0.7131	0.010	AVRG	1.0	
Methylene Chloride	0.496	0.4708	0.010	AVRG	-5.1	
Acrylonitrile	10.000	8.061	0.010	LINR	-19.4	
Carbon Disulfide	1.246	1.2707	0.010	AVRG	2.0	
Trans-1,2-Dichloroethene	0.506	0.5123	0.010	AVRG	1.2	
Vinyl Acetate	10.000	7.813	0.010	LINR	-21.9	<-
1,1-Dichloroethane	0.832	0.8416	0.100	AVRG	1.2	
2-Butanone	0.092	0.0842	0.010	AVRG	-8.5	
2,2-Dichloropropane	0.516	0.5823	0.010	AVRG	12.8	
Cis-1,2-Dichloroethene	0.504	0.5128	0.010	AVRG	1.7	
Chloroform	0.819	0.8556	0.010	AVRG	4.5	
Bromochloromethane	0.214	0.2200	0.010	AVRG	2.8	
1,1,1-Trichloroethane	0.718	0.7812	0.010	AVRG	8.8	
1,1-Dichloropropene	0.423	0.4531	0.010	AVRG	7.1	
Carbon Tetrachloride	0.397	0.4726	0.010	AVRG	19.0	
1,2-Dichloroethane	0.340	0.3635	0.010	AVRG	6.9	
Benzene	1.224	1.2519	0.010	AVRG	2.3	
Trichloroethene	0.332	0.3405	0.010	AVRG	2.6	
1,2-Dichloropropane	0.263	0.2657	0.010	AVRG	1.0	
Bromodichloromethane	0.347	0.3842	0.010	AVRG	10.7	
Dibromomethane	0.131	0.1360	0.010	AVRG	3.8	
2-Chloroethyl Vinyl Ether	10.000	7.762	0.010	LINR	-22.4	<-
4-Methyl-2-Pentanone	0.059	0.0631	0.010	AVRG	6.9	
Cis 1,3-dichloropropene	0.380	0.3990	0.010	AVRG	5.0	
Toluene	0.706	0.7350	0.010	AVRG	4.1	
Trans 1,3-Dichloropropene	10.000	9.696	0.010	LINR	-3.0	
2-Hexanone	0.107	0.1067	0.010	AVRG	-0.3	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC — Client: GOLDER ASSOCIATES

ARI Job No: VS45 — Project: LANDSBURG MINE

Instrument ID: NT2 — Cont. Calib. Date: 11/21/12

Init. Calib. Date: 11/16/12 — Cont. Calib. Time: 1014

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
1,1,2-Trichloroethane	0.177	0.1905	0.010	AVRG	7.6	
1,3-Dichloropropane	0.366	0.3779	0.010	AVRG	3.2	
Tetrachloroethene	0.370	0.3984	0.010	AVRG	7.7	
Chlorodibromomethane	10.000	8.715	0.010	LINR	-12.8	
1,2-Dibromoethane	0.173	0.1943	0.010	AVRG	12.3	
Chlorobenzene	0.838	0.8766	0.300	AVRG	4.6	
Ethyl Benzene	0.468	0.5117	0.010	AVRG	9.3	
1,1,1,2-Tetrachloroethane	0.310	0.3502	0.010	AVRG	13.0	
m,p-xylene	0.568	0.6260	0.010	AVRG	10.2	
o-Xylene	0.564	0.6229	0.010	AVRG	10.4	
Styrene	0.876	0.9788	0.010	AVRG	11.7	
Bromoform	10.000	7.347	0.100	LINR	-26.5	<-
1,1,2,2-Tetrachloroethane	0.444	0.4249	0.300	AVRG	-4.3	
1,2,3-Trichloropropane	0.153	0.1495	0.010	AVRG	-2.3	
Trans-1,4-Dichloro 2-Butene	0.139	0.1251	0.010	AVRG	-10.0	
N-Propyl Benzene	2.995	3.0764	0.010	AVRG	2.7	
Bromobenzene	0.739	0.7087	0.010	AVRG	-4.1	
Isopropyl Benzene	2.851	2.9196	0.010	AVRG	2.4	
2-Chloro Toluene	2.147	2.1693	0.010	AVRG	1.0	
4-Chloro Toluene	2.041	2.0586	0.010	AVRG	0.9	
T-Butyl Benzene	1.762	1.9385	0.010	AVRG	10.0	
1,3,5-Trimethyl Benzene	2.146	2.3758	0.010	AVRG	10.7	
1,2,4-Trimethylbenzene	2.128	2.3189	0.010	AVRG	9.0	
S-Butyl Benzene	2.438	2.7543	0.010	AVRG	13.0	
4-Isopropyl Toluene	1.923	2.2660	0.010	AVRG	17.8	
1,3-Dichlorobenzene	1.244	1.2929	0.010	AVRG	3.9	
1,4-Dichlorobenzene	1.259	1.2964	0.010	AVRG	3.0	
N-Butyl Benzene	1.595	1.9022	0.010	AVRG	19.3	
1,2-Dichlorobenzene	1.023	1.0822	0.010	AVRG	5.8	
1,2-Dibromo 3-Chloropropane	10.000	7.998	0.010	LINR	-20.0	<-
1,2,4-Trichlorobenzene	0.436	0.5028	0.010	AVRG	15.3	
Hexachloro 1,3-Butadiene	0.208	0.2826	0.010	AVRG	35.9	<-
Naphthalene	0.649	0.6779	0.010	AVRG	4.4	
1,2,3-Trichlorobenzene	0.255	0.3090	0.010	AVRG	21.2	<-
Dichlorodifluoromethane	0.463	0.5016	0.010	AVRG	8.3	
Methyl tert butyl ether	1.144	1.1358	0.010	AVRG	-0.7	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Cont. Calib. Date: 11/21/12

Init. Calib. Date: 11/16/12 Cont. Calib. Time: 1014

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.475	0.4965	0.010	AVRG	4.5
d8-Toluene	1.119	1.1267	0.010	AVRG	0.7
4-Bromofluorobenzene	0.496	0.5264	0.010	AVRG	6.1
d4-1,2-Dichlorobenzene	0.788	0.8129	0.010	AVRG	3.2
Dibromofluoromethane	0.462	0.4613	0.010	AVRG	-0.2

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Cont. Calib. Date: 11/26/12

Init. Calib. Date: 11/26/12 Cont. Calib. Time: 1735

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Chloromethane	0.618	0.6008	0.100	AVRG	-2.8
Vinyl Chloride	0.564	0.5694	0.010	AVRG	1.0
Bromomethane	0.298	0.3054	0.010	AVRG	2.5
Chloroethane	0.338	0.3242	0.010	AVRG	-4.1
Trichlorofluoromethane	0.793	0.7480	0.010	AVRG	-5.7
Acrolein	0.038	0.0432	0.010	AVRG	13.7
112Trichloro122Trifluoroetha	0.465	0.4816	0.010	AVRG	3.6
Acetone	0.072	0.0670	0.010	AVRG	-6.9
1,1-Dichloroethene	0.489	0.5106	0.010	AVRG	4.4
Bromoethane	0.375	0.3776	0.010	AVRG	0.7
Iodomethane	0.798	0.8324	0.010	AVRG	4.3
Methylene Chloride	0.550	0.5199	0.010	AVRG	-5.5
Acrylonitrile	0.093	0.0920	0.010	AVRG	-1.1
Carbon Disulfide	1.417	1.4764	0.010	AVRG	4.2
Trans-1,2-Dichloroethene	0.560	0.5467	0.010	AVRG	-2.4
Vinyl Acetate	10.000	8.430	0.010	LINR	-15.7
1,1-Dichloroethane	0.939	0.9026	0.100	AVRG	-3.9
2-Butanone	0.106	0.1068	0.010	AVRG	0.8
2,2-Dichloropropane	0.614	0.5901	0.010	AVRG	-3.9
Cis-1,2-Dichloroethene	0.564	0.5534	0.010	AVRG	-1.9
Chloroform	0.940	0.9198	0.010	AVRG	-2.1
Bromochloromethane	0.251	0.2404	0.010	AVRG	-4.2
1,1,1-Trichloroethane	0.853	0.8341	0.010	AVRG	-2.2
1,1-Dichloropropene	0.471	0.4838	0.010	AVRG	2.7
Carbon Tetrachloride	0.519	0.4922	0.010	AVRG	-5.2
1,2-Dichloroethane	0.416	0.3901	0.010	AVRG	-6.2
Benzene	1.334	1.3527	0.010	AVRG	1.4
Trichloroethene	0.364	0.3661	0.010	AVRG	0.6
1,2-Dichloropropane	0.284	0.2852	0.010	AVRG	0.4
Bromodichloromethane	0.410	0.4101	0.010	AVRG	0.0
Dibromomethane	0.151	0.1539	0.010	AVRG	1.9
2-Chloroethyl Vinyl Ether	0.108	0.1144	0.010	AVRG	5.9
4-Methyl-2-Pentanone	0.067	0.0731	0.010	AVRG	9.1
Cis 1,3-dichloropropene	0.415	0.4526	0.010	AVRG	9.1
Toluene	0.783	0.7898	0.010	AVRG	0.9
Trans 1,3-Dichloropropene	0.363	0.3833	0.010	AVRG	5.6
2-Hexanone	0.117	0.1213	0.010	AVRG	3.7

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT2 Cont. Calib. Date: 11/26/12

Init. Calib. Date: 11/26/12 Cont. Calib. Time: 1735

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
1,1,2-Trichloroethane	0.196	0.2046	0.010	AVRG	4.4
1,3-Dichloropropane	0.397	0.4003	0.010	AVRG	0.8
Tetrachloroethene	0.418	0.4062	0.010	AVRG	-2.8
Chlorodibromomethane	0.284	0.2872	0.010	AVRG	1.1
1,2-Dibromoethane	0.209	0.2142	0.010	AVRG	2.5
Chlorobenzene	0.937	0.9296	0.300	AVRG	-0.8
Ethyl Benzene	0.523	0.5285	0.010	AVRG	1.0
1,1,1,2-Tetrachloroethane	0.380	0.3667	0.010	AVRG	-3.5
m,p-xylene	0.634	0.6558	0.010	AVRG	3.4
o-Xylene	0.633	0.6586	0.010	AVRG	4.0
Styrene	0.958	1.0713	0.010	AVRG	11.8
Bromoform	10.000	8.274	0.100	LINR	-17.3
1,1,2,2-Tetrachloroethane	0.458	0.4766	0.300	AVRG	4.1
1,2,3-Trichloropropane	0.159	0.1688	0.010	AVRG	6.2
Trans-1,4-Dichloro 2-Butene	0.136	0.1441	0.010	AVRG	6.0
N-Propyl Benzene	3.116	3.2285	0.010	AVRG	3.6
Bromobenzene	0.768	0.7694	0.010	AVRG	0.2
Isopropyl Benzene	2.912	3.1056	0.010	AVRG	6.6
2-Chloro Toluene	2.297	2.3002	0.010	AVRG	0.1
4-Chloro Toluene	2.105	2.1658	0.010	AVRG	2.9
T-Butyl Benzene	1.884	1.9813	0.010	AVRG	5.2
1,3,5-Trimethyl Benzene	2.326	2.4204	0.010	AVRG	4.0
1,2,4-Trimethylbenzene	2.316	2.4160	0.010	AVRG	4.3
S-Butyl Benzene	2.648	2.7382	0.010	AVRG	3.4
4-Isopropyl Toluene	2.201	2.2641	0.010	AVRG	2.9
1,3-Dichlorobenzene	1.348	1.3403	0.010	AVRG	-0.6
1,4-Dichlorobenzene	1.389	1.3447	0.010	AVRG	-3.2
N-Butyl Benzene	1.811	1.8060	0.010	AVRG	-0.3
1,2-Dichlorobenzene	1.178	1.1221	0.010	AVRG	-4.7
1,2-Dibromo 3-Chloropropane	0.053	0.0482	0.010	AVRG	-9.0
1,2,4-Trichlorobenzene	0.494	0.4540	0.010	AVRG	-8.1
Hexachloro 1,3-Butadiene	10.000	11.468	0.010	LINR	14.7
Naphthalene	0.682	0.6547	0.010	AVRG	-4.0
1,2,3-Trichlorobenzene	0.287	0.2827	0.010	AVRG	-1.5
Dichlorodifluoromethane	0.562	0.5609	0.010	AVRG	-0.2
Methyl tert butyl ether	1.321	1.2821	0.010	AVRG	-2.9

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Instrument ID: NT2 | Cont. Calib. Date: 11/26/12

Init. Calib. Date: 11/26/12 | Cont. Calib. Time: 1735

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.516	0.4915	0.010	AVRG	-4.7
d8-Toluene	1.119	1.1559	0.010	AVRG	3.3
4-Bromofluorobenzene	0.520	0.5101	0.010	AVRG	-1.9
d4-1,2-Dichlorobenzene	0.812	0.8024	0.010	AVRG	-1.2
Dibromofluoromethane	0.477	0.4646	0.010	AVRG	-2.6

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 | Ical Date: 11/16/12

Instrument ID: NT2 | Project Run Date: 11/21/12

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	215240	5.41	307975	5.80	276465	7.88
	UPPER LIMIT	430480	5.91	615950	6.30	552930	8.38
	LOWER LIMIT	107620	4.91	153988	5.30	138232	7.38
	Sample ID						
01	LCS1121	200388	5.41	291294	5.80	263699	7.88
02	LCS1121	193638	5.40	285658	5.80	256134	7.88
03	MB1121	192234	5.41	272422	5.80	247484	7.88
04	LMW-3-1112	188285	5.40	262911	5.80	239916	7.88
05	LMW-EB-1112	182477	5.40	260084	5.80	239014	7.87
06	LMW-8-1112	176770	5.40	252366	5.80	226662	7.88
07	LMW-5-1112	181792	5.40	259164	5.80	232905	7.88
08	LMW-7-1112	178805	5.40	254390	5.80	234150	7.87
09	LMW-7-1112-D	167673	5.40	241755	5.80	220862	7.88
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IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 | Ical Date: 11/16/12

Instrument ID: NT2 | Project Run Date: 11/21/12

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	136856	9.58				
	UPPER LIMIT	273712	10.08				
	LOWER LIMIT	68428	9.08				
	Sample ID						
01	LCS1121	160154	9.58				
02	LCS1121	148389	9.57				
03	MB1121	137296	9.58				
04	LMW-3-1112	129190	9.57				
05	LMW-EB-1112	146754	9.57				
06	LMW-8-1112	130052	9.57				
07	LMW-5-1112	130720	9.57				
08	LMW-7-1112	143386	9.57				
09	LMW-7-1112-D	138984	9.57				
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IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101126 | Ical Date: 11/26/12

Instrument ID: NT2 | Project Run Date: 11/26/12

		IS1(PFB) AREA	#	RT	#	IS2(DFB) AREA	#	RT	#	IS3(CLB) AREA	#	RT	#
	ICAL MIDPT	175687		5.41		253980		5.80		231161		7.88	
	UPPER LIMIT	351374		5.91		507960		6.30		462322		8.38	
	LOWER LIMIT	87844		4.91		126990		5.30		115580		7.38	
	Sample ID												
01	ICV10	211299		5.41		305883		5.80		269584		7.88	
02													
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IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101126 | Ical Date: 11/26/12

Instrument ID: NT2 | Project Run Date: 11/26/12

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	145258	9.58				
	UPPER LIMIT	290516	10.08				
	LOWER LIMIT	72629	9.08				
	Sample ID						
01	ICV10	146300	9.58				
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IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101126 | Ical Date: 11/26/12

Instrument ID: NT2 | Project Run Date: 11/26/12

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	175687	5.41	253980	5.80	231161	7.88
	UPPER LIMIT	351374	5.91	507960	6.30	462322	8.38
	LOWER LIMIT	87844	4.91	126990	5.30	115580	7.38
	Sample ID						
01	LCS1126	202346	5.41	297350	5.80	267776	7.88
02	LCS1126	200424	5.40	295792	5.80	266877	7.88
03	MB1126	204052	5.40	297374	5.80	268065	7.88
04	TRIP BLANKS	195020	5.40	276925	5.80	249337	7.88
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IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101126 | Ical Date: 11/26/12

Instrument ID: NT2 | Project Run Date: 11/26/12

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	145258	9.58				
	UPPER LIMIT	290516	10.08				
	LOWER LIMIT	72629	9.08				
	Sample ID						
01	LCS1126	148453	9.57				
02	LCS1126	151185	9.57				
03	MB1126	143452	9.57				
04	TRIP BLANKS	134449	9.57				
05							
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IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

Semivolatile Analysis
Report and Summary QC Forms

ARI Job ID: VS45, VS46

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 2

Sample ID: LMW-3-1112
SAMPLE

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/21/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/15/12
Date Analyzed: 11/20/12 02:18
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 2 of 2

Sample ID: LMW-3-1112
SAMPLE

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Date Analyzed: 11/20/12 02:18

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	69.2%	2-Fluorobiphenyl	73.6%
d14-p-Terphenyl	81.2%	d4-1,2-Dichlorobenzene	66.0%
d5-Phenol	67.7%	2-Fluorophenol	66.4%
2,4,6-Tribromophenol	79.5%	d4-2-Chlorophenol	69.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 2

Sample ID: LMW-EB-1112
SAMPLE

Lab Sample ID: VS45B
LIMS ID: 12-22813
Matrix: Water
Data Release Authorized:
Reported: 11/21/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/15/12
Date Analyzed: 11/20/12 02:52
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-EB-1112
SAMPLE

Lab Sample ID: VS45B
LIMS ID: 12-22813
Matrix: Water
Date Analyzed: 11/20/12 02:52

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	75.6%	2-Fluorobiphenyl	76.4%
d14-p-Terphenyl	84.4%	d4-1,2-Dichlorobenzene	72.0%
d5-Phenol	73.1%	2-Fluorophenol	70.7%
2,4,6-Tribromophenol	83.5%	d4-2-Chlorophenol	74.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 2

Sample ID: LMW-8-1112
SAMPLE

Lab Sample ID: VS45C
LIMS ID: 12-22814
Matrix: Water
Data Release Authorized:
Reported: 11/21/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/15/12
Date Analyzed: 11/20/12 12:21
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 2 of 2

Sample ID: LMW-8-1112
SAMPLE

Lab Sample ID: VS45C
LIMS ID: 12-22814
Matrix: Water
Date Analyzed: 11/20/12 12:21

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.6%	2-Fluorobiphenyl	77.2%
d14-p-Terphenyl	82.4%	d4-1,2-Dichlorobenzene	69.2%
d5-Phenol	70.7%	2-Fluorophenol	68.3%
2,4,6-Tribromophenol	83.7%	d4-2-Chlorophenol	72.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-5-1112
SAMPLE

Lab Sample ID: VS45D
LIMS ID: 12-22815
Matrix: Water
Data Release Authorized:
Reported: 11/21/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/15/12
Date Analyzed: 11/20/12 12:56
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 2 of 2

Sample ID: LMW-5-1112
SAMPLE

Lab Sample ID: VS45D
LIMS ID: 12-22815
Matrix: Water
Date Analyzed: 11/20/12 12:56

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.6%	2-Fluorobiphenyl	75.6%
d14-p-Terphenyl	82.8%	d4-1,2-Dichlorobenzene	72.0%
d5-Phenol	72.3%	2-Fluorophenol	71.5%
2,4,6-Tribromophenol	79.5%	d4-2-Chlorophenol	74.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-7-1112
SAMPLE

Lab Sample ID: VS45E
LIMS ID: 12-22816
Matrix: Water
Data Release Authorized:
Reported: 11/21/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/15/12
Date Analyzed: 11/20/12 17:32
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-7-1112
SAMPLE

Lab Sample ID: VS45E
LIMS ID: 12-22816
Matrix: Water
Date Analyzed: 11/20/12 17:32

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	75.2%	2-Fluorobiphenyl	76.0%
d14-p-Terphenyl	86.4%	d4-1,2-Dichlorobenzene	72.0%
d5-Phenol	73.3%	2-Fluorophenol	72.8%
2,4,6-Tribromophenol	82.4%	d4-2-Chlorophenol	75.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 2

Sample ID: LMW-7-1112-D
SAMPLE

Lab Sample ID: VS45F
LIMS ID: 12-22817
Matrix: Water
Data Release Authorized:
Reported: 11/21/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/15/12
Date Analyzed: 11/20/12 18:06
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-7-1112-D
SAMPLE

Lab Sample ID: VS45F
LIMS ID: 12-22817
Matrix: Water
Date Analyzed: 11/20/12 18:06

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	76.8%	2-Fluorobiphenyl	78.4%
d14-p-Terphenyl	88.0%	d4-1,2-Dichlorobenzene	73.6%
d5-Phenol	77.1%	2-Fluorophenol	74.7%
2,4,6-Tribromophenol	78.9%	d4-2-Chlorophenol	76.8%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-111512	72.0%	76.4%	86.4%	67.6%	70.7%	68.8%	87.5%	72.8%	0
LCS-111512	79.2%	85.2%	88.0%	69.2%	78.7%	69.9%	97.3%	77.6%	0
LCSD-111512	77.6%	82.8%	82.8%	69.2%	73.9%	68.0%	92.5%	72.3%	0
LMW-3-1112	69.2%	73.6%	81.2%	66.0%	67.7%	66.4%	79.5%	69.1%	0
LMW-EB-1112	75.6%	76.4%	84.4%	72.0%	73.1%	70.7%	83.5%	74.9%	0
LMW-8-1112	73.6%	77.2%	82.4%	69.2%	70.7%	68.3%	83.7%	72.3%	0
LMW-5-1112	73.6%	75.6%	82.8%	72.0%	72.3%	71.5%	79.5%	74.1%	0
LMW-7-1112	75.2%	76.0%	86.4%	72.0%	73.3%	72.8%	82.4%	75.7%	0
LMW-7-1112-D	76.8%	78.4%	88.0%	73.6%	77.1%	74.7%	78.9%	76.8%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(50-100)	(34-101)
(FBP) = 2-Fluorobiphenyl	(51-100)	(38-100)
(TPH) = d14-p-Terphenyl	(54-117)	(27-122)
(DCB) = d4-1,2-Dichlorobenzene	(40-100)	(27-100)
(PHL) = d5-Phenol	(15-121)	(16-106)
(2FP) = 2-Fluorophenol	(33-100)	(23-100)
(TBP) = 2,4,6-Tribromophenol	(46-125)	(31-128)
(2CP) = d4-2-Chlorophenol	(46-102)	(33-100)

Prep Method: SW3520C
Log Number Range: 12-22812 to 12-22817

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: LCS-111512
LCS/LCSD

Lab Sample ID: LCS-111512
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/21/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted LCS/LCSD: 11/15/12

Date Analyzed LCS: 11/20/12 00:35
LCSD: 11/20/12 01:09
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: NO

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	19.5	25.0	78.0%	18.6	25.0	74.4%	4.7%
Bis-(2-Chloroethyl) Ether	18.5	25.0	74.0%	17.5	25.0	70.0%	5.6%
2-Chlorophenol	19.0	25.0	76.0%	18.0	25.0	72.0%	5.4%
1,3-Dichlorobenzene	16.7	25.0	66.8%	16.7	25.0	66.8%	0.0%
1,4-Dichlorobenzene	17.2	25.0	68.8%	17.3	25.0	69.2%	0.6%
Benzyl Alcohol	15.6	25.0	62.4%	15.3	25.0	61.2%	1.9%
1,2-Dichlorobenzene	16.9	25.0	67.6%	17.5	25.0	70.0%	3.5%
2-Methylphenol	18.1	25.0	72.4%	17.3	25.0	69.2%	4.5%
2,2'-Oxybis(1-Chloropropane)	18.1	25.0	72.4%	18.0	25.0	72.0%	0.6%
4-Methylphenol	37.5	50.0	75.0%	36.0	50.0	72.0%	4.1%
N-Nitroso-Di-N-Propylamine	18.1	25.0	72.4%	18.0	25.0	72.0%	0.6%
Hexachloroethane	16.3	25.0	65.2%	16.6	25.0	66.4%	1.8%
Nitrobenzene	19.1	25.0	76.4%	18.8	25.0	75.2%	1.6%
Isophorone	21.5	25.0	86.0%	20.9	25.0	83.6%	2.8%
2-Nitrophenol	20.3	25.0	81.2%	19.8	25.0	79.2%	2.5%
2,4-Dimethylphenol	49.4	75.0	65.9%	38.8	75.0	51.7%	24.0%
Benzoic Acid	114	138	82.6%	106	138	76.8%	7.3%
bis(2-Chloroethoxy) Methane	18.4	25.0	73.6%	18.2	25.0	72.8%	1.1%
2,4-Dichlorophenol	59.0	75.0	78.7%	57.2	75.0	76.3%	3.1%
1,2,4-Trichlorobenzene	18.4	25.0	73.6%	18.6	25.0	74.4%	1.1%
Naphthalene	17.6	25.0	70.4%	17.4	25.0	69.6%	1.1%
4-Chloroaniline	78.5	75.0	105%	79.9	75.0	107%	1.8%
Hexachlorobutadiene	18.0	25.0	72.0%	18.1	25.0	72.4%	0.6%
4-Chloro-3-methylphenol	59.7	75.0	79.6%	57.3	75.0	76.4%	4.1%
2-Methylnaphthalene	16.5	25.0	66.0%	16.1	25.0	64.4%	2.5%
Hexachlorocyclopentadiene	44.8	75.0	59.7%	47.3	75.0	63.1%	5.4%
2,4,6-Trichlorophenol	62.2	75.0	82.9%	61.8	75.0	82.4%	0.6%
2,4,5-Trichlorophenol	62.4	75.0	83.2%	61.5	75.0	82.0%	1.5%
2-Chloronaphthalene	20.9	25.0	83.6%	20.9	25.0	83.6%	0.0%
2-Nitroaniline	49.5	75.0	66.0%	49.3	75.0	65.7%	0.4%
Dimethylphthalate	20.7	25.0	82.8%	20.4	25.0	81.6%	1.5%
Acenaphthylene	19.3	25.0	77.2%	19.4	25.0	77.6%	0.5%
3-Nitroaniline	51.7	75.0	68.9%	51.0	75.0	68.0%	1.4%
Acenaphthene	18.5	25.0	74.0%	18.3	25.0	73.2%	1.1%
2,4-Dinitrophenol	122	138	88.4%	122	138	88.4%	0.0%
4-Nitrophenol	64.8	75.0	86.4%	63.3	75.0	84.4%	2.3%
Dibenzofuran	18.0	25.0	72.0%	17.8	25.0	71.2%	1.1%
2,6-Dinitrotoluene	61.4	75.0	81.9%	60.0	75.0	80.0%	2.3%
2,4-Dinitrotoluene	60.5	75.0	80.7%	59.7	75.0	79.6%	1.3%
Diethylphthalate	20.2	25.0	80.8%	19.8	25.0	79.2%	2.0%
4-Chlorophenyl-phenylether	20.9	25.0	83.6%	20.4	25.0	81.6%	2.4%
Fluorene	18.9	25.0	75.6%	18.5	25.0	74.0%	2.1%
4-Nitroaniline	50.8	75.0	67.7%	50.1	75.0	66.8%	1.4%
4,6-Dinitro-2-Methylphenol	145	138	105%	144	138	104%	0.7%
N-Nitrosodiphenylamine	19.6	25.0	78.4%	19.7	25.0	78.8%	0.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: LCS-111512
LCS/LCSD

Lab Sample ID: LCS-111512
LIMS ID: 12-22812
Matrix: Water
Date Analyzed LCS: 11/20/12 00:35
LCSD: 11/20/12 01:09

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
4-Bromophenyl-phenylether	21.2	25.0	84.8%	20.7	25.0	82.8%	2.4%
Hexachlorobenzene	21.4	25.0	85.6%	21.2	25.0	84.8%	0.9%
Pentachlorophenol	58.9	75.0	78.5%	57.9	75.0	77.2%	1.7%
Phenanthrene	20.4	25.0	81.6%	20.1	25.0	80.4%	1.5%
Carbazole	21.0	25.0	84.0%	20.5	25.0	82.0%	2.4%
Anthracene	19.6	25.0	78.4%	19.0	25.0	76.0%	3.1%
Di-n-Butylphthalate	22.1	25.0	88.4%	21.7	25.0	86.8%	1.8%
Fluoranthene	21.2	25.0	84.8%	20.8	25.0	83.2%	1.9%
Pyrene	18.4	25.0	73.6%	18.2	25.0	72.8%	1.1%
Butylbenzylphthalate	20.4	25.0	81.6%	19.7	25.0	78.8%	3.5%
3,3'-Dichlorobenzidine	59.2	75.0	78.9%	61.9	75.0	82.5%	4.5%
Benzo(a)anthracene	20.1	25.0	80.4%	19.9	25.0	79.6%	1.0%
bis(2-Ethylhexyl)phthalate	20.8	25.0	83.2%	20.6	25.0	82.4%	1.0%
Chrysene	20.2	25.0	80.8%	19.7	25.0	78.8%	2.5%
Di-n-Octyl phthalate	21.5	25.0	86.0%	21.4	25.0	85.6%	0.5%
Benzo(b)fluoranthene	20.4	25.0	81.6%	17.8	25.0	71.2%	13.6%
Benzo(k)fluoranthene	18.9	25.0	75.6%	20.2	25.0	80.8%	6.6%
Benzo(a)pyrene	18.3	25.0	73.2%	18.2	25.0	72.8%	0.5%
Indeno(1,2,3-cd)pyrene	19.4	25.0	77.6%	18.7	25.0	74.8%	3.7%
Dibenz(a,h)anthracene	20.4	25.0	81.6%	19.8	25.0	79.2%	3.0%
Benzo(g,h,i)perylene	19.7	25.0	78.8%	18.9	25.0	75.6%	4.1%
3-,4-Methylphenol	37.5	50.0	75.0%	36.0	50.0	72.0%	4.1%
1-Methylnaphthalene	22.5	25.0	90.0%	22.2	25.0	88.8%	1.3%
Total Benzofluoranthenes	38.6	50.0	77.2%	37.4	50.0	74.8%	3.2%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	79.2%	77.6%
2-Fluorobiphenyl	85.2%	82.8%
d14-p-Terphenyl	88.0%	82.8%
d4-1,2-Dichlorobenzene	69.2%	69.2%
d5-Phenol	78.7%	73.9%
2-Fluorophenol	69.9%	68.0%
2,4,6-Tribromophenol	97.3%	92.5%
d4-2-Chlorophenol	77.6%	72.3%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

VS45MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS45

Project: LANDSBURG MINE

Lab File ID: 11191216

Date Extracted: 11/15/12

Instrument ID: NT6

Date Analyzed: 11/20/12

Matrix: LIQUID

Time Analyzed: 0000

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	VS17LCSW1	VS17LCSW1	11191217	11/20/12
02	VS17LCSDW1	VS17LCSDW1	11191218	11/20/12
03	LMW-3-1112	VS45A	11191220	11/20/12
04	LMW-EB-1112	VS45B	11191221	11/20/12
05	LMW-8-1112	VS45C	11201202	11/20/12
06	LMW-5-1112	VS45D	11201203	11/20/12
07	LMW-7-1112	VS45E	11201211	11/20/12
08	LMW-7-1112-D	VS45F	11201212	11/20/12
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FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 2

Sample ID: MB-111512
METHOD BLANK

Lab Sample ID: MB-111512
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/21/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted: 11/15/12
Date Analyzed: 11/20/12 00:00
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: MB-111512
METHOD BLANK

Lab Sample ID: MB-111512
LIMS ID: 12-22812
Matrix: Water
Date Analyzed: 11/20/12 00:00

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.0%	2-Fluorobiphenyl	76.4%
d14-p-Terphenyl	86.4%	d4-1,2-Dichlorobenzene	67.6%
d5-Phenol	70.7%	2-Fluorophenol	68.8%
2,4,6-Tribromophenol	87.5%	d4-2-Chlorophenol	72.8%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 10/19/12 DFTPP Injection Time: 1620

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	38.6
68	Less than 2.0% of mass 69	0.4 (1.0)1
69	Mass 69 relative abundance	39.3
70	Less than 2.0% of mass 69	0.3 (0.8)1
127	10.0 - 80.0% of mass 198	49.1
197	Less than 2.0% of mass 198	0.2
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.5
275	10.0 - 60.0% of mass 198	23.3
365	Greater than 1.0% of mass 198	2.98
441	0.0 - 24.0% of mass 442	11.2 (13.6)2
442	50.0 - 200.0% of mass 198	81.9
443	15.0 - 24.0% of mass 442	14.7 (17.9)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC251019	IC251019	10191201	10/19/12	1620
02	IC021019	IC021019	10191202	10/19/12	1654
03	IC11019	IC11019	10191203	10/19/12	1728
04	IC51019	IC51019	10191204	10/19/12	1803
05	IC101019	IC101019	10191205	10/19/12	1837
06	IC401019	IC401019	10191206	10/19/12	1912
07	IC601019	IC601019	10191207	10/19/12	1946
08	IC801019	IC801019	10191208	10/19/12	2020
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FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 11/19/12 DFTPP Injection Time: 1519

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	42.4
68	Less than 2.0% of mass 69	0.6 (1.4)1
69	Mass 69 relative abundance	40.5
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	10.0 - 80.0% of mass 198	50.5
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 60.0% of mass 198	24.1
365	Greater than 1.0% of mass 198	2.95
441	0.0 - 24.0% of mass 442	11.5 (14.5)2
442	50.0 - 200.0% of mass 198	79.4
443	15.0 - 24.0% of mass 442	15.5 (19.5)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1119	CC1119	11191201	11/19/12	1519
02	VS17MBW1	VS17MBW1	11191216	11/20/12	0000
03	VS17LCSW1	VS17LCSW1	11191217	11/20/12	0035
04	VS17LCSDW1	VS17LCSDW1	11191218	11/20/12	0109
05	LMW-3-1112	VS45A	11191220	11/20/12	0218
06	LMW-EB-1112	VS45B	11191221	11/20/12	0252
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FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 11/20/12 DFTPP Injection Time: 1146

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	47.1
68	Less than 2.0% of mass 69	0.3 (0.6)1
69	Mass 69 relative abundance	46.7
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	10.0 - 80.0% of mass 198	53.0
197	Less than 2.0% of mass 198	0.2
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.2
275	10.0 - 60.0% of mass 198	23.6
365	Greater than 1.0% of mass 198	2.79
441	0.0 - 24.0% of mass 442	11.5 (15.4)2
442	50.0 - 200.0% of mass 198	74.6
443	15.0 - 24.0% of mass 442	15.7 (21.0)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1120	CC1120	11201201	11/20/12	1146
02	LMW-8-1112	VS45C	11201202	11/20/12	1221
03	LMW-5-1112	VS45D	11201203	11/20/12	1256
04	LMW-7-1112	VS45E	11201211	11/20/12	1732
05	LMW-7-1112-D	VS45F	11201212	11/20/12	1806
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FORM V SV

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
Phenol	2.003	1.950	1.786	1.643	1.616	1.499	1.620		1.731	10.9
Bis(2-Chloroethyl)ether	1.557	1.598	1.386	1.325	1.320	1.204	1.200		1.370	11.5
2-Chlorophenol	1.651	1.627	1.487	1.378	1.378	1.245	1.270		1.434	11.2
1,3-Dichlorobenzene	1.784	1.874	1.671	1.597	1.541	1.387	1.391		1.606	11.5
1,4-Dichlorobenzene	1.746	1.853	1.648	1.579	1.542	1.362	1.359		1.584	11.7
1,2-Dichlorobenzene	1.737	1.772	1.566	1.498	1.445	1.257	1.293		1.510	13.2
Benzyl alcohol	1.208	1.305	1.082	1.192	1.116	1.061	1.091		1.151	7.6
2,2'-oxybis(1-Chloropropane)	2.221	2.277	1.992	1.873	1.852	1.628	1.608		1.922	13.7
2-Methylphenol	1.463	1.529	1.364	1.252	1.271	1.150	1.127		1.308	11.6
Hexachloroethane	0.696	0.715	0.638	0.622	0.620	0.566	0.567		0.632	9.1
N-Nitroso-di-n-propylamine	1.041	1.143	0.987	0.932	0.937	0.877	0.870		0.970	10.0
4-Methylphenol	1.466	1.580	1.418	1.308	1.313	1.178	1.175		1.348	11.1
Nitrobenzene	0.480	0.483	0.430	0.407	0.385	0.352	0.350		0.412	13.3
Isophorone	0.704	0.743	0.651	0.628	0.600	0.571	0.568		0.638	10.4
2-Nitrophenol	0.199	0.220	0.208	0.204	0.205	0.200	0.200		0.205	3.6
2,4-Dimethylphenol	0.430	0.421	0.380	0.361	0.352	0.328	0.329		0.372	11.1
Bis(2-Chloroethoxy)methane	0.513	0.535	0.468	0.447	0.428	0.404	0.394		0.456	11.7
2,4-Dichlorophenol	0.325	0.348	0.319	0.311	0.301	0.282	0.280		0.309	7.9
1,2,4-Trichlorobenzene	0.394	0.404	0.355	0.355	0.334	0.318	0.312		0.353	10.1
Naphthalene	1.408	1.412	1.262	1.142	1.022	0.828			1.179	19.4
Benzoic acid	0.154	0.240	0.248	0.277	0.289	0.289	0.297		0.256	19.5
4-Chloroaniline	0.660	0.631	0.537	0.522	0.413	0.343	0.296		0.486	0.995
Hexachlorobutadiene	0.232	0.241	0.214	0.217	0.204	0.196	0.195		0.214	8.2
4-Chloro-3-methylphenol	0.300	0.336	0.308	0.302	0.298	0.280	0.284		0.301	6.1
2-Methylnaphthalene	0.834	0.793	0.675	0.705	0.626	0.551	0.531		0.674	17.0
Hexachlorocyclopentadiene	0.296	0.404	0.356	0.388	0.386	0.408	0.385		0.375	10.3
2,4,6-Trichlorophenol	0.392	0.402	0.390	0.380	0.376	0.371	0.376		0.384	2.9
2,4,5-Trichlorophenol	0.374	0.419	0.408	0.410	0.407	0.404	0.398		0.403	3.5
2-Chloronaphthalene	1.388	1.344	1.180	1.095	1.002	0.912	0.892		1.116	17.7
2-Nitroaniline	0.409	0.452	0.406	0.445	0.422	0.416	0.408		0.422	4.5
Acenaphthylene	2.373	2.436	2.158	1.956	1.785	1.511	1.474		1.956	19.9
Dimethylphthalate	1.329	1.412	1.260	1.208	1.154	1.070	1.098		1.219	10.2
2,6-Dinitrotoluene	0.264	0.306	0.287	0.290	0.285	0.276	0.281		0.284	4.6
Acenaphthene	1.540	1.510	1.340	1.240	1.166	1.028	1.032		1.265	16.5
3-Nitroaniline	0.387	0.422	0.371	0.364	0.282				0.365	14.2
2,4-Dinitrophenol		0.069	0.099	0.141	0.155	0.162	0.177		0.134	0.998
Dibenzofuran	2.388	2.202	1.897	1.949	1.703	1.501	1.455		1.871	18.6

<- Outside QC limits: %RSD <20% or R^2 > 0.990

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
4-Nitrophenol	0.143	0.142	0.144	0.159	0.160	0.149	0.146		0.149	5.1
2,4-Dinitrotoluene	0.304	0.394	0.379	0.382	0.373	0.356	0.372		0.366	8.0
Fluorene	1.645	1.614	1.484	1.376	1.283	1.109	1.105		1.374	16.1
4-Chlorophenyl-phenylether	0.748	0.736	0.670	0.642	0.611	0.564	0.564		0.648	11.6
Diethylphthalate	1.488	1.453	1.320	1.253	1.182	1.054	1.062		1.259	13.8
4-Nitroaniline	0.331	0.371	0.342	0.351	0.326	0.319	0.330		0.338	5.2
4,6-Dinitro-2-methylphenol		0.107	0.120	0.133	0.139	0.140	0.143		0.130	10.8
N-Nitrosodiphenylamine (1)	0.703	0.716	0.618	0.590	0.575	0.535	0.506		0.606	13.1
4-Bromophenyl-phenylether	0.270	0.271	0.249	0.236	0.233	0.228	0.219		0.244	8.3
Hexachlorobenzene	0.291	0.284	0.254	0.244	0.239	0.229	0.221		0.252	10.5
Pentachlorophenol	0.105	0.136	0.145	0.151	0.157	0.156	0.158		0.144	13.2
Phenanthrene	1.469	1.446	1.273	1.151	1.090	0.947	0.891		1.181	19.2
Anthracene	1.500	1.479	1.336	1.202	1.122	0.949	0.897		1.212	19.8
Carbazole	1.177	1.177	1.052	0.950	0.891	0.794	0.776		0.974	17.1
Di-n-butylphthalate	1.428	1.476	1.351	1.213	1.130	0.947	0.909		1.208	18.6
Fluoranthene	1.481	1.455	1.346	1.267	1.170	0.988	0.959		1.238	16.9
Pyrene	1.640	1.689	1.460	1.346	1.220	1.063			1.403	17.3
Butylbenzylphthalate	0.579	0.640	0.580	0.566	0.536	0.491	0.482		0.553	10.0
Benzo(a)anthracene	1.400	1.410	1.268	1.187	1.103	1.004	0.946		1.188	15.4
3,3'-Dichlorobenzidine	0.400	0.389	0.346	0.343	0.275	0.252			0.334	17.8
Chrysene	1.420	1.388	1.215	1.166	1.075	0.948	0.889		1.157	17.6
bis(2-Ethylhexyl)phthalate	0.690	0.726	0.645	0.624	0.607	0.566	0.557		0.631	9.8
Di-n-octylphthalate	1.246	1.220	1.104	1.046	0.987	0.893	0.847		1.049	14.5
Benzo(b)fluoranthene	1.232	1.448	1.278	1.180	1.140	1.004	1.006		1.184	13.2
Benzo(k)fluoranthene	1.504	1.434	1.307	1.290	1.107	0.964	0.861		1.210	19.8
Benzo(a)pyrene	1.254	1.306	1.178	1.129	1.040	0.934	0.894		1.105	14.1
Indeno(1,2,3-cd)pyrene	1.708	1.773	1.583	1.529	1.418	1.350	1.305		1.524	11.7
Dibenzo(a,h)anthracene	1.421	1.472	1.314	1.243	1.140	1.042	1.001		1.233	14.7
Benzo(g,h,i)perylene	1.508	1.538	1.377	1.329	1.249	1.197	1.146		1.335	11.2
N-Nitrosodimethylamine	0.937	1.013	0.886	0.857	0.878	0.885	0.862		0.902	6.1
Aniline	2.808	2.795	2.342	2.429	2.225	2.113	1.984		2.385	13.4
Benzidine		0.510	0.422	0.377	0.285	0.246	0.226		0.344	0.994
Pyridine	1.523	1.767	1.536	1.483	1.502	1.496	1.482		1.541	6.6
1-methylnaphthalene	0.566	0.547	0.471	0.504	0.463	0.436	0.424		0.487	11.1
Azobenzene (1,2-DP-Hydrazine	1.505	1.523	1.384	1.282	1.220	1.079	1.085		1.297	14.1
Total Benzofluoranthenes	1.397	1.376	1.228	1.173	1.059	0.926	0.883		1.149	17.7
2-Fluorophenol	1.559	1.408	1.252	1.278	1.263	1.227			1.331	9.6

(1) Cannot be seperated from Diphenylamine

<- Outside QC limits: %RSD <20% or R^2 > 0.990

FORM VI SV-2

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
Phenol-d5	1.864	1.830	1.608	1.563	1.546	1.503			1.652	9.4
2-Chlorophenol-d4	1.543	1.489	1.329	1.306	1.288	1.246			1.367	8.8
1,2-Dichlorobenzene-d4	1.197	1.082	0.944	0.943	0.900	0.818			0.981	13.9
Nitrobenzene-d5	0.465	0.446	0.404	0.414	0.402	0.403			0.422	6.3
2-Fluorobiphenyl	1.615	1.429	1.299	1.270	1.209	1.143			1.328	12.8
2,4,6-Tribromophenol	0.163	0.171	0.165	0.173	0.176	0.175			0.170	3.1
Terphenyl-d14	0.875	0.808	0.703	0.705	0.672	0.653			0.736	11.8

<- Outside QC limits: %RSD <20% or R^2 > 0.990

FORM VI SV-3

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Instrument ID: NT6 | Cont. Calib. Date: 11/19/12

Init. Calib. Date: 10/19/12 | Cont. Calib. Time: 1519

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Phenol	1.731	1.725	0.800	AVRG	-0.3
Bis(2-Chloroethyl)ether	1.370	1.250	0.700	AVRG	-8.8
2-Chlorophenol	1.434	1.441	0.800	AVRG	0.5
1,3-Dichlorobenzene	1.606	1.554	0.010	AVRG	-3.2
1,4-Dichlorobenzene	1.584	1.540	0.010	AVRG	-2.8
1,2-Dichlorobenzene	1.510	1.444	0.010	AVRG	-4.4
Benzyl alcohol	1.151	1.137	0.010	AVRG	-1.2
2,2'-oxybis(1-Chloropropane)	1.922	1.848	0.010	AVRG	-3.8
2-Methylphenol	1.308	1.280	0.700	AVRG	-2.1
Hexachloroethane	0.632	0.599	0.300	AVRG	-5.2
N-Nitroso-di-n-propylamine	0.970	0.880	0.500	AVRG	-9.3
4-Methylphenol	1.348	1.376	0.600	AVRG	2.1
Nitrobenzene	0.412	0.401	0.200	AVRG	-2.7
Isophorone	0.638	0.578	0.400	AVRG	-9.4
2-Nitrophenol	0.205	0.218	0.100	AVRG	6.3
2,4-Dimethylphenol	0.372	0.368	0.200	AVRG	-1.1
Bis(2-Chloroethoxy)methane	0.456	0.412	0.300	AVRG	-9.6
2,4-Dichlorophenol	0.309	0.323	0.200	AVRG	4.5
1,2,4-Trichlorobenzene	0.353	0.343	0.010	AVRG	-2.8
Naphthalene	1.179	1.122	0.700	AVRG	-4.8
Benzoic acid	0.256	0.243	0.010	AVRG	-5.1
4-Chloroaniline	25.00	25.10	0.010	2ORDR	0.4
Hexachlorobutadiene	0.214	0.213	0.010	AVRG	-0.5
4-Chloro-3-methylphenol	0.301	0.304	0.200	AVRG	1.0
2-Methylnaphthalene	0.674	0.687	0.400	AVRG	1.9
Hexachlorocyclopentadiene	0.375	0.320	0.050	AVRG	-14.7
2,4,6-Trichlorophenol	0.384	0.389	0.200	AVRG	1.3
2,4,5-Trichlorophenol	0.403	0.416	0.200	AVRG	3.2
2-Chloronaphthalene	1.116	1.081	0.800	AVRG	-3.1
2-Nitroaniline	0.422	0.433	0.010	AVRG	2.6
Acenaphthylene	1.956	1.914	0.900	AVRG	-2.1
Dimethylphthalate	1.219	1.145	0.010	AVRG	-6.1
2,6-Dinitrotoluene	0.284	0.280	0.200	AVRG	-1.4
Acenaphthene	1.265	1.191	0.900	AVRG	-5.8
3-Nitroaniline	0.365	0.359	0.010	AVRG	-1.6
2,4-Dinitrophenol	50.00	51.91	0.010	2ORDR	3.8
Dibenzofuran	1.871	1.943	0.800	AVRG	3.8

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Instrument ID: NT6 | Cont. Calib. Date: 11/19/12

Init. Calib. Date: 10/19/12 | Cont. Calib. Time: 1519

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
4-Nitrophenol	0.149	0.148	0.010	AVRG	-0.7
2,4-Dinitrotoluene	0.366	0.364	0.200	AVRG	-0.5
Fluorene	1.374	1.315	0.900	AVRG	-4.3
4-Chlorophenyl-phenylether	0.648	0.616	0.400	AVRG	-4.9
Diethylphthalate	1.259	1.151	0.010	AVRG	-8.6
4-Nitroaniline	0.338	0.329	0.010	AVRG	-2.7
4,6-Dinitro-2-methylphenol	0.130	0.149	0.010	AVRG	14.6
N-Nitrosodiphenylamine(1)	0.606	0.566	0.010	AVRG	-6.6
4-Bromophenyl-phenylether	0.244	0.227	0.100	AVRG	-7.0
Hexachlorobenzene	0.252	0.238	0.100	AVRG	-5.6
Pentachlorophenol	0.144	0.125	0.050	AVRG	-13.2
Phenanthrene	1.181	1.126	0.700	AVRG	-4.6
Anthracene	1.212	1.174	0.700	AVRG	-3.1
Carbazole	0.974	0.882	0.010	AVRG	-9.4
Di-n-butylphthalate	1.208	1.161	0.010	AVRG	-3.9
Fluoranthene	1.238	1.236	0.600	AVRG	-0.2
Pyrene	1.403	1.279	0.600	AVRG	-8.8
Butylbenzylphthalate	0.553	0.524	0.010	AVRG	-5.2
Benzo(a)anthracene	1.188	1.141	0.800	AVRG	-4.0
3,3'-Dichlorobenzidine	0.334	0.344	0.010	AVRG	3.0
Chrysene	1.157	1.100	0.700	AVRG	-4.9
bis(2-Ethylhexyl)phthalate	0.631	0.563	0.010	AVRG	-10.8
Di-n-octylphthalate	1.049	0.979	0.010	AVRG	-6.7
Benzo(b)fluoranthene	1.184	1.202	0.700	AVRG	1.5
Benzo(k)fluoranthene	1.210	1.196	0.700	AVRG	-1.2
Benzo(a)pyrene	1.105	1.060	0.700	AVRG	-4.1
Indeno(1,2,3-cd)pyrene	1.524	1.438	0.500	AVRG	-5.6
Dibenzo(a,h)anthracene	1.233	1.161	0.400	AVRG	-5.8
Benzo(g,h,i)perylene	1.335	1.301	0.500	AVRG	-2.5
N-Nitrosodimethylamine	0.902	0.821	0.010	AVRG	-9.0
Aniline	2.385	2.225	0.010	AVRG	-6.7
Benzidine	25.00	0.000	0.010	2ORDR	
Pyridine	1.541	1.457	0.010	AVRG	-5.4
1-methylnaphthalene	0.487	0.481	0.010	AVRG	-1.2
Azobenzene (1,2-DP-Hydrazine	1.297	1.233	0.010	AVRG	-4.9
Total Benzofluoranthenes	1.149	1.132	0.010	AVRG	-1.5

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-2

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/19/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1519

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
2-Fluorophenol	1.331	1.259	0.010	AVRG	-5.4
Phenol-d5	1.652	1.589	0.010	AVRG	-3.8
2-Chlorophenol-d4	1.367	1.333	0.010	AVRG	-2.5
1,2-Dichlorobenzene-d4	0.981	0.973	0.010	AVRG	-0.8
Nitrobenzene-d5	0.422	0.396	0.010	AVRG	-6.2
2-Fluorobiphenyl	1.328	1.302	0.010	AVRG	-2.0
2,4,6-Tribromophenol	0.170	0.179	0.010	AVRG	5.3
Terphenyl-d14	0.736	0.703	0.010	AVRG	-4.5

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-3

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/20/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1146

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Phenol	1.731	1.724	0.800	AVRG	-0.4
Bis(2-Chloroethyl)ether	1.370	1.307	0.700	AVRG	-4.6
2-Chlorophenol	1.434	1.452	0.800	AVRG	1.2
1,3-Dichlorobenzene	1.606	1.564	0.010	AVRG	-2.6
1,4-Dichlorobenzene	1.584	1.576	0.010	AVRG	-0.5
1,2-Dichlorobenzene	1.510	1.455	0.010	AVRG	-3.6
Benzyl alcohol	1.151	1.076	0.010	AVRG	-6.5
2,2'-oxybis(1-Chloropropane)	1.922	1.941	0.010	AVRG	1.0
2-Methylphenol	1.308	1.302	0.700	AVRG	-0.4
Hexachloroethane	0.632	0.615	0.300	AVRG	-2.7
N-Nitroso-di-n-propylamine	0.970	0.918	0.500	AVRG	-5.4
4-Methylphenol	1.348	1.364	0.600	AVRG	1.2
Nitrobenzene	0.412	0.408	0.200	AVRG	-1.0
Isophorone	0.638	0.570	0.400	AVRG	-10.6
2-Nitrophenol	0.205	0.213	0.100	AVRG	3.9
2,4-Dimethylphenol	0.372	0.368	0.200	AVRG	-1.1
Bis(2-Chloroethoxy)methane	0.456	0.416	0.300	AVRG	-8.8
2,4-Dichlorophenol	0.309	0.308	0.200	AVRG	-0.3
1,2,4-Trichlorobenzene	0.353	0.335	0.010	AVRG	-5.1
Naphthalene	1.179	1.109	0.700	AVRG	-5.9
Benzoic acid	0.256	0.227	0.010	AVRG	-11.3
4-Chloroaniline	25.00	23.46	0.010	2ORDR	-6.2
Hexachlorobutadiene	0.214	0.206	0.010	AVRG	-3.7
4-Chloro-3-methylphenol	0.301	0.298	0.200	AVRG	-1.0
2-Methylnaphthalene	0.674	0.677	0.400	AVRG	0.4
Hexachlorocyclopentadiene	0.375	0.342	0.050	AVRG	-8.8
2,4,6-Trichlorophenol	0.384	0.388	0.200	AVRG	1.0
2,4,5-Trichlorophenol	0.403	0.414	0.200	AVRG	2.7
2-Chloronaphthalene	1.116	1.107	0.800	AVRG	-0.8
2-Nitroaniline	0.422	0.445	0.010	AVRG	5.4
Acenaphthylene	1.956	1.950	0.900	AVRG	-0.3
Dimethylphthalate	1.219	1.136	0.010	AVRG	-6.8
2,6-Dinitrotoluene	0.284	0.285	0.200	AVRG	0.4
Acenaphthene	1.265	1.220	0.900	AVRG	-3.6
3-Nitroaniline	0.365	0.356	0.010	AVRG	-2.5
2,4-Dinitrophenol	50.00	40.31	0.010	2ORDR	-19.4
Dibenzofuran	1.871	1.962	0.800	AVRG	4.9

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/20/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1146

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
4-Nitrophenol	0.149	0.155	0.010	AVRG	4.0	
2,4-Dinitrotoluene	0.366	0.358	0.200	AVRG	-2.2	
Fluorene	1.374	1.324	0.900	AVRG	-3.6	
4-Chlorophenyl-phenylether	0.648	0.623	0.400	AVRG	-3.8	
Diethylphthalate	1.259	1.168	0.010	AVRG	-7.2	
4-Nitroaniline	0.338	0.355	0.010	AVRG	5.0	
4,6-Dinitro-2-methylphenol	0.130	0.146	0.010	AVRG	12.3	
N-Nitrosodiphenylamine(1)	0.606	0.559	0.010	AVRG	-7.8	
4-Bromophenyl-phenylether	0.244	0.223	0.100	AVRG	-8.6	
Hexachlorobenzene	0.252	0.233	0.100	AVRG	-7.5	
Pentachlorophenol	0.144	0.110	0.050	AVRG	-23.6	<-
Phenanthrene	1.181	1.130	0.700	AVRG	-4.3	
Anthracene	1.212	1.173	0.700	AVRG	-3.2	
Carbazole	0.974	0.928	0.010	AVRG	-4.7	
Di-n-butylphthalate	1.208	1.174	0.010	AVRG	-2.8	
Fluoranthene	1.238	1.254	0.600	AVRG	1.3	
Pyrene	1.403	1.201	0.600	AVRG	-14.4	
Butylbenzylphthalate	0.553	0.491	0.010	AVRG	-11.2	
Benzo(a)anthracene	1.188	1.145	0.800	AVRG	-3.6	
3,3'-Dichlorobenzidine	0.334	0.378	0.010	AVRG	13.2	
Chrysene	1.157	1.110	0.700	AVRG	-4.1	
bis(2-Ethylhexyl)phthalate	0.631	0.556	0.010	AVRG	-11.9	
Di-n-octylphthalate	1.049	0.984	0.010	AVRG	-6.2	
Benzo(b)fluoranthene	1.184	1.147	0.700	AVRG	-3.1	
Benzo(k)fluoranthene	1.210	1.183	0.700	AVRG	-2.2	
Benzo(a)pyrene	1.105	1.068	0.700	AVRG	-3.3	
Indeno(1,2,3-cd)pyrene	1.524	1.345	0.500	AVRG	-11.7	
Dibenzo(a,h)anthracene	1.233	1.117	0.400	AVRG	-9.4	
Benzo(g,h,i)perylene	1.335	1.094	0.500	AVRG	-18.0	
N-Nitrosodimethylamine	0.902	0.832	0.010	AVRG	-7.8	
Aniline	2.385	2.257	0.010	AVRG	-5.4	
Benzidine	25.00	0.000	0.010	2ORDR		
Pyridine	1.541	1.467	0.010	AVRG	-4.8	
1-methylnaphthalene	0.487	0.471	0.010	AVRG	-3.3	
Azobenzene (1,2-DP-Hydrazine	1.297	1.281	0.010	AVRG	-1.2	
Total Benzofluoranthenes	1.149	1.100	0.010	AVRG	-4.3	

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-2

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/20/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1146

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
2-Fluorophenol	1.331	1.316	0.010	AVRG	-1.1
Phenol-d5	1.652	1.604	0.010	AVRG	-2.9
2-Chlorophenol-d4	1.367	1.337	0.010	AVRG	-2.2
1,2-Dichlorobenzene-d4	0.981	0.996	0.010	AVRG	1.5
Nitrobenzene-d5	0.422	0.401	0.010	AVRG	-5.0
2-Fluorobiphenyl	1.328	1.329	0.010	AVRG	0.1
2,4,6-Tribromophenol	0.170	0.175	0.010	AVRG	2.9
Terphenyl-d14	0.736	0.644	0.010	AVRG	-12.5

<- Exceeds QC limit of 20% D

* RF less than minimum RF

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/19/12

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	ICAL MIDPT	735905	8.15	2597762	10.21	1503943	13.09
	UPPER LIMIT	1471810		5195524		3007886	
	LOWER LIMIT	367952		1298881		751972	
	CCAL	600590	7.56	2110233	9.63	1206456	12.49
	UPPER LIMIT		8.06		10.13		12.99
	LOWER LIMIT		7.06		9.13		11.99
01	VS17MBW1	531453	7.57	1815112	9.62	976471	12.49
02	VS17LCSW1	617687	7.56	2085406	9.63	1153166	12.49
03	VS17LCSDW1	621826	7.57	2077653	9.63	1122504	12.49
04	LMW-3-1112	563414	7.56	1930096	9.63	1046250	12.48
05	LMW-EB-1112	559147	7.56	1936953	9.62	1073276	12.48
06							
07							
08							
09							
10							
11							
12							
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15							
16							
17							
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21							
22							
23							
24							
25							

IS1 = 1,4-Dichlorobenzene-d4
IS2 = Naphthalene-d8
IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/19/12

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	ICAL MIDPT	2402003	15.48	2331938	19.80	2485610	21.97
	UPPER LIMIT	4804006		4663876		4971220	
	LOWER LIMIT	1201002		1165969		1242805	
	CCAL	1910964	14.86	1917343	19.16	1900103	21.31
	UPPER LIMIT		15.36		19.66		21.81
	LOWER LIMIT		14.36		18.66		20.81
01	VS17MBW1	1505064	14.85	1504566	19.15	1736607	21.30
02	VS17LCSW1	1732228	14.86	1793787	19.16	2087211	21.31
03	VS17LCSDW1	1673737	14.86	1763912	19.16	2115006	21.31
04	LMW-3-1112	1563843	14.85	1604521	19.15	1814916	21.30
05	LMW-EB-1112	1635369	14.85	1619575	19.15	1757583	21.30
06							
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25							

IS4 = Phenanthrene-d10
IS5 = Chrysene-d12
IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/19/12

		IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	2790605	20.94				
	UPPER LIMIT	5581210					
	LOWER LIMIT	1395302					
	CCAL	2365172	20.35				
	UPPER LIMIT		20.85				
	LOWER LIMIT		19.85				
01	VS17MBW1	1775971	20.35				
02	VS17LCSW1	2073937	20.35				
03	VS17LCSDW1	1980558	20.35				
04	LMW-3-1112	1825325	20.35				
05	LMW-EB-1112	1904935	20.34				
06							
07							
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IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-3

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/20/12

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	ICAL MIDPT	735905	8.15	2597762	10.21	1503943	13.09
	UPPER LIMIT	1471810		5195524		3007886	
	LOWER LIMIT	367952		1298881		751972	
	CCAL	540804	7.57	1930354	9.63	1040645	12.49
	UPPER LIMIT		8.07		10.13		12.99
	LOWER LIMIT		7.07		9.13		11.99
01	LMW-8-1112	529580	7.56	1804151	9.62	960457	12.48
02	LMW-5-1112	564604	7.56	1949031	9.62	1037181	12.48
03	LMW-7-1112	577665	7.57	2002326	9.62	1122307	12.49
04	LMW-7-1112-D	638131	7.57	2290754	9.62	1286157	12.49
05							
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IS1 = 1,4-Dichlorobenzene-d4
IS2 = Naphthalene-d8
IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS45 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/20/12

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	ICAL MIDPT	2402003	15.48	2331938	19.80	2485610	21.97
	UPPER LIMIT	4804006		4663876		4971220	
	LOWER LIMIT	1201002		1165969		1242805	
	CCAL	1651199	14.85	1819749	19.16	2021178	21.31
	UPPER LIMIT		15.35		19.66		21.81
	LOWER LIMIT		14.35		18.66		20.81
01	LMW-8-1112	1487764	14.85	1606463	19.15	1654253	21.30
02	LMW-5-1112	1562793	14.85	1609928	19.15	1649262	21.30
03	LMW-7-1112	1685480	14.85	1695264	19.15	1896384	21.30
04	LMW-7-1112-D	1969012	14.85	1810307	19.15	1911748	21.30
05							
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IS4 = Phenanthrene-d10
IS5 = Chrysene-d12
IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS45 | Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 | Ical Date: 10/19/12

Instrument ID: NT6 | Cont. Cal Date: 11/20/12

		IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	2790605	20.94				
	UPPER LIMIT	5581210					
	LOWER LIMIT	1395302					
	CCAL	2098121	20.34				
	UPPER LIMIT		20.84				
	LOWER LIMIT		19.84				
01	LMW-8-1112	1787366	20.34				
02	LMW-5-1112	1798746	20.34				
03	LMW-7-1112	1977849	20.34				
04	LMW-7-1112-D	2179440	20.34				
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25							

IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-3

Pesticide Analysis
Report and Summary QC Forms

ARI Job ID: VS45, VS46

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-3-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/17/12
Date Analyzed: 11/20/12 22:03
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	82.5%
Tetrachlorometaxylene	55.5%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-EB-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS45B
LIMS ID: 12-22813
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/17/12
Date Analyzed: 11/20/12 22:21
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	72.0%
Tetrachlorometaxylene	66.0%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-8-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS45C
LIMS ID: 12-22814
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/17/12
Date Analyzed: 11/20/12 22:39
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	85.0%
Tetrachlorometaxylene	62.0%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-5-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS45D
LIMS ID: 12-22815
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/17/12
Date Analyzed: 11/20/12 22:57
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	77.0%
Tetrachlorometaxylene	56.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-7-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS45E
LIMS ID: 12-22816
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/17/12
Date Analyzed: 11/20/12 23:15
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	91.2%
Tetrachlorometaxylene	62.2%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-7-1112-D**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS45F
LIMS ID: 12-22817
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/17/12
Date Analyzed: 11/20/12 23:32
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	97.0%
Tetrachlorometaxylene	66.0%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

SW8081/PESTICIDE WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Client ID	DCBP	TCMX	TOT OUT
MB-111712	69.5%	51.0%	0
LCS-111712	84.0%	61.2%	0
LCSD-111712	67.8%	56.8%	0
LMW-3-1112	82.5%	55.5%	0
LMW-EB-1112	72.0%	66.0%	0
LMW-8-1112	85.0%	62.0%	0
LMW-5-1112	77.0%	56.8%	0
LMW-7-1112	91.2%	62.2%	0
LMW-7-1112-D	97.0%	66.0%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(37-125)	(11-144)
(TCMX) = Tetrachlorometaxylene	(38-103)	(30-105)

Prep Method: SW3510C
Log Number Range: 12-22812 to 12-22817

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LCS-111712**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-111712
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted LCS/LCSD: 11/17/12

Sample Amount LCS: 500 mL
LCSD: 500 mL

Date Analyzed LCS: 11/20/12 21:28
LCSD: 11/20/12 21:46

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD6/YZ
LCSD: ECD6/YZ

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Florisil Cleanup: No

Sulfur Cleanup: No
Silica Gel: No

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
alpha-BHC	0.177	0.200	88.5%	0.156	0.200	78.0%	12.6%
beta-BHC	0.181	0.200	90.5%	0.160	0.200	80.0%	12.3%
delta-BHC	0.0759	0.200	38.0%	0.0679	0.200	34.0%	11.1%
gamma-BHC (Lindane)	0.184	0.200	92.0%	0.162	0.200	81.0%	12.7%
Heptachlor	0.146	0.200	73.0%	0.147	0.200	73.5%	0.7%
Aldrin	0.136	0.200	68.0%	0.141	0.200	70.5%	3.6%
Heptachlor Epoxide	0.194	0.200	97.0%	0.173	0.200	86.5%	11.4%
Endosulfan I	0.202	0.200	101%	0.181	0.200	90.5%	11.0%
Dieldrin	0.399	0.400	99.8%	0.357	0.400	89.2%	11.1%
4,4'-DDE	0.390	0.400	97.5%	0.354	0.400	88.5%	9.7%
Endrin	0.389	0.400	97.2%	0.344	0.400	86.0%	12.3%
Endosulfan II	0.422	0.400	106%	0.370	0.400	92.5%	13.1%
4,4'-DDD	0.415	0.400	104%	0.366	0.400	91.5%	12.5%
Endosulfan Sulfate	0.311	0.400	77.8%	0.272	0.400	68.0%	13.4%
4,4'-DDT	0.369	0.400	92.2%	0.326	0.400	81.5%	12.4%
Methoxychlor	1.76	2.00	88.0%	1.54	2.00	77.0%	13.3%
Endrin Ketone	0.441	0.400	110%	0.390	0.400	97.5%	12.3%
Endrin Aldehyde	0.370	0.400	92.5%	0.328	0.400	82.0%	12.0%
trans-Chlordane	0.188	0.200	94.0%	0.171	0.200	85.5%	9.5%
cis-Chlordane	0.186	0.200	93.0%	0.169	0.200	84.5%	9.6%

Pest/PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	84.0%	67.8%
Tetrachlorometaxylene	61.2%	56.8%

Results reported in µg/L (ppb)
RPD calculated using sample concentrations per SW846.

FORM 4
PESTICIDE METHOD BLANK SUMMARY

BLANK NO.

VS45MBW1

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

Lab Sample ID: VS45MBW1
Lab File ID: 1120A033

Date Extracted: 11/17/12
Matrix: LIQUID

Date Analyzed: 11/20/12
Instrument ID: ECD6

Time Analyzed: 2110
GC Columns: STX-CLP1/STX-CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS45LCSW1	VS45LCSW1	11/20/12
02	VS45LCSDW1	VS45LCSDW1	11/20/12
03	LMW-3-1112	VS45A	11/20/12
04	LMW-EB-1112	VS45B	11/20/12
05	LMW-8-1112	VS45C	11/20/12
06	LMW-5-1112	VS45D	11/20/12
07	LMW-7-1112	VS45E	11/20/12
08	LMW-7-1112-D	VS45F	11/20/12
09	LMW-9-1112	VS61A	11/21/12
10	LMW-11-1112	VS61B	11/21/12
11	LMW-6-1112	VS61C	11/21/12

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: MB-111712**
Extraction Method: SW3510C **METHOD BLANK**

Lab Sample ID: MB-111712
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted: 11/17/12
Date Analyzed: 11/20/12 21:10
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	69.5%
Tetrachlorometaxylene	51.0%

6D

8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	RT OF STANDARDS							MEAN	RT WINDOW	
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT	FROM	TO
alpha-BHC	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.10	4.20
beta-BHC	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.45	4.55
delta-BHC	4.66	4.66	4.66	4.66	4.66	4.66	4.66	4.66	4.61	4.71
gamma-BHC (Lindane)	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.37	4.47
Heptachlor	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.81	4.91
Aldrin	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.10	5.20
Heptachlor epoxide b	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.67	5.77
Endosulfan I	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.05	6.15
Dieldrin	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.27	6.37
4,4'-DDE	6.03	6.03	6.03	6.03	6.03	6.03	6.03	6.03	5.98	6.08
Endrin	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.49	6.59
Endosulfan II	6.75	6.75	6.75	6.75	6.75	6.74	6.75	6.75	6.70	6.80
4,4'-DDD	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.53	6.63
Endosulfan sulfate	7.51	7.51	7.51	7.51	7.51	7.51	7.51	7.51	7.46	7.56
4,4'-DDT	6.84	6.84	6.84	6.84	6.84	6.84	6.84	6.84	6.79	6.89
Methoxychlor	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.22	7.32
Endrin ketone	7.77	7.77	7.77	7.77	7.77	7.77	7.77	7.77	7.72	7.82
Endrin aldehyde	7.12	7.12	7.12	7.12	7.12	7.12	7.12	7.12	7.07	7.17
gamma-Chlordane	5.84	5.84	5.84	5.84	5.84	5.84	5.84	5.84	5.79	5.89
alpha-Chlordane	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.92	6.02
Hexachlorobutadiene	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.16	2.26
Hexachlorobenzene	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.95	4.05
Tetrachloro-m-xylene	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.62	3.72
Decachlorobiphenyl	8.61	8.61	8.61	8.61	8.61	8.61	8.61	8.61	8.56	8.66

6D

8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	RT OF STANDARDS							MEAN	RT WINDOW	
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT	FROM	TO
alpha-BHC	4.58	4.58	4.58	4.58	4.58	4.58	4.59	4.58	4.54	4.64
beta-BHC	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	4.96	5.06
delta-BHC	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.26	5.36
gamma-BHC (Lindane)	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.89	4.99
Heptachlor	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.35	5.45
Aldrin	5.73	5.73	5.73	5.73	5.74	5.74	5.74	5.73	5.69	5.79
Heptachlor epoxide b	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.24	6.34
Endosulfan I	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.63	6.73
Dieldrin	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.89	6.99
4,4'-DDE	6.74	6.74	6.74	6.74	6.74	6.74	6.75	6.74	6.70	6.80
Endrin	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.18	7.28
Endosulfan II	7.42	7.42	7.42	7.42	7.42	7.42	7.42	7.42	7.37	7.47
4,4'-DDD	7.28	7.28	7.28	7.28	7.28	7.28	7.28	7.28	7.23	7.33
Endosulfan sulfate	7.96	7.96	7.96	7.96	7.96	7.96	7.96	7.96	7.91	8.01
4,4'-DDT	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.52	7.62
Methoxychlor	8.16	8.16	8.16	8.16	8.16	8.16	8.16	8.16	8.11	8.21
Endrin ketone	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.40	8.50
Endrin aldehyde	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.66	7.76
gamma-Chlordane	6.47	6.47	6.47	6.47	6.47	6.47	6.48	6.47	6.43	6.53
alpha-Chlordane	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.56	6.66
Hexachlorobutadiene	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.33	2.43
Hexachlorobenzene	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.41	4.51
Tetrachloro-m-xylene	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01	3.96	4.06
Decachlorobiphenyl	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.52	9.62

6E

8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	CALIBRATION FACTORS								R^2
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.4836	1.4616	1.4938	1.4882	1.4985	1.4906	1.5199	1.4909	1.2
beta-BHC	0.7515	0.6928	0.6569	0.6074	0.5837	0.5625	0.5568	0.6302	11.6
delta-BHC	1.2027	1.1705	1.1786	1.1878	1.2088	1.2162	1.2478	1.2018	2.2
gamma-BHC (Lindane)	1.4203	1.3736	1.3766	1.3565	1.3552	1.3431	1.3628	1.3697	1.8
Heptachlor	1.3710	1.2938	1.2653	1.2234	1.2040	1.1717	1.1640	1.2419	5.9
Aldrin	1.3883	1.3094	1.2895	1.2509	1.2369	1.2047	1.1979	1.2682	5.3
Heptachlor epoxide b	1.4111	1.3113	1.2616	1.1995	1.1708	1.1149	1.0884	1.2225	9.3
Endosulfan I	1.3006	1.2127	1.1670	1.1114	1.0773	1.0349	1.0155	1.1313	9.0
Dieldrin	1.2696	1.2204	1.2149	1.1719	1.1402	1.0940	1.0752	1.1694	6.1
4,4'-DDE	1.1509	1.1089	1.1091	1.0833	1.0630	1.0274	1.0156	1.0797	4.5
Endrin	1.1855	1.1373	1.1231	1.0879	1.0757	1.0200	1.0221	1.0931	5.6
Endosulfan II	1.1881	1.1269	1.0957	1.0423	1.0170	0.9634	0.9552	1.0555	8.2
4,4'-DDD	1.0319	0.9916	0.9750	0.9474	0.9355	0.8986	0.9012	0.9544	5.1
Endosulfan sulfate	0.9858	0.9374	0.9084	0.8788	0.8558	0.8264	0.8267	0.8885	6.7
4,4'-DDT	1.0119	0.9801	0.9720	0.9504	0.9467	0.9240	0.9327	0.9597	3.2
Methoxychlor	0.5578	0.5238	0.4924	0.4554	0.4308	0.4096	0.4145	0.4692	12.2
Endrin ketone	1.2244	1.1156	1.0606	1.0086	0.9677	0.9416	0.9544	1.0390	9.9
Endrin aldehyde	0.9849	0.9225	0.8807	0.8346	0.8072	0.7659	0.7630	0.8512	9.7
gamma-Chlordane	1.3792	1.2811	1.2367	1.1861	1.1606	1.1322	1.1335	1.2156	7.4
alpha-Chlordane	1.3429	1.2457	1.2000	1.1461	1.1150	1.0849	1.0777	1.1732	8.2
Hexachlorobutadiene	2.0812	1.9402	1.8804	1.7634	1.7036	1.6425	1.6366	1.8068	9.2
Hexachlorobenzene	1.5903	1.4533	1.3696	1.2635	1.1969	1.1324	1.1201	1.3037	13.5
Tetrachloro-m-xylene	1.3460	1.2798	1.2458	1.1734	1.1286	1.0704	1.0536	1.1854	9.3
Decachlorobiphenyl	1.3890	1.2243	1.1239	1.0205	0.9531	0.8948	0.8784	1.0691	17.6

6E

8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	CALIBRATION FACTORS								R^2
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.7068	1.7328	1.8043	1.7772	1.7612	1.7241	1.7099	1.7452	2.1
beta-BHC	0.7886	0.7507	0.7499	0.7007	0.6746	0.6525	0.6274	0.7063	8.3
delta-BHC	1.3355	1.3664	1.4106	1.3838	1.4129	1.3944	1.3874	1.3844	1.9
gamma-BHC (Lindane)	1.6094	1.6044	1.6375	1.5988	1.5712	1.5315	1.4910	1.5777	3.2
Heptachlor	1.5856	1.5485	1.5510	1.4820	1.4155	1.3165	1.2123	1.4445	9.6
Aldrin	1.5160	1.4979	1.5123	1.4628	1.4083	1.3241	1.2212	1.4204	7.8
Heptachlor epoxide b	1.4476	1.4003	1.3792	1.3046	1.2384	1.1438	1.0491	1.2804	11.3
Endosulfan I	1.2698	1.2439	1.2336	1.1730	1.1176	1.0464	0.9643	1.1498	9.9
Dieldrin	1.3591	1.3384	1.3315	1.2542	1.1663	1.0710	0.9940	1.2164	11.8
4,4'-DDE	1.2998	1.2792	1.2771	1.2008	1.1147	1.0160	0.9308	1.1598	12.4
Endrin	1.5909	1.5373	1.4937	1.4092	1.3284	1.1857	1.1161	1.3802	13.0
Endosulfan II	1.5871	1.5228	1.4855	1.3975	1.3177	1.2030	1.1435	1.3796	12.1
4,4'-DDD	1.4343	1.4084	1.3921	1.3338	1.2712	1.1686	1.1160	1.3035	9.5
Endosulfan sulfate	1.2785	1.2434	1.2172	1.1779	1.1320	1.0535	1.0179	1.1600	8.4
4,4'-DDT	1.3464	1.3100	1.3003	1.2588	1.2128	1.1433	1.1114	1.2404	7.1
Methoxychlor	0.6592	0.6042	0.5527	0.4972	0.4495	0.4126	0.3783	0.5077	17.7
Endrin ketone	1.3456	1.2690	1.2127	1.1525	1.0924	1.0274	1.0120	1.1588	10.8
Endrin aldehyde	1.2587	1.1952	1.1528	1.0937	1.0369	0.9549	0.9102	1.0860	11.7
gamma-Chlordane	1.4955	1.4315	1.4100	1.3398	1.2967	1.2245	1.1522	1.3357	9.1
alpha-Chlordane	1.3740	1.3339	1.3210	1.2563	1.2048	1.1471	1.0808	1.2454	8.6
Hexachlorobutadiene	1.9645	1.8894	1.8576	1.7256	1.6592	1.5549	1.5070	1.7369	10.0
Hexachlorobenzene	1.7774	1.6637	1.6110	1.4932	1.4081	1.3179	1.2412	1.5018	12.9
Tetrachloro-m-xylene	1.6512	1.5834	1.5355	1.4058	1.2945	1.1692	1.0938	1.3905	15.3
Decachlorobiphenyl	1.5427	1.4016	1.2929	1.1902	1.1187	1.0455	1.0196	1.2302	15.7

6G

8081 INITIAL CALIBRATION OF SINGLE POINT PCBs and TOXAPHENE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

Toxaphene			
Peak	RT	RT WIN	Cal Factor
1	6.490	6.44- 6.54	0.0183
2	6.843	6.79- 6.89	0.0244
3	7.212	7.16- 7.26	0.0197
4	7.466	7.42- 7.52	0.0242
5	7.745	7.69- 7.79	0.0207
6	7.874	7.82- 7.92	0.0142

6G

8081 INITIAL CALIBRATION OF SINGLE POINT PCBs and TOXAPHENE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

Toxaphene			
Peak	RT	RT WIN	Cal Factor
1	7.158	7.11- 7.21	0.0395
2	7.483	7.43- 7.53	0.0572
3	7.713	7.66- 7.76	0.0618
4	8.180	8.13- 8.23	0.0427
5	8.527	8.48- 8.58	0.0191

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: VS45

Analysis Date: 20-NOV-2012 20:17 Init. Calib. Date: 03-OCT-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.017	96477
Endrin	6.520	4562001
4,4'-DDD	6.573	573904
4,4'-DDT	6.828	4110483
Endrin ketone	7.747	578151
Endrin aldehyde	7.105	156492

DDT Percent Breakdown = 14.0 %
((96477+573904) * 100)/(96477+573904+4110483)

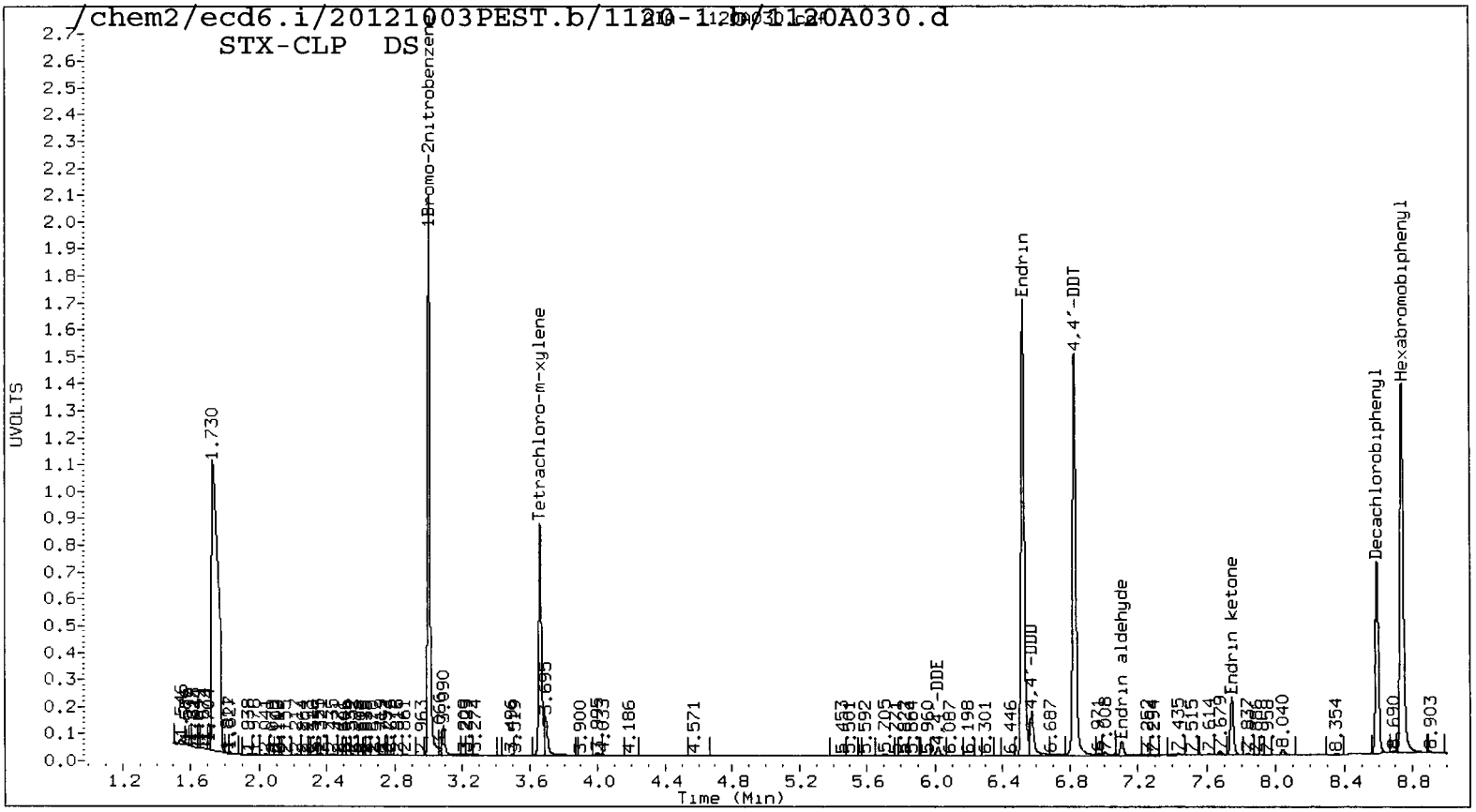
Endrin Percent Breakdown = 13.9 %
((156492+578151) * 100)/(156492+578151+4562001)

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.731	576432
Endrin	7.210	20207894
4,4'-DDD	7.270	2358212
4,4'-DDT	7.556	18349722
Endrin ketone	8.430	2464961
Endrin aldehyde	7.697	628996

DDT Percent Breakdown = 13.8 %
((576432+2358212) * 100)/(576432+2358212+18349722)

Endrin Percent Breakdown = 13.3 %
((628996+2464961) * 100)/(628996+2464961+20207894)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STX-CLP DS
UVOLTS
Time (Min)
1.730
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Tetrachloro-m-xylene
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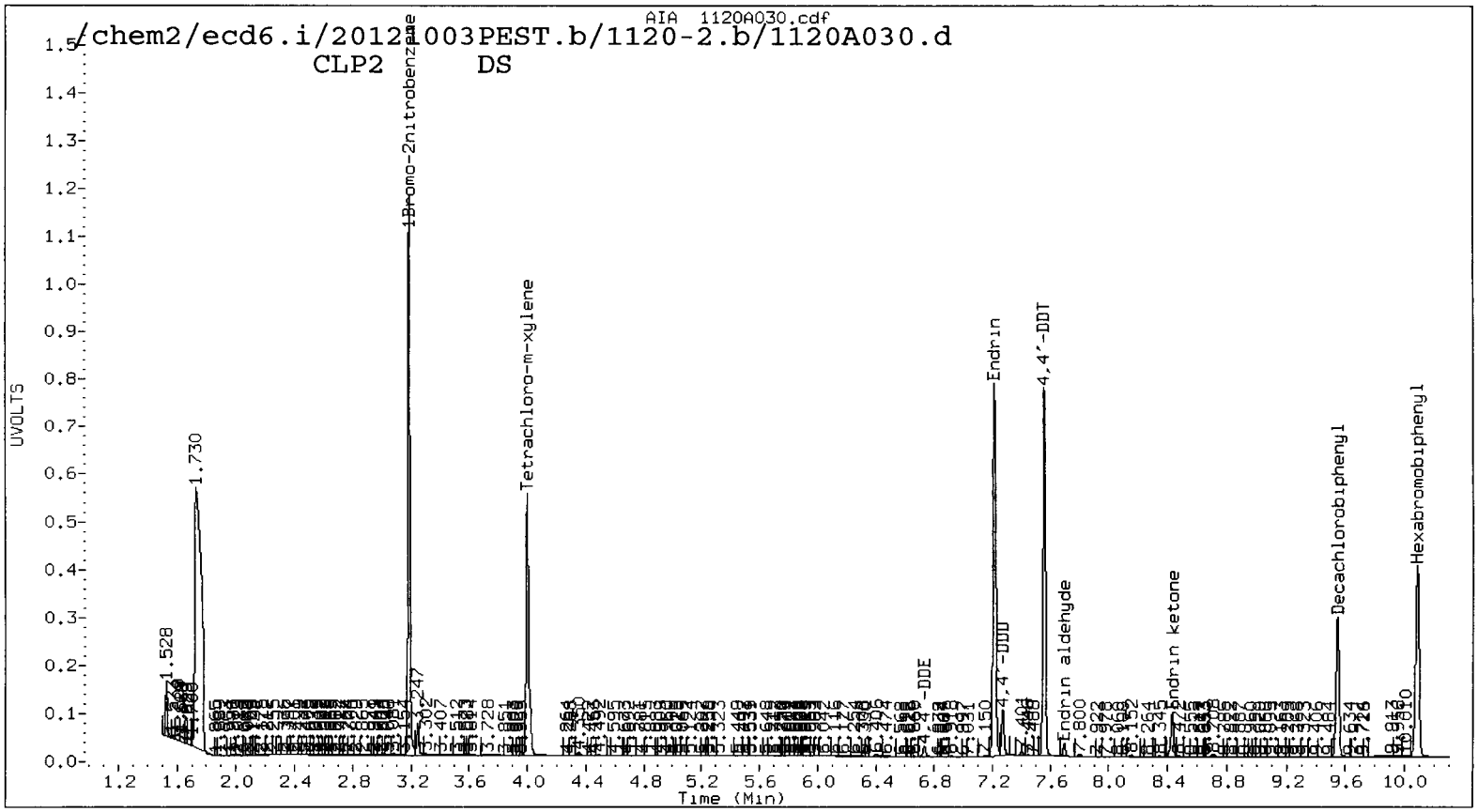
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl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CLP2 DS
UVOLTS
Time (Min)
1.528
1.730
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
4,4'-DDE
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/20/12,2034

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
alpha-BHC	4.13	4.10	4.20	21.6	20.0	8.0
beta-BHC	4.50	4.45	4.55	20.0	20.0	-0.1
delta-BHC	4.66	4.61	4.71	21.4	20.0	6.9
gamma-BHC (Lindane)	4.41	4.37	4.47	20.5	20.0	2.7
Heptachlor	4.85	4.81	4.91	20.4	20.0	1.8
Aldrin	5.13	5.10	5.20	20.9	20.0	4.6
Heptachlor epoxide b	5.70	5.67	5.77	20.1	20.0	0.7
Endosulfan I	6.08	6.05	6.15	21.7	20.0	8.4
Dieldrin	6.30	6.27	6.37	41.8	40.0	4.5
4,4'-DDE	6.01	5.98	6.08	40.7	40.0	1.7
Endrin	6.52	6.49	6.59	36.6	40.0	-8.5
Endosulfan II	6.73	6.70	6.80	39.6	40.0	-1.1
4,4'-DDD	6.57	6.53	6.63	41.5	40.0	3.6
Endosulfan sulfate	7.49	7.46	7.56	39.2	40.0	-2.0
4,4'-DDT	6.83	6.79	6.89	36.6	40.0	-8.4
Methoxychlor	7.25	7.22	7.32	173.1	200.0	-13.4
Endrin ketone	7.75	7.72	7.82	46.3	40.0	15.8
Endrin aldehyde	7.10	7.07	7.17	38.8	40.0	-3.1
gamma-Chlordane	5.83	5.79	5.89	20.5	20.0	2.5
alpha-Chlordane	5.95	5.92	6.02	20.1	20.0	0.4
Hexachlorobutadiene	2.20	2.16	2.26	22.3	20.0	11.4
Hexachlorobenzene	4.00	3.95	4.05	21.1	20.0	5.6
Tetrachloro-m-xylene	3.66	3.62	3.72	37.3	40.0	-6.9
Decachlorobiphenyl	8.59	8.56	8.66	39.0	40.0	-2.5

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/20/12,2034

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
alpha-BHC	4.57	4.54	4.64	20.2	20.0	1.1	
beta-BHC	5.00	4.96	5.06	18.6	20.0	-7.0	
delta-BHC	5.30	5.26	5.36	19.7	20.0	-1.7	
gamma-BHC (Lindane)	4.92	4.89	4.99	19.5	20.0	-2.5	
Heptachlor	5.38	5.35	5.45	19.1	20.0	-4.4	
Aldrin	5.72	5.69	5.79	19.8	20.0	-0.9	
Heptachlor epoxide b	6.28	6.24	6.34	19.1	20.0	-4.7	
Endosulfan I	6.66	6.63	6.73	19.1	20.0	-4.6	
Dieldrin	6.92	6.89	6.99	37.4	40.0	-6.4	
4,4'-DDE	6.73	6.70	6.80	38.2	40.0	-4.4	
Endrin	7.21	7.18	7.28	39.6	40.0	-0.9	
Endosulfan II	7.40	7.37	7.47	43.4	40.0	8.4	
4,4'-DDD	7.27	7.23	7.33	44.9	40.0	12.3	
Endosulfan sulfate	7.94	7.91	8.01	41.5	40.0	3.7	
4,4'-DDT	7.56	7.52	7.62	37.7	40.0	-5.8	
Methoxychlor	8.14	8.11	8.21	174.0	200.0	-13.0	
Endrin ketone	8.43	8.40	8.50	49.3	40.0	23.1	<-
Endrin aldehyde	7.70	7.66	7.76	42.7	40.0	6.8	
gamma-Chlordane	6.46	6.43	6.53	18.3	20.0	-8.3	
alpha-Chlordane	6.60	6.56	6.66	18.2	20.0	-8.8	
Hexachlorobutadiene	2.37	2.33	2.43	19.5	20.0	-2.6	
Hexachlorobenzene	4.45	4.41	4.51	25.1	20.0	25.6	<-
Tetrachloro-m-xylene	4.00	3.96	4.06	40.0	40.0	-0.0	
Decachlorobiphenyl	9.54	9.52	9.62	47.3	40.0	18.2	

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: VS45

Analysis Date: 21-NOV-2012 01:19 Init. Calib. Date: 03-OCT-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.020	107198
Endrin	6.522	4579690
4,4'-DDD	6.576	436296
4,4'-DDT	6.830	4169507
Endrin ketone	7.748	585575
Endrin aldehyde	7.106	174856

DDT Percent Breakdown = 11.5 %
((107198+436296) * 100)/(107198+436296+4169507)

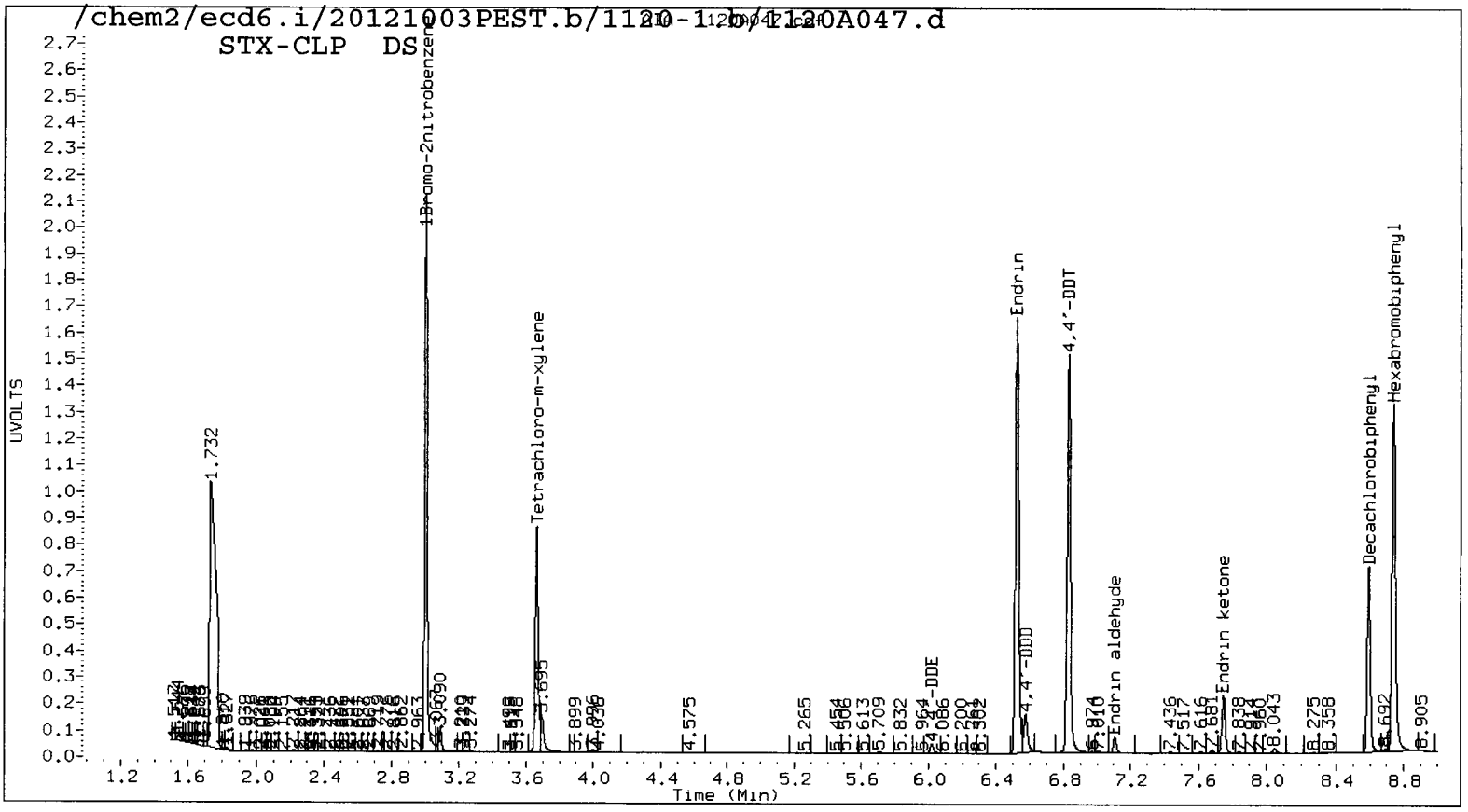
Endrin Percent Breakdown = 14.2 %
((174856+585575) * 100)/(174856+585575+4579690)

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.734	662007
Endrin	7.212	20532021
4,4'-DDD	7.273	2086306
4,4'-DDT	7.559	19008478
Endrin ketone	8.432	2470224
Endrin aldehyde	7.700	776131

DDT Percent Breakdown = 12.6 %
((662007+2086306) * 100)/(662007+2086306+19008478)

Endrin Percent Breakdown = 13.7 %
((776131+2470224) * 100)/(776131+2470224+20532021)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Time (Min)
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Tetrachloro-m-xylene
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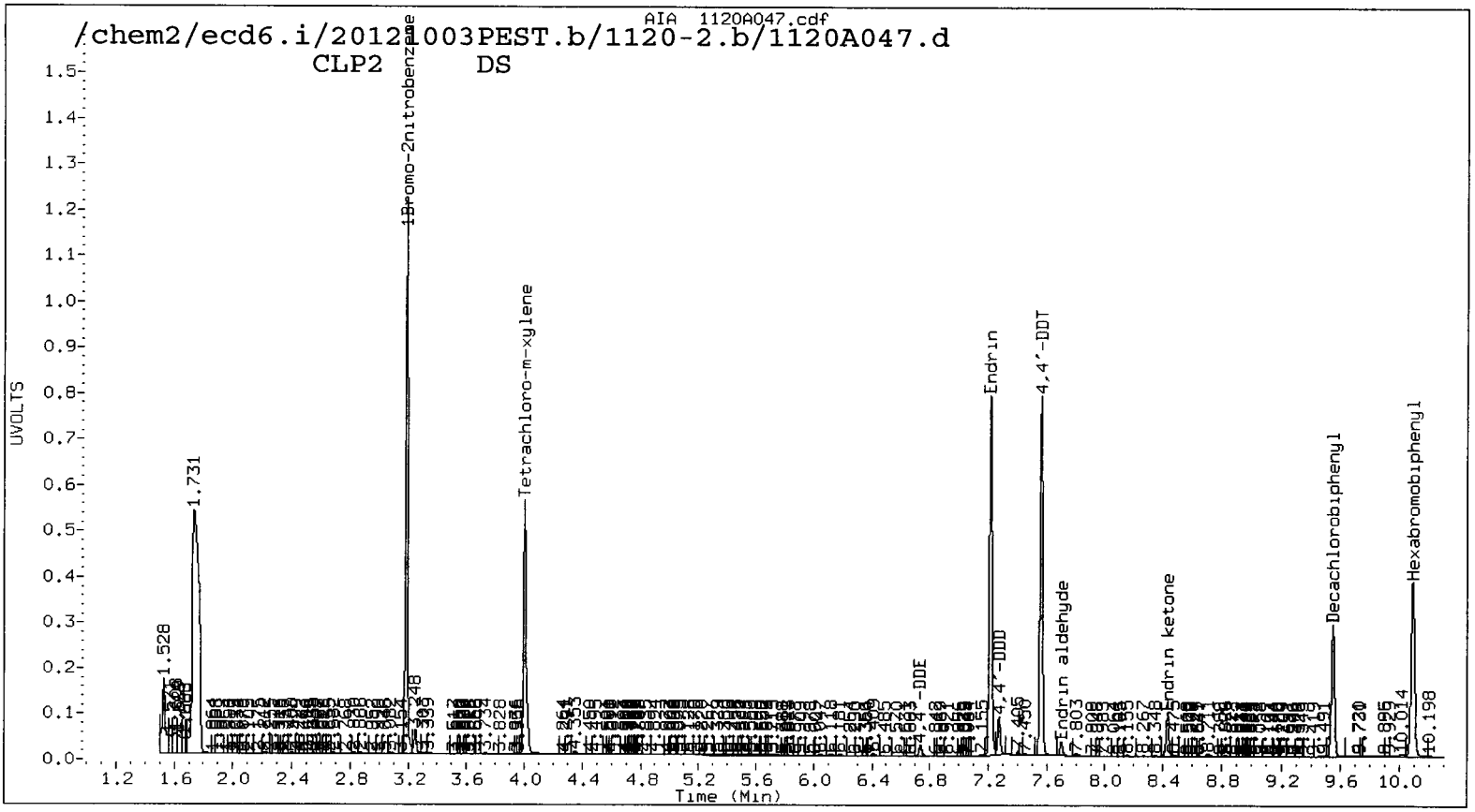
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl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CLP2 DS
UVOLTS
Time (Min)
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1.731
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
4,4'-DDE
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/21/12,0137

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
alpha-BHC	4.13	4.10	4.20	21.8	20.0	8.9
beta-BHC	4.50	4.45	4.55	20.3	20.0	1.4
delta-BHC	4.66	4.61	4.71	21.5	20.0	7.5
gamma-BHC (Lindane)	4.41	4.37	4.47	20.7	20.0	3.4
Heptachlor	4.85	4.81	4.91	20.4	20.0	2.0
Aldrin	5.13	5.10	5.20	21.1	20.0	5.4
Heptachlor epoxide b	5.70	5.67	5.77	20.3	20.0	1.5
Endosulfan I	6.08	6.05	6.15	22.0	20.0	10.0
Dieldrin	6.30	6.27	6.37	41.9	40.0	4.8
4,4'-DDE	6.02	5.98	6.08	40.4	40.0	1.0
Endrin	6.52	6.49	6.59	37.1	40.0	-7.1
Endosulfan II	6.73	6.70	6.80	40.8	40.0	2.0
4,4'-DDD	6.57	6.53	6.63	41.9	40.0	4.8
Endosulfan sulfate	7.49	7.46	7.56	39.9	40.0	-0.2
4,4'-DDT	6.83	6.79	6.89	38.2	40.0	-4.6
Methoxychlor	7.26	7.22	7.32	179.2	200.0	-10.4
Endrin ketone	7.75	7.72	7.82	47.7	40.0	19.2
Endrin aldehyde	7.10	7.07	7.17	40.0	40.0	0.1
gamma-Chlordane	5.83	5.79	5.89	20.6	20.0	2.9
alpha-Chlordane	5.95	5.92	6.02	20.1	20.0	0.6
Hexachlorobutadiene	2.20	2.16	2.26	22.3	20.0	11.4
Hexachlorobenzene	4.00	3.95	4.05	21.2	20.0	6.1
Tetrachloro-m-xylene	3.66	3.62	3.72	37.0	40.0	-7.4
Decachlorobiphenyl	8.59	8.56	8.66	39.5	40.0	-1.2

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/21/12,0137

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
alpha-BHC	4.57	4.54	4.64	20.3	20.0	1.6	
beta-BHC	5.00	4.96	5.06	18.8	20.0	-6.1	
delta-BHC	5.31	5.26	5.36	19.7	20.0	-1.4	
gamma-BHC (Lindane)	4.92	4.89	4.99	19.7	20.0	-1.7	
Heptachlor	5.38	5.35	5.45	19.1	20.0	-4.3	
Aldrin	5.72	5.69	5.79	19.9	20.0	-0.6	
Heptachlor epoxide b	6.28	6.24	6.34	19.1	20.0	-4.6	
Endosulfan I	6.66	6.63	6.73	19.0	20.0	-5.1	
Dieldrin	6.92	6.89	6.99	37.1	40.0	-7.2	
4,4'-DDE	6.73	6.70	6.80	37.7	40.0	-5.6	
Endrin	7.21	7.18	7.28	40.2	40.0	0.6	
Endosulfan II	7.40	7.37	7.47	44.2	40.0	10.5	
4,4'-DDD	7.27	7.23	7.33	45.2	40.0	13.0	
Endosulfan sulfate	7.94	7.91	8.01	42.2	40.0	5.4	
4,4'-DDT	7.56	7.52	7.62	39.2	40.0	-2.0	
Methoxychlor	8.14	8.11	8.21	180.2	200.0	-9.9	
Endrin ketone	8.43	8.40	8.50	50.5	40.0	26.3	<-
Endrin aldehyde	7.70	7.66	7.76	43.3	40.0	8.2	
gamma-Chlordane	6.46	6.43	6.53	18.3	20.0	-8.5	
alpha-Chlordane	6.60	6.56	6.66	18.2	20.0	-9.0	
Hexachlorobutadiene	2.37	2.33	2.43	19.5	20.0	-2.5	
Hexachlorobenzene	4.45	4.41	4.51	25.2	20.0	26.2	<-
Tetrachloro-m-xylene	4.00	3.96	4.06	40.3	40.0	0.8	
Decachlorobiphenyl	9.55	9.52	9.62	48.6	40.0	21.5	<-

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/20/12,2052

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
Toxaphene -1	6.48	6.44	6.54	2380	2500	-4.8	
Toxaphene -2	6.83	6.79	6.89	2510	2500	0.4	
Toxaphene -3	7.20	7.16	7.26	2420	2500	-3.2	
Toxaphene -4	7.47	7.42	7.52	1920	2500	-23.2	<-
Toxaphene -5	7.73	7.69	7.79	2560	2500	2.4	
Toxaphene -6	7.86	7.82	7.92	2460	2500	-1.6	

AVERAGE %D = 5.9

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/20/12,2052

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
Toxaphene -1	7.15	7.11	7.21	2400	2500	-4.0
Toxaphene -2	7.47	7.43	7.53	2420	2500	-3.2
Toxaphene -3	7.70	7.66	7.76	2460	2500	-1.6
Toxaphene -4	8.17	8.13	8.23	2480	2500	-0.8
Toxaphene -5	8.52	8.48	8.58	2620	2500	4.8

AVERAGE %D = 2.9

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/21/12,0155

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
Toxaphene -1	6.48	6.44	6.54	2450	2500	-2.0	
Toxaphene -2	6.83	6.79	6.89	2620	2500	4.8	
Toxaphene -3	7.20	7.16	7.26	2500	2500	0.0	
Toxaphene -4	7.47	7.42	7.52	1970	2500	-21.2	<-
Toxaphene -5	7.73	7.69	7.79	2660	2500	6.4	
Toxaphene -6	7.86	7.82	7.92	2600	2500	4.0	

AVERAGE %D = 6.4

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/21/12,0155

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
Toxaphene -1	7.15	7.11	7.21	2370	2500	-5.2
Toxaphene -2	7.47	7.43	7.53	2400	2500	-4.0
Toxaphene -3	7.70	7.66	7.76	2420	2500	-3.2
Toxaphene -4	8.17	8.13	8.23	2470	2500	-1.2
Toxaphene -5	8.52	8.48	8.58	2610	2500	4.4

AVERAGE %D = 3.6

FORM VII PEST-3

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 10/03/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	4060064	3.015	3748709	8.750
	UPPER LIMIT	8120128	3.065	7497418	8.800
	LOWER LIMIT	2030032	2.965	1874354	8.700

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		INDAE	10/03/12	1639	4060064	3.015	3748709	8.750
02		INDAA	10/03/12	1656	4049993	3.015	3734455	8.750
03		INDAB	10/03/12	1714	4090558	3.015	3771845	8.750
04		INDAC	10/03/12	1732	4021073	3.015	3724289	8.750
05		INDAD	10/03/12	1750	4048036	3.015	3782157	8.750
06		INDAF	10/03/12	1808	4083237	3.015	3825703	8.750
07		INDAG	10/03/12	1826	4094375	3.015	3786416	8.750
08		TOXAPH	10/12/12	1241	5080195	3.009	4970606	8.746
09		DS	11/20/12	2017	4039144	3.003	3955732	8.738
10		INDAE	11/20/12	2034	4356127	3.003	4185014	8.738
11		TOXAPH	11/20/12	2052	4091087	3.003	4026531	8.737
12	VS45MBW1	VS45MBW1	11/20/12	2110	4297281	3.003	4123557	8.737
13	VS45LCSW1	VS45LCSW1	11/20/12	2128	3994844	3.003	3871840	8.737
14	VS45LCSDW1	VS45LCSDW1	11/20/12	2146	4526892	3.003	4401841	8.737
15	LMW-3-1112	VS45A	11/20/12	2203	4418134	3.003	4285610	8.737
16	LMW-EB-1112	VS45B	11/20/12	2221	4372441	3.002	4234517	8.738
17	LMW-8-1112	VS45C	11/20/12	2239	4706786	3.003	4451063	8.737
18	LMW-5-1112	VS45D	11/20/12	2257	4498425	3.003	4169065	8.737
19	LMW-7-1112	VS45E	11/20/12	2315	4862121	3.003	4356360	8.738
20	LMW-7-1112-D	VS45F	11/20/12	2332	4377086	3.002	4014624	8.738
21	LMW-9-1112	VS61A	11/21/12	0026	4659322	3.002	4162228	8.737
22	LMW-11-1112	VS61B	11/21/12	0044	4440332	3.003	3955014	8.737
23	LMW-6-1112	VS61C	11/21/12	0102	4578639	3.002	4267844	8.738
24		DS	11/21/12	0119	4119772	3.003	3880458	8.740
25		INDAE	11/21/12	0137	4398580	3.003	4115604	8.741
26		TOXAPH	11/21/12	0155	4102644	3.003	3942935	8.738

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 10/03/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	21032891	3.195	14864285	10.105
	UPPER LIMIT	42065782	3.245	29728570	10.155
	LOWER LIMIT	10516446	3.145	7432142	10.055

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		INDAE	10/03/12	1639	21032891	3.195	14864285	10.105
02		INDAA	10/03/12	1656	21107593	3.195	14677423	10.106
03		INDAB	10/03/12	1714	21416427	3.195	15039648	10.106
04		INDAC	10/03/12	1732	21029129	3.195	15016060	10.106
05		INDAD	10/03/12	1750	21297295	3.195	15199043	10.107
06		INDAF	10/03/12	1808	21266311	3.195	15407292	10.106
07		INDAG	10/03/12	1826	21395806	3.195	15257890	10.107
08		TOXAPH	10/12/12	1241	25258671	3.190	15955179	10.098
09		DS	11/20/12	2017	21952130	3.184	13466386	10.083
10		INDAE	11/20/12	2034	23550420	3.184	14126548	10.083
11		TOXAPH	11/20/12	2052	22235794	3.185	12958120	10.086
12	VS45MBW1	VS45MBW1	11/20/12	2110	23113751	3.185	14087457	10.086
13	VS45LCSW1	VS45LCSW1	11/20/12	2128	21783269	3.185	13146983	10.085
14	VS45LCSDW1	VS45LCSDW1	11/20/12	2146	24592583	3.185	15060869	10.085
15	LMW-3-1112	VS45A	11/20/12	2203	23769250	3.185	14760151	10.086
16	LMW-EB-1112	VS45B	11/20/12	2221	23050400	3.185	14524655	10.086
17	LMW-8-1112	VS45C	11/20/12	2239	24488957	3.185	15298224	10.086
18	LMW-5-1112	VS45D	11/20/12	2257	23494480	3.185	12505405	10.086
19	LMW-7-1112	VS45E	11/20/12	2315	24755011	3.185	14609357	10.086
20	LMW-7-1112-D	VS45F	11/20/12	2332	23014829	3.184	13678172	10.085
21	LMW-9-1112	VS61A	11/21/12	0026	24150932	3.184	13312237	10.084
22	LMW-11-1112	VS61B	11/21/12	0044	23419708	3.185	12922411	10.085
23	LMW-6-1112	VS61C	11/21/12	0102	24759135	3.185	14269872	10.086
24		DS	11/21/12	0119	22796918	3.185	13115540	10.087
25		INDAE	11/21/12	0137	24031979	3.185	13942788	10.087
26		TOXAPH	11/21/12	0155	22750350	3.185	13294508	10.086

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

PCB Analysis
Report and Summary QC Forms

ARI Job ID: VS45, VS46

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C
Page 1 of 1

Sample ID: LMW-3-1112
SAMPLE

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 17:36
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	110%
Tetrachlorometaxylene	79.8%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C

Sample ID: LMW-EB-1112
SAMPLE

Lab Sample ID: VS45B
LIMS ID: 12-22813
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 17:56
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	67.5%
Tetrachlorometaxylene	68.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A **Sample ID: LMW-8-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS45C
LIMS ID: 12-22814
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 18:16
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	102%
Tetrachlorometaxylene	77.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C
Page 1 of 1

Sample ID: LMW-5-1112
SAMPLE

Lab Sample ID: VS45D
LIMS ID: 12-22815
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 18:36
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	95.2%
Tetrachlorometaxylene	72.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C

Sample ID: LMW-7-1112
SAMPLE

Lab Sample ID: VS45E
LIMS ID: 12-22816
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 18:57
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	108%
Tetrachlorometaxylene	72.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C

Sample ID: LMW-7-1112-D
SAMPLE

Lab Sample ID: VS45F
LIMS ID: 12-22817
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 19:17
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	72.5%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-111912	106%	32-108	75.0%	31-100	0
LCS-111912	108%	32-108	75.8%	31-100	0
LCSD-111912	101%	32-108	77.0%	31-100	0
LMW-3-1112	110%	19-111	79.8%	21-100	0
LMW-EB-1112	67.5%	19-111	68.8%	21-100	0
LMW-8-1112	102%	19-111	77.5%	21-100	0
LMW-5-1112	95.2%	19-111	72.2%	21-100	0
LMW-7-1112	108%	19-111	72.5%	21-100	0
LMW-7-1112-D	106%	19-111	72.5%	21-100	0

Prep Method: SW3510C
Log Number Range: 12-22812 to 12-22817

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Page 1 of 1

Sample ID: LCS-111912
LCS/LCSD

Lab Sample ID: LCS-111912
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 11/19/12
Date Analyzed LCS: 11/27/12 16:55
LCSD: 11/27/12 17:16
Instrument/Analyst LCS: ECD5/PKC
LCSD: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount LCS: 1000 mL
LCSD: 1000 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	0.041	0.050	82.0%	0.043	0.050	86.0%	4.8%
Aroclor 1260	0.055	0.050	110%	0.058	0.050	116%	5.3%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	108%	101%
Tetrachlorometaxylene	75.8%	77.0%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

PCB METHOD BLANK SUMMARY

BLANK NO.

VS45MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

Lab Sample ID: VS45MBW1

Lab File ID: 1127A008

Date Extracted: 11/19/12

Matrix: LIQUID

Date Analyzed: 11/27/12

Instrument ID: ECD5

Time Analyzed: 1635

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS45LCSW1	VS45LCSW1	11/27/12
02	VS45LCSDW1	VS45LCSDW1	11/27/12
03	LMW-3-1112	VS45A	11/27/12
04	LMW-EB-1112	VS45B	11/27/12
05	LMW-8-1112	VS45C	11/27/12
06	LMW-5-1112	VS45D	11/27/12
07	LMW-7-1112	VS45E	11/27/12
08	LMW-7-1112-D	VS45F	11/27/12
09	LMW-2-1112	VS80A	11/27/12
10	LMW-4-1112	VS80B	11/27/12
11	LMW-10-1112	VS80C	11/27/12
12	LMW-9-1112	VS61A	11/27/12
13	LMW-11-1112	VS61B	11/27/12
14	LMW-6-1112	VS61C	11/27/12

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C
Page 1 of 1

Sample ID: MB-111912
METHOD BLANK

Lab Sample ID: MB-111912
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 16:35
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	75.0%

6F

8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Instrument ID: ECD5

Calibration Date: 11/02/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	4.35- 4.55	1.7463	1.7366	1.7919	1.6885	1.5990	1.4618	1.6707	7.3
DCB	12.76-12.96	1.4419	1.3542	1.3255	1.1568	1.0372	0.9164	1.2053	16.9

Aroclor-1016 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	6.00- 6.20	0.0526	0.0492	0.0480	0.0431	0.0399	0.0355	0.0447	14.3
2	6.40- 6.60	0.1677	0.1545	0.1513	0.1334	0.1220	0.1073	0.1394	16.2
3	6.55- 6.75	0.0718	0.0670	0.0652	0.0578	0.0527	0.0464	0.0601	15.9
4	6.66- 6.86	0.0505	0.0471	0.0462	0.0417	0.0385	0.0340	0.0430	14.2

AROCLOR AVERAGE %RSD = 15.1

Aroclor-1260 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	9.90-10.10	0.0536	0.0493	0.0479	0.0428	0.0388	0.0345	0.0445	12.5
2	10.21-10.41	0.0532	0.0494	0.0483	0.0433	0.0394	0.0351	0.0448	11.6
3	10.59-10.79	0.1298	0.1173	0.1141	0.1011	0.0918	0.0821	0.1060	13.3
4	10.99-11.19	0.0754	0.0665	0.0648	0.0581	0.0527	0.0471	0.0608	13.6
5	11.18-11.38	0.0346	0.0319	0.0317	0.0292	0.0269	0.0244	0.0298	9.5

AROCLOR AVERAGE %RSD = 12.1

8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Instrument ID: ECD5

Calibration Date: 11/02/12

SURROGATES

RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX 4.36- 4.56	1.1947	1.1506	1.1889	1.1588	1.1066	1.0428	1.1404	5.0
DCB 13.15-13.35	1.2887	1.1842	1.1439	1.0432	0.9699	0.8923	1.0871	13.5

Aroclor-1016 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	6.11- 6.31	0.0541	0.0496	0.0481	0.0428	0.0390	0.0352	0.0448	15.8
2	6.75- 6.95	0.1119	0.1025	0.1010	0.0916	0.0847	0.0773	0.0948	13.4
3	7.13- 7.33	0.0277	0.0264	0.0263	0.0242	0.0226	0.0209	0.0247	10.6
4	7.24- 7.44	0.0325	0.0303	0.0296	0.0268	0.0247	0.0226	0.0277	13.5

AROCLOR AVERAGE %RSD = 13.3

Aroclor-1260 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	10.20-10.40	0.0510	0.0463	0.0455	0.0410	0.0379	0.0345	0.0427	14.1
2	10.65-10.85	0.0605	0.0575	0.0561	0.0509	0.0468	0.0427	0.0524	13.0
3	10.93-11.13	0.1180	0.1138	0.1111	0.1016	0.0945	0.0868	0.1043	11.6
4	11.45-11.65	0.0395	0.0332	0.0327	0.0299	0.0279	0.0254	0.0314	15.7

AROCLOR AVERAGE %RSD = 13.6

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB5

Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1221			
Peak	RT	RT WIN	Cal Factor
1	4.817	4.72- 4.92	0.01953
2	4.995	4.89- 5.09	0.01337
3	5.101	5.00- 5.20	0.04356

Aroclor-1232			
Peak	RT	RT WIN	Cal Factor
1	6.094	5.99- 6.19	0.01822
2	6.497	6.40- 6.60	0.05697
3	6.647	6.55- 6.75	0.02485
4	7.901	7.80- 8.00	0.03114

Aroclor-1242			
Peak	RT	RT WIN	Cal Factor
1	6.097	6.00- 6.20	0.03480
2	6.500	6.40- 6.60	0.10781
3	6.650	6.55- 6.75	0.04681
4	7.902	7.80- 8.00	0.05490

Aroclor-1248			
Peak	RT	RT WIN	Cal Factor
1	6.497	6.40- 6.60	0.07048
2	7.474	7.37- 7.57	0.07420
3	7.902	7.80- 8.00	0.09369
4	8.138	8.04- 8.24	0.07222

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB5

Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	8.223	8.12- 8.32	0.09552
2	8.597	8.50- 8.70	0.06279
3	8.731	8.63- 8.83	0.12204
4	9.080	8.98- 9.18	0.13358
5	9.440	9.34- 9.54	0.08400

Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	9.996	9.90-10.10	0.06957
2	10.312	10.21-10.41	0.05282
3	10.687	10.59-10.79	0.13695
4	11.202	11.10-11.30	0.05159
5	11.275	11.18-11.38	0.05664

Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	11.203	11.10-11.30	0.13880
2	11.275	11.17-11.37	0.13349
3	11.661	11.56-11.76	0.11731
4	12.449	12.35-12.55	0.33525

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No.: VS45 | Project: LANDSBURG MINE

GC Column: ZB35 | Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1221

Peak	RT	RT WIN	Cal Factor
1	5.141	5.04- 5.24	0.01355
2	5.393	5.29- 5.49	0.00798
3	5.507	5.41- 5.61	0.02510
4	5.576	5.48- 5.68	0.00433

Aroclor-1232

Peak	RT	RT WIN	Cal Factor
1	6.210	6.11- 6.31	0.01985
2	6.841	6.74- 6.94	0.03912
3	7.050	6.95- 7.15	0.01635
4	8.276	8.18- 8.38	0.01389

Aroclor-1242

Peak	RT	RT WIN	Cal Factor
1	6.210	6.11- 6.31	0.03416
2	6.842	6.74- 6.94	0.07272
3	7.051	6.95- 7.15	0.03022
4	8.276	8.18- 8.38	0.02545

Aroclor-1248

Peak	RT	RT WIN	Cal Factor
1	6.841	6.74- 6.94	0.04749
2	7.747	7.65- 7.85	0.03939
3	8.276	8.18- 8.38	0.04070
4	8.622	8.52- 8.72	0.05034

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	8.341	8.24- 8.44	0.03474
2	8.515	8.41- 8.61	0.04387
3	9.037	8.94- 9.14	0.03370
4	9.188	9.09- 9.29	0.07393
5	9.971	9.87-10.07	0.04454

Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	10.302	10.20-10.40	0.06977
2	10.752	10.65-10.85	0.06199
3	11.025	10.92-11.12	0.13603
4	11.547	11.45-11.65	0.05505
5	12.347	12.25-12.45	0.05291

Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	11.547	11.45-11.65	0.13895
2	11.613	11.51-11.71	0.13513
3	12.011	11.91-12.11	0.11296
4	12.834	12.73-12.93	0.33487

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1254
Time Analyzed :1556

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1254-1	8.22	8.12	8.32	251.7	250.0	0.7
Aroclor-1254-2	8.60	8.50	8.70	213.6	250.0	-14.6
Aroclor-1254-3	8.73	8.63	8.83	255.7	250.0	2.3
Aroclor-1254-4	9.08	8.98	9.18	260.1	250.0	4.0
Aroclor-1254-5	9.44	9.34	9.54	259.1	250.0	3.6

AVERAGE %D = 5.0

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1254

Time Analyzed :1556

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1254-1	8.34	8.24	8.44	280.0	250.0	12.0
Aroclor-1254-2	8.51	8.41	8.61	280.9	250.0	12.4
Aroclor-1254-3	9.04	8.94	9.14	301.1	250.0	20.4
Aroclor-1254-4	9.19	9.09	9.29	273.0	250.0	9.2
Aroclor-1254-5	9.97	9.87	10.07	284.1	250.0	13.6

AVERAGE %D = 13.5

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.09	6.00	6.20	238.2	250.0	-4.7
Aroclor-1016-2	6.50	6.40	6.60	247.3	250.0	-1.1
Aroclor-1016-3	6.65	6.55	6.75	244.5	250.0	-2.2
Aroclor-1016-4	6.76	6.66	6.86	251.1	250.0	0.4

AVERAGE %D = 2.1

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	265.9	250.0	6.3
Aroclor-1260-2	10.31	10.21	10.41	266.6	250.0	6.6
Aroclor-1260-3	10.69	10.59	10.79	264.1	250.0	5.6
Aroclor-1260-4	11.09	10.99	11.19	256.7	250.0	2.7
Aroclor-1260-5	11.28	11.18	11.38	260.4	250.0	4.2

AVERAGE %D = 5.1

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB35
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	252.5	250.0	1.0
Aroclor-1016-2	6.84	6.75	6.95	223.6	250.0	-10.6
Aroclor-1016-3	7.23	7.13	7.33	259.4	250.0	3.8
Aroclor-1016-4	7.33	7.24	7.44	256.7	250.0	2.7

AVERAGE %D = 4.5

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	280.7	250.0	12.3
Aroclor-1260-2	10.75	10.65	10.85	284.5	250.0	13.8
Aroclor-1260-3	11.02	10.93	11.13	284.9	250.0	14.0
Aroclor-1260-4	11.55	11.45	11.65	279.6	250.0	11.8

AVERAGE %D = 13.0

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1248
Time Analyzed :2038

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1248-1	6.50	6.40	6.60	258.6	250.0	3.4
Aroclor-1248-2	7.47	7.37	7.57	266.8	250.0	6.7
Aroclor-1248-3	7.90	7.80	8.00	262.1	250.0	4.8
Aroclor-1248-4	8.14	8.04	8.24	268.9	250.0	7.5

AVERAGE %D = 5.6

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1248

Time Analyzed :2038

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1248-1	6.84	6.74	6.94	247.5	250.0	-1.0
Aroclor-1248-2	7.75	7.65	7.85	275.3	250.0	10.1
Aroclor-1248-3	8.28	8.18	8.38	275.7	250.0	10.3
Aroclor-1248-4	8.62	8.52	8.72	279.5	250.0	11.8

AVERAGE %D = 8.3

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.10	6.00	6.20	236.0	250.0	-5.6
Aroclor-1016-2	6.50	6.40	6.60	245.4	250.0	-1.8
Aroclor-1016-3	6.65	6.55	6.75	243.2	250.0	-2.7
Aroclor-1016-4	6.76	6.66	6.86	253.7	250.0	1.5

AVERAGE %D = 2.9

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	256.3	250.0	2.5
Aroclor-1260-2	10.31	10.21	10.41	257.1	250.0	2.8
Aroclor-1260-3	10.69	10.59	10.79	255.3	250.0	2.1
Aroclor-1260-4	11.09	10.99	11.19	248.0	250.0	-0.8
Aroclor-1260-5	11.28	11.18	11.38	256.4	250.0	2.5

AVERAGE %D = 2.1

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB35
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	249.8	250.0	-0.1
Aroclor-1016-2	6.84	6.75	6.95	221.9	250.0	-11.2
Aroclor-1016-3	7.23	7.13	7.33	259.1	250.0	3.6
Aroclor-1016-4	7.34	7.24	7.44	255.4	250.0	2.2

AVERAGE %D = 4.3

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	268.9	250.0	7.6
Aroclor-1260-2	10.75	10.65	10.85	273.2	250.0	9.3
Aroclor-1260-3	11.03	10.93	11.13	275.4	250.0	10.1
Aroclor-1260-4	11.55	11.45	11.65	272.7	250.0	9.1

AVERAGE %D = 9.0

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1242
Time Analyzed :0102

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1242-1	6.10	6.00	6.20	223.2	250.0	-10.7
Aroclor-1242-2	6.50	6.40	6.60	229.9	250.0	-8.0
Aroclor-1242-3	6.65	6.55	6.75	227.2	250.0	-9.1
Aroclor-1242-4	7.90	7.80	8.00	229.8	250.0	-8.1

AVERAGE %D = 9.0

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1242

Time Analyzed :0102

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1242-1	6.21	6.11	6.31	251.8	250.0	0.7
Aroclor-1242-2	6.84	6.74	6.94	252.7	250.0	1.1
Aroclor-1242-3	7.05	6.95	7.15	255.6	250.0	2.2
Aroclor-1242-4	8.28	8.18	8.38	260.7	250.0	4.3

AVERAGE %D = 2.1

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB5

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1660

Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.10	6.00	6.20	235.8	250.0	-5.7
Aroclor-1016-2	6.50	6.40	6.60	246.1	250.0	-1.5
Aroclor-1016-3	6.65	6.55	6.75	246.5	250.0	-1.4
Aroclor-1016-4	6.76	6.66	6.86	257.4	250.0	3.0

AVERAGE %D = 2.9

Date Analyzed :11/28/12

Lab Standard ID: AR1660

Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	267.6	250.0	7.0
Aroclor-1260-2	10.31	10.21	10.41	264.7	250.0	5.9
Aroclor-1260-3	10.69	10.59	10.79	266.8	250.0	6.7
Aroclor-1260-4	11.09	10.99	11.19	254.7	250.0	1.9
Aroclor-1260-5	11.28	11.18	11.38	264.6	250.0	5.8

AVERAGE %D = 5.5

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1660

Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	250.5	250.0	0.2
Aroclor-1016-2	6.84	6.75	6.95	221.8	250.0	-11.3
Aroclor-1016-3	7.23	7.13	7.33	259.0	250.0	3.6
Aroclor-1016-4	7.34	7.24	7.44	255.6	250.0	2.2

AVERAGE %D = 4.3

Date Analyzed :11/28/12

Lab Standard ID: AR1660

Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	278.3	250.0	11.3
Aroclor-1260-2	10.75	10.65	10.85	280.5	250.0	12.2
Aroclor-1260-3	11.03	10.93	11.13	285.1	250.0	14.0
Aroclor-1260-4	11.55	11.45	11.65	278.1	250.0	11.2

AVERAGE %D = 12.2

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	31244918	2.274	64198300	13.214
	UPPER LIMIT	62489836	2.374	128396600	13.314
	LOWER LIMIT	15622459	2.174	32099150	13.114

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01	ZZZZZ	ZZZZZ	11/02/12	2017	32121330	2.277	65627042	13.214
02		0.25PPMAR166	11/02/12	2037	31244918	2.274	64198300	13.214
03		0.02PPMAR166	11/02/12	2058	31736267	2.277	66012881	13.214
04		0.05PPMAR166	11/02/12	2118	31079093	2.275	64685135	13.214
05		1PPMAR1660	11/02/12	2138	32560778	2.275	67466235	13.214
06		0.1PPMAR1660	11/02/12	2158	31562437	2.274	66063497	13.214
07		0.5PPMAR1660	11/02/12	2218	32469455	2.273	67388285	13.214
08		AR1242	11/02/12	2238	32779971	2.273	67800793	13.214
09		AR1248	11/02/12	2259	33486089	2.279	68805737	13.214
10		AR1254	11/02/12	2319	32866846	2.276	67839772	13.214
11		AR2162	11/02/12	2340	32037907	2.280	66658077	13.215
12		AR3268	11/03/12	0000	33288564	2.280	69153536	13.215
13	ZZZZZ	ZZZZZ	11/03/12	0020	32275358	2.276	69016020	13.215
14	ZZZZZ	ZZZZZ	11/03/12	0041	34992364	2.279	71027100	13.215
15	ZZZZZ	ZZZZZ	11/03/12	0101	33719935	2.275	69100267	13.214
16	ZZZZZ	ZZZZZ	11/03/12	0121	34274216	2.277	70290566	13.215
17	ZZZZZ	ZZZZZ	11/03/12	0142	33531129	2.274	69260863	13.214
18	ZZZZZ	ZZZZZ	11/03/12	0202	33384825	2.277	69841459	13.214
19		AR1254	11/27/12	1556	31355840	2.277	60463087	13.216
20		AR1660	11/27/12	1616	26380762	2.277	49251705	13.215
21	VS45MBW1	VS45MBW1	11/27/12	1635	37850879	2.276	66730789	13.215
22	VS45LCSW1	VS45LCSW1	11/27/12	1655	38471396	2.277	68058410	13.216
23	VS45LCSDW1	VS45LCSDW1	11/27/12	1716	37775632	2.277	66976674	13.215
24	LMW-3-1112	VS45A	11/27/12	1736	38352102	2.276	69679975	13.216
25	LMW-EB-1112	VS45B	11/27/12	1756	37735670	2.278	69060343	13.215
26	LMW-8-1112	VS45C	11/27/12	1816	38759189	2.276	69292543	13.216
27	LMW-5-1112	VS45D	11/27/12	1836	39096740	2.277	72571060	13.215
28	LMW-7-1112	VS45E	11/27/12	1857	39936132	2.278	72905231	13.214
29	LMW-7-1112-D	VS45F	11/27/12	1917	40386717	2.277	73249886	13.216
30	LMW-2-1112	VS80A	11/27/12	1937	40659775	2.277	73156003	13.216
31	LMW-4-1112	VS80B	11/27/12	1957	39866227	2.279	73286301	13.216
32	LMW-10-1112	VS80C	11/27/12	2018	39622809	2.278	72195861	13.216

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	31244918	2.274	64198300	13.214
				UPPER LIMIT	62489836	2.374	128396600	13.314
				LOWER LIMIT	15622459	2.174	32099150	13.114
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
33		AR1248	11/27/12	2038	32375111	2.277	64181082	13.216
34		AR1660	11/27/12	2059	28784889	2.279	56853217	13.216
35	LMW-9-1112	VS61A	11/27/12	2119	43481965	2.277	75432143	13.217
36	LMW-11-1112	VS61B	11/27/12	2139	51607223	2.276	75467547	13.216
37	LMW-6-1112	VS61C	11/27/12	2159	41685341	2.278	76685668	13.216
38		AR1242	11/28/12	0102	35209545	2.279	58213591	13.217
39		AR1660	11/28/12	0122	30334360	2.280	54319976	13.216

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

			IS1 AREA	RT	IS2 AREA	RT
		ICAL MIDPT	14536489	2.761	15789428	14.115
		UPPER LIMIT	29072978	2.861	31578856	14.215
		LOWER LIMIT	7268244	2.661	7894714	14.015

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01	ZZZZZ	ZZZZZ	11/02/12	2017	14713535	2.764	16088294	14.115
02		0.25PPMAR166	11/02/12	2037	14536489	2.761	15789428	14.115
03		0.02PPMAR166	11/02/12	2058	14662512	2.763	16195930	14.116
04		0.05PPMAR166	11/02/12	2118	14425871	2.761	15804667	14.115
05		1PPMAR1660	11/02/12	2138	14668819	2.761	16259905	14.115
06		0.1PPMAR1660	11/02/12	2158	14552241	2.763	15974909	14.115
07		0.5PPMAR1660	11/02/12	2218	14811515	2.761	16169446	14.114
08		AR1242	11/02/12	2238	14876946	2.761	16149950	14.115
09		AR1248	11/02/12	2259	15137931	2.765	16358718	14.115
10		AR1254	11/02/12	2319	14737446	2.762	15955858	14.116
11		AR2162	11/02/12	2340	14169986	2.766	15683025	14.116
12		AR3268	11/03/12	0000	14704019	2.765	16219252	14.116
13	ZZZZZ	ZZZZZ	11/03/12	0020	14465214	2.762	15841317	14.116
14	ZZZZZ	ZZZZZ	11/03/12	0041	15000485	2.765	16204591	14.116
15	ZZZZZ	ZZZZZ	11/03/12	0101	14278309	2.762	15675954	14.116
16	ZZZZZ	ZZZZZ	11/03/12	0121	14593306	2.764	15921593	14.117
17	ZZZZZ	ZZZZZ	11/03/12	0142	14012549	2.762	15630049	14.116
18	ZZZZZ	ZZZZZ	11/03/12	0202	13930274	2.762	15765289	14.115
19		AR1254	11/27/12	1556	12425950	2.764	13269271	14.114
20		AR1660	11/27/12	1616	10294938	2.763	10779495	14.114
21	VS45MBW1	VS45MBW1	11/27/12	1635	14010375	2.764	14342194	14.116
22	VS45LCSW1	VS45LCSW1	11/27/12	1655	14340389	2.762	14500145	14.115
23	VS45LCSDW1	VS45LCSDW1	11/27/12	1716	13859133	2.762	14355147	14.115
24	LMW-3-1112	VS45A	11/27/12	1736	13963437	2.762	14774249	14.115
25	LMW-EB-1112	VS45B	11/27/12	1756	13664823	2.763	14406035	14.115
26	LMW-8-1112	VS45C	11/27/12	1816	14104559	2.761	14466522	14.115
27	LMW-5-1112	VS45D	11/27/12	1836	13928838	2.762	15102344	14.114
28	LMW-7-1112	VS45E	11/27/12	1857	14712002	2.763	15203722	14.115
29	LMW-7-1112-D	VS45F	11/27/12	1917	14432514	2.762	15247833	14.116
30	LMW-2-1112	VS80A	11/27/12	1937	14550770	2.761	15198767	14.115
31	LMW-4-1112	VS80B	11/27/12	1957	14205014	2.763	15183526	14.115
32	LMW-10-1112	VS80C	11/27/12	2018	14178574	2.762	14929328	14.115

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	14536489	2.761	15789428	14.115
				UPPER LIMIT	29072978	2.861	31578856	14.215
				LOWER LIMIT	7268244	2.661	7894714	14.015
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
33		AR1248	11/27/12	2038	12131754	2.762	13445167	14.116
34		AR1660	11/27/12	2059	10710635	2.763	11900024	14.116
35	LMW-9-1112	VS61A	11/27/12	2119	14650549	2.762	15642227	14.116
36	LMW-11-1112	VS61B	11/27/12	2139	14516755	2.763	15551439	14.116
37	LMW-6-1112	VS61C	11/27/12	2159	14713616	2.763	15747089	14.116
38		AR1242	11/28/12	0102	12073846	2.764	11517474	14.115
39		AR1660	11/28/12	0122	10935659	2.763	11044707	14.115

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

HCID Analysis
Report and Summary QC Forms

ARI Job ID: VS45, VS46

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Extraction Method: SW3510C

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Matrix: Water

Data Release Authorized:
Reported: 11/16/12

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-111512	Method Blank	11/15/12	11/15/12	1.0	Gas	< 0.25 U
12-22812					Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	103%
VS45A	LMW-3-1112	11/15/12	11/15/12	1.0	Gas	< 0.25 U
12-22812	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	108%
VS45B	LMW-EB-1112	11/15/12	11/15/12	1.0	Gas	< 0.25 U
12-22813	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	101%
VS45C	LMW-8-1112	11/15/12	11/15/12	1.0	Gas	< 0.25 U
12-22814	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	102%
VS45D	LMW-5-1112	11/15/12	11/15/12	1.0	Gas	< 0.25 U
12-22815	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	106%
VS45E	LMW-7-1112	11/15/12	11/15/12	1.0	Gas	< 0.25 U
12-22816	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	103%
VS45F	LMW-7-1112-D	11/15/12	11/16/12	1.0	Gas	< 0.25 U
12-22817	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	107%

Reported in mg/L (ppm)

Gas value based on total peaks in the range from Toluene to C12.
Diesel value based on the total peaks in the range from C12 to C24.
Oil value based on the total peaks in the range from C24 to C38.

ANALYTICAL RESOURCES INCORPORATED

HCID SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Client ID	O-TER	TOT OUT
MB-111512	103%	0
LCS-111512	103%	0
LCSD-111512	103%	0
LMW-3-1112	108%	0
LMW-EB-1112	101%	0
LMW-8-1112	102%	0
LMW-5-1112	106%	0
LMW-7-1112	103%	0
LMW-7-1112-D	107%	0

	LCS/MB LIMITS	QC LIMITS
(O-TER) = o-Terphenyl	(55-110)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-22812 to 12-22817

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Page 1 of 1

Sample ID: LCS-111512
LCS/LCSD

Lab Sample ID: LCS-111512
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/16/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Date Extracted LCS/LCSD: 11/15/12

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Date Analyzed LCS: 11/15/12 21:32
LCSD: 11/15/12 21:53
Instrument/Analyst LCS: FID/JGR
LCSD: FID/JGR

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2.81	3.00	93.7%	2.71	3.00	90.3%	3.6%

HCID Surrogate Recovery

	LCS	LCSD
o-Terphenyl	103%	103%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

4

TPH METHOD BLANK SUMMARY

BLANK NO.

VS45MBW1

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOC

SDG No.: VS45 Project No.: LANDSBURG

Date Extracted: 11/15/12 Matrix: LIQUID

Date Analyzed : 11/15/12 Instrument ID : FID4A

Time Analyzed : 2110

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS45LCSW1	VS45LCSW1	11/15/12
02	VS45LCSDW1	VS45LCSDW1	11/15/12
03	LMW-3-1112	VS45A	11/15/12
04	LMW-EB-1112	VS45B	11/15/12
05	LMW-8-1112	VS45C	11/15/12
06	LMW-5-1112	VS45D	11/15/12
07	LMW-7-1112	VS45E	11/15/12
08	LMW-7-1112-D	VS45F	11/16/12
09			
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FORM IV TPH

8

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOC

SDG No.: VS45 Project: LANDSBURG

Instrument ID: FID4A GC Column: RTX-1

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 5.99 TRIAC: 8.88

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01	RT	RT	11/15/12	1411	5.99	8.88
02	IB	IB	11/15/12	1433	5.99	8.88
03	VS45MBW1	VS45MBW1	11/15/12	2110	5.99	8.86
04	VS45LCSW1	VS45LCSW1	11/15/12	2132	6.00	8.86
05	VS45LCSDW1	VS45LCSDW1	11/15/12	2153	6.00	8.86
06	LMW-3-1112	VS45A	11/15/12	2215	5.99	8.87
07	LMW-EB-1112	VS45B	11/15/12	2237	5.99	8.86
08	LMW-8-1112	VS45C	11/15/12	2259	5.99	8.86
09	LMW-5-1112	VS45D	11/15/12	2321	5.99	8.86
10	LMW-7-1112	VS45E	11/15/12	2342	5.99	8.86
11	LMW-7-1112-D	VS45F	11/16/12	0004	5.99	8.86
12	GDHCIDW	GDHCIDW	11/16/12	0109	5.99	8.89
13	MHCIDW	MHCIDW	11/16/12	0131	6.00	8.86

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

FORM VIII TPH

Metals Analysis
Report and Summary QC Forms

ARI Job ID: VS45, VS46

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS45

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-3-1112	VS45A	12-22812	
LMW-3-1112D	VS45ADUP	12-22812	
LMW-3-1112S	VS45ASPK	12-22812	
LMW-EB-1112	VS45B	12-22813	
PBW	VS45MB1	12-22813	
LCSW	VS45MB1SPK	12-22813	
LMW-8-1112	VS45C	12-22814	
LMW-5-1112	VS45D	12-22815	
LMW-7-1112	VS45E	12-22816	
LMW-7-1112-D	VS45F	12-22817	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 11/30/12 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-3-1112
SAMPLE

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/26/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	**7440-38-2**	**Arsenic**	0.048	0.2	**0.7**	
3010A	11/19/12	6010C	11/26/12	**7440-39-3**	**Barium**	1.33	3	**74**	
3010A	11/19/12	6010C	11/26/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/26/12	**7440-70-2**	**Calcium**	11.3	50	**37,500**	
3010A	11/19/12	6010C	11/26/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/26/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	**7440-50-8**	**Copper**	0.92	2	**2**	
3010A	11/19/12	6010C	11/26/12	7439-89-6	Iron	7.5	50	50	U
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/26/12	**7439-95-4**	**Magnesium**	9.6	50	**15,900**	
3010A	11/19/12	6010C	11/26/12	**7439-96-5**	**Manganese**	0.28	1	**57**	
3010A	11/19/12	6010C	11/26/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/26/12	**7440-09-7**	**Potassium**	65.7	500	**1,700**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/26/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/26/12	**7440-23-5**	**Sodium**	11.4	500	**10,400**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-EB-1112**
Page 1 of 1 **SAMPLE**

Lab Sample ID: VS45B
LIMS ID: 12-22813
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/26/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-39-3	Barium	1.33	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/26/12	7440-70-2	Calcium	11.3	50	50	U
3010A	11/19/12	6010C	11/26/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/26/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/26/12	7439-89-6	Iron	7.5	50	50	U
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/26/12	7439-95-4	Magnesium	9.6	50	50	U
3010A	11/19/12	6010C	11/26/12	7439-96-5	Manganese	0.28	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/26/12	7440-09-7	Potassium	65.7	500	500	U
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/26/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-23-5	Sodium	11.4	500	500	U
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-8-1112**
Page 1 of 1 **SAMPLE**

Lab Sample ID: VS45C
LIMS ID: 12-22814
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/26/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	**7440-38-2**	**Arsenic**	0.048	0.2	**2.2**	
3010A	11/19/12	6010C	11/26/12	**7440-39-3**	**Barium**	1.33	3	**58**	
3010A	11/19/12	6010C	11/26/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/26/12	**7440-70-2**	**Calcium**	11.3	50	**77,600**	
3010A	11/19/12	6010C	11/26/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/26/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/26/12	**7439-89-6**	**Iron**	7.5	50	**10,900**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/26/12	**7439-95-4**	**Magnesium**	9.6	50	**43,900**	
3010A	11/19/12	6010C	11/26/12	**7439-96-5**	**Manganese**	0.28	1	**533**	
3010A	11/19/12	6010C	11/26/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/26/12	**7440-09-7**	**Potassium**	65.7	500	**2,440**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/26/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/26/12	**7440-23-5**	**Sodium**	11.4	500	**15,400**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-5-1112
SAMPLE

Lab Sample ID: VS45D
LIMS ID: 12-22815
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/26/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	**7440-39-3**	**Barium**	1.33	3	**252**	
3010A	11/19/12	6010C	11/26/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/26/12	**7440-70-2**	**Calcium**	11.3	50	**84,800**	
3010A	11/19/12	6010C	11/26/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/26/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/26/12	**7439-89-6**	**Iron**	7.5	50	**110**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/26/12	**7439-95-4**	**Magnesium**	9.6	50	**48,700**	
3010A	11/19/12	6010C	11/26/12	**7439-96-5**	**Manganese**	0.28	1	**213**	
3010A	11/19/12	6010C	11/26/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/26/12	**7440-09-7**	**Potassium**	65.7	500	**2,620**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/26/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/26/12	**7440-23-5**	**Sodium**	11.4	500	**16,300**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-7-1112**
Page 1 of 1 **SAMPLE**

Lab Sample ID: VS45E
LIMS ID: 12-22816
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/26/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	**7440-38-2**	**Arsenic**	0.048	0.2	**1.8**	
3010A	11/19/12	6010C	11/26/12	**7440-39-3**	**Barium**	1.33	3	**476**	
3010A	11/19/12	6010C	11/26/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/26/12	**7440-70-2**	**Calcium**	11.3	50	**52,400**	
3010A	11/19/12	6010C	11/26/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/26/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/26/12	**7439-89-6**	**Iron**	7.5	50	**1,050**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/26/12	**7439-95-4**	**Magnesium**	9.6	50	**24,600**	
3010A	11/19/12	6010C	11/26/12	**7439-96-5**	**Manganese**	0.28	1	**136**	
3010A	11/19/12	6010C	11/26/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/26/12	**7440-09-7**	**Potassium**	65.7	500	**3,000**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/26/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/26/12	**7440-23-5**	**Sodium**	11.4	500	**42,600**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-7-1112-D
SAMPLE

Lab Sample ID: VS45F
LIMS ID: 12-22817
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/26/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	**7440-38-2**	**Arsenic**	0.048	0.2	**1.8**	
3010A	11/19/12	6010C	11/26/12	**7440-39-3**	**Barium**	1.33	3	**455**	
3010A	11/19/12	6010C	11/26/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/26/12	**7440-70-2**	**Calcium**	11.3	50	**50,300**	
3010A	11/19/12	6010C	11/26/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/26/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/26/12	**7439-89-6**	**Iron**	7.5	50	**1,010**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/26/12	**7439-95-4**	**Magnesium**	9.6	50	**23,700**	
3010A	11/19/12	6010C	11/26/12	**7439-96-5**	**Manganese**	0.28	1	**130**	
3010A	11/19/12	6010C	11/26/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/26/12	**7440-09-7**	**Potassium**	65.7	500	**2,900**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/26/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/26/12	**7440-23-5**	**Sodium**	11.4	500	**41,500**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-3-1112**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Aluminum	6010C	50 U	1,880	2,000	94.0%	
Antimony	200.8	0.2 U	24.7	25.0	98.8%	
Arsenic	200.8	0.7	25.6	25.0	99.6%	
Barium	6010C	74	2,000	2,000	96.3%	
Beryllium	6010C	1 U	482	500	96.4%	
Cadmium	6010C	2 U	515	500	103%	
Calcium	6010C	37,500	44,400	10,000	69.0%	N
Chromium	6010C	5 U	476	500	95.2%	
Cobalt	6010C	3 U	494	500	98.8%	
Copper	6010C	2	518	500	103%	
Iron	6010C	50 U	1,910	2,000	95.5%	
Lead	200.8	0.1 U	24.3	25.0	97.2%	
Magnesium	6010C	15,900	24,900	10,000	90.0%	
Manganese	6010C	57	523	500	93.2%	
Nickel	6010C	10 U	480	500	96.0%	
Potassium	6010C	1,700	11,200	10,000	95.0%	
Selenium	200.8	0.5 U	77.1	80.0	96.4%	
Silver	6010C	3 U	533	500	107%	
Sodium	6010C	10,400	19,700	10,000	93.0%	
Thallium	200.8	0.2 U	23.4	25.0	93.6%	
Vanadium	6010C	3 U	500	500	100%	
Zinc	6010C	10 U	480	500	96.0%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked
NR-Not Recovered

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-3-1112
DUPLICATE

Lab Sample ID: VS45A
LIMS ID: 12-22812
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Aluminum	6010C	50 U	50 U	0.0%	+/- 50	L
Antimony	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Arsenic	200.8	0.7	0.8	13.3%	+/- 0.2	L
Barium	6010C	74	73	1.4%	+/- 20%	
Beryllium	6010C	1 U	1 U	0.0%	+/- 1	L
Cadmium	6010C	2 U	2 U	0.0%	+/- 2	L
Calcium	6010C	37,500	36,200	3.5%	+/- 20%	
Chromium	6010C	5 U	5 U	0.0%	+/- 5	L
Cobalt	6010C	3 U	3 U	0.0%	+/- 3	L
Copper	6010C	2	2 U	0.0%	+/- 2	L
Iron	6010C	50 U	50 U	0.0%	+/- 50	L
Lead	200.8	0.1 U	0.1 U	0.0%	+/- 0.1	L
Magnesium	6010C	15,900	15,300	3.8%	+/- 20%	
Manganese	6010C	57	55	3.6%	+/- 20%	
Nickel	6010C	10 U	10 U	0.0%	+/- 10	L
Potassium	6010C	1,700	1,700	0.0%	+/- 500	L
Selenium	200.8	0.5 U	0.5 U	0.0%	+/- 0.5	L
Silver	6010C	3 U	3 U	0.0%	+/- 3	L
Sodium	6010C	10,400	10,300	1.0%	+/- 20%	
Thallium	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Vanadium	6010C	3 U	3 U	0.0%	+/- 3	L
Zinc	6010C	10 U	10 U	0.0%	+/- 10	L

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: VS45LCS
LIMS ID: 12-22813
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	1850	2000	92.5%	
Antimony	200.8	23.7	25.0	94.8%	
Arsenic	200.8	24.8	25.0	99.2%	
Barium	6010C	1910	2000	95.5%	
Beryllium	6010C	481	500	96.2%	
Cadmium	6010C	504	500	101%	
Calcium	6010C	9220	10000	92.2%	
Chromium	6010C	473	500	94.6%	
Cobalt	6010C	487	500	97.4%	
Copper	6010C	486	500	97.2%	
Iron	6010C	1870	2000	93.5%	
Lead	200.8	24.8	25.0	99.2%	
Magnesium	6010C	9510	10000	95.1%	
Manganese	6010C	467	500	93.4%	
Nickel	6010C	480	500	96.0%	
Potassium	6010C	9400	10000	94.0%	
Selenium	200.8	80.8	80.0	101%	
Silver	6010C	520	500	104%	
Sodium	6010C	9640	10000	96.4%	
Thallium	200.8	23.7	25.0	94.8%	
Vanadium	6010C	494	500	98.8%	
Zinc	6010C	480	500	96.0%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**
Page 1 of 1

Lab Sample ID: VS45MB
LIMS ID: 12-22813
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS45-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/26/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-39-3	Barium	1.33	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/26/12	7440-70-2	Calcium	11.3	50	50	U
3010A	11/19/12	6010C	11/26/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/26/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/26/12	7439-89-6	Iron	7.5	50	50	U
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/26/12	7439-95-4	Magnesium	9.6	50	50	U
3010A	11/19/12	6010C	11/26/12	7439-96-5	Manganese	0.28	1	1	U
3010A	11/19/12	6010C	11/26/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/26/12	7440-09-7	Potassium	65.7	500	500	U
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/26/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-23-5	Sodium	11.4	500	500	U
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/26/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/26/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

UNITS: ug/L

SDG: VS45

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Aluminum	AL	ICP	IP112671	2000.0	2067.09	**103.4**	2000.0	2007.97	**100.4**	2017.32	**100.9**	2094.06	**104.7**	2071.84	**103.6**	2023.01	**101.2**
Antimony	SB	PMS	MS112811	50.0	50.24	**100.5**	50.0	50.81	**101.6**	50.65	**101.3**	50.20	**100.4**	50.07	**100.1**	50.17	**100.3**
Arsenic	AS	PMS	MS112811	50.0	50.55	**101.1**	50.0	50.51	**101.0**	50.43	**100.9**	49.58	**99.2**	50.34	**100.7**	49.91	**99.8**
Barium	BA	ICP	IP112671	1000.0	1035.69	**103.6**	1000.0	1007.68	**100.8**	1010.87	**101.1**	1023.80	**102.4**	1017.20	**101.7**	1012.28	**101.2**
Beryllium	BE	ICP	IP112671	1000.0	1036.58	**103.7**	1000.0	1019.88	**102.0**	1016.02	**101.6**	1025.11	**102.5**	1016.98	**101.7**	1011.76	**101.2**
Cadmium	CD	ICP	IP112671	1000.0	1046.70	**104.7**	1000.0	1059.85	**106.0**	1062.89	**106.3**	1062.02	**106.2**	1059.95	**106.0**	1061.63	**106.2**
Calcium	CA	ICP	IP112671	2000.0	1994.41	**99.7**	2000.0	1932.94	**96.6**	1949.03	**97.5**	1987.61	**99.4**	1982.88	**99.1**	1933.27	**96.7**
Chromium	CR	ICP	IP112671	1000.0	1038.33	**103.8**	1000.0	1013.99	**101.4**	1018.99	**101.9**	1030.82	**103.1**	1024.70	**102.5**	1011.29	**101.1**
Cobalt	CO	ICP	IP112671	1000.0	1018.62	**101.9**	1000.0	1030.26	**103.0**	1032.48	**103.2**	1031.15	**103.1**	1032.16	**103.2**	1028.39	**102.8**
Copper	CU	ICP	IP112671	1000.0	1053.42	**105.3**	1000.0	1062.46	**106.2**	1033.08	**103.3**	1028.59	**102.9**	1056.20	**105.6**	1072.08	**107.2**
Iron	FE	ICP	IP112671	2000.0	2107.78	**105.4**	2000.0	2037.31	**101.9**	2065.29	**103.3**	2143.77	**107.2**	2117.47	**105.9**	2031.60	**101.6**
Lead	PB	PMS	MS112811	50.0	49.55	**99.1**	50.0	48.78	**97.6**	48.57	**97.1**	47.99	**96.0**	47.91	**95.8**	48.04	**96.1**
Magnesium	MG	ICP	IP112671	2000.0	2081.03	**104.1**	2000.0	2019.03	**101.0**	2038.73	**101.9**	2077.72	**103.9**	2072.22	**103.6**	2025.42	**101.3**
Manganese	MN	ICP	IP112671	1000.0	1005.74	**100.6**	1000.0	975.22	**97.5**	985.59	**98.6**	1000.56	**100.1**	990.76	**99.1**	972.63	**97.3**
Nickel	NI	ICP	IP112671	1000.0	1045.51	**104.6**	1000.0	1021.03	**102.1**	1025.13	**102.5**	1040.55	**104.1**	1035.25	**103.5**	1018.14	**101.8**
Potassium	K	ICP	IP112671	20000.0	20464.95	**102.3**	20000.0	19840.51	**99.2**	20087.47	**100.4**	20335.53	**101.7**	20212.87	**101.1**	20125.88	**100.6**
Selenium	SE	PMS	MS112811	80.0	81.27	**101.6**	50.0	52.11	**104.2**	51.21	**102.4**	50.84	**101.7**	51.37	**102.7**	51.12	**102.2**
Silver	AG	ICP	IP112671	1000.0	1045.92	**104.6**	1000.0	1053.03	**105.3**	1055.42	**105.5**	1052.50	**105.3**	1049.64	**105.0**	1063.15	**106.3**
Sodium	NA	ICP	IP112671	50000.0	53299.27	**106.6**	50000.0	52542.91	**105.1**	52703.31	**105.4**	52984.32	**106.0**	52676.01	**105.4**	52834.38	**105.7**
Thallium	TL	PMS	MS112811	50.0	47.45	**94.9**	50.0	46.62	**93.2**	46.67	**93.3**	45.84	**91.7**	46.12	**92.2**	45.55	**91.1**
Vanadium	V	ICP	IP112671	1000.0	1042.60	**104.3**	1000.0	1054.83	**105.5**	1056.02	**105.6**	1052.49	**105.2**	1050.81	**105.1**	1055.84	**105.6**
Zinc	ZN	ICP	IP112671	1000.0	1081.32	**108.1**	1000.0	1052.08	**105.2**	1059.45	**105.9**	1075.95	**107.6**	1072.58	**107.3**	1044.04	**104.4**

VS45 . 09209

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

UNITS:ug/L

SDG: VS45

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Aluminum	AL	ICP	IP112671	2000.0	1981.55	99.1	2009.01	100.5	1987.11	99.4	2021.13	101.1	2058.54	102.9		
Antimony	SB	PMS	MS112811	50.0	49.97	99.9	50.35	100.7	49.56	99.1	49.70	99.4	50.48	101.0		
Arsenic	AS	PMS	MS112811	50.0	49.93	99.9	49.80	99.6	49.18	98.4	50.03	100.1	51.10	102.2		
Barium	BA	ICP	IP112671	1000.0	991.31	99.1	1013.64	101.4	1003.15	100.3	1017.48	101.7	1010.00	101.0		
Beryllium	BE	ICP	IP112671	1000.0	998.48	99.8	1000.20	100.0	1006.25	100.6	1016.31	101.6	1011.51	101.2		
Cadmium	CD	ICP	IP112671	1000.0	1051.98	105.2	1052.58	105.3	1060.00	106.0	1064.07	106.4	1056.69	105.7		
Calcium	CA	ICP	IP112671	2000.0	1903.98	95.2	1914.22	95.7	1930.11	96.5	1972.57	98.6	1963.25	98.2		
Chromium	CR	ICP	IP112671	1000.0	992.32	99.2	1002.15	100.2	1001.69	100.2	1020.90	102.1	1012.43	101.2		
Cobalt	CO	ICP	IP112671	1000.0	1022.50	102.3	1029.39	102.9	1036.73	103.7	1039.66	104.0	1027.39	102.7		
Copper	CU	ICP	IP112671	1000.0	1064.51	106.5	1073.83	107.4	1065.42	106.5	1037.06	103.7	1024.56	102.5		
Iron	FE	ICP	IP112671	2000.0	1990.33	99.5	1983.77	99.2	2014.69	100.7	2060.92	103.0	2097.20	104.9		
Lead	PB	PMS	MS112811	50.0	47.41	94.8	48.43	96.9	47.26	94.5	47.23	94.5	48.64	97.3		
Magnesium	MG	ICP	IP112671	2000.0	1979.38	99.0	2004.47	100.2	1998.58	99.9	2049.56	102.5	2050.15	102.5		
Manganese	MN	ICP	IP112671	1000.0	958.39	95.8	959.85	96.0	966.20	96.6	984.93	98.5	985.85	98.6		
Nickel	NI	ICP	IP112671	1000.0	999.93	100.0	1013.95	101.4	1009.60	101.0	1030.48	103.0	1022.64	102.3		
Potassium	K	ICP	IP112671	20000.0	19789.03	98.9	19978.16	99.9	19668.56	98.3	20020.06	100.1	20132.07	100.7		
Selenium	SE	PMS	MS112811	50.0	51.57	103.1	51.25	102.5	51.63	103.3	52.19	104.4	53.22	106.4		
Silver	AG	ICP	IP112671	1000.0	1057.94	105.8	1069.61	107.0	1056.37	105.6	1061.19	106.1	1053.52	105.4		
Sodium	NA	ICP	IP112671	50000.0	51570.92	103.1	52256.50	104.5	51948.87	103.9	52659.69	105.3	52672.17	105.3		
Thallium	TL	PMS	MS112811	50.0	45.14	90.3	46.14	92.3	45.45	90.9	45.02	90.0	46.38	92.8		
Vanadium	V	ICP	IP112671	1000.0	1050.30	105.0	1058.14	105.8	1056.23	105.6	1061.07	106.1	1052.21	105.2		
Zinc	ZN	ICP	IP112671	1000.0	1025.01	102.5	1029.24	102.9	1042.50	104.3	1068.45	106.8	1053.56	105.4		

VS45-SDG

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

UNITS: ug/L

SDG: VS45

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Aluminum	AL	ICP	IP112671	50.0	52.48	**105.0**	61.91	**123.8**	48.12	**96.2**						
Antimony	SB	PMS	MS112811	0.2	0.21	**105.0**										
Arsenic	AS	PMS	MS112811	0.2	0.21	**105.0**										
Barium	BA	ICP	IP112671	3.0	2.96	**98.7**	4.01	**133.7**	3.87	**129.0**						
Beryllium	BE	ICP	IP112671	1.0	1.03	**103.0**	1.05	**105.0**	1.07	**107.0**						
Cadmium	CD	ICP	IP112671	2.0	1.89	**94.5**	2.12	**106.0**	2.10	**105.0**						
Calcium	CA	ICP	IP112671	50.0	49.20	**98.4**	51.46	**102.9**	54.15	**108.3**						
Chromium	CR	ICP	IP112671	5.0	4.96	**99.2**	4.89	**97.8**	6.32	**126.4**						
Cobalt	CO	ICP	IP112671	3.0	3.80	**126.7**	3.68	**122.7**	3.70	**123.3**						
Copper	CU	ICP	IP112671	2.0	1.57	**78.5**	1.54	**77.0**	1.67	**83.5**						
Iron	FE	ICP	IP112671	50.0	51.46	**102.9**	62.04	**124.1**	50.68	**101.4**						
Lead	PB	PMS	MS112811	0.1	0.11	**110.0**										
Magnesium	MG	ICP	IP112671	50.0	51.14	**102.3**	53.60	**107.2**	55.92	**111.8**						
Manganese	MN	ICP	IP112671	1.0	1.17	**117.0**	1.66	**166.0**	1.10	**110.0**						
Nickel	NI	ICP	IP112671	10.0	11.96	**119.6**	11.86	**118.6**	12.68	**126.8**						
Potassium	K	ICP	IP112671	500.0	514.89	**103.0**	498.89	**99.8**	505.58	**101.1**						
Selenium	SE	PMS	MS112811	0.5	0.56	**112.0**										
Silver	AG	ICP	IP112671	3.0	2.89	**96.3**	3.09	**103.0**	3.09	**103.0**						
Sodium	NA	ICP	IP112671	500.0	502.26	**100.5**	503.15	**100.6**	507.46	**101.5**						
Thallium	TL	PMS	MS112811	0.2	0.21	**105.0**										
Vanadium	V	ICP	IP112671	3.0	3.09	**103.0**	3.18	**106.0**	3.30	**110.0**						
Zinc	ZN	ICP	IP112671	10.0	10.54	**105.4**	10.52	**105.2**	10.06	**100.6**						

VS45-9021

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

UNITS: ug/L

SDG: VS45

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Aluminum	AL	ICP	IP112671	200.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Antimony	SB	PMS	MS112811	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Arsenic	AS	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Barium	BA	ICP	IP112671	200.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Beryllium	BE	ICP	IP112671	5.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cadmium	CD	ICP	IP112671	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Calcium	CA	ICP	IP112671	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Chromium	CR	ICP	IP112671	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Cobalt	CO	ICP	IP112671	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Copper	CU	ICP	IP112671	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Iron	FE	ICP	IP112671	100.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Lead	PB	PMS	MS112811	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Magnesium	MG	ICP	IP112671	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Manganese	MN	ICP	IP112671	15.0	1.0	1.0	U	1.0	U	1.0	U	1.2	B	1.0	U	1.0	U
Nickel	NI	ICP	IP112671	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Potassium	K	ICP	IP112671	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Selenium	SE	PMS	MS112811	5.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Silver	AG	ICP	IP112671	10.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Sodium	NA	ICP	IP112671	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Thallium	TL	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vanadium	V	ICP	IP112671	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Zinc	ZN	ICP	IP112671	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

UNITS: ug/L

SDG: VS45

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Aluminum	AL	ICP	IP112671	200.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Antimony	SB	PMS	MS112811	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U		
Arsenic	AS	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U		
Barium	BA	ICP	IP112671	200.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Beryllium	BE	ICP	IP112671	5.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cadmium	CD	ICP	IP112671	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Calcium	CA	ICP	IP112671	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Chromium	CR	ICP	IP112671	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Cobalt	CO	ICP	IP112671	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Copper	CU	ICP	IP112671	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Iron	FE	ICP	IP112671	100.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Lead	PB	PMS	MS112811	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U		
Magnesium	MG	ICP	IP112671	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Manganese	MN	ICP	IP112671	15.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Nickel	NI	ICP	IP112671	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Potassium	K	ICP	IP112671	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Selenium	SE	PMS	MS112811	5.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U		
Silver	AG	ICP	IP112671	10.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Sodium	NA	ICP	IP112671	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Thallium	TL	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U		
Vanadium	V	ICP	IP112671	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Zinc	ZN	ICP	IP112671	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

VS45 : 09213

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: Landsburg Mine

RUNID: IP112671

SDG: VS45

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	196858.1	194133.9	**97.1**	199546.5	197449.7	**98.7**	198481.0	196057.7	**98.0**
Antimony		1000	10.9	1007.7	**100.8**	11.3	1030.9	**103.1**	7.8	1041.3	**104.1**
Arsenic		1000	16.8	990.2	**99.0**	16.9	1007.7	**100.8**	19.4	1015.3	**101.5**
Barium		1000	-4.6	981.6	**98.2**	-3.8	991.3	**99.1**	-2.7	987.3	**98.7**
Beryllium		1000	0.1	1001.1	**100.1**	0.1	1024.1	**102.4**	0.1	1018.7	**101.9**
Boron			-4.9	-6.1		-6.7	-5.8		-3.1	-4.7	
Cadmium		1000	-0.3	1001.0	**100.1**	-0.1	1023.4	**102.3**	0.0	1030.9	**103.1**
Calcium	100000	100000	98481.7	97438.1	**97.4**	99235.0	99361.5	**99.4**	98252.5	98747.8	**98.7**
Chromium		1000	1.0	994.2	**99.4**	0.5	1011.3	**101.1**	1.0	1003.5	**100.4**
Cobalt		1000	-0.6	967.7	**96.8**	-0.5	984.2	**98.4**	-0.6	993.5	**99.4**
Copper		1000	-0.6	1008.3	**100.8**	-0.6	1030.9	**103.1**	-0.7	1041.7	**104.2**
Iron	200000	200000	193545.9	191318.1	**95.7**	196742.4	196456.1	**98.2**	194711.1	194951.5	**97.5**
Lead		1000	1.3	942.2	**94.2**	1.0	959.4	**95.9**	0.3	966.5	**96.7**
Magnesium	100000	100000	101709.0	96852.1	**96.9**	103217.7	98770.5	**98.8**	102374.9	97980.2	**98.0**
Manganese		1000	1.0	946.0	**94.6**	1.4	969.7	**97.0**	0.8	962.7	**96.3**
Molybdenum			1.7	1.8		2.1	2.0		2.0	1.8	
Nickel		1000	1.3	975.5	**97.6**	0.8	989.3	**98.9**	-0.4	982.6	**98.3**
Potassium			6.5	-47.9		10.7	-35.0		4.6	-31.9	
Selenium		1000	11.0	966.6	**96.7**	3.5	983.7	**98.4**	11.0	998.7	**99.9**
Silicon			0.2	3.6		1.3	2.1		4.2	9.1	
Silver		1000	-1.0	983.1	**98.3**	-1.0	1001.8	**100.2**	-1.1	1011.6	**101.2**
Sodium			19.2	26.8		14.1	27.6		21.3	33.8	
Strontium			4.1	4.1		4.2	4.2		4.3	4.3	
Thallium		1000	-1.5	911.9	**91.2**	-0.3	924.4	**92.4**	-3.3	931.6	**93.2**
Tin			-8.1	-7.5		-7.3	-6.8		-6.8	-6.8	
Titanium			3.5	2.6		3.2	3.0		3.0	2.5	
Vanadium		1000	3.4	956.5	**95.7**	3.6	973.6	**97.4**	4.3	983.1	**98.3**
Zinc		1000	2.5	966.5	**96.7**	3.3	982.4	**98.2**	3.1	977.9	**97.8**

VS45 9621 14

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: Landsburg Mine

RUNID: MS112811

SDG: VS45

INSTRUMENT ID: NEXION 300D

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Antimony			0.1	0.1							
Arsenic		20	0.1	20.0	**100.0**						
Cadmium		20	0.1	19.8	**99.0**						
Chromium		20	0.7	20.8	**104.0**						
Cobalt		20	0.0	20.6	**103.0**						
Copper		20	0.9	21.5	**107.5**						
Manganese		20	0.1	19.5	**97.5**						
Molybdenum	400	400	434.3	401.0	**100.3**						
Nickel		20	0.4	21.1	**105.5**						
Selenium			-0.2	-0.2							
Silver		20	0.0	21.1	**105.5**						
Thorium			0.2	0.1							
Zinc		20	0.9	20.3	**101.5**						

VS45 0215

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

ANALYSIS METHOD: ICP

SDG: VS45

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Aluminum	LMW-3-1112L	VS45A-L	Water	IP112671	50.00	U	250.00	U		
Barium	LMW-3-1112L	VS45A-L	Water	IP112671	74.12	B	71.60	B	3.4	
Beryllium	LMW-3-1112L	VS45A-L	Water	IP112671	1.00	U	5.00	U		
Cadmium	LMW-3-1112L	VS45A-L	Water	IP112671	2.00	U	10.00	U		
Calcium	LMW-3-1112L	VS45A-L	Water	IP112671	37488.71		35501.10		5.3	
Chromium	LMW-3-1112L	VS45A-L	Water	IP112671	5.00	U	25.00	U		
Cobalt	LMW-3-1112L	VS45A-L	Water	IP112671	3.00	U	15.00	U		
Copper	LMW-3-1112L	VS45A-L	Water	IP112671	2.03	B	10.00	U	100.0	
Iron	LMW-3-1112L	VS45A-L	Water	IP112671	50.00	U	250.00	U		
Magnesium	LMW-3-1112L	VS45A-L	Water	IP112671	15924.63		15127.55	B	5.0	
Manganese	LMW-3-1112L	VS45A-L	Water	IP112671	56.87		54.60	B	4.0	
Nickel	LMW-3-1112L	VS45A-L	Water	IP112671	10.00	U	50.00	U		
Potassium	LMW-3-1112L	VS45A-L	Water	IP112671	1704.16	B	2500.00	U	100.0	
Silver	LMW-3-1112L	VS45A-L	Water	IP112671	3.00	U	15.00	U		
Sodium	LMW-3-1112L	VS45A-L	Water	IP112671	10376.67		10113.65	B	2.5	
Vanadium	LMW-3-1112L	VS45A-L	Water	IP112671	3.00	U	15.00	U		
Zinc	LMW-3-1112L	VS45A-L	Water	IP112671	10.00	U	50.00	U		

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

ANALYSIS METHOD: PMS

SDG: VS45

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Antimony	LMW-3-1112L	VS45A-L	Water	MS112811	0.01	U	0.10	B		
Arsenic	LMW-3-1112L	VS45A-L	Water	MS112811	0.74	B	0.80	B	8.1	
Lead	LMW-3-1112L	VS45A-L	Water	MS112811	0.01	U	0.30	B		
Selenium	LMW-3-1112L	VS45A-L	Water	MS112811	0.08	U	0.00	B		
Thallium	LMW-3-1112L	VS45A-L	Water	MS112811	0.01	U	0.00	B		

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS45 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Aluminum	AL	ICP	OPTIMA ICP 2	308.22		200	50.0	4/1/2012	250000.0	7/30/2012
Antimony	SB	PMS	NEXION 300D MS	0.00		60	0.2	4/1/2012		
Arsenic	AS	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2012		
Barium	BA	ICP	OPTIMA ICP 2	455.50		200	3.0	4/1/2012	100000.0	7/30/2012
Beryllium	BE	ICP	OPTIMA ICP 2	313.04		5	1.0	4/1/2012	5000.0	7/30/2012
Cadmium	CD	ICP	OPTIMA ICP 2	228.80		5	2.0	4/1/2012	20000.0	7/30/2012
Calcium	CA	ICP	OPTIMA ICP 2	317.93		5000	50.0	4/1/2012	500000.0	7/30/2012
Chromium	CR	ICP	OPTIMA ICP 2	267.72		10	5.0	4/1/2012	100000.0	7/30/2012
Cobalt	CO	ICP	OPTIMA ICP 2	228.62		50	3.0	4/1/2012	80000.0	7/30/2012
Copper	CU	ICP	OPTIMA ICP 2	324.75		25	2.0	4/1/2012	40000.0	7/30/2012
Iron	FE	ICP	OPTIMA ICP 2	259.94		100	50.0	4/1/2012	250000.0	7/30/2012
Lead	PB	PMS	NEXION 300D MS	0.00		3	0.1	4/1/2012		
Magnesium	MG	ICP	OPTIMA ICP 2	279.08		5000	50.0	4/1/2012	500000.0	7/30/2012
Manganese	MN	ICP	OPTIMA ICP 2	257.61		15	1.0	4/1/2012	30000.0	7/30/2012
Nickel	NI	ICP	OPTIMA ICP 2	231.60		40	10.0	4/1/2012	100000.0	7/30/2012
Potassium	K	ICP	OPTIMA ICP 2	766.49		5000	500.0	4/1/2012	500000.0	7/30/2012
Selenium	SE	PMS	NEXION 300D MS	0.00		5	0.5	4/1/2012		
Silver	AG	ICP	OPTIMA ICP 2	328.07		10	3.0	4/1/2012	5000.0	7/30/2012
Sodium	NA	ICP	OPTIMA ICP 2	589.00		5000	500.0	4/1/2012	5000000.0	7/30/2012
Thallium	TL	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2012		
Vanadium	V	ICP	OPTIMA ICP 2	292.40		50	3.0	4/1/2012	50000.0	7/30/2012
Zinc	ZN	ICP	OPTIMA ICP 2	213.86		20	10.0	4/1/2012	100000.0	7/30/2012

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

IEC DATE: 11/12/2012

SDG: VS45

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	9.1050360	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0581760	0.0000000	-0.8953680	1.5607750	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1763230	0.0000000	0.0000000	0.1637240
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	6.5458340	0.0000000	0.0000000	0.0000000	0.0000000	0.1152580	0.0000000	0.0000000	0.0095100
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0295099	0.0000000	0.0091790	0.0000000	-0.0348880	0.0000000	0.0000000	-0.0392710
Cobalt	228.62	0.0000000	0.0000000	0.0788170	0.0000000	0.0000000	0.0000000	0.0000000	-0.0346500	0.0000000	0.0130090
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1608400	0.0000000	0.0000000	-0.0442360
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.4437390	0.0000000	0.0000000
Lead	220.35	-0.2393490	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1467250	-1.7804540	1.4264890	0.0412430
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.4396410	-1.1694080	0.0000000	0.5321920
Manganese	257.61	0.0046450	0.0000000	0.0000000	0.0000000	0.0019080	0.0000000	0.0000000	0.0000000	0.0000000	-0.0054280
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0108090	0.0000000	0.0000000	0.0540880	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.4883700	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.5902270	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	5.5577350	0.3891400	0.0000000	-0.1069480
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1236770	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0477260	0.0000000	0.0000000	0.1988470	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-4.2880510	0.0000000	0.0349450
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0645950	0.0000000	0.0000000

VS45-6921-3

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

IEC DATE: 11/12/2012

SDG: VS45

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	17.2648390	0.0000000	0.0000000	0.0000000	2.1534780	0.0000000	14.6676620	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	-0.3171320	0.0000000	0.0000000	-1.6488050	0.0000000	-2.7828430	0.0000000
Arsenic	188.98	0.0000000	0.0000000	3.5824010	0.0000000	0.0000000	0.0000000	-28.6279570	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.1006020	0.0000000	0.0000000	0.0000000	0.0000000	0.2160840	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0120420	0.0000000	0.1997240	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.9709640	0.0000000	0.0000000	0.0000000	0.0000000	0.6837900	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0863140	0.0880780	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.3314250	0.0362000
Cobalt	228.62	0.0000000	0.0000000	-0.1203920	0.1624660	0.0000000	0.0000000	1.9337740	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0084630	0.0000000	0.4010840	0.0000000	0.0000000	0.0000000	0.2064430	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	8.4794020	0.0000000
Lead	220.35	0.0000000	0.0000000	-0.4099510	-0.1101090	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-5.5537550	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	-0.2086980	0.0000000	0.0000000	0.0000000	-0.0242310	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5468870	0.0000000	0.4309940	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5703720	0.0000000
Silicon	288.16	-0.1197150	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0400098	0.0000000	-2.8848200	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	-0.8464030	-0.9915990	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	3.4340400	0.0000000
Tin	189.93	0.0000000	0.0000000	0.8648230	0.0000000	-0.0322750	-0.4551870	-0.1436590	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.8648230	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1521530	0.5765370	0.0000000	0.0000000	0.0000000	0.5629710	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2677330	0.0000000	-0.0519400	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

VS45 - 60226

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS45

ANALYSIS METHOD: ICP

ARI PREP CODE: TWC

PREPDATE: 11/19/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-3-1112	VS45A	0.000	50.0	50.0
LMW-3-1112D	VS45ADUP	0.000	50.0	50.0
LMW-3-1112S	VS45ASPK	0.000	50.0	50.0
LMW-EB-1112	VS45B	0.000	50.0	50.0
LMW-8-1112	VS45C	0.000	50.0	50.0
LMW-5-1112	VS45D	0.000	50.0	50.0
LMW-7-1112	VS45E	0.000	50.0	50.0
LMW-7-1112-D	VS45F	0.000	50.0	50.0
PBW	VS45MB1	0.000	50.0	50.0
LCSW	VS45MB1SPK	0.000	50.0	50.0

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS45

ANALYSIS METHOD: PMS

ARI PREP CODE: REN

PREPDATE: 11/16/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-3-1112	VS45A	0.000	50.0	25.0
LMW-3-1112D	VS45ADUP	0.000	50.0	25.0
LMW-3-1112S	VS45ASPK	0.000	50.0	25.0
LMW-EB-1112	VS45B	0.000	50.0	25.0
LMW-8-1112	VS45C	0.000	50.0	25.0
LMW-5-1112	VS45D	0.000	50.0	25.0
LMW-7-1112	VS45E	0.000	50.0	25.0
LMW-7-1112-D	VS45F	0.000	50.0	25.0
PBW	VS45MB1	0.000	50.0	25.0
LCSW	VS45MB1SPK	0.000	50.0	25.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 11/26/2012

SDG: VS45 | RUNID: IP112671 | METHOD: ICP | END DATE: 11/26/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	11143		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
S2	S2	1.00	11184						X			X	X	X	X					X												X	
S3	S3	1.00	11203		X					X													X										X
S4	S4	1.00	11225																														
S5	S5	1.00	11250			X					X					X		X	X			X											
S0	S0	1.00	11410		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
S2	S2	1.00	11445						X			X	X	X	X					X												X	
S2	S2	1.00	12351						X			X	X	X	X					X												X	
ZZZZZZ	ZZZZZZ	1.00	12385																														
S4	S4	1.00	12485																														
S5	S5	1.00	12505			X					X					X		X	X			X											
ICV	ICV	1.00	12530		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICB	ICB	1.00	12571		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRII	1.00	13012		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAI	1.00	13054		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABI	1.00	13095		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	HiPurQC7M	1.00	13150																														
ZZZZZZ	SPEXQC21	1.00	13192																														
ZZZZZZ	DICHECK	1.00	13233																														
CCV	CCV1	1.00	13275		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB1	1.00	13315		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	VS21MB1	2.00	13361																														
ZZZZZZ	VS20E	5.00	13402																														
ZZZZZZ	VS21B	5.00	13442																														
ZZZZZZ	VS21C	5.00	13482																														
ZZZZZZ	VS21A-L	25.00	13522																														
ZZZZZZ	VS21A	5.00	13562																														
ZZZZZZ	VS21ADUP	5.00	14002																														
ZZZZZZ	VS21ASPK	5.00	14042																														
ZZZZZZ	ZZZZZZ	5.00	14081																														
ZZZZZZ	VS21MB1SPK	2.00	14112																														
CCV	CCV2	1.00	14152		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB2	1.00	14193		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	VS21D	5.00	14234																														
ZZZZZZ	VS21E	5.00	14274																														

VS45 - 11/26/2012

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 11/26/2012

SDG: VS45 | RUNID: IP112671 METHOD: ICP | END DATE: 11/26/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS21F	5.00	14314																														
ZZZZZZ	VS21G	5.00	14354																														
ZZZZZZ	VS21H	5.00	14394																														
ZZZZZZ	VS21I	5.00	14434																														
ZZZZZZ	VS21J	5.00	14474																														
ZZZZZZ	VS21K	5.00	14514																														
ZZZZZZ	VS21L	5.00	14554																														
CCV	CCV3	1.00	14594		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB3	1.00	15035		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB4	1.00	15084		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CRI	CRIF	1.00	15125		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
ICSA	ICSAF	1.00	15171		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
ICSAB	ICSABF	1.00	15213		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCV	CCV4	1.00	15251		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB5	1.00	15292		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
ZZZZZZ	VS36MB	1.00	15333																														
ZZZZZZ	VS36B	1.00	15375																														
ZZZZZZ	VS36C	1.00	15420																														
ZZZZZZ	VS36D	1.00	15460																														
ZZZZZZ	VS36E	1.00	15502																														
ZZZZZZ	VS36F	1.00	15543																														
ZZZZZZ	VS36ADUP	1.00	15585																														
ZZZZZZ	VS36A	1.00	16030																														
ZZZZZZ	VS36ASPK	1.00	16071																														
ZZZZZZ	VS36MBSPK	1.00	16111																														
CCV	CCV5	1.00	16151		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB6	1.00	16192		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
ZZZZZZ	VS36G	1.00	16233																														
ZZZZZZ	VS36H	1.00	16275																														
ZZZZZZ	VS36I	1.00	16320																														
CCV	CCV6	1.00	16362		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB7	1.00	16402		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
ZZZZZZ	VR80MB1	1.00	16443																														
ZZZZZZ	VR80B	1.00	16485																														
ZZZZZZ	VR80C	1.00	16530																														

FORM XIV

IP112671-VS45-092212

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 11/26/2012

SDG: VS45 | RUNID: IP112671 | METHOD: ICP | END DATE: 11/26/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VR80D	1.00	16571																														
ZZZZZZ	VR80ADUP	1.00	17013																														
ZZZZZZ	VR80A	1.00	17054																														
ZZZZZZ	VR80ASPK	1.00	17100																														
ZZZZZZ	ZZZZZZ	1.00	17140																														
ZZZZZZ	VR80MB1SPK	1.00	17180																														
CCV	CCV7	1.00	17220		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB8	1.00	17260		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
PBW	VS45MB1	1.00	17301		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-EB-1112	VS45B	1.00	17343		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-8-1112	VS45C	1.00	17385		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-5-1112	VS45D	1.00	17430		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-3-1112L	VS45A-L	5.00	17472		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-3-1112	VS45A	1.00	17513		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-3-1112D	VS45ADUP	1.00	17554		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-3-1112S	VS45ASPK	1.00	18000		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-3-1112A	VS45APOST	1.00	18040																														
LCSW	VS45MB1SPK	1.00	18080		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCV	CCV8	1.00	18120		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB9	1.00	18160		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-7-1112	VS45E	1.00	18201		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
LMW-7-1112-D	VS45F	1.00	18243		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCV	CCV9	1.00	18284		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB10	1.00	18325		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CRI	CRIF1	1.00	18370		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
ICSA	ICSAF1	1.00	18412		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
ICSAB	ICSABF1	1.00	18454		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCV	CCV10	1.00	18493		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X
CCB	CCB11	1.00	18533		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X								X	X

VS45 : 9/22/13

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS45 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09160				X																	X	X	X				X			
S1	S1	1.00	09200				X																	X	X	X				X			
S2	S2	1.00	09240				X																	X	X	X				X			
S3	S3	1.00	09280				X																	X	X	X				X			
S4	S4	1.00	09330				X																	X	X	X				X			
S5	S5	1.00	09390																														
ZZZZZZ	Rinse sampl	1.00	09460																														
ICV	MICV	1.00	10010				X																	X	X	X				X			
ICB	ICB	1.00	10080				X																	X	X	X				X			
CCV	MCCV1	1.00	10120				X																	X	X	X				X			
CCB	CCB1	1.00	10190				X																	X	X	X				X			
CRI	MCRI	1.00	10230				X																	X	X	X				X			
ICSA	ICSAI	1.00	10270				X																	X	X	X				X			
ICSAB	ICSABI	1.00	10340				X																	X	X	X				X			
ZZZZZZ	LR200	1.00	10410																														
ZZZZZZ	LR300	1.00	10470																														
ZZZZZZ	B1	1.00	10540																														
ZZZZZZ	B2	1.00	11000																														
ZZZZZZ	B3	1.00	11060																														
CCV	MCCV2	1.00	11100				X																	X	X	X				X			
CCB	CCB2	1.00	11170				X																	X	X	X				X			
ZZZZZZ	VT84MB1	2.00	11350																														
ZZZZZZ	VT84MB2	2.00	11390																														
ZZZZZZ	VT84MB2SPK	2.00	11430																														
ZZZZZZ	VT84MB1SPK	2.00	11470																														
ZZZZZZ	VT84A	2.00	11510																														
ZZZZZZ	VT84B	2.00	11550																														
CCV	MCCV3	1.00	12060				X																	X	X	X				X			
CCB	CCB3	1.00	12130				X																	X	X	X				X			
ZZZZZZ	VS20MB1	20.00	12220																														
ZZZZZZ	VS20MB1SPK	20.00	12260																														
ZZZZZZ	VR88MB2SPK	2.00	12310																														
ZZZZZZ	VR88J	5.00	12360																														
ZZZZZZ	VS20B	20.00	12400																														
ZZZZZZ	VS20C	20.00	12440																														

FORM XIV

VS45 9225

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS45 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS20D	20.00	12480																														
ZZZZZZ	VS20E	20.00	12520																														
ZZZZZZ	VS20G	20.00	12560																														
ZZZZZZ	VS20H	20.00	13000																														
CCV	MCCV4	1.00	13050				X																	X	X	X				X			
CCB	CCB4	1.00	13120				X																	X	X	X				X			
ZZZZZZ	VS21MB1	20.00	13220																														
ZZZZZZ	VS21MB1SPK	20.00	13260																														
ZZZZZZ	VS21A-L	100.00	13300																														
ZZZZZZ	VS21A	20.00	13340																														
ZZZZZZ	VS21ADUP	20.00	13380																														
ZZZZZZ	VS21ASPK	20.00	13420																														
ZZZZZZ	ZZZZZZ	20.00	13470																														
ZZZZZZ	VS21B	20.00	13510																														
ZZZZZZ	VS20I	20.00	13550																														
ZZZZZZ	VS20D	100.00	13590																														
CCV	MCCV5	1.00	14030				X																	X	X	X				X			
CCB	CCB5	1.00	14100				X																	X	X	X				X			
ZZZZZZ	VS21C	20.00	14170																														
ZZZZZZ	VS21D	20.00	14210																														
ZZZZZZ	VS21E	20.00	14260																														
ZZZZZZ	VS21F	20.00	14300																														
ZZZZZZ	VS21G	20.00	14340																														
ZZZZZZ	VS21H	20.00	14390																														
ZZZZZZ	VS21I	20.00	14430																														
ZZZZZZ	VS21J	20.00	14470																														
ZZZZZZ	VS21K	20.00	14510																														
ZZZZZZ	VS21L	20.00	14550																														
CCV	MCCV6	1.00	14590				X																	X	X	X				X			
CCB	CCB6	1.00	15060				X																	X	X	X				X			
ZZZZZZ	VS22MB1	20.00	15130																														
ZZZZZZ	VS22MB1SPK	20.00	15180																														
ZZZZZZ	VS22A-L	100.00	15230																														
ZZZZZZ	VS22A	20.00	15270																														
ZZZZZZ	VS22ADUP	20.00	15310																														

FORM XIV

VS45 12208

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS45 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS22ASPK	20.00	15350																														
ZZZZZZ	VS22APOST	20.00	15390																														
ZZZZZZ	VS22B	20.00	15430																														
ZZZZZZ	VS22C	20.00	15470																														
ZZZZZZ	VS21B	100.00	15520																														
CCV	MCCV7	1.00	15560				X																	X	X	X				X			
CCB	CCB7	1.00	16030				X																	X	X	X				X			
ZZZZZZ	VS22D	20.00	16160																														
ZZZZZZ	VS22E	20.00	16200																														
ZZZZZZ	VS22F	20.00	16250																														
ZZZZZZ	VS22G	20.00	16290																														
ZZZZZZ	VS22H	20.00	16330																														
ZZZZZZ	VS22I	20.00	16370																														
ZZZZZZ	VS22J	20.00	16420																														
ZZZZZZ	VS22K	20.00	16460																														
ZZZZZZ	VS22L	20.00	16500																														
LMW-EB-1112	VS45B	2.00	16540				X																	X	X	X				X			
CCV	MCCV8	1.00	16580				X																	X	X	X				X			
CCB	CCB8	1.00	17050				X																	X	X	X				X			
PBW	VS45MB1	2.00	17090				X																	X	X	X				X			
LCSW	VS45MB1SPK	2.00	17130				X																	X	X	X				X			
LMW-3-1112L	VS45A-L	10.00	17180				X																	X	X	X				X			
LMW-3-1112	VS45A	2.00	17230				X																	X	X	X				X			
LMW-3-1112D	VS45ADUP	2.00	17270				X																	X	X	X				X			
LMW-3-1112S	VS45ASPK	2.00	17310				X																	X	X	X				X			
ZZZZZZ	ZZZZZZ	2.00	17350																														
LMW-8-1112	VS45C	2.00	17390				X																	X	X	X				X			
LMW-5-1112	VS45D	2.00	17430				X																	X	X	X				X			
LMW-7-1112	VS45E	2.00	17470				X																	X	X	X				X			
CCV	MCCV9	1.00	17510				X																	X	X	X				X			
CCB	CCB9	1.00	17580				X																	X	X	X				X			
ZZZZZZ	VS61MB1	2.00	18020																														
ZZZZZZ	VS61MB1SPK	2.00	18070																														
ZZZZZZ	VS61A-L	10.00	18120																														
ZZZZZZ	VS61A	2.00	18160																														

FORM XIV

VS15-092812

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS45 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS61ADUP	2.00	18200																														
ZZZZZZ	VS61ASPK	2.00	18240																														
ZZZZZZ	ZZZZZZ	2.00	18280																														
LMW-7-1112-D	VS45F	2.00	18320				X																	X	X	X				X			
ZZZZZZ	VS61B	2.00	18370																														
ZZZZZZ	VS61C	2.00	18410																														
CCV	MCCV10	1.00	18450				X																	X	X	X				X			
CCB	CCB10	1.00	18520				X																	X	X	X				X			

VS45 : 6229

Mercury Analysis
Report and Summary QC Forms

ARI Job ID: VS45, VS46

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS46

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-3-1112	VS46A	12-22819	
LMW-3-1112D	VS46ADUP	12-22819	
LMW-3-1112S	VS46ASPK	12-22819	
LMW-EB-1112	VS46B	12-22820	
PBW	VS46MB1	12-22820	
LCSW	VS46MB1SPK	12-22820	
LMW-8-1112	VS46C	12-22821	
LMW-5-1112	VS46D	12-22822	
LMW-7-1112	VS46E	12-22823	
LMW-7-1112-D	VS46F	12-22824	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 11/26/12 Title: Inorganics Director

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

ANALYTICAL RESOURCES INCORPORATED

Data Release Authorized:
Reported: 12/07/12
Date Received: 11/13/12
Page 1 of 1

QC Report No: VS46-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
LMW-3-1112 VS46A 12-22819	11/13/12	Water	11/19/12 11/26/12	100	100 U
LMW-EB-1112 VS46B 12-22820	11/13/12	Water	11/19/12 11/26/12	100	100 U
LMW-8-1112 VS46C 12-22821	11/13/12	Water	11/19/12 11/26/12	100	100 U
LMW-5-1112 VS46D 12-22822	11/13/12	Water	11/19/12 11/26/12	100	100 U
LMW-7-1112 VS46E 12-22823	11/13/12	Water	11/19/12 11/26/12	100	100 U
LMW-7-1112-D VS46F 12-22824	11/13/12	Water	11/19/12 11/26/12	100	100 U
MB-111912 Method Blank	NA	Water	11/19/12 11/26/12	100	100 U

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

FORM-I

VS45:00230

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-3-1112**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: VS46A
LIMS ID: 12-22819
Matrix: Water
Data Release Authorized:
Reported: 12/07/12

QC Report No: VS46-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7470A	100 U	102	100	102%	

Reported in ng/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

VS45:00233 12/10/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-3-1112
DUPLICATE

Lab Sample ID: VS46A
LIMS ID: 12-22819
Matrix: Water
Data Release Authorized:
Reported: 12/07/12

QC Report No: VS46-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/13/12
Date Received: 11/13/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7470A	100 U	100 U	0.0%	+/- 100	L

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

FORM-VI

VS45 00934 PN 12/10/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: VS46LCS
LIMS ID: 12-22820
Matrix: Water
Data Release Authorized:
Reported: 12/07/12

QC Report No: VS46-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	193	200	96.5%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

VS45:0235 AV 12/10/12

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

UNITS: ng/L

SDG: VS46

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Mercury	HG	CVL	HG112601	500.0	458.00	**91.6**	500.0	493.00	**98.6**	490.00	**98.0**	493.00	**98.6**	503.00	**100.6**		

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS46

UNITS: ng/L

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Mercury	HG	CVL	HG112601	20.0	15.20	**76.0**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS46

UNITS: ng/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Mercury	HG	CVL	HG112601	25.0	20.0	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U		

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS46 UNITS: ng/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ng/L)	ICP LR DATE
Mercury	HG	CVL	CETAC MERCURY	253.70		25	20.0	4/1/2012		

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS46

ANALYSIS METHOD: CVL

ARI PREP CODE: TLM

PREPDATE: 11/19/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-3-1112	VS46A	0.000	20.0	20.0
LMW-3-1112D	VS46ADUP	0.000	20.0	20.0
LMW-3-1112S	VS46ASPK	0.000	20.0	20.0
LMW-EB-1112	VS46B	0.000	20.0	20.0
LMW-8-1112	VS46C	0.000	20.0	20.0
LMW-5-1112	VS46D	0.000	20.0	20.0
LMW-7-1112	VS46E	0.000	20.0	20.0
LMW-7-1112-D	VS46F	0.000	20.0	20.0
PBW	VS46MB1	0.000	20.0	20.0
LCSW	VS46MB1SPK	0.000	20.0	20.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: CETAC MERCURY | START DATE: 11/26/2012

SDG: VS46 | RUNID: HG112601 | METHOD: CVL | END DATE: 11/26/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	11000														X																
S20	S20	1.00	11025														X																
S50	S50	1.00	11053														X																
S100	S100	1.00	11081														X																
S200	S200	1.00	11105														X																
S400	S400	1.00	11133														X																
S1000	S1000	1.00	11162														X																
ICV	AICV	1.00	11230														X																
ICB	ICB	1.00	11254														X																
CCV	ACCV1	1.00	11282														X																
CCB	CCB1	1.00	11311														X																
CRA	CRA	1.00	11335														X																
ZZZZZZ	VS63MB1	1.00	11363																														
ZZZZZZ	VS63MB1SPK	1.00	11391																														
ZZZZZZ	VS63A	1.00	11415																														
ZZZZZZ	VS63ADUP	1.00	11444																														
ZZZZZZ	VS63ASPK	1.00	11472																														
ZZZZZZ	VS63B	1.00	11500																														
ZZZZZZ	VS63C	1.00	11524																														
ZZZZZZ	VS81MB1	1.00	11552																														
ZZZZZZ	VS81MB1SPK	1.00	11581																														
CCV	ACCV2	1.00	12005														X																
CCB	CCB2	1.00	12034														X																
ZZZZZZ	VS81A	1.00	12062																														
ZZZZZZ	VS81ADUP	1.00	12090																														
ZZZZZZ	VS81ASPK	1.00	12114																														
ZZZZZZ	VS81B	1.00	12142																														
ZZZZZZ	VS81C	1.00	12170																														
PBW	VS46MB1	1.00	12194														X																
LCSW	VS46MB1SPK	1.00	12223														X																
LMW-3-1112	VS46A	1.00	12251														X																
LMW-3-1112D	VS46ADUP	1.00	12275														X																
LMW-3-1112S	VS46ASPK	1.00	12303														X																
CCV	ACCV3	1.00	12332														X																
CCB	CCB3	1.00	12360														X																

FORM XIV

VS46-1259-1512

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: CETAC MERCURY | START DATE: 11/26/2012

SDG: VS46 | RUNID: HG112601 | METHOD: CVL | END DATE: 11/26/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
LMW-EB-1112	VS46B	1.00	12385														X																
LMW-8-1112	VS46C	1.00	12413														X																
LMW-5-1112	VS46D	1.00	12441														X																
LMW-7-1112	VS46E	1.00	12465														X																
LMW-7-1112-D	VS46F	1.00	12493														X																
CCV	ACCV4	1.00	12522														X																
CCB	CCB4	1.00	12550														X																

VS15 00212

Table of Contents: ARI Job VS61, VS63

Client: Golder Associates Project:

BC
Signature

November-30-2012
Date

Table of Contents: ARI Job VS61, VS63

Client: Golder Associates Project:

BC
Signature

November-30-2012
Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 5, 2012

Doug Morell
Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Client Project Name: Landsburg Mine
Client Project Number: 923-1000-002.R273
ARI ID: VS61, VS63

Dear Mr. Morell:

Please find enclosed the original Chain of Custody record, sample receipt documentation, and the final results for the project referenced above.

Sample receipt and analytical details are addressed in the enclosed Case Narrative.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to call me at any time.

Respectfully,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: VS61, VS63

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: USC1	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Golder Associates	Phone: 4258830777	Date: 11/14/2012	Ice Present? Y
Client Contact: Douglas Morell / Jill Lamberts		No. of Coolers: 4	Cooler Temps: 1.5-2.7
Client Project Name: Landsburg Mine			
Client Project #: 923-1000-002-R273	Samplers: J. Lamberts, C. Wilder		

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

Sample ID	Date	Time	Matrix	No Containers	Analysis Requested: VOCs - client list	PCBs / Pest	SVOC client list 8270	TPH-HCID	TAML Total Metals	TAML ** Diss Metals			Notes/Comments
Trip Blank	11/14/2012	—	DI	6	X			X					Golder + ARI
LMW-9-1112		1000	W	17	X	X	X	X	X	HOLD			
LMW-11-1112		1150	W	17	X	X	X	X	X				
LMW-6-1112		1410	W	17	X	X	X	X	X				

** Field Filtered w/ 0.45 µm filter
Please analyze under existing MSA btwn

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by (Signature)
Please cc. tklongley@golder.com jlamberts@golder.com dmorell@golder.com				
	Printed Name: CLARA WILDER	Printed Name: Jason Stracka	Printed Name:	Printed Name:
	Company: GOLDER	Company: ARI	Company:	Company:
	Date & Time: 11/14/12 1540	Date & Time: 11-14-12 1546	Date & Time:	Date & Time:

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.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Landsburg mine

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

Assigned ARI Job No: VS61 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): 2.7 0.5 2.4 1.5 ____ ____

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID# 90871962

Cooler Accepted by: TL Date: 11-14-12 Time: 1540

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	10-30-12	

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

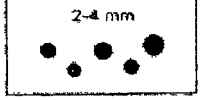
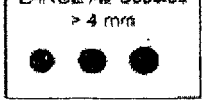
Samples Logged by: KS Date: 11-14-12 Time: 1603

***** 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 Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
		

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 11/14/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **VS61**

Inquiry Number: NONE
Analysis Requested: 11/15/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: TS
Sample Set Used: Yes-119
Validatable Package: Lv4
Deliverables:

PC: Kelly
VTSR: 11/14/12

Project #:
Project:
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-22879 **VS61A**	LMW-9-1112						TOT P															
12-22880 **VS61B**	LMW-11-1112						TOT P															
12-22881 **VS61C**	LMW-6-1112						TOT P															

P= Pass

VS61 ..9055

Checked By TJ Date 11/14/12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder

Project Name: Landsburg mine

COC No(s): _____ NA

Delivered by Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: VS63

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): 2.7 0.5 2.4 1.5 ____ ____

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 7657796 2

Cooler Accepted by: TR Date: 11-14-12 Time: 1540

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)		_____

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

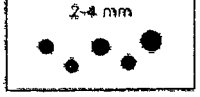
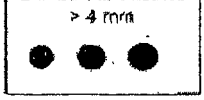
Samples Logged by: CJ Date: 11-14-12 Time: 1633

***** 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 Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
		

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 11/14/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **VS63**

Inquiry Number: NONE
Analysis Requested: 11/14/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: TS
Sample Set Used: Yes-119
Validatable Package: Lv4
Deliverables:

PC: Kelly
VTSR: 11/14/12

Project #:
Project:
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-22883 **VS63A**	LMW-9-1112						TOT															
12-22884 **VS63B**	LMW-11-1112						TOT															
12-22885 **VS63C**	LMW-6-1112						TOT															

P-, pass

VS63 : 90907

Checked By TS Date 11-14-12

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: VS61, VS63

Case Narrative
Project: Landsburg Mine
ARI ID: VS61, VS63
December 5, 2012

Sample Receipt:

Analytical Resources, Inc. (ARI) accepted three water samples and a trip blank in good condition on November 14, 2012 under ARI Sample Delivery Groups (SDGs) VS61 and VS63. The samples were received with cooler temperatures between 0.5 and 2.7°C.

For further details regarding sample receipt please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for Volatile Organics, Semivolatile Organics, Pesticides, PCBs, HCID and Total Metals, as requested on the Chain of Custody. The dissolved metals were placed on hold pending further instructions. All HCID samples were non-detect and did not require follow up analyses.

Volatile Organics by Method 8260C:

The samples were analyzed on 11/23/12 - within the method recommended holding times. All samples had a pH of <2.0.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The percent differences for several compounds were high for the CCALs that bracketed the analyses of these samples. All positive results for these analytes have been flagged with a "Q" qualifier. No further corrective action was taken.

Surrogates: All surrogates are in control.

Method Blank(s): A small amount of hexachlorobutadiene was detected in the method blank associated with these samples. Since this compound was not detected in any sample associated with this blank, no corrective actions were taken.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): The percent recoveries for hexechlorobutadiene were high following the analyses of the LCS/LCSD analyzed on 11/23/12. Since this compound was not detected in any sample associated with this LCS/LCSD, except as noted above, the high bias does not compromise any RL. No corrective actions were taken.

Semivolatile Organics by Method 8270D:

The samples were extracted on 11/19/12 and analyzed between 11/21/12 and 11/22/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

VS61:09 BC 12/5/12

Case Narrative
Project: Landsburg Mine
ARI ID: VS61, VS63
December 5, 2012

Surrogates: All surrogates are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

Pesticides by Method 8081B:

The samples were extracted on 11/17/12 and analyzed on 11/21/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

PCBs by Method 8082A:

The samples were extracted on 11/19/12 and analyzed on 11/27/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Method Blank(s): The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

HCID by NWTPH:

The samples were extracted on 11/15/12 and analyzed on 11/16/12 - within the method recommended holding times.

Case Narrative
Project: Landsburg Mine
ARI ID: VS61, VS63
December 5, 2012

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): The LCS and LCSD were in control.

Total Metals by EPA Methods 6010C, 200.8, and 7471A

The samples were digested between 11/16/12 and 11/19/12. The digests were analyzed on 11/28/12 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Samples: No anomalies were encountered for these samples.

Lab Control(s): The LCS recoveries were within control limits.

Method Blank(s): The method blanks were free of contamination.

Matrix spike(s)/ RPD(s): All percent recoveries and RPDs were within acceptable QC limits.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VS61
Client: Golder Associates
Project Event: N/A
Project Name: N/A

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-9-1112	VS61A	12-22879	Water	11/14/12 10:00	11/14/12 15:40
2.	LMW-11-1112	VS61B	12-22880	Water	11/14/12 11:50	11/14/12 15:40
3.	LMW-6-1112	VS61C	12-22881	Water	11/14/12 14:10	11/14/12 15:40
4.	Trip Blanks	VS61D	12-22882	Water	11/14/12	11/14/12 15:40

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VS63
Client: Golder Associates
Project Event: N/A
Project Name: N/A

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-9-1112	VS63A	12-22883	Water	11/14/12 10:00	11/14/12 15:40
2.	LMW-11-1112	VS63B	12-22884	Water	11/14/12 11:50	11/14/12 15:40
3.	LMW-6-1112	VS63C	12-22885	Water	11/14/12 14:10	11/14/12 15:40

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
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).

S — Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA — The flagged analyte was not analyzed for

NR — Spiked compound recovery is not reported due to chromatographic interference

NS — The flagged analyte was not spiked into the sample

M — Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters This flag is used only for GC-MS analyses

M2 — The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N — The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y — The analyte is not detected at or above the reported concentration The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit

EMPC — Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C — The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P — The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X — Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z — Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)					
Analyte	**DL[1] µg/L**	**LOD[1] µg/L**	**LOQ[1] µg/L**	**LCS Recovery[2,4]**	**Replicate RPD[3]**
Chloromethane	0.095	0.25	**0.5**	77 – 122	≤ 40
Vinyl Chloride	0.057	0.1	**0.2**	74 – 123	≤ 40
Bromomethane	0.252	0.5	**1.0**	68 – 130	≤ 40
Chloroethane	0.086	0.1	**0.2**	68 – 133	≤ 40
Trichlorofluoromethane	0.037	0.1	**0.2**	74 – 135	≤ 40
Acrolein	2.476	2.5	**5.0**	60 – 124	≤ 40
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.043	0.1	**0.2**	76 – 124	≤ 40
Acetone	2.057	2.5	**5.0**	64 – 125	≤ 40
1,1-Dichloroethene	0.054	0.1	**0.2**	74 – 120	≤ 40
Bromoethane	0.041	0.1	**0.2**	77 – 122	≤ 40
Iodomethane (Methyl Iodide)	0.227	0.5	**1.0**	76 – 123	≤ 40
Methylene Chloride	0.485	0.5	**1.0**	71 – 125	≤ 40
Acrylonitrile	0.604	1.0	**1.0**	76 – 123	≤ 40
Carbon Disulfide	0.037	0.1	**0.2**	77 – 124	≤ 40
trans-1,2-Dichloroethene	0.048	0.1	**0.2**	75 – 120	≤ 40
Vinyl Acetate	0.069	0.1	**0.2**	74 – **120**	≤ 40
1,1-Dichloroethane	0.053	0.1	**0.2**	80 – 120	≤ 40
2-Butanone	0.814	2.5	**5.0**	73 – 123	≤ 40
2,2-Dichloropropane	0.052	0.1	**0.2**	72 – 133	≤ 40
cis-1,2-Dichloroethene	0.043	0.1	**0.2**	78 – 120	≤ 40
Chloroform	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Bromochloromethane	0.061	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1-Trichloroethane	0.041	0.1	**0.2**	79 – 124	≤ 40
1,1-Dichloropropene	0.034	0.1	**0.2**	**80 – 120**	≤ 40
Carbon Tetrachloride	0.044	0.1	**0.2**	71 – 139	≤ 40
1,2-Dichloroethane	0.072	0.1	**0.2**	**80** – 121	≤ 40
Benzene	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Trichloroethene	0.049	0.1	**0.2**	**80 – 120**	≤ 40
1,2-Dichloropropane	0.035	0.1	**0.2**	**80 – 120**	≤ 40
Bromodichloromethane	0.051	0.1	**0.2**	**80** – 122	≤ 40
Dibromomethane	0.145	0.2	**0.2**	**80 – 120**	≤ 40
2-Chloroethylvinyl Ether	0.250	0.5	**1.0**	62 – 130	≤ 40
4-Methyl-2-Pentanone	0.974	2.5	**5.0**	**80** – 125	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
cis 1,3-dichloropropene	0.061	0.1	**0.2**	**80** – 127	≤ 40
Toluene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
trans 1,3-Dichloropropene	0.081	0.1	**0.2**	79 – 132	≤ 40
2-Hexanone	0.902	2.5	**5.0**	80 – 129	≤ 40
1,1,2-Trichloroethane	0.129	0.2	**0.2**	**80 – 120**	≤ 40
1,3-Dichloropropane	0.062	0.1	**0.2**	**80 – 120**	≤ 40
Tetrachloroethene	0.047	0.1	**0.2**	**80 – 120**	≤ 40
Dibromochloromethane	0.048	0.1	**0.2**	**80** – 120	≤ 40
1,2-Dibromoethane (Ethylene Dibromide)	0.075	0.1	**0.2**	**80 – 120**	≤ 40
Chlorobenzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Ethyl Benzene	0.037	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1,2-Tetrachloroethane	0.040	0.1	**0.2**	**80** – 128	≤ 40
m,p-xylene	0.052	0.2	**0.4**	**80 – 120**	≤ 40
o-Xylene	0.035	0.1	**0.2**	**80** – 120	≤ 40
Styrene	0.045	0.1	**0.2**	**80** – 121	≤ 40
Bromoform	0.062	0.1	**0.2**	62 – 149	≤ 40
1,1,2,2-Tetrachloroethane	0.060	0.1	**0.2**	**80 – 120**	≤ 40
1,2,3-Trichloropropane	0.131	0.25	**0.5**	**80 – 120**	≤ 40
trans-1,4-Dichloro 2-Butene	0.324	0.5	**1.0**	47 – 147	≤ 40
n-Propyl Benzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Bromobenzene	0.060	0.1	**0.2**	**80 – 120**	≤ 40
iso-propyl Benzene	0.021	0.1	**0.2**	**80 – 120**	≤ 40
2-Chloro Toluene	0.024	0.1	**0.2**	**80 – 120**	≤ 40
4-Chloro Toluene	0.016	0.1	**0.2**	**80 – 120**	≤ 40
tert-Butyl Benzene	0.026	0.1	**0.2**	**80** – 121	≤ 40
1,3,5-Trimethyl Benzene	0.015	0.1	**0.2**	**80 – 120**	≤ 40
1,2,4-Trimethylbenzene	0.024	0.1	**0.2**	**80** – 122	≤ 40
sec-Butyl Benzene	0.024	0.1	**0.2**	**80** – 121	≤ 40
4-Isopropyl Toluene	0.026	0.1	**0.2**	**80** – 124	≤ 40
1,3-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40
1,4-Dichlorobenzene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
n-Butyl Benzene	0.025	0.1	**0.2**	**80** – 125	≤ 40
1,2-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
1,2-Dibromo 3-Chloropropane	0.366	0.5	**0.5**	79 – 129	≤ 40
1,2,4-Trichlorobenzene	0.107	0.25	**0.5**	77 – 127	≤ 40
Hexachloro-1,3-Butadiene	0.073	0.25	**0.5**	80 – 135	≤ 40
Naphthalene	0.118	0.25	**0.5**	**80** – 128	≤ 40
1,2,3-Trichlorobenzene	0.110	0.25	**0.5**	**80** - 125	≤ 40
Dichlorodifluoromethane	0.052	0.1	**0.2**	68 – 133	≤ 40
Methyl-*tert*-butyl ether	0.073	0.25	**0.5**	79 – 121	≤ 40
Surrogate Standards			**MB / LCS**	**Samples**	**RPD**
1,2-Dichloroethane-d_4			**80 – 120**	**80** – 130	≤ 40
1,2-Dichlorobenzene-d_4			**80 – 120**	**80 – 120**	≤ 40
Toluene-d_8			**80 – 120**	**80 – 120**	≤ 40
4-Bromofluorobenzene			**80 – 120**	**80 – 120**	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Control limits calculated using all data from 1/1/12 through 5/31/12.
(3) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(4) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that:
a. ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit or
b. Control limits for analyzes with no separate preparation procedure are adjusted to reflect the minimum uncertainty in the calibration of the instrument allowed by the referenced analytical method.

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
Phenol	**0.445**	**0.5**	**1**	26 – 112	≤ 40
Bis(2-Chloroethyl)ether	**0.257**	**0.5**	**1**	51 – **100**	≤ 40
2-Chlorophenol	**0.246**	**0.5**	**1**	50 – **100**	≤ 40
1,3-Dichlorobenzene	**0.499**	**0.5**	**1**	27 – **100**	≤ 40
1,4-Dichlorobenzene	**0.470**	**0.5**	**1**	29 – **100**	≤ 40
1,2-Dichlorobenzene	**0.436**	**0.5**	**1**	32 – **100**	≤ 40
Benzyl alcohol	**0.409**	**1.0**	**2**	**10** - 128	≤ 40
2,2'-oxybis(1-Chloropropane)	**0.221**	**0.5**	**1**	39 - 101	≤ 40
2-Methylphenol	**0.329**	**0.5**	**1**	47 – **100**	≤ 40
Hexachloroethane	**0.610**	**1.0**	**2**	19 – **100**	≤ 40
N-Nitroso-di-n-propylamine	**0.365**	**0.5**	**1**	46 – **100**	≤ 40
4-Methylphenol	**0.536**	**1.0**	**2**	46 – **100**	≤ 40
Nitrobenzene	**0.490**	**0.5**	**1**	46 – 103	≤ 40
Isophorone	**0.258**	**0.5**	**1**	62 – 105	≤ 40
2-Nitrophenol	**0.979**	**1.5**	**3**	32 – 116	≤ 40
2,4-Dimethylphenol	**0.627**	**1.5**	**3**	15 – **100**	≤ 40
Bis(2-Chloroethoxy)methane	**0.252**	**0.5**	**1**	44 – **100**	≤ 40
2,4-Dichlorophenol	**1.109**	**1.5**	**3**	35 – 114	≤ 40
1,2,4-Trichlorobenzene	**0.495**	**0.5**	**1**	34 – **100**	≤ 40
Naphthalene	**0.326**	**0.5**	**1**	48 – **100**	≤ 40
Benzoic acid	**8.647**	**10**	**20**	**10** - 172	≤ 40
4-Chloroaniline	**1.733**	**2.5**	**5**	**10** - 153	≤ 40
2,6-Dinitrotoluene	**1.300**	**1.5**	**3**	32 – 129	≤ 40
Hexachlorobutadiene	**0.604**	**1.5**	**3**	22 – **100**	≤ 40
4-Chloro-3-methylphenol	**0.919**	**1.5**	**3**	33 – 123	≤ 40
Hexachlorocyclopentadiene	**1.862**	**2.5**	**5**	**10** – **100**	≤ 40
2,4,6-Trichlorophenol	**1.235**	**1.5**	**3**	37 – 120	≤ 40
2,4,5-Trichlorophenol	**1.706**	**2.5**	**5**	37 – 124	≤ 40
2-Chloronaphthalene	**0.340**	**0.5**	**1**	49 – **100**	≤ 40
2-Nitroaniline	**0.784**	**1.5**	**3**	18 – 140	≤ 40
Acenaphthylene	**0.274**	**0.5**	**1**	47 – 110	≤ 40
Dimethylphthalate	**0.264**	**0.5**	**1**	60 – 106	≤ 40
Acenaphthene	**0.347**	**0.5**	**1**	55 – 101	≤ 40

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
3-Nitroaniline	**1.140**	**1.5**	**3**	**10** – 208	≤ 40
2-Methylnaphthalene	**0.241**	**0.5**	**1**	38 – **100**	≤ 40
2,4-Dinitrophenol	**5.474**	**10**	**20**	**10** – 224	≤ 40
Dibenzofuran	**0.198**	**0.5**	**1**	46 – 108	≤ 40
4-Nitrophenol	**2.895**	**5.0**	**10**	**10** – 103	≤ 40
2,4-Dinitrotoluene	**1.277**	**1.5**	**3**	33 – 134	≤ 40
Fluorene	**0.266**	**0.5**	**1**	59 – 108	≤ 40
4-Chlorophenyl-phenylether	**0.342**	**0.5**	**1**	54 – 104	≤ 40
Diethylphthalate	**0.407**	**0.5**	**1**	60 - 108	≤ 40
4-Nitroaniline	**1.366**	**1.5**	**3**	13 – 144	≤ 40
4,6-Dinitro-2-methylphenol	**4.928**	**5.0**	**10**	**10** – 190	≤ 40
N-Nitrosodiphenylamine	**0.392**	**0.5**	**1**	39 – 100	≤ 40
4-Bromophenyl-phenylether	**0.262**	**0.5**	**1**	56 – 105	≤ 40
Hexachlorobenzene	**0.335**	**0.5**	**1**	54 – 108	≤ 40
Pentachlorophenol	**2.746**	**5.0**	**10**	25 – 144	≤ 40
Phenanthrene	**0.283**	**0.5**	**1**	64 – 115	≤ 40
Anthracene	**0.303**	**0.5**	**1**	59 – 107	≤ 40
Carbazole	**0.251**	**0.5**	**1**	36 – 123	≤ 40
Di-n-butylphthalate	**0.304**	**0.5**	**1**	62 – 110	≤ 40
Fluoranthene	**0.290**	**0.5**	**1**	63 – 119	≤ 40
Pyrene	**0.379**	**0.5**	**1**	57 – 117	≤ 40
Butylbenzylphthalate	**0.402**	**0.5**	**1**	49 – 118	≤ 40
Benzo(a)anthracene	**0.373**	**0.5**	**1**	61 – 113	≤ 40
3,3'-Dichlorobenzidine	**1.553**	**2.5**	**5**	**10** – 151	≤ 40
Chrysene	**0.397**	**0.5**	**1**	62 – 115	≤ 40
bis(2-Ethylhexyl)phthalate	**1.050**	**1.5**	**3**	47 – 127	≤ 40
Di-n-octylphthalate	**0.331**	**0.5**	**1**	60 – 106	≤ 40
Benzo(b)fluoranthene	**0.298**	**0.5**	**1**	61 – 120	≤ 40
Benzo(k)fluoranthene	**0.487**	**0.5**	**1**	59 – 120	≤ 40
Benzo(a)pyrene	**0.425**	**0.5**	**1**	46 – 105	≤ 40
Indeno(1,2,3-cd)pyrene	**0.435**	**0.5**	**1**	42 – 134	≤ 40
Dibenzo(a,h)anthracene	**0.437**	**0.5**	**1**	46 – 132	≤ 40
Benzo(g,h,i)perylene	**0.464**	**0.5**	**1**	33 – 135	≤ 40
N-Nitrosodimethylamine	**1.209**	**1.5**	**3**	17 - 106	≤ 40

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
Aniline	**0.470**	**0.5**	**1**	**10** – 113	≤ 40
1-methylnaphthalene	**0.199**	**0.5**	**1**	43 – **100**	≤ 40
Azobenzene (1,2-DP-Hydrazine)	**0.214**	**0.5**	**1**	52 – 111	≤ 40
Benzofluoranthenes, Total	**2.317**	**2.5**	**5**	60 – 130[5]	≤ 40
Surrogate Standard Recovery			**MB / LCS**	**Samples**	**RPD**
2-Fluorophenol			33 – 100	23 – **100**	≤ 40
Phenol-d_5			15 - 121	16 – 106	≤ 40
2-Chlorophenol-d_4			46 – 102	33 – 100	≤ 40
1,2-Dichlorobenzene-d_4			40 – **100**	27 – **100**	≤ 40
Nitrobenzene-d_5			50 – **100**	34 – 101	≤ 40
2-Fluorobiphenyl			51 – **100**	38 – **100**	≤ 40
2,4,6-Tribromophenol			46 – 125	31 – 128	≤ 40
p-Terphenyl-d_{14}			54 – 117	27 – 122	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Control limits calculated using all data from 8/1/10 through 7/31/11.
(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(5) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits.

DL[1], LOD[1], LOQ[1] and Control Limits Summary
Analysis of Water Samples for Chlorinated Pesticides
EPA Method 8081B

Separatory Funnel (EPA Method 3510C) Extraction using 500 mL sample with extract concentrated to 5 mL final volume. ARI Bench Sheet 3038F

LOD Spike level = LOQ Concentration

Analyte	DL[1,2] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Control Limit[3,4]	Replicate RPD[5]
alpha-BHC	0.0085	0.025	**0.05**	51 – 120	≤ 40
beta-BHC	0.0098	0.025	**0.05**	44 – 134	≤ 40
gamma-BHC (Lindane)	0.0159	0.025	**0.05**	59 – 131	≤ 40
delta-BHC	0.0087	0.025	**0.05**	44 – 156	≤ 40
Heptachlor	0.0113	0.025	**0.05**	47 – 110	≤ 40
Aldrin	0.0103	0.025	**0.05**	47 – 106	≤ 40
Heptachlor Epoxide	0.0079	0.025	**0.05**	62 – 121	≤ 40
trans-Chlordane (*beta*-Chlordane, *gamma*-Chlordane)	0.0082	0.025	**0.05**	63 – 125	≤ 40
cis-Chlordane (*alpha*-chlordane)	0.0082	0.025	**0.05**	62 – 123	≤ 40
Endosulfan I	0.0089	0.025	**0.05**	**10** – 110	≤ 40
4,4'-DDE	0.0184	0.05	**0.10**	61 – 138	≤ 40
Dieldrin	0.0168	0.05	**0.10**	64 – 123	≤ 40
Endrin	0.0167	0.05	**0.10**	53 – 127	≤ 40
Endosulfan II	0.0139	0.05	**0.10**	23 – 102	≤ 40
4,4'-DDD	0.0186	0.05	**0.10**	53 – 133	≤ 40
Endrin Aldehyde	0.0163	0.05	**0.10**	28 – 107	≤ 40
4,4'-DDT	0.0169	0.05	**0.10**	49 – 127	≤ 40
Endosulfan Sulfate	0.0235	0.05	**0.10**	49 – 121	≤ 40
Endrin Ketone	0.0151	0.05	**0.10**	45 – 126	≤ 40
Methoxychlor	0.0744	0.25	**0.50**	48 – 118	≤ 40
Hexachlorobutadiene	0.0123	0.05	**0.10**	23 – **100**	≤ 40
Hexachlorobenzene	0.0101	0.05	**0.10**	44 – 101	≤ 40
Surrogate Standard Recovery			**MB / LCS**	**Samples**	**RPD**
Tetrachloro-*m*-xylene (TCMX)			38 – 103	30 – 105	≤ 40
Decachlorobiphenyl			37 – 125	11 – 144	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation as defined in ARI SOP 1018S.
(2) MDL study QD48
(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(4) Control limits calculated using all data from 1/1/12 through 7/31/12.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Quality Control Criteria for Analysis of Aqueous and Tissue Samples for Aroclors (Polychlorinated Biphenyls – PCB) EPA Method 8082B

Analysis Code	Extraction	DL[1]	LOD[1]	LOQ[1]	Analyte	Spike Recovery Control Limits (%)[2,3]			RPD[4]
						LCS	MB/LCS Surrogate	Sample Surrogate	
Aqueous Samples (Separatory Funnel Extraction – EPA Method 3510C)									
PCBWSI 01-3018F	500 to 5 mL	0.130 µg/L	0.5 µg/L	1 µg/L	Aroclor 1016	45 – 121	--	--	≤ 40
		0.147 µg/L	0.5 µg/L	1 µg/L	Aroclor 1260	54 – 129	--	--	
		--	--	--	TCMX	--	40 – 118	38 – 118	
		--	--	--	DCBP	--	41 – 111	29 – 118	
PCBWSM 02-3021F	500 to 1 mL	0.0175 µg/L	0.05 µg/L	0.1 µg/L	Aroclor 1016	36 – **100**	--	--	≤ 40
		0.0174 µg/L	0.05 µg/L	0.1 µg/L	Aroclor 1260	41 – 113	--	--	
		--	--	--	TCMX	--	29 – **100**	25 – **100**	
		--	--	--	DCBP	--	39 – 116	**10** – 128	
PCBWLS	1000 to 0.5 mL[5]	0.00248 µg/L	0.005 µg/L	0.01 µg/L	Aroclor 1016	44 – 117	--	--	≤ 40
		0.00276 µg/L	0.005 µg/L	0.01 µg/L	Aroclor 1260	46 – 131	--	--	
		--	--	--	TCMX	--	31 – **100**	21 – **100**	
		--	--	--	DCBP	--	32 – 108	19 – 111	
TCLP Extract (Separatory Funnel Extraction – EPA Method 3510C)									
PCBWST	100 to 10 mL	0.130 µg/L[8]	5 µg/L	10 µg/L	Aroclor 1016	30 – 160	--	--	≤ 40
		0.147 µg/L[8]	5 µg/L	10 µg/L	Aroclor 1260	30 – 160	--	--	
		--	--	--	TCMX	--	30 – 160	30 – 160	
		--	--	--	DCBP	--	30 – 160	30 – 160	
Tissue Samples (Tissuemizer / Blender Extraction – EPA Method 3550C Modified) – Concentrations in µg/kg as received (wet weight)									
PCBUZI 09-3029F	10 g to 5 mL	2.92 µg/kg[6]	25 µg/kg	50 µg/kg	Aroclor 1016	30 – 160			≤ 40
		3.91 µg/kg[6]	25 µg/kg	50 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	
PCBUZM 10-3027F	25 g to 5 mL	2.37 µg/kg[7]	10 µg/kg	20 µg/kg	Aroclor 1016	30 – 160			≤ 40
		1.06 µg/kg[7]	10 µg/kg	20 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	
PCBUZL 11-3030F	25 g to 1 mL	2.37[7] µg/kg	2 µg/kg	4 µg/kg	Aroclor 1016	30 – 160			≤ 40
		1.06[7] µg/kg	2 µg/kg	4 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	

(1) Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) are defined in ARI SOP 1018S.
(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(3) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(5) Low level extraction solvent is hexane instead of Methylene Chloride.
(6) LOD Study SM10
(7) MDL Study QZ25
(8) Based on PCBWSI until sufficient TCLP data is collected to calculate LOD.

Analytical Resources,Incorporated
Analytical Chemists and Consultants

Quality Control Criteria
Total Petroleum Hydrocarbons
(Diesel & Motor Oil)

Analysis Code	Analyte[5]	DL[1] ppm	LOD[1] ppm	LOQ[2] ppm	Spike % Recovery Control Limits[3]			RPD[4]
					LCS	MB/LCS Surrogate	Sample Surrogate	
HCIWVX	NWTPH-HCID – Water Samples	--	--	0.50 [7]	--	--	50-150	≤ 40
HCISVX	NWTPH-HCID – Solid Samples	--	--	50 [7]	--	--	50-150	
Aqueous Samples – No Extract Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.022	0.05	0.1	64-112	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.022	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.044	0.1	0.2	60 – 130 [8]	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [9]	0.1	0.2	60-120 [6]	60-120	50-150	
Aqueous Samples – With Acid and/or Silica Gel Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.039	0.05	0.1	61-104	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.042	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.010	0.1	0.2	60 – 130 [8]	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [8]	0.1	0.2	60-120 [6]	60-120	50-150	
Solid Matrix Samples – No Extract Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.35	2.5	5	62-119	50-150	50-150	≤ 40
DIESMI	DRO – NWTPH-Dext Jet A	2.22 [11]	2.5	5	60 – 130 [8]	50-150	50-150	
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.43	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	2.48	5	10	60 – 130 [8]	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [9]	5	10	60-120 [6]	60-120	50-150	
Solid Matrix Samples – With Acid and/or Silica Gel Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.28	2.5	5	60-108	50-150	50-150	≤ 40
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.06	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	1.57	5	10	60 – 130 [8]	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [10]	5	10	60-120 [6]	60-120	50-150	

(1) DL (Detection Limit) and LOD (Limit of Detection) as defined in ARI SOP 1018S.
(2) Limit of Quantitation as defined in ARI SOP 1018S. The spike concentration used to determine the DL and the concentration of the lowest standard used to calibrate the GC-FID instrument.
(3) All surrogate recovery limits are specified in the published methods (AK102, AK103 & NWTPH-Dext). The surrogate standard is *o*-Terphenyl.
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$
(5) DRO = Diesel Range Organics and RRO = Residual Range Organics as defined in the methods referenced in footnote 3.
(6) Method specified LCS acceptance limits.
(7) Method specified reporting limits
(8) Default LCS control limits pending calculation of historic limits
(9) MDL study QD55 completed 2/12/10
(10) MDL study QD35 completed 1/29/10
(11) LOD Study UI44 completed 2/28/12

Quality Control Parameters for Metals Analysis-ICP-OES 200.7/6010C

	Aqueous Samples[2]			Spike Recovery		RPD[5]	Solids[3]	Tissue[4]
Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ mg/kg	LOQ mg/kg
Aluminum	7.57	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Antimony	6.28	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Arsenic	3.33	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Barium	1.33	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Beryllium	0.16	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Boron	7.39	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Cadmium	0.18	0.5	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Calcium	11.27	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Chromium	1.24	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Cobalt	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Copper	0.92	1.0	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Iron	7.50	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Lead	1.55	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Magnesium	9.61	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Manganese	0.28	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Molybdenum	0.79	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Nickel	3.86	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Potassium	65.70	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Selenium	4.99	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Silicon	8.17	30	**60**	75 – 125	80 – 120	≤ 20	**(6)**	**(6)**
Silver	0.43	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Sodium	11.35	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Strontium	0.09	1.0	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Thallium	3.10	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Tin	1.41	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Titanium	2.11	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.01**
Vanadium	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Zinc	1.45	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Tissue is reported on an "as received" (wet weight) basis using 2.5 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$
(6) ARI does not analyze for Silicon in solids or tissue samples

Quality Control Parameters for Metals Analysis ICP-MS 200.8/6020A

Analyte	Mass	Aqueous Samples[2]			Spike Recovery		RPD[4]	Solids[3]
		DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ[1] mg/kg
Aluminum	27	1.601	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Antimony	121	0.010	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
	123	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #1	75	0.048	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #2	75	0.092	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Barium	135	0.020	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	137	0.019	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Beryllium	9	0.021	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Cadmium	111	0.010	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
	114	0.005	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Calcium	43	3.983	25	**50.0**	75 – 125	80 – 120	≤ 20	**50.0**
Chromium	52	0.045	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	53	0.118	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Cobalt	59	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Copper	63	0.158	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	65	0.236	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Iron	54	5.753	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
	57	3.876	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Lead	208	0.046	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Magnesium	24	0.297	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Manganese	55	0.022	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Molybdenum	98	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Nickel	60	0.079	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	62	0.089	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Potassium	39	2.944	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Selenium	82	0.127	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	78	0.324	0.25	**2.0**	75 – 125	80 – 120	≤ 20	**2.0**
Silver	107	0.008	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Sodium	23	2.833	50	**100.0**	75 – 125	80 – 120	≤ 20	**100.0**
Thorium[5]	232	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Thallium	205	0.004	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Uranium[5]	238	0.003	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Vanadium	51	0.043	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Zinc	66	0.497	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	67	0.531	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	68	0.524	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(5) ARI has no accreditation for these elements.

Quality Control Parameters for Mercury Analysis using CVAA

	Aqueous Samples[2]			Spike Recovery		RPD[5]
	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS	
Mercury	0.0069	0.05	**0.10**[2]	75 – 125	80 – 120	≤ 20
Mercury (low level)	0.0026	0.01	**0.02**[2]	75 – 125	80 – 120	≤ 20
	Soil / Sediment Samples			**Spike Recovery**		**RPD**[5]
	DL[1] mg/kg	**LOD[1] mg/kg**	**LOQ[1] mg/kg**	**Matrix Spike**	**LCS**	
Mercury	0.0021	0.0125	0.025[3]	75 – 125	80 – 120	≤ 20
	Tissue Samples			**Spike Recovery**		**RPD**[5]
	DL[1] mg/kg	**LOD[1] mg/kg**	**LOQ[1] mg/kg**	**Matrix Spike**	**LCS**	
Mercury	0.0021	0.0125	0.005[4]	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 20 mL sample with 20 mL final volume
(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.
(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

Volatile Analysis
Report and Summary QC Forms

ARI Job ID: VS61, VS63

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-9-1112**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS61A
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized: MW
Reported: 11/26/12

QC Report No: VS61-Golder Associates
Project:
Date Sampled: 11/14/12
Date Received: 11/14/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 18:42

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS61A QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project:
Matrix: Water
Date Analyzed: 11/23/12 18:42

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	113%
d8-Toluene	99.4%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	107%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-11-1112**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS61B
LIMS ID: 12-22880
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS61-Golder Associates
Project:
Date Sampled: 11/14/12
Date Received: 11/14/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 19:08

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS61B QC Report No: VS61-Golder Associates
LIMS ID: 12-22880 Project:
Matrix: Water
Date Analyzed: 11/23/12 19:08

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	98.6%
Bromofluorobenzene	106%
d4-1,2-Dichlorobenzene	105%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-6-1112**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS61C
LIMS ID: 12-22881
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS61-Golder Associates
Project:
Date Sampled: 11/14/12
Date Received: 11/14/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 19:35

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-6-1112**
 SAMPLE

Lab Sample ID: VS61C QC Report No: VS61-Golder Associates
LIMS ID: 12-22881 Project:
Matrix: Water
Date Analyzed: 11/23/12 19:35

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	99.2%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	104%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS61D
LIMS ID: 12-22882
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS61-Golder Associates
Project:
Date Sampled: 11/14/12
Date Received: 11/14/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 16:53

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS61D QC Report No: VS61-Golder Associates
LIMS ID: 12-22882 Project:
Matrix: Water
Date Analyzed: 11/23/12 16:53

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	111%
d8-Toluene	100%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	108%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS61-Golder Associates
Project:

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-112312A	Method Blank	10	110%	99.9%	104%	105%	0
LCS-112312A	Lab Control	10	108%	101%	109%	106%	0
LCSD-112312A	Lab Control Dup	10	105%	102%	107%	105%	0
VS61A	LMW-9-1112	10	113%	99.4%	104%	107%	0
VS61B	LMW-11-1112	10	110%	98.6%	106%	105%	0
VS61C	LMW-6-1112	10	108%	99.2%	102%	104%	0
VS61D	Trip Blanks	10	111%	100%	103%	108%	0

	LCS/MB LIMITS	QC LIMITS
SW8260C		
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-130)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 12-22879 to 12-22882

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-112312A**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-112312A QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project:
Matrix: Water
Data Release Authorized:
Reported: 11/26/12 Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT2/PKC Sample Amount LCS: 10.0 mL
LCSD: NT2/PKC LCSD: 10.0 mL
Date Analyzed LCS: 11/23/12 14:11 Purge Volume LCS: 10.0 mL
LCSD: 11/23/12 14:38 LCSD: 10.0 mL

Analyte	LCS		Spike Added-LCS	LCS Recovery	LCSD		Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	9.75		10.0	97.5%	10.5		10.0	105%	7.4%
Bromomethane	11.2		10.0	112%	11.5		10.0	115%	2.6%
Vinyl Chloride	10.6		10.0	106%	11.5		10.0	115%	8.1%
Chloroethane	10.7		10.0	107%	11.1		10.0	111%	3.7%
Methylene Chloride	9.96		10.0	99.6%	10.4		10.0	104%	4.3%
Acetone	56.2		50.0	112%	60.6		50.0	121%	7.5%
Carbon Disulfide	10.5		10.0	105%	12.1		10.0	121%	14.2%
1,1-Dichloroethene	10.9		10.0	109%	11.6		10.0	116%	6.2%
1,1-Dichloroethane	10.4		10.0	104%	10.8		10.0	108%	3.8%
trans-1,2-Dichloroethene	10.3		10.0	103%	10.7		10.0	107%	3.8%
cis-1,2-Dichloroethene	10.5		10.0	105%	10.9		10.0	109%	3.7%
Chloroform	10.9		10.0	109%	11.1		10.0	111%	1.8%
1,2-Dichloroethane	11.6	Q	10.0	116%	11.5	Q	10.0	115%	0.9%
2-Butanone	55.7		50.0	111%	55.1		50.0	110%	1.1%
1,1,1-Trichloroethane	11.5		10.0	115%	11.9		10.0	119%	3.4%
Carbon Tetrachloride	12.6	Q	10.0	126%	13.2	Q	10.0	132%	4.7%
Vinyl Acetate	8.65		10.0	86.5%	8.43		10.0	84.3%	2.6%
Bromodichloromethane	11.8	Q	10.0	118%	11.7	Q	10.0	117%	0.9%
1,2-Dichloropropane	10.6		10.0	106%	10.4		10.0	104%	1.9%
cis-1,3-Dichloropropene	11.3		10.0	113%	11.4		10.0	114%	0.9%
Trichloroethene	10.6		10.0	106%	10.9		10.0	109%	2.8%
Dibromochloromethane	9.46		10.0	94.6%	9.39		10.0	93.9%	0.7%
1,1,2-Trichloroethane	11.0		10.0	110%	11.3		10.0	113%	2.7%
Benzene	10.6		10.0	106%	10.8		10.0	108%	1.9%
trans-1,3-Dichloropropene	10.3		10.0	103%	10.2		10.0	102%	1.0%
2-Chloroethylvinylether	8.50		10.0	85.0%	7.96		10.0	79.6%	6.6%
Bromoform	7.78		10.0	77.8%	7.73		10.0	77.3%	0.6%
4-Methyl-2-Pentanone (MIBK)	60.8	Q	50.0	122%	60.5	Q	50.0	121%	0.5%
2-Hexanone	53.2		50.0	106%	53.5		50.0	107%	0.6%
Tetrachloroethene	11.0		10.0	110%	10.9		10.0	109%	0.9%
1,1,2,2-Tetrachloroethane	9.77		10.0	97.7%	9.98		10.0	99.8%	2.1%
Toluene	11.0		10.0	110%	10.8		10.0	108%	1.8%
Chlorobenzene	10.7		10.0	107%	10.8		10.0	108%	0.9%
Ethylbenzene	11.1		10.0	111%	11.0		10.0	110%	0.9%
Styrene	12.0	Q	10.0	120%	11.7	Q	10.0	117%	2.5%
Trichlorofluoromethane	11.8	Q	10.0	118%	12.3	Q	10.0	123%	4.1%
1,1,2-Trichloro-1,2,2-trifluoroetha	10.6		10.0	106%	12.5		10.0	125%	16.5%
m,p-Xylene	22.8		20.0	114%	22.7		20.0	114%	0.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-112312A**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-112312A QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project:
Matrix: Water

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
o-Xylene	11.7	10.0	117%	11.6	10.0	116%	0.9%
1,2-Dichlorobenzene	11.4	10.0	114%	11.1	10.0	111%	2.7%
1,3-Dichlorobenzene	10.6	10.0	106%	10.6	10.0	106%	0.0%
1,4-Dichlorobenzene	10.6	10.0	106%	10.5	10.0	105%	0.9%
Acrolein	45.0	50.0	90.0%	48.0	50.0	96.0%	6.5%
Iodomethane	10.2	10.0	102%	12.0	10.0	120%	16.2%
Acrylonitrile	9.31	10.0	93.1%	9.77	10.0	97.7%	4.8%
1,1-Dichloropropene	11.0	10.0	110%	11.4	10.0	114%	3.6%
Dibromomethane	11.3	10.0	113%	11.7	10.0	117%	3.5%
1,1,1,2-Tetrachloroethane	12.0 Q	10.0	120%	12.0	10.0	120%	0.0%
1,2-Dibromo-3-chloropropane	10.1	10.0	101%	9.68	10.0	96.8%	4.2%
1,2,3-Trichloropropane	9.76	10.0	97.6%	10.5	10.0	105%	7.3%
trans-1,4-Dichloro-2-butene	8.33	10.0	83.3%	9.00	10.0	90.0%	7.7%
1,3,5-Trimethylbenzene	11.1	10.0	111%	11.1	10.0	111%	0.0%
1,2,4-Trimethylbenzene	11.3	10.0	113%	11.1	10.0	111%	1.8%
Hexachlorobutadiene	15.2 Q	10.0	152%	14.6 Q	10.0	146%	4.0%
1,2-Dibromoethane	11.8 Q	10.0	118%	12.0 Q	10.0	120%	1.7%
Bromochloromethane	10.8	10.0	108%	11.1	10.0	111%	2.7%
2,2-Dichloropropane	11.4	10.0	114%	12.3	10.0	123%	7.6%
1,3-Dichloropropane	10.8	10.0	108%	10.5	10.0	105%	2.8%
Isopropylbenzene	10.1	10.0	101%	10.2	10.0	102%	1.0%
n-Propylbenzene	10.0	10.0	100%	10.1	10.0	101%	1.0%
Bromobenzene	9.52	10.0	95.2%	9.58	10.0	95.8%	0.6%
2-Chlorotoluene	10.4	10.0	104%	10.1	10.0	101%	2.9%
4-Chlorotoluene	9.93	10.0	99.3%	9.96	10.0	99.6%	0.3%
tert-Butylbenzene	11.2	10.0	112%	11.0	10.0	110%	1.8%
sec-Butylbenzene	11.6	10.0	116%	11.4	10.0	114%	1.7%
4-Isopropyltoluene	12.3 Q	10.0	123%	12.0 Q	10.0	120%	2.5%
n-Butylbenzene	12.5 Q	10.0	125%	12.2 Q	10.0	122%	2.4%
1,2,4-Trichlorobenzene	14.0	10.0	140%	12.9	10.0	129%	8.2%
Naphthalene	12.8	10.0	128%	12.0	10.0	120%	6.5%
1,2,3-Trichlorobenzene	14.6	10.0	146%	14.1	10.0	141%	3.5%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	108%	105%
d8-Toluene	101%	102%
Bromofluorobenzene	109%	107%
d4-1,2-Dichlorobenzene	106%	105%

4A
VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB1123

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS61

Project: LANDSBURG MINE

Lab File ID: MB1123A

Lab Sample ID: MB1123

Date Analyzed: 11/23/12

Time Analyzed: 1532

Instrument ID: NT2

Heated Purge: (Y/N) N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS1123	LCS1123	LCS1123A	1411
02	LCS1123	LCS1123	LCS1123B	1438
03	TRIP BLANKS	VS61D	VS61D	1653
04	TRIP BLANKS	VS80D	VS80D	1720
05	LMW-9-1112	VS61A	VS61A	1842
06	LMW-11-1112	VS61B	VS61B	1908
07	LMW-6-1112	VS61C	VS61C	1935
08	LMW-2-1112	VS80A	VS80A	2001
09	LMW-4-1112	VS80B	VS80B	2028
10	LMW-10-1112	VS80C	VS80C	2054
11				
12				
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COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-112312A**
 METHOD BLANK

Lab Sample ID: MB-112312A
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS61-Golder Associates
Project:
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 15:32

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: MB-112312A QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project:
Matrix: Water
Date Analyzed: 11/23/12 15:32

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	**Hexachlorobutadiene**	**0.07**	**0.20**	**0.38**
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	99.9%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	105%

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: VS97 Case No.: LANDSBURG MINE SDG No.: VS61

Lab File ID: BFB1116 BFB Injection Date: 11/16/12

Instrument ID: NT2 BFB Injection Time: 0714

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.9
75	30.0 - 60.0% of mass 95	48.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.6 (0.7)1
174	50.0 - 100.0% of mass 95	83.5
175	5.0 - 9.0% of mass 174	6.3 (7.5)1
176	95.0 - 101.0% of mass 174	80.3 (96.1)1
177	5.0 - 9.0% of mass 176	6.0 (7.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD1	IC1116	0011116	11/16/12	0822
02	VSTD2	IC1116	0021116	11/16/12	0849
03	VSTD5	IC1116	0051116	11/16/12	0915
04	VSTD10	IC1116	0101116	11/16/12	0942
05	VSTD2	IC1116	0201116	11/16/12	1008
06	VSTD10	IC1116	1001116	11/16/12	1034
07	VSTD20	IC1116	2001116	11/16/12	1101
08	VSTD40	IC1116	4001116	11/16/12	1128
09	VSTD60	IC1116	6001116	11/16/12	1155
10	ICV1116	ICV1116	ICV1116	11/16/12	1438
11					
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5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: VS97 Case No.: LANDSBURG MINE SDG No.: VS61

Lab File ID: BFB1123 BFB Injection Date: 11/23/12

Instrument ID: NT2 BFB Injection Time: 1241

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.3
75	30.0 - 60.0% of mass 95	49.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 100.0% of mass 95	85.6
175	5.0 - 9.0% of mass 174	6.3 (7.4)1
176	95.0 - 101.0% of mass 174	83.4 (97.5)1
177	5.0 - 9.0% of mass 176	5.3 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1123	CC1123	CC1123A	11/23/12	1344
02	LCS1123	LCS1123	LCS1123A	11/23/12	1411
03	LCS1123	LCS1123	LCS1123B	11/23/12	1438
04	MB1123	MB1123	MB1123A	11/23/12	1532
05	TRIP BLANKS	VS61D	VS61D	11/23/12	1653
06	TRIP BLANKS	VS80D	VS80D	11/23/12	1720
07	LMW-9-1112	VS61A	VS61A	11/23/12	1842
08	LMW-11-1112	VS61B	VS61B	11/23/12	1908
09	LMW-6-1112	VS61C	VS61C	11/23/12	1935
10	LMW-2-1112	VS80A	VS80A	11/23/12	2001
11	LMW-4-1112	VS80B	VS80B	11/23/12	2028
12	LMW-10-1112	VS80C	VS80C	11/23/12	2054
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
Chloromethane		0.496	0.568	0.583	0.483
Vinyl Chloride	0.463	0.363	0.531	0.502	0.410
Bromomethane		0.216	0.289	0.278	0.214
Chloroethane		0.270	0.332	0.310	0.238
Trichlorofluoromethane		0.506	0.700	0.624	0.507
Acrolein			0.034	0.036	0.029
112Trichloro122Trifluoroetha		0.351	0.415	0.466	0.332
Acetone			0.052	0.056	0.041
1,1-Dichloroethene		0.377	0.423	0.437	0.376
Bromoethane		0.298	0.326	0.324	0.287
Iodomethane		0.664	0.672	0.809	0.638
Methylene Chloride		0.496	0.522	0.527	0.404
Acrylonitrile			0.065	0.076	0.055
Carbon Disulfide		1.199	1.260	1.355	1.128
Trans-1,2-Dichloroethene		0.426	0.505	0.544	0.416
Vinyl Acetate		0.223	0.323	0.364	0.271
1,1-Dichloroethane		0.696	0.872	0.884	0.665
2-Butanone		0.077	0.086	0.093	0.069
2,2-Dichloropropane	0.456	0.476	0.537	0.568	0.440
Cis-1,2-Dichloroethene		0.372	0.515	0.552	0.417
Chloroform		0.686	0.800	0.901	0.684
Bromochloromethane		0.147	0.216	0.225	0.180
1,1,1-Trichloroethane		0.611	0.747	0.751	0.570
1,1-Dichloropropene	0.392	0.377	0.423	0.480	0.333
Carbon Tetrachloride		0.350	0.387	0.436	0.322
1,2-Dichloroethane		0.298	0.322	0.378	0.282
Benzene		1.072	1.262	1.335	1.006
Trichloroethene		0.271	0.349	0.368	0.279
1,2-Dichloropropane		0.220	0.241	0.299	0.216
Bromodichloromethane		0.240	0.342	0.359	0.279
Dibromomethane		0.084	0.137	0.138	0.107
2-Chloroethyl Vinyl Ether			0.081	0.089	0.076
4-Methyl-2-Pentanone		0.040	0.051	0.056	0.049
Cis 1,3-dichloropropene		0.304	0.329	0.378	0.289
Toluene		0.591	0.688	0.778	0.584
Trans 1,3-Dichloropropene		0.202	0.273	0.320	0.248
2-Hexanone			0.090	0.104	0.081

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
1,1,2-Trichloroethane		0.139	0.168	0.192	0.143
1,3-Dichloropropane	0.298	0.304	0.353	0.391	0.297
Tetrachloroethene		0.333	0.374	0.406	0.306
Chlorodibromomethane		0.167	0.207	0.233	0.179
1,2-Dibromoethane	0.120	0.130	0.163	0.194	0.145
Chlorobenzene		0.711	0.859	0.881	0.697
Ethyl Benzene		0.388	0.446	0.497	0.382
1,1,1,2-Tetrachloroethane		0.242	0.271	0.317	0.256
m,p-xylene		0.447	0.562	0.630	0.481
o-Xylene		0.452	0.543	0.580	0.472
Styrene		0.589	0.799	0.841	0.702
Bromoform		0.217	0.247	0.286	0.217
1,1,2,2-Tetrachloroethane	0.318	0.386	0.456	0.492	0.365
1,2,3-Trichloropropane		0.101	0.165	0.162	0.131
Trans-1,4-Dichloro 2-Butene			0.107	0.148	0.101
N-Propyl Benzene		2.403	2.942	3.342	2.388
Bromobenzene		0.615	0.753	0.802	0.596
Isopropyl Benzene		2.159	2.708	3.093	2.322
2-Chloro Toluene	2.070	1.748	2.208	2.358	1.746
4-Chloro Toluene		1.671	2.022	2.223	1.640
T-Butyl Benzene		1.338	1.732	1.963	1.488
1,3,5-Trimethyl Benzene		1.665	2.088	2.347	1.776
1,2,4-Trimethylbenzene		1.565	2.156	2.330	1.704
S-Butyl Benzene		1.938	2.442	2.697	2.033
4-Isopropyl Toluene	1.736	1.530	1.855	2.073	1.619
1,3-Dichlorobenzene		1.127	1.219	1.289	1.039
1,4-Dichlorobenzene		1.124	1.281	1.345	1.017
N-Butyl Benzene		1.331	1.451	1.655	1.283
1,2-Dichlorobenzene		0.856	1.037	1.086	0.832
1,2-Dibromo 3-Chloropropane			0.070	0.045	0.032
1,2,4-Trichlorobenzene			0.394	0.413	0.332
Hexachloro 1,3-Butadiene		0.192	0.245	0.223	0.173
Naphthalene			0.577	0.576	0.449
1,2,3-Trichlorobenzene		0.160	0.272	0.242	0.224
Dichlorodifluoromethane		0.329	0.440	0.429	0.376
Methyl tert butyl ether		0.973	1.124	1.204	0.944

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
d4-1,2-Dichloroethane	0.465	0.483	0.473	0.474	0.486
d8-Toluene	1.095	1.113	1.093	1.125	1.126
4-Bromofluorobenzene	0.497	0.500	0.480	0.493	0.497
d4-1,2-Dichlorobenzene	0.793	0.782	0.789	0.791	0.784
Dibromofluoromethane	0.460	0.456	0.460	0.460	0.457

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
Chloromethane	0.598	0.570	0.609	0.556
Vinyl Chloride	0.560	0.532	0.565	0.517
Bromomethane	0.300	0.267	0.269	0.251
Chloroethane	0.322	0.289	0.298	0.254
Trichlorofluoromethane	0.726	0.672	0.700	0.627
Acrolein	0.038	0.042	0.047	0.049
112Trichloro122Trifluoroetha	0.429	0.391	0.446	0.371
Acetone	0.055	0.058	0.060	0.062
1,1-Dichloroethene	0.446	0.420	0.430	0.395
Bromoethane	0.332	0.364	0.393	0.357
Iodomethane	0.726	0.690	0.805	0.641
Methylene Chloride	0.498	0.501	0.530	0.493
Acrylonitrile	0.085	0.093	0.096	0.099
Carbon Disulfide	1.341	1.247	1.283	1.151
Trans-1,2-Dichloroethene	0.542	0.528	0.561	0.522
Vinyl Acetate	0.388	0.432	0.453	0.472
1,1-Dichloroethane	0.883	0.871	0.920	0.864
2-Butanone	0.095	0.105	0.103	0.107
2,2-Dichloropropane	0.567	0.529	0.579	0.492
Cis-1,2-Dichloroethene	0.542	0.539	0.564	0.529
Chloroform	0.877	0.868	0.897	0.838
Bromochloromethane	0.236	0.235	0.244	0.232
1,1,1-Trichloroethane	0.794	0.764	0.788	0.722
1,1-Dichloropropene	0.456	0.456	0.462	0.431
Carbon Tetrachloride	0.427	0.421	0.436	0.397
1,2-Dichloroethane	0.359	0.370	0.359	0.348
Benzene	1.314	1.291	1.300	1.215
Trichloroethene	0.348	0.351	0.355	0.338
1,2-Dichloropropane	0.279	0.282	0.289	0.281
Bromodichloromethane	0.374	0.393	0.400	0.391
Dibromomethane	0.142	0.149	0.147	0.147
2-Chloroethyl Vinyl Ether	0.100	0.121	0.123	0.131
4-Methyl-2-Pentanone	0.068	0.071	0.068	0.066
Cis 1,3-dichloropropene	0.408	0.437	0.450	0.446
Toluene	0.734	0.764	0.766	0.740
Trans 1,3-Dichloropropene	0.344	0.368	0.361	0.368
2-Hexanone	0.113	0.122	0.121	0.119

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
1,1,2-Trichloroethane	0.182	0.198	0.196	0.199
1,3-Dichloropropane	0.389	0.410	0.428	0.422
Tetrachloroethene	0.394	0.390	0.397	0.361
Chlorodibromomethane	0.274	0.292	0.304	0.299
1,2-Dibromoethane	0.194	0.205	0.202	0.207
Chlorobenzene	0.896	0.890	0.913	0.857
Ethyl Benzene	0.522	0.511	0.514	0.483
1,1,1,2-Tetrachloroethane	0.351	0.349	0.355	0.336
m,p-xylene	0.635	0.618	0.613	0.557
o-Xylene	0.633	0.622	0.623	0.588
Styrene	1.020	1.038	1.038	0.985
Bromoform	0.301	0.346	0.382	0.374
1,1,2,2-Tetrachloroethane	0.467	0.494	0.509	0.506
1,2,3-Trichloropropane	0.163	0.166	0.173	0.163
Trans-1,4-Dichloro 2-Butene	0.139	0.151	0.166	0.159
N-Propyl Benzene	3.137	3.267	3.327	3.155
Bromobenzene	0.750	0.785	0.829	0.784
Isopropyl Benzene	3.021	3.164	3.256	3.084
2-Chloro Toluene	2.253	2.299	2.360	2.278
4-Chloro Toluene	2.089	2.212	2.289	2.184
T-Butyl Benzene	1.881	1.944	1.881	1.871
1,3,5-Trimethyl Benzene	2.317	2.365	2.337	2.276
1,2,4-Trimethylbenzene	2.303	2.337	2.337	2.288
S-Butyl Benzene	2.605	2.662	2.571	2.560
4-Isopropyl Toluene	2.133	2.151	2.093	2.116
1,3-Dichlorobenzene	1.293	1.316	1.360	1.308
1,4-Dichlorobenzene	1.304	1.326	1.360	1.316
N-Butyl Benzene	1.737	1.757	1.774	1.770
1,2-Dichlorobenzene	1.084	1.073	1.117	1.100
1,2-Dibromo 3-Chloropropane	0.049	0.048	0.054	0.058
1,2,4-Trichlorobenzene	0.454	0.446	0.501	0.511
Hexachloro 1,3-Butadiene	0.229	0.209	0.196	0.201
Naphthalene	0.675	0.669	0.781	0.818
1,2,3-Trichlorobenzene	0.294	0.273	0.284	0.290
Dichlorodifluoromethane	0.554	0.526	0.551	0.497
Methyl tert butyl ether	1.211	1.220	1.266	1.212

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
d4-1,2-Dichloroethane	0.479	0.479	0.468	0.470
d8-Toluene	1.107	1.131	1.135	1.148
4-Bromofluorobenzene	0.511	0.499	0.497	0.489
d4-1,2-Dichlorobenzene	0.783	0.779	0.782	0.806
Dibromofluoromethane	0.473	0.468	0.467	0.455

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	0.558	8.2
Vinyl Chloride	AVRG	0.494	14.0
Bromomethane	AVRG	0.260	12.1
Chloroethane	AVRG	0.289	11.5
Trichlorofluoromethane	AVRG	0.633	13.5
Acrolein	AVRG	0.039	18.7
112Trichloro122Trifluoroetha	AVRG	0.400	11.7
Acetone	AVRG	0.055	12.3
1,1-Dichloroethene	AVRG	0.413	6.6
Bromoethane	AVRG	0.335	10.4
Iodomethane	AVRG	0.706	9.7
Methylene Chloride	AVRG	0.496	8.1
Acrylonitrile	LINR		0.9988
Carbon Disulfide	AVRG	1.246	6.6
Trans-1,2-Dichloroethene	AVRG	0.505	10.8
Vinyl Acetate	LINR		0.9979
1,1-Dichloroethane	AVRG	0.832	11.5
2-Butanone	AVRG	0.092	14.8
2,2-Dichloropropane	AVRG	0.516	10.0
Cis-1,2-Dichloroethene	AVRG	0.504	13.9
Chloroform	AVRG	0.819	10.8
Bromochloromethane	AVRG	0.214	15.8
1,1,1-Trichloroethane	AVRG	0.718	11.6
1,1-Dichloropropene	AVRG	0.423	11.2
Carbon Tetrachloride	AVRG	0.397	10.6
1,2-Dichloroethane	AVRG	0.340	10.3
Benzene	AVRG	1.224	9.9
Trichloroethene	AVRG	0.332	11.0
1,2-Dichloropropane	AVRG	0.263	12.4
Bromodichloromethane	AVRG	0.347	16.8
Dibromomethane	AVRG	0.131	17.9
2-Chloroethyl Vinyl Ether	LINR		0.9964
4-Methyl-2-Pentanone	AVRG	0.058	19.2
Cis 1,3-dichloropropene	AVRG	0.380	17.2
Toluene	AVRG	0.706	11.0
Trans 1,3-Dichloropropene	LINR		0.9996
2-Hexanone	AVRG	0.107	15.3

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.177	13.9
1,3-Dichloropropane	AVRG	0.366	14.8
Tetrachloroethene	AVRG	0.370	9.4
Chlorodibromomethane	LINR		0.9994
1,2-Dibromoethane	AVRG	0.173	19.8
Chlorobenzene	AVRG	0.838	10.1
Ethyl Benzene	AVRG	0.468	12.0
1,1,1,2-Tetrachloroethane	AVRG	0.310	14.9
m,p-xylene	AVRG	0.568	12.5
o-Xylene	AVRG	0.564	12.3
Styrene	AVRG	0.877	19.5
Bromoform	LINR		0.9979
1,1,2,2-Tetrachloroethane	AVRG	0.444	15.7
1,2,3-Trichloropropane	AVRG	0.153	15.9
Trans-1,4-Dichloro 2-Butene	AVRG	0.139	18.2
N-Propyl Benzene	AVRG	2.995	13.1
Bromobenzene	AVRG	0.739	11.7
Isopropyl Benzene	AVRG	2.851	14.4
2-Chloro Toluene	AVRG	2.147	11.3
4-Chloro Toluene	AVRG	2.041	12.3
T-Butyl Benzene	AVRG	1.762	13.0
1,3,5-Trimethyl Benzene	AVRG	2.146	13.0
1,2,4-Trimethylbenzene	AVRG	2.128	14.7
S-Butyl Benzene	AVRG	2.439	11.9
4-Isopropyl Toluene	AVRG	1.923	12.6
1,3-Dichlorobenzene	AVRG	1.244	8.8
1,4-Dichlorobenzene	AVRG	1.259	9.7
N-Butyl Benzene	AVRG	1.595	13.0
1,2-Dichlorobenzene	AVRG	1.023	11.0
1,2-Dibromo 3-Chloropropane	LINR		0.9936
1,2,4-Trichlorobenzene	AVRG	0.436	14.3
Hexachloro 1,3-Butadiene	AVRG	0.208	11.0
Naphthalene	AVRG	0.649	19.6
1,2,3-Trichlorobenzene	AVRG	0.255	17.8
Dichlorodifluoromethane	AVRG	0.463	17.9
Methyl tert butyl ether	AVRG	1.144	10.6

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.475	1.5
d8-Toluene	AVRG	1.119	1.6
4-Bromofluorobenzene	AVRG	0.496	1.7
d4-1,2-Dichlorobenzene	AVRG	0.788	1.0
Dibromofluoromethane	AVRG	0.462	1.3

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC — Client: GOLDER ASSOCIATES

ARI Job No: VS61 — Project: LANDSBURG MINE

Instrument ID: NT2 — Cont. Calib. Date: 11/23/12

Init. Calib. Date: 11/16/12 — Cont. Calib. Time: 1344

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	0.558	0.5666	0.100	AVRG	1.5	
Vinyl Chloride	0.494	0.5524	0.010	AVRG	11.8	
Bromomethane	0.260	0.2906	0.010	AVRG	11.8	
Chloroethane	0.289	0.3254	0.010	AVRG	12.6	
Trichlorofluoromethane	0.633	0.7726	0.010	AVRG	22.0	<-
Acrolein	0.039	0.0342	0.010	AVRG	-12.3	
112Trichloro122Trifluoroetha	0.400	0.4390	0.010	AVRG	9.8	
Acetone	0.055	0.0642	0.010	AVRG	16.7	
1,1-Dichloroethene	0.413	0.4510	0.010	AVRG	9.2	
Bromoethane	0.335	0.3697	0.010	AVRG	10.4	
Iodomethane	0.706	0.7487	0.010	AVRG	6.0	
Methylene Chloride	0.496	0.5119	0.010	AVRG	3.2	
Acrylonitrile	10.000	9.564	0.010	LINR	-4.4	
Carbon Disulfide	1.246	1.3394	0.010	AVRG	7.5	
Trans-1,2-Dichloroethene	0.506	0.5333	0.010	AVRG	5.4	
Vinyl Acetate	10.000	8.590	0.010	LINR	-14.1	
1,1-Dichloroethane	0.832	0.8929	0.100	AVRG	7.3	
2-Butanone	0.092	0.1000	0.010	AVRG	8.7	
2,2-Dichloropropane	0.516	0.6150	0.010	AVRG	19.2	
Cis-1,2-Dichloroethene	0.504	0.5342	0.010	AVRG	6.0	
Chloroform	0.819	0.9064	0.010	AVRG	10.7	
Bromochloromethane	0.214	0.2422	0.010	AVRG	13.2	
1,1,1-Trichloroethane	0.718	0.8423	0.010	AVRG	17.3	
1,1-Dichloropropene	0.423	0.4897	0.010	AVRG	15.8	
Carbon Tetrachloride	0.397	0.5167	0.010	AVRG	30.2	<-
1,2-Dichloroethane	0.340	0.4120	0.010	AVRG	21.2	<-
Benzene	1.224	1.3476	0.010	AVRG	10.1	
Trichloroethene	0.332	0.3703	0.010	AVRG	11.5	
1,2-Dichloropropane	0.263	0.2880	0.010	AVRG	9.5	
Bromodichloromethane	0.347	0.4259	0.010	AVRG	22.7	<-
Dibromomethane	0.131	0.1506	0.010	AVRG	15.0	
2-Chloroethyl Vinyl Ether	10.000	8.887	0.010	LINR	-11.1	
4-Methyl-2-Pentanone	0.059	0.0729	0.010	AVRG	23.6	<-
Cis 1,3-dichloropropene	0.380	0.4504	0.010	AVRG	18.5	
Toluene	0.706	0.8038	0.010	AVRG	13.8	
Trans 1,3-Dichloropropene	10.000	10.943	0.010	LINR	9.4	
2-Hexanone	0.107	0.1159	0.010	AVRG	8.3	

<- Exceeds QC limit of 20% D

* RF less than minimum RF

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Cont. Calib. Date: 11/23/12

Init. Calib. Date: 11/16/12 Cont. Calib. Time: 1344

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
1,1,2-Trichloroethane	0.177	0.2031	0.010	AVRG	14.7	
1,3-Dichloropropane	0.366	0.4112	0.010	AVRG	12.3	
Tetrachloroethene	0.370	0.4290	0.010	AVRG	15.9	
Chlorodibromomethane	10.000	10.005	0.010	LINR	0.0	
1,2-Dibromoethane	0.173	0.2120	0.010	AVRG	22.5	<-
Chlorobenzene	0.838	0.9350	0.300	AVRG	11.6	
Ethyl Benzene	0.468	0.5428	0.010	AVRG	16.0	
1,1,1,2-Tetrachloroethane	0.310	0.3860	0.010	AVRG	24.5	<-
m,p-xylene	0.568	0.6590	0.010	AVRG	16.0	
o-Xylene	0.564	0.6635	0.010	AVRG	17.6	
Styrene	0.876	1.0585	0.010	AVRG	20.8	<-
Bromoform	10.000	8.869	0.100	LINR	-11.3	
1,1,2,2-Tetrachloroethane	0.444	0.4635	0.300	AVRG	4.4	
1,2,3-Trichloropropane	0.153	0.1721	0.010	AVRG	12.5	
Trans-1,4-Dichloro 2-Butene	0.139	0.1307	0.010	AVRG	-6.0	
N-Propyl Benzene	2.995	3.3141	0.010	AVRG	10.6	
Bromobenzene	0.739	0.7783	0.010	AVRG	5.3	
Isopropyl Benzene	2.851	3.1765	0.010	AVRG	11.4	
2-Chloro Toluene	2.147	2.3522	0.010	AVRG	9.6	
4-Chloro Toluene	2.041	2.2202	0.010	AVRG	8.8	
T-Butyl Benzene	1.762	2.0534	0.010	AVRG	16.5	
1,3,5-Trimethyl Benzene	2.146	2.5270	0.010	AVRG	17.8	
1,2,4-Trimethylbenzene	2.128	2.4785	0.010	AVRG	16.5	
S-Butyl Benzene	2.438	2.8912	0.010	AVRG	18.6	
4-Isopropyl Toluene	1.923	2.3843	0.010	AVRG	24.0	<-
1,3-Dichlorobenzene	1.244	1.3897	0.010	AVRG	11.7	
1,4-Dichlorobenzene	1.259	1.3963	0.010	AVRG	10.9	
N-Butyl Benzene	1.595	1.9497	0.010	AVRG	22.2	<-
1,2-Dichlorobenzene	1.023	1.1504	0.010	AVRG	12.4	
1,2-Dibromo 3-Chloropropane	10.000	8.919	0.010	LINR	-10.8	
1,2,4-Trichlorobenzene	0.436	0.4876	0.010	AVRG	11.8	
Hexachloro 1,3-Butadiene	0.208	0.2684	0.010	AVRG	29.0	<-
Naphthalene	0.649	0.6540	0.010	AVRG	0.8	
1,2,3-Trichlorobenzene	0.255	0.2947	0.010	AVRG	15.6	
Dichlorodifluoromethane	0.463	0.5049	0.010	AVRG	9.0	
Methyl tert butyl ether	1.144	1.2774	0.010	AVRG	11.7	

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII VOA

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Cont. Calib. Date: 11/23/12

Init. Calib. Date: 11/16/12 Cont. Calib. Time: 1344

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.475	0.5021	0.010	AVRG	5.7
d8-Toluene	1.119	1.1354	0.010	AVRG	1.5
4-Bromofluorobenzene	0.496	0.5135	0.010	AVRG	3.5
d4-1,2-Dichlorobenzene	0.788	0.8033	0.010	AVRG	1.9
Dibromofluoromethane	0.462	0.4644	0.010	AVRG	0.5

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII VOA

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS61 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 | Ical Date: 11/16/12

Instrument ID: NT2 | Project Run Date: 11/16/12

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	215240	5.41	307975	5.80	276465	7.88
	UPPER LIMIT	430480	5.91	615950	6.30	552930	8.38
	LOWER LIMIT	107620	4.91	153988	5.30	138232	7.38
	Sample ID						
01	ICV1116	237707	5.41	356472	5.80	310639	7.88
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 Ical Date: 11/16/12

Instrument ID: NT2 Project Run Date: 11/16/12

		IS4 (DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	136856	9.58				
	UPPER LIMIT	273712	10.08				
	LOWER LIMIT	68428	9.08				
	Sample ID						
01	ICV1116	159421	9.58				
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 Ical Date: 11/16/12

Instrument ID: NT2 Project Run Date: 11/23/12

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	215240	5.41	307975	5.80	276465	7.88
	UPPER LIMIT	430480	5.91	615950	6.30	552930	8.38
	LOWER LIMIT	107620	4.91	153988	5.30	138232	7.38
	Sample ID						
01	LCS1123	192435	5.41	281644	5.80	255482	7.88
02	LCS1123	184957	5.40	266897	5.80	241733	7.88
03	MB1123	180319	5.40	257693	5.80	236509	7.88
04	TRIP BLANKS	178297	5.40	255482	5.80	234437	7.88
05	TRIP BLANKS	184264	5.40	259658	5.80	238130	7.88
06	LMW-9-1112	170851	5.40	248215	5.80	224454	7.88
07	LMW-11-1112	167571	5.40	242610	5.80	218084	7.88
08	LMW-6-1112	175784	5.40	249510	5.80	226576	7.88
09	LMW-2-1112	164416	5.40	235436	5.80	217567	7.88
10	LMW-4-1112	171593	5.40	249056	5.80	223837	7.88
11	LMW-10-1112	158984	5.40	230280	5.80	213068	7.88
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 Ical Date: 11/16/12

Instrument ID: NT2 Project Run Date: 11/23/12

		IS4 (DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	136856	9.58				
	UPPER LIMIT	273712	10.08				
	LOWER LIMIT	68428	9.08				
	Sample ID						
01	LCS1123	158558	9.58				
02	LCS1123	146882	9.57				
03	MB1123	131709	9.57				
04	TRIP BLANKS	129126	9.57				
05	TRIP BLANKS	128139	9.57				
06	LMW-9-1112	127462	9.57				
07	LMW-11-1112	128161	9.57				
08	LMW-6-1112	127952	9.57				
09	LMW-2-1112	125090	9.57				
10	LMW-4-1112	124147	9.57				
11	LMW-10-1112	123672	9.57				
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

Semivolatile Analysis
Report and Summary QC Forms

ARI Job ID: VS61, VS63

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-9-1112
SAMPLE

Lab Sample ID: VS61A
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS61-Golder Associates
Project: NA
NA
Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/19/12
Date Analyzed: 11/21/12 23:44
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: LMW-9-1112**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VS61A QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project: NA
Matrix: Water NA
Date Analyzed: 11/21/12 23:44

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	77.2%	2-Fluorobiphenyl	76.0%
d14-p-Terphenyl	85.2%	d4-1,2-Dichlorobenzene	75.6%
d5-Phenol	76.8%	2-Fluorophenol	70.9%
2,4,6-Tribromophenol	83.2%	d4-2-Chlorophenol	78.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: LMW-11-1112**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VS61B
LIMS ID: 12-22880
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS61-Golder Associates
Project: NA
NA
Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/19/12
Date Analyzed: 11/22/12 00:18
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: LMW-11-1112**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VS61B QC Report No: VS61-Golder Associates
LIMS ID: 12-22880 Project: NA
Matrix: Water NA
Date Analyzed: 11/22/12 00:18

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	79.6%	2-Fluorobiphenyl	80.0%
d14-p-Terphenyl	85.2%	d4-1,2-Dichlorobenzene	76.0%
d5-Phenol	78.9%	2-Fluorophenol	72.5%
2,4,6-Tribromophenol	83.5%	d4-2-Chlorophenol	78.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-6-1112
SAMPLE

Lab Sample ID: VS61C
LIMS ID: 12-22881
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS61-Golder Associates
Project: NA
NA
Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/19/12
Date Analyzed: 11/22/12 00:52
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: LMW-6-1112**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VS61C QC Report No: VS61-Golder Associates
LIMS ID: 12-22881 Project: NA
Matrix: Water NA
Date Analyzed: 11/22/12 00:52

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	66.8%	2-Fluorobiphenyl	64.4%
d14-p-Terphenyl	80.8%	d4-1,2-Dichlorobenzene	64.4%
d5-Phenol	65.6%	2-Fluorophenol	63.5%
2,4,6-Tribromophenol	70.4%	d4-2-Chlorophenol	66.9%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS61-Golder Associates
Project:

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-111912	73.2%	66.4%	82.8%	63.6%	70.4%	64.0%	80.5%	72.5%	0
LCS-111912	77.2%	75.6%	86.4%	69.6%	83.7%	73.1%	97.3%	79.5%	0
LCSD-111912	73.2%	71.6%	83.6%	64.4%	76.8%	65.6%	97.6%	73.1%	0
LMW-9-1112	77.2%	76.0%	85.2%	75.6%	76.8%	70.9%	83.2%	78.1%	0
LMW-11-1112	79.6%	80.0%	85.2%	76.0%	78.9%	72.5%	83.5%	78.9%	0
LMW-6-1112	66.8%	64.4%	80.8%	64.4%	65.6%	63.5%	70.4%	66.9%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(50-100)	(34-101)
(FBP) = 2-Fluorobiphenyl	(51-100)	(38-100)
(TPH) = d14-p-Terphenyl	(54-117)	(27-122)
(DCB) = d4-1,2-Dichlorobenzene	(40-100)	(27-100)
(PHL) = d5-Phenol	(15-121)	(16-106)
(2FP) = 2-Fluorophenol	(33-100)	(23-100)
(TBP) = 2,4,6-Tribromophenol	(46-125)	(31-128)
(2CP) = d4-2-Chlorophenol	(46-102)	(33-100)

Prep Method: SW3520C
Log Number Range: 12-22879 to 12-22881

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: LCS-111912
LCS/LCSD

Lab Sample ID: LCS-111912
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted LCS/LCSD: 11/19/12

Date Analyzed LCS: 11/21/12 22:36
LCSD: 11/21/12 23:10
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ
GPC Cleanup: NO

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	20.0	25.0	80.0%	19.4	25.0	77.6%	3.0%
Bis-(2-Chloroethyl) Ether	18.9	25.0	75.6%	17.5	25.0	70.0%	7.7%
2-Chlorophenol	19.4	25.0	77.6%	18.1	25.0	72.4%	6.9%
1,3-Dichlorobenzene	17.5	25.0	70.0%	16.6	25.0	66.4%	5.3%
1,4-Dichlorobenzene	18.1	25.0	72.4%	17.2	25.0	68.8%	5.1%
Benzyl Alcohol	15.7	25.0	62.8%	14.9	25.0	59.6%	5.2%
1,2-Dichlorobenzene	18.4	25.0	73.6%	17.4	25.0	69.6%	5.6%
2-Methylphenol	18.0	25.0	72.0%	17.8	25.0	71.2%	1.1%
2,2'-Oxybis(1-Chloropropane)	19.1	25.0	76.4%	18.1	25.0	72.4%	5.4%
4-Methylphenol	37.9	50.0	75.8%	36.4	50.0	72.8%	4.0%
N-Nitroso-Di-N-Propylamine	17.8	25.0	71.2%	16.9	25.0	67.6%	5.2%
Hexachloroethane	17.1	25.0	68.4%	16.5	25.0	66.0%	3.6%
Nitrobenzene	18.3	25.0	73.2%	17.8	25.0	71.2%	2.8%
Isophorone	20.5	25.0	82.0%	20.2	25.0	80.8%	1.5%
2-Nitrophenol	20.2	25.0	80.8%	18.9	25.0	75.6%	6.6%
2,4-Dimethylphenol	36.0	75.0	48.0%	42.4	75.0	56.5%	16.3%
Benzoic Acid	116	138	84.1%	118	138	85.5%	1.7%
bis(2-Chloroethoxy) Methane	17.6	25.0	70.4%	17.1	25.0	68.4%	2.9%
2,4-Dichlorophenol	58.7	75.0	78.3%	56.8	75.0	75.7%	3.3%
1,2,4-Trichlorobenzene	18.6	25.0	74.4%	17.7	25.0	70.8%	5.0%
Naphthalene	17.3	25.0	69.2%	16.6	25.0	66.4%	4.1%
4-Chloroaniline	72.4	75.0	96.5%	70.2	75.0	93.6%	3.1%
Hexachlorobutadiene	18.3	25.0	73.2%	17.5	25.0	70.0%	4.5%
4-Chloro-3-methylphenol	59.9	75.0	79.9%	60.2	75.0	80.3%	0.5%
2-Methylnaphthalene	16.2	25.0	64.8%	15.8	25.0	63.2%	2.5%
Hexachlorocyclopentadiene	30.1	75.0	40.1%	31.3	75.0	41.7%	3.9%
2,4,6-Trichlorophenol	59.4	75.0	79.2%	58.2	75.0	77.6%	2.0%
2,4,5-Trichlorophenol	60.7	75.0	80.9%	59.4	75.0	79.2%	2.2%
2-Chloronaphthalene	19.4	25.0	77.6%	18.8	25.0	75.2%	3.1%
2-Nitroaniline	48.8	75.0	65.1%	49.5	75.0	66.0%	1.4%
Dimethylphthalate	20.8	25.0	83.2%	20.5	25.0	82.0%	1.5%
Acenaphthylene	18.5	25.0	74.0%	17.9	25.0	71.6%	3.3%
3-Nitroaniline	50.9	75.0	67.9%	52.3	75.0	69.7%	2.7%
Acenaphthene	17.6	25.0	70.4%	17.2	25.0	68.8%	2.3%
2,4-Dinitrophenol	113	138	81.9%	117	138	84.8%	3.5%
4-Nitrophenol	67.0	75.0	89.3%	66.6	75.0	88.8%	0.6%
Dibenzofuran	17.4	25.0	69.6%	17.1	25.0	68.4%	1.7%
2,6-Dinitrotoluene	62.2	75.0	82.9%	61.6	75.0	82.1%	1.0%
2,4-Dinitrotoluene	61.9	75.0	82.5%	62.6	75.0	83.5%	1.1%
Diethylphthalate	20.4	25.0	81.6%	20.4	25.0	81.6%	0.0%
4-Chlorophenyl-phenylether	20.0	25.0	80.0%	20.1	25.0	80.4%	0.5%
Fluorene	18.9	25.0	75.6%	18.4	25.0	73.6%	2.7%
4-Nitroaniline	52.8	75.0	70.4%	52.9	75.0	70.5%	0.2%
4,6-Dinitro-2-Methylphenol	120	138	87.0%	122	138	88.4%	1.7%
N-Nitrosodiphenylamine	17.7	25.0	70.8%	17.9	25.0	71.6%	1.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: LCS-111912**
 LCS/LCSD

Lab Sample ID: LCS-111912 QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project:
Matrix: Water
Date Analyzed LCS: 11/21/12 22:36
LCSD: 11/21/12 23:10

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
4-Bromophenyl-phenylether	19.5	25.0	78.0%	19.4	25.0	77.6%	0.5%
Hexachlorobenzene	20.2	25.0	80.8%	19.8	25.0	79.2%	2.0%
Pentachlorophenol	55.6 Q	75.0	74.1%	56.5 Q	75.0	75.3%	1.6%
Phenanthrene	19.4	25.0	77.6%	19.0	25.0	76.0%	2.1%
Carbazole	20.4	25.0	81.6%	19.9	25.0	79.6%	2.5%
Anthracene	18.2	25.0	72.8%	18.0	25.0	72.0%	1.1%
Di-n-Butylphthalate	21.8	25.0	87.2%	21.4	25.0	85.6%	1.9%
Fluoranthene	21.0	25.0	84.0%	20.9	25.0	83.6%	0.5%
Pyrene	17.6	25.0	70.4%	17.6	25.0	70.4%	0.0%
Butylbenzylphthalate	20.1	25.0	80.4%	19.9	25.0	79.6%	1.0%
3,3'-Dichlorobenzidine	44.7	75.0	59.6%	51.0	75.0	68.0%	13.2%
Benzo(a)anthracene	19.2	25.0	76.8%	19.5	25.0	78.0%	1.6%
bis(2-Ethylhexyl)phthalate	19.7	25.0	78.8%	19.8	25.0	79.2%	0.5%
Chrysene	18.7	25.0	74.8%	18.9	25.0	75.6%	1.1%
Di-n-Octyl phthalate	20.4	25.0	81.6%	20.1	25.0	80.4%	1.5%
Benzo(b)fluoranthene	19.0	25.0	76.0%	20.2	25.0	80.8%	6.1%
Benzo(k)fluoranthene	20.0	25.0	80.0%	18.7	25.0	74.8%	6.7%
Benzo(a)pyrene	17.5	25.0	70.0%	17.5	25.0	70.0%	0.0%
Indeno(1,2,3-cd)pyrene	17.5	25.0	70.0%	17.4	25.0	69.6%	0.6%
Dibenz(a,h)anthracene	18.0	25.0	72.0%	18.0	25.0	72.0%	0.0%
Benzo(g,h,i)perylene	18.0	25.0	72.0%	18.0	25.0	72.0%	0.0%
3-,4-Methylphenol	37.9	50.0	75.8%	36.4	50.0	72.8%	4.0%
1-Methylnaphthalene	22.2	25.0	88.8%	21.6	25.0	86.4%	2.7%
Total Benzofluoranthenes	38.3	50.0	76.6%	38.1	50.0	76.2%	0.5%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	77.2%	73.2%
2-Fluorobiphenyl	75.6%	71.6%
d14-p-Terphenyl	86.4%	83.6%
d4-1,2-Dichlorobenzene	69.6%	64.4%
d5-Phenol	83.7%	76.8%
2-Fluorophenol	73.1%	65.6%
2,4,6-Tribromophenol	97.3%	97.6%
d4-2-Chlorophenol	79.5%	73.1%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

VS61MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS61

Project: Landsburg Mine

Lab File ID: 11211211

Date Extracted: 11/19/12

Instrument ID: NT6

Date Analyzed: 11/21/12

Matrix: LIQUID

Time Analyzed: 2202

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	VS61LCSW1	VS61LCSW1	11211212	11/21/12
02	VS61LCSDW1	VS61LCSDW1	11211213	11/21/12
03	LMW-9-1112	VS61A	11211214	11/21/12
04	LMW-11-1112	VS61B	11211215	11/22/12
05	LMW-6-1112	VS61C	11211216	11/22/12
06	LMW-2-1112	VS80A	11211217	11/22/12
07	LMW-4-1112	VS80B	11211218	11/22/12
08	LMW-10-1112	VS80C	11211219	11/22/12
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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: MB-111912
METHOD BLANK

Lab Sample ID: MB-111912
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS61-Golder Associates
Project: NA
NA
Date Sampled: NA
Date Received: NA

Date Extracted: 11/19/12
Date Analyzed: 11/21/12 22:02
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: MB-111912**
Extraction Method: SW3520C **METHOD BLANK**

Lab Sample ID: MB-111912 QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project: NA
Matrix: Water NA
Date Analyzed: 11/21/12 22:02

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.2%	2-Fluorobiphenyl	66.4%
d14-p-Terphenyl	82.8%	d4-1,2-Dichlorobenzene	63.6%
d5-Phenol	70.4%	2-Fluorophenol	64.0%
2,4,6-Tribromophenol	80.5%	d4-2-Chlorophenol	72.5%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

VS80MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS61

Project: LANDSBURG MINES

Lab File ID: 11291204

Date Extracted: 11/27/12

Instrument ID: NT6

Date Analyzed: 11/29/12

Matrix: LIQUID

Time Analyzed: 1508

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	VS80LCSW1	VS80LCSW1	11291205	11/29/12
02	VS80LCSDW1	VS80LCSDW1	11291206	11/29/12
03	LMW-2-1112	VS80ARE	11291207	11/29/12
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FORM IV SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 10/19/12 DFTPP Injection Time: 1620

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	38.6
68	Less than 2.0% of mass 69	0.4 (1.0)1
69	Mass 69 relative abundance	39.3
70	Less than 2.0% of mass 69	0.3 (0.8)1
127	10.0 - 80.0% of mass 198	49.1
197	Less than 2.0% of mass 198	0.2
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.5
275	10.0 - 60.0% of mass 198	23.3
365	Greater than 1.0% of mass 198	2.98
441	0.0 - 24.0% of mass 442	11.2 (13.6)2
442	50.0 - 200.0% of mass 198	81.9
443	15.0 - 24.0% of mass 442	14.7 (17.9)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC251019	IC251019	10191201	10/19/12	1620
02	IC021019	IC021019	10191202	10/19/12	1654
03	IC11019	IC11019	10191203	10/19/12	1728
04	IC51019	IC51019	10191204	10/19/12	1803
05	IC101019	IC101019	10191205	10/19/12	1837
06	IC401019	IC401019	10191206	10/19/12	1912
07	IC601019	IC601019	10191207	10/19/12	1946
08	IC801019	IC801019	10191208	10/19/12	2020
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FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 11/21/12 DFTPP Injection Time: 1620

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	42.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	42.3
70	Less than 2.0% of mass 69	0.4 (0.9)1
127	10.0 - 80.0% of mass 198	50.0
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 60.0% of mass 198	23.1
365	Greater than 1.0% of mass 198	3.02
441	0.0 - 24.0% of mass 442	12.0 (14.6)2
442	50.0 - 200.0% of mass 198	81.9
443	15.0 - 24.0% of mass 442	15.9 (19.4)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1121	CC1121	11211201	11/21/12	1620
02	VS61MBW1	VS61MBW1	11211211	11/21/12	2202
03	VS61LCSW1	VS61LCSW1	11211212	11/21/12	2236
04	VS61LCSDW1	VS61LCSDW1	11211213	11/21/12	2310
05	LMW-9-1112	VS61A	11211214	11/21/12	2344
06	LMW-11-1112	VS61B	11211215	11/22/12	0018
07	LMW-6-1112	VS61C	11211216	11/22/12	0052
08	LMW-2-1112	VS80A	11211217	11/22/12	0126
09	LMW-4-1112	VS80B	11211218	11/22/12	0201
10	LMW-10-1112	VS80C	11211219	11/22/12	0235
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FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 11/29/12 DFTPP Injection Time: 1234

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	42.1
68	Less than 2.0% of mass 69	0.2 (0.5)1
69	Mass 69 relative abundance	41.6
70	Less than 2.0% of mass 69	0.4 (1.0)1
127	10.0 - 80.0% of mass 198	48.1
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 60.0% of mass 198	23.1
365	Greater than 1.0% of mass 198	3.03
441	0.0 - 24.0% of mass 442	10.9 (13.5)2
442	50.0 - 200.0% of mass 198	80.4
443	15.0 - 24.0% of mass 442	16.3 (20.3)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1129	CC1129	11291201	11/29/12	1234
02	VS80MBW1	VS80MBW1	11291204	11/29/12	1508
03	VS80LCSW1	VS80LCSW1	11291205	11/29/12	1706
04	VS80LCSDW1	VS80LCSDW1	11291206	11/29/12	1740
05	LMW-2-1112	VS80ARE	11291207	11/29/12	1814
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FORM V SV

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
Phenol	2.003	1.950	1.786	1.643	1.616	1.499	1.620		1.731	10.9
Bis(2-Chloroethyl)ether	1.557	1.598	1.386	1.325	1.320	1.204	1.200		1.370	11.5
2-Chlorophenol	1.651	1.627	1.487	1.378	1.378	1.245	1.270		1.434	11.2
1,3-Dichlorobenzene	1.784	1.874	1.671	1.597	1.541	1.387	1.391		1.606	11.5
1,4-Dichlorobenzene	1.746	1.853	1.648	1.579	1.542	1.362	1.359		1.584	11.7
1,2-Dichlorobenzene	1.737	1.772	1.566	1.498	1.445	1.257	1.293		1.510	13.2
Benzyl alcohol	1.208	1.305	1.082	1.192	1.116	1.061	1.091		1.151	7.6
2,2'-oxybis(1-Chloropropane)	2.221	2.277	1.992	1.873	1.852	1.628	1.608		1.922	13.7
2-Methylphenol	1.463	1.529	1.364	1.252	1.271	1.150	1.127		1.308	11.6
Hexachloroethane	0.696	0.715	0.638	0.622	0.620	0.566	0.567		0.632	9.1
N-Nitroso-di-n-propylamine	1.041	1.143	0.987	0.932	0.937	0.877	0.870		0.970	10.0
4-Methylphenol	1.466	1.580	1.418	1.308	1.313	1.178	1.175		1.348	11.1
Nitrobenzene	0.480	0.483	0.430	0.407	0.385	0.352	0.350		0.412	13.3
Isophorone	0.704	0.743	0.651	0.628	0.600	0.571	0.568		0.638	10.4
2-Nitrophenol	0.199	0.220	0.208	0.204	0.205	0.200	0.200		0.205	3.6
2,4-Dimethylphenol	0.430	0.421	0.380	0.361	0.352	0.328	0.329		0.372	11.1
Bis(2-Chloroethoxy)methane	0.513	0.535	0.468	0.447	0.428	0.404	0.394		0.456	11.7
2,4-Dichlorophenol	0.325	0.348	0.319	0.311	0.301	0.282	0.280		0.309	7.9
1,2,4-Trichlorobenzene	0.394	0.404	0.355	0.355	0.334	0.318	0.312		0.353	10.1
Naphthalene	1.408	1.412	1.262	1.142	1.022	0.828			1.179	19.4
Benzoic acid	0.154	0.240	0.248	0.277	0.289	0.289	0.297		0.256	19.5
4-Chloroaniline	0.660	0.631	0.537	0.522	0.413	0.343	0.296		0.486	0.995
Hexachlorobutadiene	0.232	0.241	0.214	0.217	0.204	0.196	0.195		0.214	8.2
4-Chloro-3-methylphenol	0.300	0.336	0.308	0.302	0.298	0.280	0.284		0.301	6.1
2-Methylnaphthalene	0.834	0.793	0.675	0.705	0.626	0.551	0.531		0.674	17.0
Hexachlorocyclopentadiene	0.296	0.404	0.356	0.388	0.386	0.408	0.385		0.375	10.3
2,4,6-Trichlorophenol	0.392	0.402	0.390	0.380	0.376	0.371	0.376		0.384	2.9
2,4,5-Trichlorophenol	0.374	0.419	0.408	0.410	0.407	0.404	0.398		0.403	3.5
2-Chloronaphthalene	1.388	1.344	1.180	1.095	1.002	0.912	0.892		1.116	17.7
2-Nitroaniline	0.409	0.452	0.406	0.445	0.422	0.416	0.408		0.422	4.5
Acenaphthylene	2.373	2.436	2.158	1.956	1.785	1.511	1.474		1.956	19.9
Dimethylphthalate	1.329	1.412	1.260	1.208	1.154	1.070	1.098		1.219	10.2
2,6-Dinitrotoluene	0.264	0.306	0.287	0.290	0.285	0.276	0.281		0.284	4.6
Acenaphthene	1.540	1.510	1.340	1.240	1.166	1.028	1.032		1.265	16.5
3-Nitroaniline	0.387	0.422	0.371	0.364	0.282				0.365	14.2
2,4-Dinitrophenol		0.069	0.099	0.141	0.155	0.162	0.177		0.134	0.998
Dibenzofuran	2.388	2.202	1.897	1.949	1.703	1.501	1.455		1.871	18.6

<- Outside QC limits: %RSD <20% or R^2 > 0.990

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
4-Nitrophenol	0.143	0.142	0.144	0.159	0.160	0.149	0.146		0.149	5.1
2,4-Dinitrotoluene	0.304	0.394	0.379	0.382	0.373	0.356	0.372		0.366	8.0
Fluorene	1.645	1.614	1.484	1.376	1.283	1.109	1.105		1.374	16.1
4-Chlorophenyl-phenylether	0.748	0.736	0.670	0.642	0.611	0.564	0.564		0.648	11.6
Diethylphthalate	1.488	1.453	1.320	1.253	1.182	1.054	1.062		1.259	13.8
4-Nitroaniline	0.331	0.371	0.342	0.351	0.326	0.319	0.330		0.338	5.2
4,6-Dinitro-2-methylphenol		0.107	0.120	0.133	0.139	0.140	0.143		0.130	10.8
N-Nitrosodiphenylamine (1)	0.703	0.716	0.618	0.590	0.575	0.535	0.506		0.606	13.1
4-Bromophenyl-phenylether	0.270	0.271	0.249	0.236	0.233	0.228	0.219		0.244	8.3
Hexachlorobenzene	0.291	0.284	0.254	0.244	0.239	0.229	0.221		0.252	10.5
Pentachlorophenol	0.105	0.136	0.145	0.151	0.157	0.156	0.158		0.144	13.2
Phenanthrene	1.469	1.446	1.273	1.151	1.090	0.947	0.891		1.181	19.2
Anthracene	1.500	1.479	1.336	1.202	1.122	0.949	0.897		1.212	19.8
Carbazole	1.177	1.177	1.052	0.950	0.891	0.794	0.776		0.974	17.1
Di-n-butylphthalate	1.428	1.476	1.351	1.213	1.130	0.947	0.909		1.208	18.6
Fluoranthene	1.481	1.455	1.346	1.267	1.170	0.988	0.959		1.238	16.9
Pyrene	1.640	1.689	1.460	1.346	1.220	1.063			1.403	17.3
Butylbenzylphthalate	0.579	0.640	0.580	0.566	0.536	0.491	0.482		0.553	10.0
Benzo(a)anthracene	1.400	1.410	1.268	1.187	1.103	1.004	0.946		1.188	15.4
3,3'-Dichlorobenzidine	0.400	0.389	0.346	0.343	0.275	0.252			0.334	17.8
Chrysene	1.420	1.388	1.215	1.166	1.075	0.948	0.889		1.157	17.6
bis(2-Ethylhexyl)phthalate	0.690	0.726	0.645	0.624	0.607	0.566	0.557		0.631	9.8
Di-n-octylphthalate	1.246	1.220	1.104	1.046	0.987	0.893	0.847		1.049	14.5
Benzo(b)fluoranthene	1.232	1.448	1.278	1.180	1.140	1.004	1.006		1.184	13.2
Benzo(k)fluoranthene	1.504	1.434	1.307	1.290	1.107	0.964	0.861		1.210	19.8
Benzo(a)pyrene	1.254	1.306	1.178	1.129	1.040	0.934	0.894		1.105	14.1
Indeno(1,2,3-cd)pyrene	1.708	1.773	1.583	1.529	1.418	1.350	1.305		1.524	11.7
Dibenzo(a,h)anthracene	1.421	1.472	1.314	1.243	1.140	1.042	1.001		1.233	14.7
Benzo(g,h,i)perylene	1.508	1.538	1.377	1.329	1.249	1.197	1.146		1.335	11.2
N-Nitrosodimethylamine	0.937	1.013	0.886	0.857	0.878	0.885	0.862		0.902	6.1
Aniline	2.808	2.795	2.342	2.429	2.225	2.113	1.984		2.385	13.4
Benzidine		0.510	0.422	0.377	0.285	0.246	0.226		0.344	0.994
Pyridine	1.523	1.767	1.536	1.483	1.502	1.496	1.482		1.541	6.6
1-methylnaphthalene	0.566	0.547	0.471	0.504	0.463	0.436	0.424		0.487	11.1
Azobenzene (1,2-DP-Hydrazine	1.505	1.523	1.384	1.282	1.220	1.079	1.085		1.297	14.1
Total Benzofluoranthenes	1.397	1.376	1.228	1.173	1.059	0.926	0.883		1.149	17.7
2-Fluorophenol	1.559	1.408	1.252	1.278	1.263	1.227			1.331	9.6

(1) Cannot be seperated from Diphenylamine

<- Outside QC limits: %RSD <20% or R^2 > 0.990

FORM VI SV-2

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
Phenol-d5	1.864	1.830	1.608	1.563	1.546	1.503			1.652	9.4
2-Chlorophenol-d4	1.543	1.489	1.329	1.306	1.288	1.246			1.367	8.8
1,2-Dichlorobenzene-d4	1.197	1.082	0.944	0.943	0.900	0.818			0.981	13.9
Nitrobenzene-d5	0.465	0.446	0.404	0.414	0.402	0.403			0.422	6.3
2-Fluorobiphenyl	1.615	1.429	1.299	1.270	1.209	1.143			1.328	12.8
2,4,6-Tribromophenol	0.163	0.171	0.165	0.173	0.176	0.175			0.170	3.1
Terphenyl-d14	0.875	0.808	0.703	0.705	0.672	0.653			0.736	11.8

<- Outside QC limits: %RSD <20% or R^2 > 0.990

FORM VI SV-3

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/21/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1620

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Phenol	1.731	1.765	0.800	AVRG	2.0
Bis(2-Chloroethyl)ether	1.370	1.273	0.700	AVRG	-7.1
2-Chlorophenol	1.434	1.453	0.800	AVRG	1.3
1,3-Dichlorobenzene	1.606	1.535	0.010	AVRG	-4.4
1,4-Dichlorobenzene	1.584	1.549	0.010	AVRG	-2.2
1,2-Dichlorobenzene	1.510	1.455	0.010	AVRG	-3.6
Benzyl alcohol	1.151	1.181	0.010	AVRG	2.6
2,2'-oxybis(1-Chloropropane)	1.922	1.948	0.010	AVRG	1.4
2-Methylphenol	1.308	1.331	0.700	AVRG	1.8
Hexachloroethane	0.632	0.594	0.300	AVRG	-6.0
N-Nitroso-di-n-propylamine	0.970	0.919	0.500	AVRG	-5.2
4-Methylphenol	1.348	1.420	0.600	AVRG	5.3
Nitrobenzene	0.412	0.404	0.200	AVRG	-1.9
Isophorone	0.638	0.588	0.400	AVRG	-7.8
2-Nitrophenol	0.205	0.216	0.100	AVRG	5.4
2,4-Dimethylphenol	0.372	0.371	0.200	AVRG	-0.3
Bis(2-Chloroethoxy)methane	0.456	0.422	0.300	AVRG	-7.4
2,4-Dichlorophenol	0.309	0.335	0.200	AVRG	8.4
1,2,4-Trichlorobenzene	0.353	0.350	0.010	AVRG	-0.8
Naphthalene	1.179	1.117	0.700	AVRG	-5.2
Benzoic acid	0.256	0.254	0.010	AVRG	-0.8
4-Chloroaniline	25.00	24.31	0.010	2ORDR	-2.8
Hexachlorobutadiene	0.214	0.218	0.010	AVRG	1.9
4-Chloro-3-methylphenol	0.301	0.316	0.200	AVRG	5.0
2-Methylnaphthalene	0.674	0.709	0.400	AVRG	5.2
Hexachlorocyclopentadiene	0.375	0.318	0.050	AVRG	-15.2
2,4,6-Trichlorophenol	0.384	0.415	0.200	AVRG	8.1
2,4,5-Trichlorophenol	0.403	0.429	0.200	AVRG	6.4
2-Chloronaphthalene	1.116	1.100	0.800	AVRG	-1.4
2-Nitroaniline	0.422	0.421	0.010	AVRG	-0.2
Acenaphthylene	1.956	1.890	0.900	AVRG	-3.4
Dimethylphthalate	1.219	1.122	0.010	AVRG	-8.0
2,6-Dinitrotoluene	0.284	0.273	0.200	AVRG	-3.9
Acenaphthene	1.265	1.183	0.900	AVRG	-6.5
3-Nitroaniline	0.365	0.323	0.010	AVRG	-11.5
2,4-Dinitrophenol	50.00	54.27	0.010	2ORDR	8.5
Dibenzofuran	1.871	1.930	0.800	AVRG	3.2

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/21/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1620

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
4-Nitrophenol	0.149	0.151	0.010	AVRG	1.3	
2,4-Dinitrotoluene	0.366	0.359	0.200	AVRG	-1.9	
Fluorene	1.374	1.307	0.900	AVRG	-4.9	
4-Chlorophenyl-phenylether	0.648	0.623	0.400	AVRG	-3.8	
Diethylphthalate	1.259	1.150	0.010	AVRG	-8.6	
4-Nitroaniline	0.338	0.325	0.010	AVRG	-3.8	
4,6-Dinitro-2-methylphenol	0.130	0.142	0.010	AVRG	9.2	
N-Nitrosodiphenylamine(1)	0.606	0.542	0.010	AVRG	-10.6	
4-Bromophenyl-phenylether	0.244	0.219	0.100	AVRG	-10.2	
Hexachlorobenzene	0.252	0.238	0.100	AVRG	-5.6	
Pentachlorophenol	0.144	0.110	0.050	AVRG	-23.6	<-
Phenanthrene	1.181	1.127	0.700	AVRG	-4.6	
Anthracene	1.212	1.158	0.700	AVRG	-4.4	
Carbazole	0.974	0.888	0.010	AVRG	-8.8	
Di-n-butylphthalate	1.208	1.196	0.010	AVRG	-1.0	
Fluoranthene	1.238	1.296	0.600	AVRG	4.7	
Pyrene	1.403	1.233	0.600	AVRG	-12.1	
Butylbenzylphthalate	0.553	0.514	0.010	AVRG	-7.0	
Benzo(a)anthracene	1.188	1.153	0.800	AVRG	-2.9	
3,3'-Dichlorobenzidine	0.334	0.358	0.010	AVRG	7.2	
Chrysene	1.157	1.097	0.700	AVRG	-5.2	
bis(2-Ethylhexyl)phthalate	0.631	0.560	0.010	AVRG	-11.2	
Di-n-octylphthalate	1.049	0.974	0.010	AVRG	-7.1	
Benzo(b)fluoranthene	1.184	1.218	0.700	AVRG	2.9	
Benzo(k)fluoranthene	1.210	1.128	0.700	AVRG	-6.8	
Benzo(a)pyrene	1.105	1.056	0.700	AVRG	-4.4	
Indeno(1,2,3-cd)pyrene	1.524	1.383	0.500	AVRG	-9.2	
Dibenzo(a,h)anthracene	1.233	1.122	0.400	AVRG	-9.0	
Benzo(g,h,i)perylene	1.335	1.216	0.500	AVRG	-8.9	
N-Nitrosodimethylamine	0.902	0.769	0.010	AVRG	-14.7	
Aniline	2.385	2.207	0.010	AVRG	-7.5	
Benzidine	25.00	0.000	0.010	2ORDR		
Pyridine	1.541	1.339	0.010	AVRG	-13.1	
1-methylnaphthalene	0.487	0.492	0.010	AVRG	1.0	
Azobenzene (1,2-DP-Hydrazine	1.297	1.307	0.010	AVRG	0.8	
Total Benzofluoranthenes	1.149	1.101	0.010	AVRG	-4.2	

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-2

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/21/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1620

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
2-Fluorophenol	1.331	1.223	0.010	AVRG	-8.1
Phenol-d5	1.652	1.604	0.010	AVRG	-2.9
2-Chlorophenol-d4	1.367	1.344	0.010	AVRG	-1.7
1,2-Dichlorobenzene-d4	0.981	0.995	0.010	AVRG	1.4
Nitrobenzene-d5	0.422	0.403	0.010	AVRG	-4.5
2-Fluorobiphenyl	1.328	1.318	0.010	AVRG	-0.8
2,4,6-Tribromophenol	0.170	0.186	0.010	AVRG	9.4
Terphenyl-d14	0.736	0.694	0.010	AVRG	-5.7

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-3

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/29/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1234

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Phenol	1.731	1.716	0.800	AVRG	-0.9
Bis(2-Chloroethyl)ether	1.370	1.288	0.700	AVRG	-6.0
2-Chlorophenol	1.434	1.427	0.800	AVRG	-0.5
1,3-Dichlorobenzene	1.606	1.554	0.010	AVRG	-3.2
1,4-Dichlorobenzene	1.584	1.538	0.010	AVRG	-2.9
1,2-Dichlorobenzene	1.510	1.462	0.010	AVRG	-3.2
Benzyl alcohol	1.151	1.036	0.010	AVRG	-10.0
2,2'-oxybis(1-Chloropropane)	1.922	1.843	0.010	AVRG	-4.1
2-Methylphenol	1.308	1.286	0.700	AVRG	-1.7
Hexachloroethane	0.632	0.592	0.300	AVRG	-6.3
N-Nitroso-di-n-propylamine	0.970	0.864	0.500	AVRG	-10.9
4-Methylphenol	1.348	1.341	0.600	AVRG	-0.5
Nitrobenzene	0.412	0.397	0.200	AVRG	-3.6
Isophorone	0.638	0.566	0.400	AVRG	-11.3
2-Nitrophenol	0.205	0.217	0.100	AVRG	5.8
2,4-Dimethylphenol	0.372	0.370	0.200	AVRG	-0.5
Bis(2-Chloroethoxy)methane	0.456	0.410	0.300	AVRG	-10.1
2,4-Dichlorophenol	0.309	0.329	0.200	AVRG	6.5
1,2,4-Trichlorobenzene	0.353	0.352	0.010	AVRG	-0.3
Naphthalene	1.179	1.119	0.700	AVRG	-5.1
Benzoic acid	0.256	0.222	0.010	AVRG	-13.3
4-Chloroaniline	25.00	26.05	0.010	2ORDR	4.2
Hexachlorobutadiene	0.214	0.224	0.010	AVRG	4.7
4-Chloro-3-methylphenol	0.301	0.297	0.200	AVRG	-1.3
2-Methylnaphthalene	0.674	0.693	0.400	AVRG	2.8
Hexachlorocyclopentadiene	0.375	0.359	0.050	AVRG	-4.3
2,4,6-Trichlorophenol	0.384	0.400	0.200	AVRG	4.2
2,4,5-Trichlorophenol	0.403	0.432	0.200	AVRG	7.2
2-Chloronaphthalene	1.116	1.101	0.800	AVRG	-1.3
2-Nitroaniline	0.422	0.410	0.010	AVRG	-2.8
Acenaphthylene	1.956	1.905	0.900	AVRG	-2.6
Dimethylphthalate	1.219	1.115	0.010	AVRG	-8.5
2,6-Dinitrotoluene	0.284	0.268	0.200	AVRG	-5.6
Acenaphthene	1.265	1.187	0.900	AVRG	-6.2
3-Nitroaniline	0.365	0.330	0.010	AVRG	-9.6
2,4-Dinitrophenol	50.00	45.52	0.010	2ORDR	-9.0
Dibenzofuran	1.871	1.935	0.800	AVRG	3.4

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/29/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1234

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
4-Nitrophenol	0.149	0.140	0.010	AVRG	-6.0	
2,4-Dinitrotoluene	0.366	0.332	0.200	AVRG	-9.3	
Fluorene	1.374	1.288	0.900	AVRG	-6.2	
4-Chlorophenyl-phenylether	0.648	0.614	0.400	AVRG	-5.2	
Diethylphthalate	1.259	1.118	0.010	AVRG	-11.2	
4-Nitroaniline	0.338	0.308	0.010	AVRG	-8.9	
4,6-Dinitro-2-methylphenol	0.130	0.133	0.010	AVRG	2.3	
N-Nitrosodiphenylamine(1)	0.606	0.570	0.010	AVRG	-5.9	
4-Bromophenyl-phenylether	0.244	0.235	0.100	AVRG	-3.7	
Hexachlorobenzene	0.252	0.242	0.100	AVRG	-4.0	
Pentachlorophenol	0.144	0.093	0.050	AVRG	-35.4	<-
Phenanthrene	1.181	1.135	0.700	AVRG	-3.9	
Anthracene	1.212	1.162	0.700	AVRG	-4.1	
Carbazole	0.974	0.847	0.010	AVRG	-13.0	
Di-n-butylphthalate	1.208	1.090	0.010	AVRG	-9.8	
Fluoranthene	1.238	1.170	0.600	AVRG	-5.5	
Pyrene	1.403	1.370	0.600	AVRG	-2.4	
Butylbenzylphthalate	0.553	0.530	0.010	AVRG	-4.2	
Benzo(a)anthracene	1.188	1.162	0.800	AVRG	-2.2	
3,3'-Dichlorobenzidine	0.334	0.368	0.010	AVRG	10.2	
Chrysene	1.157	1.121	0.700	AVRG	-3.1	
bis(2-Ethylhexyl)phthalate	0.631	0.565	0.010	AVRG	-10.4	
Di-n-octylphthalate	1.049	0.988	0.010	AVRG	-5.8	
Benzo(b)fluoranthene	1.184	1.156	0.700	AVRG	-2.4	
Benzo(k)fluoranthene	1.210	1.187	0.700	AVRG	-1.9	
Benzo(a)pyrene	1.105	1.060	0.700	AVRG	-4.1	
Indeno(1,2,3-cd)pyrene	1.524	1.550	0.500	AVRG	1.7	
Dibenzo(a,h)anthracene	1.233	1.257	0.400	AVRG	1.9	
Benzo(g,h,i)perylene	1.335	1.397	0.500	AVRG	4.6	
N-Nitrosodimethylamine	0.902	0.776	0.010	AVRG	-14.0	
Aniline	2.385	2.120	0.010	AVRG	-11.1	
Benzidine	25.00	0.000	0.010	2ORDR		
Pyridine	1.541	1.359	0.010	AVRG	-11.8	
1-methylnaphthalene	0.487	0.475	0.010	AVRG	-2.5	
Azobenzene (1,2-DP-Hydrazine	1.297	1.265	0.010	AVRG	-2.5	
Total Benzofluoranthenes	1.149	1.103	0.010	AVRG	-4.0	

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-2

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/29/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1234

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
2-Fluorophenol	1.331	1.239	0.010	AVRG	-6.9
Phenol-d5	1.652	1.568	0.010	AVRG	-5.1
2-Chlorophenol-d4	1.367	1.325	0.010	AVRG	-3.1
1,2-Dichlorobenzene-d4	0.981	0.988	0.010	AVRG	0.7
Nitrobenzene-d5	0.422	0.398	0.010	AVRG	-5.7
2-Fluorobiphenyl	1.328	1.326	0.010	AVRG	-0.2
2,4,6-Tribromophenol	0.170	0.176	0.010	AVRG	3.5
Terphenyl-d14	0.736	0.735	0.010	AVRG	-0.1

<- Exceeds QC limit of 20% D

* RF less than minimum RF

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/21/12

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	ICAL MIDPT	735905	8.15	2597762	10.21	1503943	13.09
	UPPER LIMIT	1471810		5195524		3007886	
	LOWER LIMIT	367952		1298881		751972	
	CCAL	577182	7.46	2079664	9.52	1236467	12.37
	UPPER LIMIT		7.96		10.02		12.87
	LOWER LIMIT		6.96		9.02		11.87
01	VS61MBW1	469338	7.46	1696291	9.52	984534	12.37
02	VS61LCSW1	463644	7.46	1678804	9.52	998650	12.37
03	VS61LCSDW1	518209	7.46	1838837	9.52	1112179	12.37
04	LMW-9-1112	457074	7.45	1630916	9.52	968303	12.37
05	LMW-11-1112	475492	7.46	1695926	9.52	987956	12.37
06	LMW-6-1112	473371	7.46	1676502	9.51	972339	12.37
07	LMW-2-1112	447582	7.46	1581630	9.51	952600	12.37
08	LMW-4-1112	445748	7.46	1593560	9.51	948694	12.37
09	LMW-10-1112	478904	7.46	1735060	9.51	1010371	12.37
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IS1 = 1,4-Dichlorobenzene-d4
IS2 = Naphthalene-d8
IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/21/12

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	ICAL MIDPT	2402003	15.48	2331938	19.80	2485610	21.97
	UPPER LIMIT	4804006		4663876		4971220	
	LOWER LIMIT	1201002		1165969		1242805	
	CCAL	2026457	14.74	2201280	19.03	2314156	21.17
	UPPER LIMIT		15.24		19.53		21.67
	LOWER LIMIT		14.24		18.53		20.67
01	VS61MBW1	1607718	14.73	1707331	19.02	1811474	21.16
02	VS61LCSW1	1646733	14.73	1770246	19.02	1862808	21.17
03	VS61LCSDW1	1847673	14.74	1969567	19.02	2072263	21.17
04	LMW-9-1112	1606325	14.73	1662095	19.02	1751041	21.16
05	LMW-11-1112	1604244	14.73	1669599	19.02	1795017	21.16
06	LMW-6-1112	1573913	14.73	1607280	19.02	1729535	21.16
07	LMW-2-1112	1529083	14.73	1606337	19.02	1672861	21.16
08	LMW-4-1112	1551523	14.73	1605833	19.02	1658681	21.16
09	LMW-10-1112	1619568	14.73	1697238	19.02	1790239	21.16
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IS4 = Phenanthrene-d10
IS5 = Chrysene-d12
IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/21/12

		IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	2790605	20.94				
	UPPER LIMIT	5581210					
	LOWER LIMIT	1395302					
	CCAL	2754965	20.23				
	UPPER LIMIT		20.73				
	LOWER LIMIT		19.73				
01	VS61MBW1	2164594	20.22				
02	VS61LCSW1	2161582	20.23				
03	VS61LCSDW1	2406296	20.22				
04	LMW-9-1112	2114360	20.22				
05	LMW-11-1112	2164145	20.22				
06	LMW-6-1112	2050039	20.22				
07	LMW-2-1112	2052564	20.22				
08	LMW-4-1112	2101189	20.22				
09	LMW-10-1112	2174421	20.22				
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IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-3

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/29/12

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	ICAL MIDPT	735905	8.15	2597762	10.21	1503943	13.09
	UPPER LIMIT	1471810		5195524		3007886	
	LOWER LIMIT	367952		1298881		751972	
	CCAL	529757	7.31	1833463	9.37	1046247	12.23
	UPPER LIMIT		7.81		9.87		12.73
	LOWER LIMIT		6.81		8.87		11.73
01	VS80MBW1	731692	7.31	2514452	9.37	1343253	12.22
02	VS80LCSW1	533256	7.31	1835773	9.37	1029757	12.22
03	VS80LCSDW1	643809	7.31	2215168	9.37	1241062	12.22
04	LMW-2-1112	653977	7.31	2217993	9.37	1238161	12.22
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IS1 = 1,4-Dichlorobenzene-d4
IS2 = Naphthalene-d8
IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/29/12

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	ICAL MIDPT	2402003	15.48	2331938	19.80	2485610	21.97
	UPPER LIMIT	4804006		4663876		4971220	
	LOWER LIMIT	1201002		1165969		1242805	
	CCAL	1580017	14.58	1398498	18.87	1495239	21.00
	UPPER LIMIT		15.08		19.37		21.50
	LOWER LIMIT		14.08		18.37		20.50
01	VS80MBW1	2012667	14.58	1655074	18.86	1498843	21.00
02	VS80LCSW1	1568807	14.58	1368897	18.86	1262734	20.99
03	VS80LCSDW1	1868909	14.58	1641537	18.86	1492083	21.00
04	LMW-2-1112	1938794	14.58	1672817	18.85	1581013	21.00
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IS4 = Phenanthrene-d10
IS5 = Chrysene-d12
IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS61 | Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 | Ical Date: 10/19/12

Instrument ID: NT6 | Cont. Cal Date: 11/29/12

		IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	2790605	20.94				
	UPPER LIMIT	5581210					
	LOWER LIMIT	1395302					
	CCAL	1782229	20.09				
	UPPER LIMIT		20.59				
	LOWER LIMIT		19.59				
01	VS80MBW1	2216528	20.08				
02	VS80LCSW1	1733314	20.08				
03	VS80LCSDW1	2031453	20.08				
04	LMW-2-1112	2116193	20.08				
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IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-3

Pesticide Analysis
Report and Summary QC Forms

ARI Job ID: VS61, VS63

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-9-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS61A
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/17/12
Date Analyzed: 11/21/12 00:26
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	93.0%
Tetrachlorometaxylene	66.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-11-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS61B
LIMS ID: 12-22880
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/17/12
Date Analyzed: 11/21/12 00:44
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	96.0%
Tetrachlorometaxylene	63.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-6-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS61C
LIMS ID: 12-22881
Matrix: Water
Data Release Authorized:
Reported: 11/27/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/17/12
Date Analyzed: 11/21/12 01:02
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	75.8%
Tetrachlorometaxylene	61.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

SW8081/PESTICIDE WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS61-Golder Associates
Project:

Client ID	DCBP	TCMX	TOT OUT
MB-111712	69.5%	51.0%	0
LCS-111712	84.0%	61.2%	0
LCSD-111712	67.8%	56.8%	0
LMW-9-1112	93.0%	66.8%	0
LMW-11-1112	96.0%	63.8%	0
LMW-6-1112	75.8%	61.8%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(37-125)	(11-144)
(TCMX) = Tetrachlorometaxylene	(38-103)	(30-105)

Prep Method: SW3510C
Log Number Range: 12-22879 to 12-22881

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LCS-111712**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-111712 QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project:
Matrix: Water
Data Release Authorized:
Reported: 11/27/12 Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted LCS/LCSD: 11/17/12 Sample Amount LCS: 500 mL
LCSD: 500 mL
Date Analyzed LCS: 11/20/12 21:28 Final Extract Volume LCS: 5.0 mL
LCSD: 11/20/12 21:46 LCSD: 5.0 mL
Instrument/Analyst LCS: ECD6/YZ Dilution Factor LCS: 1.00
LCSD: ECD6/YZ LCSD: 1.00
GPC Cleanup: No Sulfur Cleanup: No
Florisil Cleanup: No Silica Gel: No

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
alpha-BHC	0.177	0.200	88.5%	0.156	0.200	78.0%	12.6%
beta-BHC	0.181	0.200	90.5%	0.160	0.200	80.0%	12.3%
delta-BHC	0.0759	0.200	38.0%	0.0679	0.200	34.0%	11.1%
gamma-BHC (Lindane)	0.184	0.200	92.0%	0.162	0.200	81.0%	12.7%
Heptachlor	0.146	0.200	73.0%	0.147	0.200	73.5%	0.7%
Aldrin	0.136	0.200	68.0%	0.141	0.200	70.5%	3.6%
Heptachlor Epoxide	0.194	0.200	97.0%	0.173	0.200	86.5%	11.4%
Endosulfan I	0.202	0.200	101%	0.181	0.200	90.5%	11.0%
Dieldrin	0.399	0.400	99.8%	0.357	0.400	89.2%	11.1%
4,4'-DDE	0.390	0.400	97.5%	0.354	0.400	88.5%	9.7%
Endrin	0.389	0.400	97.2%	0.344	0.400	86.0%	12.3%
Endosulfan II	0.422	0.400	106%	0.370	0.400	92.5%	13.1%
4,4'-DDD	0.415	0.400	104%	0.366	0.400	91.5%	12.5%
Endosulfan Sulfate	0.311	0.400	77.8%	0.272	0.400	68.0%	13.4%
4,4'-DDT	0.369	0.400	92.2%	0.326	0.400	81.5%	12.4%
Methoxychlor	1.76	2.00	88.0%	1.54	2.00	77.0%	13.3%
Endrin Ketone	0.441	0.400	110%	0.390	0.400	97.5%	12.3%
Endrin Aldehyde	0.370	0.400	92.5%	0.328	0.400	82.0%	12.0%
trans-Chlordane	0.188	0.200	94.0%	0.171	0.200	85.5%	9.5%
cis-Chlordane	0.186	0.200	93.0%	0.169	0.200	84.5%	9.6%

Pest/PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	84.0%	67.8%
Tetrachlorometaxylene	61.2%	56.8%

Results reported in µg/L (ppb)
RPD calculated using sample concentrations per SW846.

FORM 4
PESTICIDE METHOD BLANK SUMMARY

BLANK NO.

VS45MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

Lab Sample ID: VS45MBW1

Lab File ID: 1120A033

Date Extracted: 11/17/12

Matrix: LIQUID

Date Analyzed: 11/20/12

Instrument ID: ECD6

Time Analyzed: 2110

GC Columns: STX-CLP1/STX-CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS45LCSW1	VS45LCSW1	11/20/12
02	VS45LCSDW1	VS45LCSDW1	11/20/12
03	LMW-3-1112	VS45A	11/20/12
04	LMW-EB-1112	VS45B	11/20/12
05	LMW-8-1112	VS45C	11/20/12
06	LMW-5-1112	VS45D	11/20/12
07	LMW-7-1112	VS45E	11/20/12
08	LMW-7-1112-D	VS45F	11/20/12
09	LMW-9-1112	VS61A	11/21/12
10	LMW-11-1112	VS61B	11/21/12
11	LMW-6-1112	VS61C	11/21/12

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: MB-111712**
Extraction Method: SW3510C **METHOD BLANK**

Lab Sample ID: MB-111712 QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project:
Matrix: Water
Data Release Authorized:
Reported: 11/27/12 Date Sampled: NA
Date Received: NA

Date Extracted: 11/17/12 Sample Amount: 500 mL
Date Analyzed: 11/20/12 21:10 Final Extract Volume: 5.0 mL
Instrument/Analyst: ECD6/YZ Dilution Factor: 1.00
GPC Cleanup: No Silica Gel: No
Sulfur Cleanup: No
Florisil Cleanup: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	69.5%
Tetrachlorometaxylene	51.0%

6D

8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	RT OF STANDARDS							MEAN	RT WINDOW	
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT	FROM	TO
alpha-BHC	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.10	4.20
beta-BHC	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.45	4.55
delta-BHC	4.66	4.66	4.66	4.66	4.66	4.66	4.66	4.66	4.61	4.71
gamma-BHC (Lindane)	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.37	4.47
Heptachlor	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.81	4.91
Aldrin	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.10	5.20
Heptachlor epoxide b	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.67	5.77
Endosulfan I	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.05	6.15
Dieldrin	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.27	6.37
4,4'-DDE	6.03	6.03	6.03	6.03	6.03	6.03	6.03	6.03	5.98	6.08
Endrin	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.49	6.59
Endosulfan II	6.75	6.75	6.75	6.75	6.75	6.74	6.75	6.75	6.70	6.80
4,4'-DDD	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.53	6.63
Endosulfan sulfate	7.51	7.51	7.51	7.51	7.51	7.51	7.51	7.51	7.46	7.56
4,4'-DDT	6.84	6.84	6.84	6.84	6.84	6.84	6.84	6.84	6.79	6.89
Methoxychlor	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.22	7.32
Endrin ketone	7.77	7.77	7.77	7.77	7.77	7.77	7.77	7.77	7.72	7.82
Endrin aldehyde	7.12	7.12	7.12	7.12	7.12	7.12	7.12	7.12	7.07	7.17
gamma-Chlordane	5.84	5.84	5.84	5.84	5.84	5.84	5.84	5.84	5.79	5.89
alpha-Chlordane	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.92	6.02
Hexachlorobutadiene	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.16	2.26
Hexachlorobenzene	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.95	4.05
Tetrachloro-m-xylene	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.62	3.72
Decachlorobiphenyl	8.61	8.61	8.61	8.61	8.61	8.61	8.61	8.61	8.56	8.66

6D

8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

COMPOUND	RT OF STANDARDS							MEAN	RT WINDOW	
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT	FROM	TO
alpha-BHC	4.58	4.58	4.58	4.58	4.58	4.58	4.59	4.58	4.54	4.64
beta-BHC	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	4.96	5.06
delta-BHC	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.26	5.36
gamma-BHC (Lindane)	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.89	4.99
Heptachlor	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.35	5.45
Aldrin	5.73	5.73	5.73	5.73	5.74	5.74	5.74	5.73	5.69	5.79
Heptachlor epoxide b	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.24	6.34
Endosulfan I	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.63	6.73
Dieldrin	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.89	6.99
4,4'-DDE	6.74	6.74	6.74	6.74	6.74	6.74	6.75	6.74	6.70	6.80
Endrin	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.18	7.28
Endosulfan II	7.42	7.42	7.42	7.42	7.42	7.42	7.42	7.42	7.37	7.47
4,4'-DDD	7.28	7.28	7.28	7.28	7.28	7.28	7.28	7.28	7.23	7.33
Endosulfan sulfate	7.96	7.96	7.96	7.96	7.96	7.96	7.96	7.96	7.91	8.01
4,4'-DDT	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.52	7.62
Methoxychlor	8.16	8.16	8.16	8.16	8.16	8.16	8.16	8.16	8.11	8.21
Endrin ketone	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.40	8.50
Endrin aldehyde	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.66	7.76
gamma-Chlordane	6.47	6.47	6.47	6.47	6.47	6.47	6.48	6.47	6.43	6.53
alpha-Chlordane	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.56	6.66
Hexachlorobutadiene	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.33	2.43
Hexachlorobenzene	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.41	4.51
Tetrachloro-m-xylene	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01	3.96	4.06
Decachlorobiphenyl	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.52	9.62

6E
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	CALIBRATION FACTORS								R^2
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.4836	1.4616	1.4938	1.4882	1.4985	1.4906	1.5199	1.4909	1.2
beta-BHC	0.7515	0.6928	0.6569	0.6074	0.5837	0.5625	0.5568	0.6302	11.6
delta-BHC	1.2027	1.1705	1.1786	1.1878	1.2088	1.2162	1.2478	1.2018	2.2
gamma-BHC (Lindane)	1.4203	1.3736	1.3766	1.3565	1.3552	1.3431	1.3628	1.3697	1.8
Heptachlor	1.3710	1.2938	1.2653	1.2234	1.2040	1.1717	1.1640	1.2419	5.9
Aldrin	1.3883	1.3094	1.2895	1.2509	1.2369	1.2047	1.1979	1.2682	5.3
Heptachlor epoxide b	1.4111	1.3113	1.2616	1.1995	1.1708	1.1149	1.0884	1.2225	9.3
Endosulfan I	1.3006	1.2127	1.1670	1.1114	1.0773	1.0349	1.0155	1.1313	9.0
Dieldrin	1.2696	1.2204	1.2149	1.1719	1.1402	1.0940	1.0752	1.1694	6.1
4,4'-DDE	1.1509	1.1089	1.1091	1.0833	1.0630	1.0274	1.0156	1.0797	4.5
Endrin	1.1855	1.1373	1.1231	1.0879	1.0757	1.0200	1.0221	1.0931	5.6
Endosulfan II	1.1881	1.1269	1.0957	1.0423	1.0170	0.9634	0.9552	1.0555	8.2
4,4'-DDD	1.0319	0.9916	0.9750	0.9474	0.9355	0.8986	0.9012	0.9544	5.1
Endosulfan sulfate	0.9858	0.9374	0.9084	0.8788	0.8558	0.8264	0.8267	0.8885	6.7
4,4'-DDT	1.0119	0.9801	0.9720	0.9504	0.9467	0.9240	0.9327	0.9597	3.2
Methoxychlor	0.5578	0.5238	0.4924	0.4554	0.4308	0.4096	0.4145	0.4692	12.2
Endrin ketone	1.2244	1.1156	1.0606	1.0086	0.9677	0.9416	0.9544	1.0390	9.9
Endrin aldehyde	0.9849	0.9225	0.8807	0.8346	0.8072	0.7659	0.7630	0.8512	9.7
gamma-Chlordane	1.3792	1.2811	1.2367	1.1861	1.1606	1.1322	1.1335	1.2156	7.4
alpha-Chlordane	1.3429	1.2457	1.2000	1.1461	1.1150	1.0849	1.0777	1.1732	8.2
Hexachlorobutadiene	2.0812	1.9402	1.8804	1.7634	1.7036	1.6425	1.6366	1.8068	9.2
Hexachlorobenzene	1.5903	1.4533	1.3696	1.2635	1.1969	1.1324	1.1201	1.3037	13.5
Tetrachloro-m-xylene	1.3460	1.2798	1.2458	1.1734	1.1286	1.0704	1.0536	1.1854	9.3
Decachlorobiphenyl	1.3890	1.2243	1.1239	1.0205	0.9531	0.8948	0.8784	1.0691	17.6

6E
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	CALIBRATION FACTORS								R^2
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.7068	1.7328	1.8043	1.7772	1.7612	1.7241	1.7099	1.7452	2.1
beta-BHC	0.7886	0.7507	0.7499	0.7007	0.6746	0.6525	0.6274	0.7063	8.3
delta-BHC	1.3355	1.3664	1.4106	1.3838	1.4129	1.3944	1.3874	1.3844	1.9
gamma-BHC (Lindane)	1.6094	1.6044	1.6375	1.5988	1.5712	1.5315	1.4910	1.5777	3.2
Heptachlor	1.5856	1.5485	1.5510	1.4820	1.4155	1.3165	1.2123	1.4445	9.6
Aldrin	1.5160	1.4979	1.5123	1.4628	1.4083	1.3241	1.2212	1.4204	7.8
Heptachlor epoxide b	1.4476	1.4003	1.3792	1.3046	1.2384	1.1438	1.0491	1.2804	11.3
Endosulfan I	1.2698	1.2439	1.2336	1.1730	1.1176	1.0464	0.9643	1.1498	9.9
Dieldrin	1.3591	1.3384	1.3315	1.2542	1.1663	1.0710	0.9940	1.2164	11.8
4,4'-DDE	1.2998	1.2792	1.2771	1.2008	1.1147	1.0160	0.9308	1.1598	12.4
Endrin	1.5909	1.5373	1.4937	1.4092	1.3284	1.1857	1.1161	1.3802	13.0
Endosulfan II	1.5871	1.5228	1.4855	1.3975	1.3177	1.2030	1.1435	1.3796	12.1
4,4'-DDD	1.4343	1.4084	1.3921	1.3338	1.2712	1.1686	1.1160	1.3035	9.5
Endosulfan sulfate	1.2785	1.2434	1.2172	1.1779	1.1320	1.0535	1.0179	1.1600	8.4
4,4'-DDT	1.3464	1.3100	1.3003	1.2588	1.2128	1.1433	1.1114	1.2404	7.1
Methoxychlor	0.6592	0.6042	0.5527	0.4972	0.4495	0.4126	0.3783	0.5077	17.7
Endrin ketone	1.3456	1.2690	1.2127	1.1525	1.0924	1.0274	1.0120	1.1588	10.8
Endrin aldehyde	1.2587	1.1952	1.1528	1.0937	1.0369	0.9549	0.9102	1.0860	11.7
gamma-Chlordane	1.4955	1.4315	1.4100	1.3398	1.2967	1.2245	1.1522	1.3357	9.1
alpha-Chlordane	1.3740	1.3339	1.3210	1.2563	1.2048	1.1471	1.0808	1.2454	8.6
Hexachlorobutadiene	1.9645	1.8894	1.8576	1.7256	1.6592	1.5549	1.5070	1.7369	10.0
Hexachlorobenzene	1.7774	1.6637	1.6110	1.4932	1.4081	1.3179	1.2412	1.5018	12.9
Tetrachloro-m-xylene	1.6512	1.5834	1.5355	1.4058	1.2945	1.1692	1.0938	1.3905	15.3
Decachlorobiphenyl	1.5427	1.4016	1.2929	1.1902	1.1187	1.0455	1.0196	1.2302	15.7

6G

8081 INITIAL CALIBRATION OF SINGLE POINT PCBs and TOXAPHENE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

Toxaphene			
Peak	RT	RT WIN	Cal Factor
1	6.490	6.44- 6.54	0.0183
2	6.843	6.79- 6.89	0.0244
3	7.212	7.16- 7.26	0.0197
4	7.466	7.42- 7.52	0.0242
5	7.745	7.69- 7.79	0.0207
6	7.874	7.82- 7.92	0.0142

6G

8081 INITIAL CALIBRATION OF SINGLE POINT PCBs and TOXAPHENE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

Toxaphene			
Peak	RT	RT WIN	Cal Factor
1	7.158	7.11- 7.21	0.0395
2	7.483	7.43- 7.53	0.0572
3	7.713	7.66- 7.76	0.0618
4	8.180	8.13- 8.23	0.0427
5	8.527	8.48- 8.58	0.0191

FORM VI PEST-4C

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: VS45

Analysis Date: 20-NOV-2012 20:17 Init. Calib. Date: 03-OCT-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.017	96477
Endrin	6.520	4562001
4,4'-DDD	6.573	573904
4,4'-DDT	6.828	4110483
Endrin ketone	7.747	578151
Endrin aldehyde	7.105	156492

DDT Percent Breakdown = 14.0 %
((96477+573904) * 100)/(96477+573904+4110483)

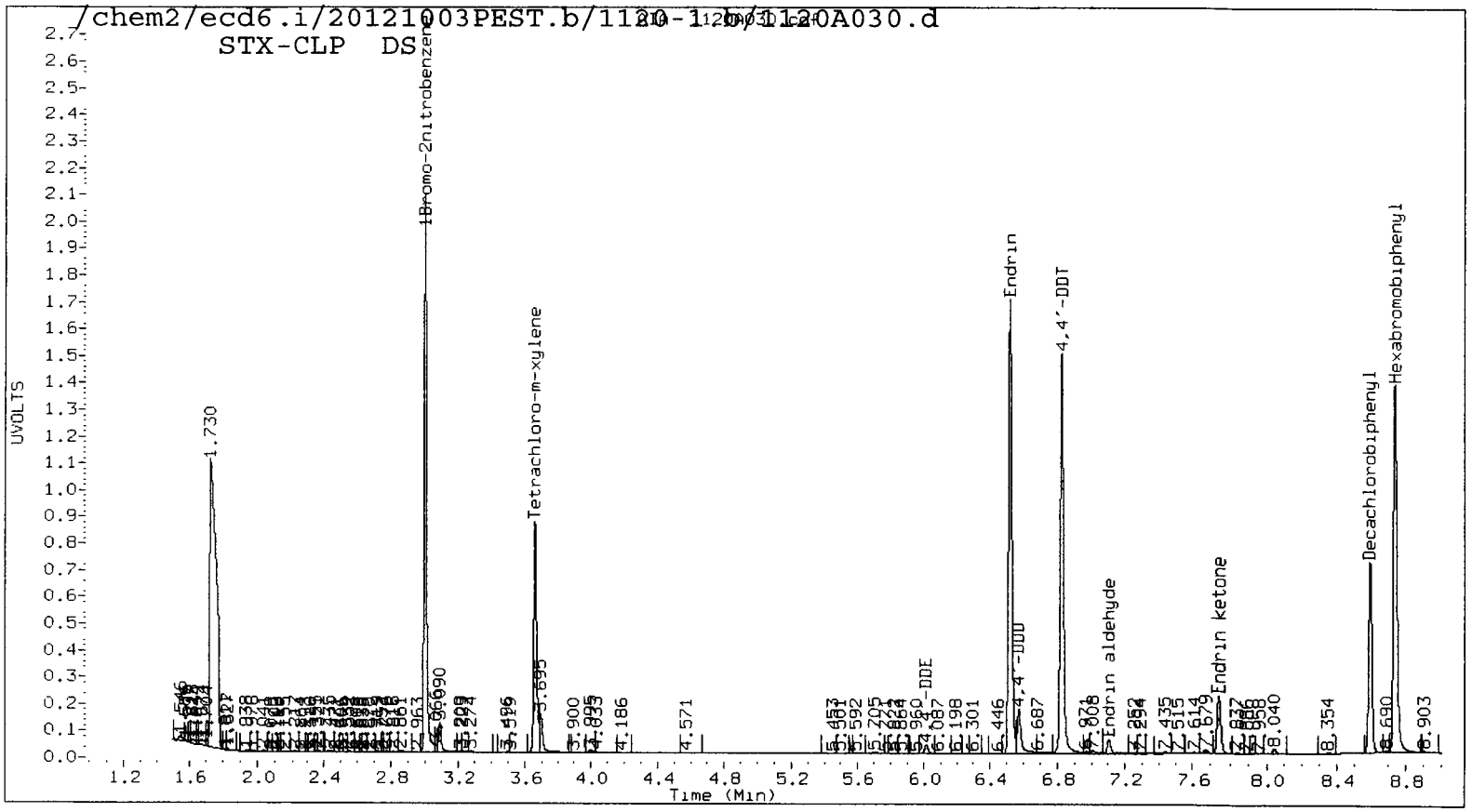
Endrin Percent Breakdown = 13.9 %
((156492+578151) * 100)/(156492+578151+4562001)

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.731	576432
Endrin	7.210	20207894
4,4'-DDD	7.270	2358212
4,4'-DDT	7.556	18349722
Endrin ketone	8.430	2464961
Endrin aldehyde	7.697	628996

DDT Percent Breakdown = 13.8 %
((576432+2358212) * 100)/(576432+2358212+18349722)

Endrin Percent Breakdown = 13.3 %
((628996+2464961) * 100)/(628996+2464961+20207894)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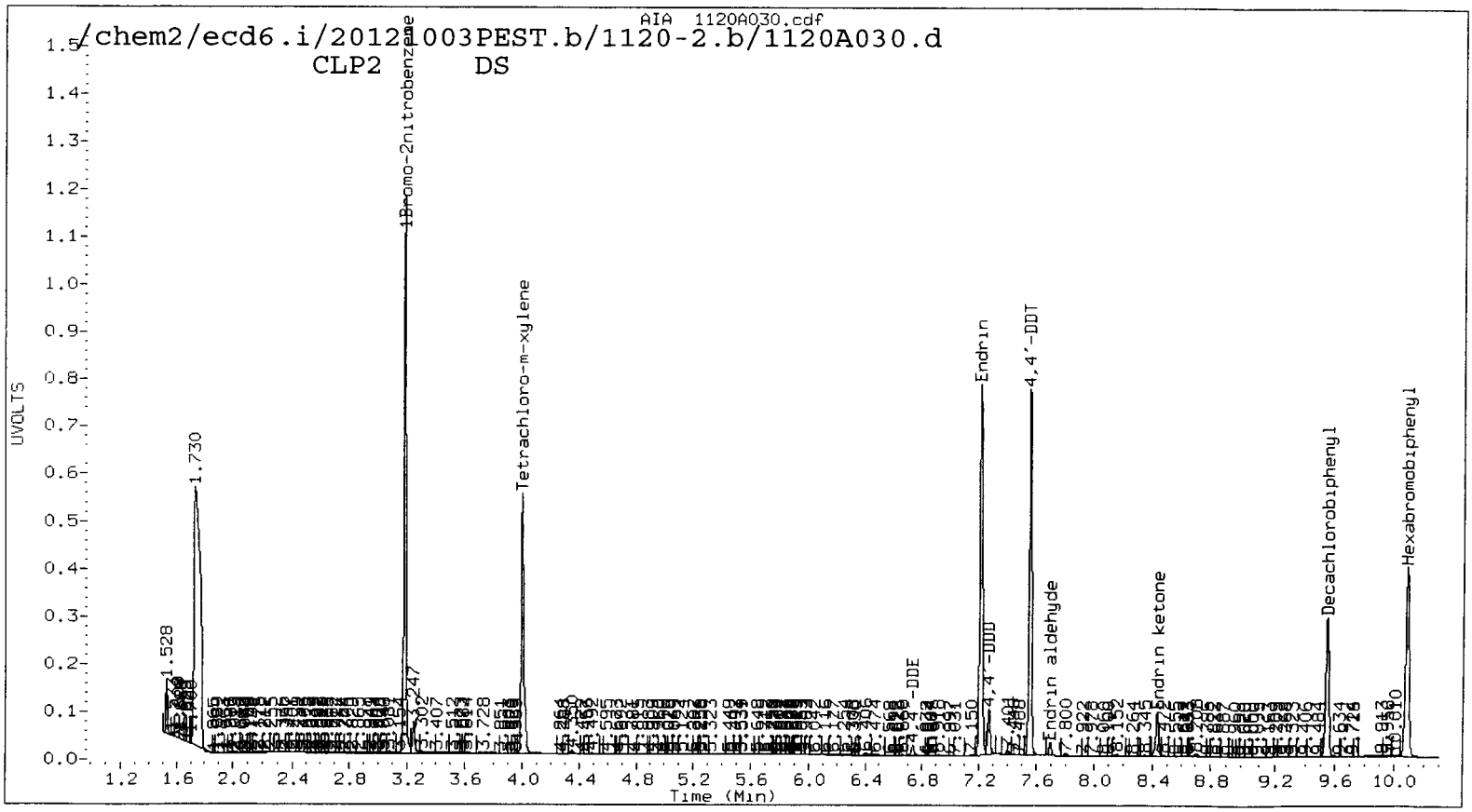
Tetrachloro-m-xylene
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl
1.730
4,4'-DDD
4,4'-DDE
UVOLTS
Time (Min)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CLP2 DS
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl
1.528
1.730
4,4'-DDD
4,4'-DDE
UVOLTS
Time (Min)

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/20/12,2034

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
alpha-BHC	4.13	4.10	4.20	21.6	20.0	8.0
beta-BHC	4.50	4.45	4.55	20.0	20.0	-0.1
delta-BHC	4.66	4.61	4.71	21.4	20.0	6.9
gamma-BHC (Lindane)	4.41	4.37	4.47	20.5	20.0	2.7
Heptachlor	4.85	4.81	4.91	20.4	20.0	1.8
Aldrin	5.13	5.10	5.20	20.9	20.0	4.6
Heptachlor epoxide b	5.70	5.67	5.77	20.1	20.0	0.7
Endosulfan I	6.08	6.05	6.15	21.7	20.0	8.4
Dieldrin	6.30	6.27	6.37	41.8	40.0	4.5
4,4'-DDE	6.01	5.98	6.08	40.7	40.0	1.7
Endrin	6.52	6.49	6.59	36.6	40.0	-8.5
Endosulfan II	6.73	6.70	6.80	39.6	40.0	-1.1
4,4'-DDD	6.57	6.53	6.63	41.5	40.0	3.6
Endosulfan sulfate	7.49	7.46	7.56	39.2	40.0	-2.0
4,4'-DDT	6.83	6.79	6.89	36.6	40.0	-8.4
Methoxychlor	7.25	7.22	7.32	173.1	200.0	-13.4
Endrin ketone	7.75	7.72	7.82	46.3	40.0	15.8
Endrin aldehyde	7.10	7.07	7.17	38.8	40.0	-3.1
gamma-Chlordane	5.83	5.79	5.89	20.5	20.0	2.5
alpha-Chlordane	5.95	5.92	6.02	20.1	20.0	0.4
Hexachlorobutadiene	2.20	2.16	2.26	22.3	20.0	11.4
Hexachlorobenzene	4.00	3.95	4.05	21.1	20.0	5.6
Tetrachloro-m-xylene	3.66	3.62	3.72	37.3	40.0	-6.9
Decachlorobiphenyl	8.59	8.56	8.66	39.0	40.0	-2.5

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/20/12,2034

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
alpha-BHC	4.57	4.54	4.64	20.2	20.0	1.1	
beta-BHC	5.00	4.96	5.06	18.6	20.0	-7.0	
delta-BHC	5.30	5.26	5.36	19.7	20.0	-1.7	
gamma-BHC (Lindane)	4.92	4.89	4.99	19.5	20.0	-2.5	
Heptachlor	5.38	5.35	5.45	19.1	20.0	-4.4	
Aldrin	5.72	5.69	5.79	19.8	20.0	-0.9	
Heptachlor epoxide b	6.28	6.24	6.34	19.1	20.0	-4.7	
Endosulfan I	6.66	6.63	6.73	19.1	20.0	-4.6	
Dieldrin	6.92	6.89	6.99	37.4	40.0	-6.4	
4,4'-DDE	6.73	6.70	6.80	38.2	40.0	-4.4	
Endrin	7.21	7.18	7.28	39.6	40.0	-0.9	
Endosulfan II	7.40	7.37	7.47	43.4	40.0	8.4	
4,4'-DDD	7.27	7.23	7.33	44.9	40.0	12.3	
Endosulfan sulfate	7.94	7.91	8.01	41.5	40.0	3.7	
4,4'-DDT	7.56	7.52	7.62	37.7	40.0	-5.8	
Methoxychlor	8.14	8.11	8.21	174.0	200.0	-13.0	
Endrin ketone	8.43	8.40	8.50	49.3	40.0	23.1	<-
Endrin aldehyde	7.70	7.66	7.76	42.7	40.0	6.8	
gamma-Chlordane	6.46	6.43	6.53	18.3	20.0	-8.3	
alpha-Chlordane	6.60	6.56	6.66	18.2	20.0	-8.8	
Hexachlorobutadiene	2.37	2.33	2.43	19.5	20.0	-2.6	
Hexachlorobenzene	4.45	4.41	4.51	25.1	20.0	25.6	<-
Tetrachloro-m-xylene	4.00	3.96	4.06	40.0	40.0	-0.0	
Decachlorobiphenyl	9.54	9.52	9.62	47.3	40.0	18.2	

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS

ARI Job No.: VS45

Analysis Date: 21-NOV-2012 01:19

Init. Calib. Date: 03-OCT-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.020	107198
Endrin	6.522	4579690
4,4'-DDD	6.576	436296
4,4'-DDT	6.830	4169507
Endrin ketone	7.748	585575
Endrin aldehyde	7.106	174856

DDT Percent Breakdown = 11.5 %
((107198+436296) * 100)/(107198+436296+4169507)

Endrin Percent Breakdown = 14.2 %
((174856+585575) * 100)/(174856+585575+4579690)

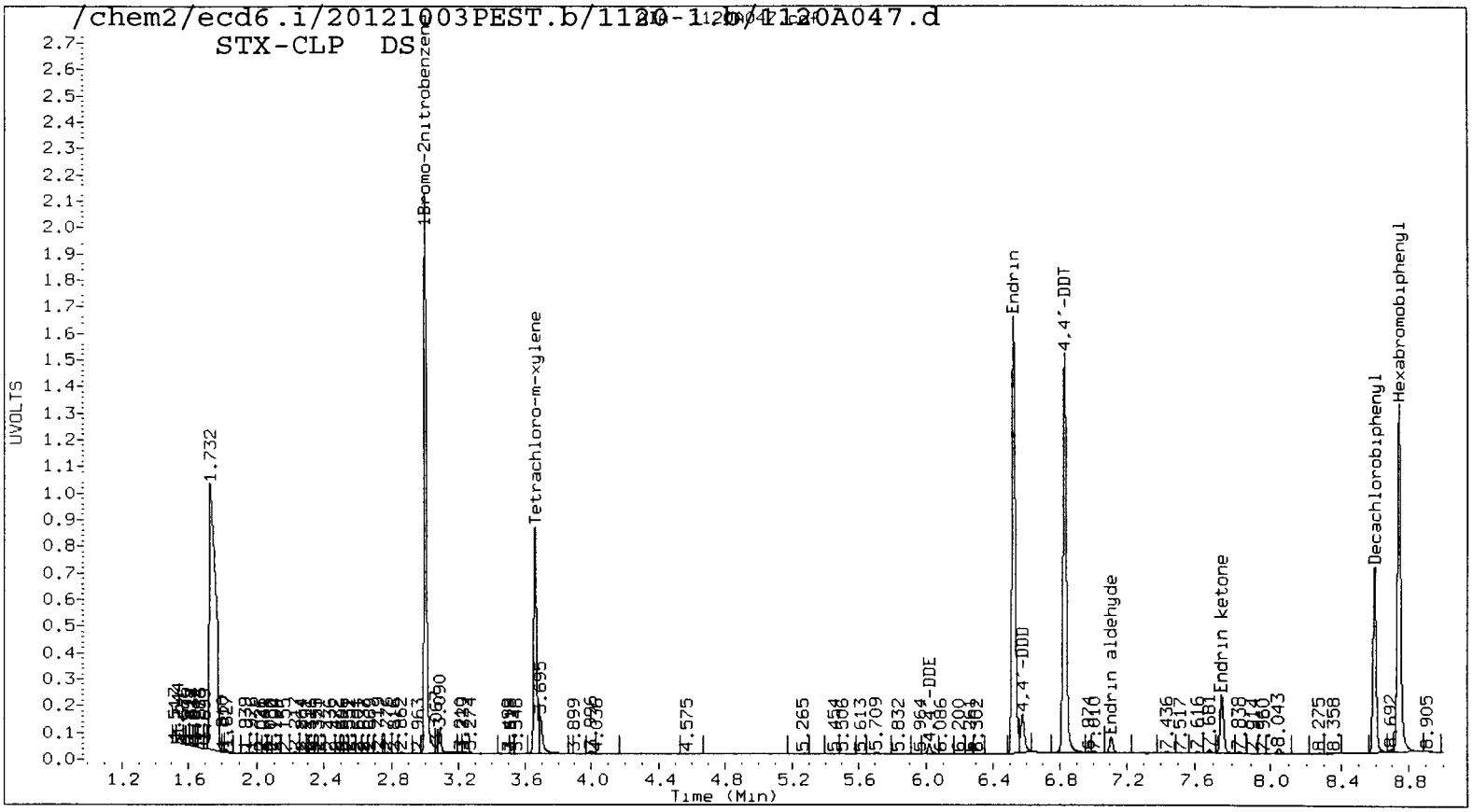
GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.734	662007
Endrin	7.212	20532021
4,4'-DDD	7.273	2086306
4,4'-DDT	7.559	19008478
Endrin ketone	8.432	2470224
Endrin aldehyde	7.700	776131

DDT Percent Breakdown = 12.6 %
((662007+2086306) * 100)/(662007+2086306+19008478)

Endrin Percent Breakdown = 13.7 %
((776131+2470224) * 100)/(776131+2470224+20532021)

Form VII Pest-1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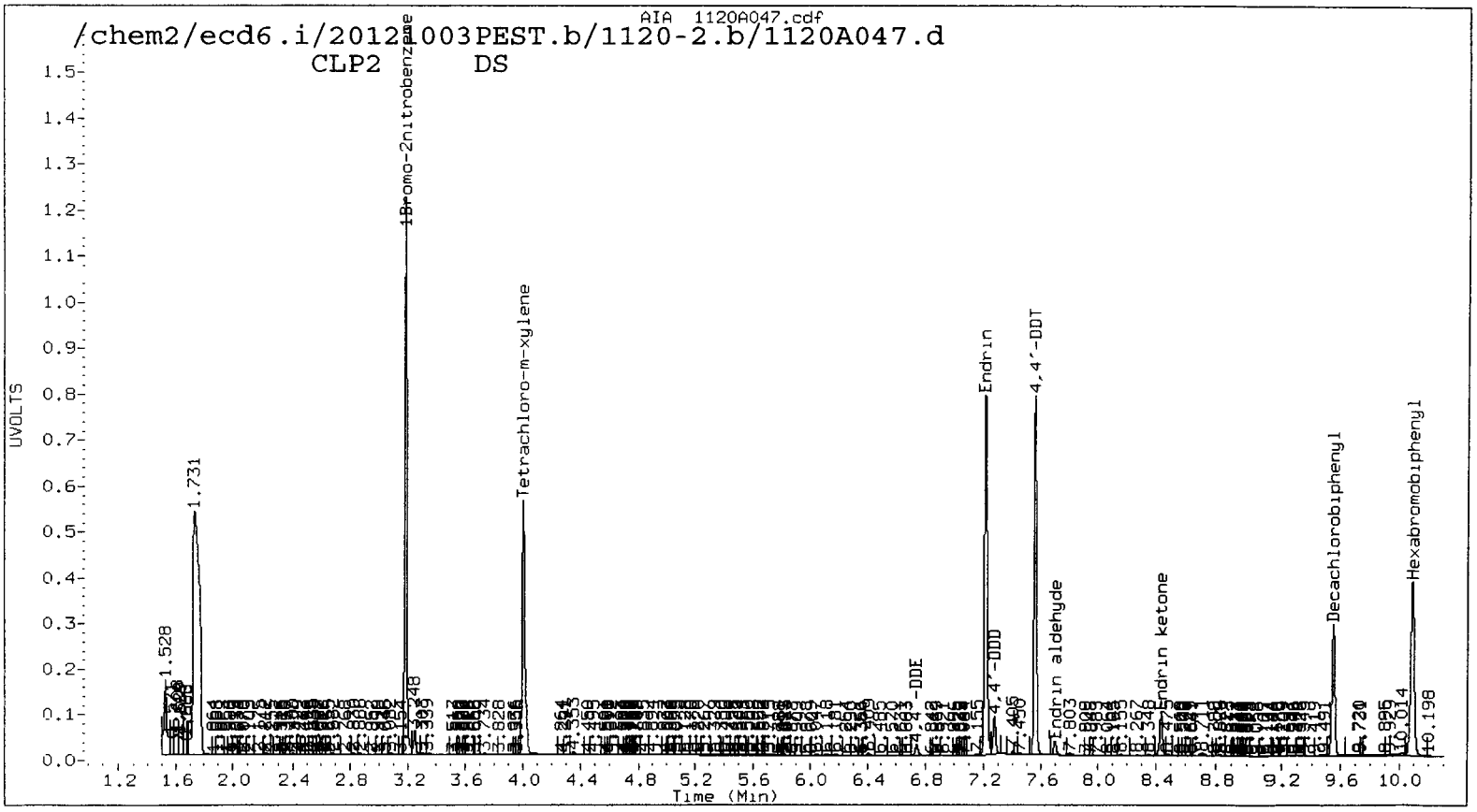
STX-CLP DS
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
Endrin
4,4'-DDT
4,4'-DDD
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl
1.732
3.695
4.575
5.265
5.832
5.964
6.086
6.200
6.362
6.876
7.436
7.517
7.681
7.838
8.043
8.275
8.358
8.692
8.905
UVOLTS
Time (Min)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CLP2 DS
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
Endrin
4,4'-DDT
4,4'-DDD
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl
1.528
1.731
4.406
7.803
9.720
10.014
10.198
UVOLTS
Time (Min)

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/21/12,0137

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
alpha-BHC	4.13	4.10	4.20	21.8	20.0	8.9
beta-BHC	4.50	4.45	4.55	20.3	20.0	1.4
delta-BHC	4.66	4.61	4.71	21.5	20.0	7.5
gamma-BHC (Lindane)	4.41	4.37	4.47	20.7	20.0	3.4
Heptachlor	4.85	4.81	4.91	20.4	20.0	2.0
Aldrin	5.13	5.10	5.20	21.1	20.0	5.4
Heptachlor epoxide b	5.70	5.67	5.77	20.3	20.0	1.5
Endosulfan I	6.08	6.05	6.15	22.0	20.0	10.0
Dieldrin	6.30	6.27	6.37	41.9	40.0	4.8
4,4'-DDE	6.02	5.98	6.08	40.4	40.0	1.0
Endrin	6.52	6.49	6.59	37.1	40.0	-7.1
Endosulfan II	6.73	6.70	6.80	40.8	40.0	2.0
4,4'-DDD	6.57	6.53	6.63	41.9	40.0	4.8
Endosulfan sulfate	7.49	7.46	7.56	39.9	40.0	-0.2
4,4'-DDT	6.83	6.79	6.89	38.2	40.0	-4.6
Methoxychlor	7.26	7.22	7.32	179.2	200.0	-10.4
Endrin ketone	7.75	7.72	7.82	47.7	40.0	19.2
Endrin aldehyde	7.10	7.07	7.17	40.0	40.0	0.1
gamma-Chlordane	5.83	5.79	5.89	20.6	20.0	2.9
alpha-Chlordane	5.95	5.92	6.02	20.1	20.0	0.6
Hexachlorobutadiene	2.20	2.16	2.26	22.3	20.0	11.4
Hexachlorobenzene	4.00	3.95	4.05	21.2	20.0	6.1
Tetrachloro-m-xylene	3.66	3.62	3.72	37.0	40.0	-7.4
Decachlorobiphenyl	8.59	8.56	8.66	39.5	40.0	-1.2

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/21/12,0137

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
alpha-BHC	4.57	4.54	4.64	20.3	20.0	1.6	
beta-BHC	5.00	4.96	5.06	18.8	20.0	-6.1	
delta-BHC	5.31	5.26	5.36	19.7	20.0	-1.4	
gamma-BHC (Lindane)	4.92	4.89	4.99	19.7	20.0	-1.7	
Heptachlor	5.38	5.35	5.45	19.1	20.0	-4.3	
Aldrin	5.72	5.69	5.79	19.9	20.0	-0.6	
Heptachlor epoxide b	6.28	6.24	6.34	19.1	20.0	-4.6	
Endosulfan I	6.66	6.63	6.73	19.0	20.0	-5.1	
Dieldrin	6.92	6.89	6.99	37.1	40.0	-7.2	
4,4'-DDE	6.73	6.70	6.80	37.7	40.0	-5.6	
Endrin	7.21	7.18	7.28	40.2	40.0	0.6	
Endosulfan II	7.40	7.37	7.47	44.2	40.0	10.5	
4,4'-DDD	7.27	7.23	7.33	45.2	40.0	13.0	
Endosulfan sulfate	7.94	7.91	8.01	42.2	40.0	5.4	
4,4'-DDT	7.56	7.52	7.62	39.2	40.0	-2.0	
Methoxychlor	8.14	8.11	8.21	180.2	200.0	-9.9	
Endrin ketone	8.43	8.40	8.50	50.5	40.0	26.3	<-
Endrin aldehyde	7.70	7.66	7.76	43.3	40.0	8.2	
gamma-Chlordane	6.46	6.43	6.53	18.3	20.0	-8.5	
alpha-Chlordane	6.60	6.56	6.66	18.2	20.0	-9.0	
Hexachlorobutadiene	2.37	2.33	2.43	19.5	20.0	-2.5	
Hexachlorobenzene	4.45	4.41	4.51	25.2	20.0	26.2	<-
Tetrachloro-m-xylene	4.00	3.96	4.06	40.3	40.0	0.8	
Decachlorobiphenyl	9.55	9.52	9.62	48.6	40.0	21.5	<-

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/20/12,2052

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
Toxaphene -1	6.48	6.44	6.54	2380	2500	-4.8	
Toxaphene -2	6.83	6.79	6.89	2510	2500	0.4	
Toxaphene -3	7.20	7.16	7.26	2420	2500	-3.2	
Toxaphene -4	7.47	7.42	7.52	1920	2500	-23.2	<-
Toxaphene -5	7.73	7.69	7.79	2560	2500	2.4	
Toxaphene -6	7.86	7.82	7.92	2460	2500	-1.6	

AVERAGE %D = 5.9

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/20/12,2052

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
Toxaphene -1	7.15	7.11	7.21	2400	2500	-4.0
Toxaphene -2	7.47	7.43	7.53	2420	2500	-3.2
Toxaphene -3	7.70	7.66	7.76	2460	2500	-1.6
Toxaphene -4	8.17	8.13	8.23	2480	2500	-0.8
Toxaphene -5	8.52	8.48	8.58	2620	2500	4.8

AVERAGE %D = 2.9

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/21/12,0155

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
Toxaphene -1	6.48	6.44	6.54	2450	2500	-2.0	
Toxaphene -2	6.83	6.79	6.89	2620	2500	4.8	
Toxaphene -3	7.20	7.16	7.26	2500	2500	0.0	
Toxaphene -4	7.47	7.42	7.52	1970	2500	-21.2	<-
Toxaphene -5	7.73	7.69	7.79	2660	2500	6.4	
Toxaphene -6	7.86	7.82	7.92	2600	2500	4.0	

AVERAGE %D = 6.4

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/21/12,0155

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
Toxaphene -1	7.15	7.11	7.21	2370	2500	-5.2
Toxaphene -2	7.47	7.43	7.53	2400	2500	-4.0
Toxaphene -3	7.70	7.66	7.76	2420	2500	-3.2
Toxaphene -4	8.17	8.13	8.23	2470	2500	-1.2
Toxaphene -5	8.52	8.48	8.58	2610	2500	4.4

AVERAGE %D = 3.6

FORM VII PEST-3

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 10/03/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	4060064	3.015	3748709	8.750
				UPPER LIMIT	8120128	3.065	7497418	8.800
				LOWER LIMIT	2030032	2.965	1874354	8.700
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		INDAE	10/03/12	1639	4060064	3.015	3748709	8.750
02		INDAA	10/03/12	1656	4049993	3.015	3734455	8.750
03		INDAB	10/03/12	1714	4090558	3.015	3771845	8.750
04		INDAC	10/03/12	1732	4021073	3.015	3724289	8.750
05		INDAD	10/03/12	1750	4048036	3.015	3782157	8.750
06		INDAF	10/03/12	1808	4083237	3.015	3825703	8.750
07		INDAG	10/03/12	1826	4094375	3.015	3786416	8.750
08		TOXAPH	10/12/12	1241	5080195	3.009	4970606	8.746
09		DS	11/20/12	2017	4039144	3.003	3955732	8.738
10		INDAE	11/20/12	2034	4356127	3.003	4185014	8.738
11		TOXAPH	11/20/12	2052	4091087	3.003	4026531	8.737
12	VS45MBW1	VS45MBW1	11/20/12	2110	4297281	3.003	4123557	8.737
13	VS45LCSW1	VS45LCSW1	11/20/12	2128	3994844	3.003	3871840	8.737
14	VS45LCSDW1	VS45LCSDW1	11/20/12	2146	4526892	3.003	4401841	8.737
15	LMW-3-1112	VS45A	11/20/12	2203	4418134	3.003	4285610	8.737
16	LMW-EB-1112	VS45B	11/20/12	2221	4372441	3.002	4234517	8.738
17	LMW-8-1112	VS45C	11/20/12	2239	4706786	3.003	4451063	8.737
18	LMW-5-1112	VS45D	11/20/12	2257	4498425	3.003	4169065	8.737
19	LMW-7-1112	VS45E	11/20/12	2315	4862121	3.003	4356360	8.738
20	LMW-7-1112-D	VS45F	11/20/12	2332	4377086	3.002	4014624	8.738
21	LMW-9-1112	VS61A	11/21/12	0026	4659322	3.002	4162228	8.737
22	LMW-11-1112	VS61B	11/21/12	0044	4440332	3.003	3955014	8.737
23	LMW-6-1112	VS61C	11/21/12	0102	4578639	3.002	4267844	8.738
24		DS	11/21/12	0119	4119772	3.003	3880458	8.740
25		INDAE	11/21/12	0137	4398580	3.003	4115604	8.741
26		TOXAPH	11/21/12	0155	4102644	3.003	3942935	8.738

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 10/03/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	21032891	3.195	14864285	10.105
				UPPER LIMIT	42065782	3.245	29728570	10.155
				LOWER LIMIT	10516446	3.145	7432142	10.055

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		INDAE	10/03/12	1639	21032891	3.195	14864285	10.105
02		INDAA	10/03/12	1656	21107593	3.195	14677423	10.106
03		INDAB	10/03/12	1714	21416427	3.195	15039648	10.106
04		INDAC	10/03/12	1732	21029129	3.195	15016060	10.106
05		INDAD	10/03/12	1750	21297295	3.195	15199043	10.107
06		INDAF	10/03/12	1808	21266311	3.195	15407292	10.106
07		INDAG	10/03/12	1826	21395806	3.195	15257890	10.107
08		TOXAPH	10/12/12	1241	25258671	3.190	15955179	10.098
09		DS	11/20/12	2017	21952130	3.184	13466386	10.083
10		INDAE	11/20/12	2034	23550420	3.184	14126548	10.083
11		TOXAPH	11/20/12	2052	22235794	3.185	12958120	10.086
12	VS45MBW1	VS45MBW1	11/20/12	2110	23113751	3.185	14087457	10.086
13	VS45LCSW1	VS45LCSW1	11/20/12	2128	21783269	3.185	13146983	10.085
14	VS45LCSDW1	VS45LCSDW1	11/20/12	2146	24592583	3.185	15060869	10.085
15	LMW-3-1112	VS45A	11/20/12	2203	23769250	3.185	14760151	10.086
16	LMW-EB-1112	VS45B	11/20/12	2221	23050400	3.185	14524655	10.086
17	LMW-8-1112	VS45C	11/20/12	2239	24488957	3.185	15298224	10.086
18	LMW-5-1112	VS45D	11/20/12	2257	23494480	3.185	12505405	10.086
19	LMW-7-1112	VS45E	11/20/12	2315	24755011	3.185	14609357	10.086
20	LMW-7-1112-D	VS45F	11/20/12	2332	23014829	3.184	13678172	10.085
21	LMW-9-1112	VS61A	11/21/12	0026	24150932	3.184	13312237	10.084
22	LMW-11-1112	VS61B	11/21/12	0044	23419708	3.185	12922411	10.085
23	LMW-6-1112	VS61C	11/21/12	0102	24759135	3.185	14269872	10.086
24		DS	11/21/12	0119	22796918	3.185	13115540	10.087
25		INDAE	11/21/12	0137	24031979	3.185	13942788	10.087
26		TOXAPH	11/21/12	0155	22750350	3.185	13294508	10.086

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

PCB Analysis
Report and Summary QC Forms

ARI Job ID: VS61, VS63

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C
Page 1 of 1

Sample ID: LMW-9-1112
SAMPLE

Lab Sample ID: VS61A
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 21:19
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	75.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C
Page 1 of 1

Sample ID: LMW-11-1112
SAMPLE

Lab Sample ID: VS61B
LIMS ID: 12-22880
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 21:39
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	110%
Tetrachlorometaxylene	77.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C
Page 1 of 1

Sample ID: LMW-6-1112
SAMPLE

Lab Sample ID: VS61C
LIMS ID: 12-22881
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 21:59
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	69.5%

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS61-Golder Associates
Project:

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-111912	106%	32-108	75.0%	31-100	0
LCS-111912	108%	32-108	75.8%	31-100	0
LCSD-111912	101%	32-108	77.0%	31-100	0
LMW-9-1112	106%	19-111	75.2%	21-100	0
LMW-11-1112	110%	19-111	77.2%	21-100	0
LMW-6-1112	106%	19-111	69.5%	21-100	0

Prep Method: SW3510C
Log Number Range: 12-22879 to 12-22881

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Page 1 of 1

Sample ID: LCS-111912
LCS/LCSD

Lab Sample ID: LCS-111912
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 11/19/12

Date Analyzed LCS: 11/27/12 16:55
LCSD: 11/27/12 17:16

Instrument/Analyst LCS: ECD5/PKC
LCSD: ECD5/PKC

GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount LCS: 1000 mL
LCSD: 1000 mL

Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL

Dilution Factor LCS: 1.00
LCSD: 1.00

Silica Gel: Yes
Acid Cleanup: Yes

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	0.041	0.050	82.0%	0.043	0.050	86.0%	4.8%
Aroclor 1260	0.055	0.050	110%	0.058	0.050	116%	5.3%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	108%	101%
Tetrachlorometaxylene	75.8%	77.0%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

PCB METHOD BLANK SUMMARY

BLANK NO.

VS45MBW1

Lab Name: ANALYTICAL RESOURCES INC — Client: GOLDER ASSOCIATES

ARI Job No.: VS45 — Project: LANDSBURG MINE

Lab Sample ID: VS45MBW1 — Lab File ID: 1127A008

Date Extracted: 11/19/12 — Matrix: LIQUID

Date Analyzed: 11/27/12 — Instrument ID: ECD5

Time Analyzed: 1635 — GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS45LCSW1	VS45LCSW1	11/27/12
02	VS45LCSDW1	VS45LCSDW1	11/27/12
03	LMW-3-1112	VS45A	11/27/12
04	LMW-EB-1112	VS45B	11/27/12
05	LMW-8-1112	VS45C	11/27/12
06	LMW-5-1112	VS45D	11/27/12
07	LMW-7-1112	VS45E	11/27/12
08	LMW-7-1112-D	VS45F	11/27/12
09	LMW-2-1112	VS80A	11/27/12
10	LMW-4-1112	VS80B	11/27/12
11	LMW-10-1112	VS80C	11/27/12
12	LMW-9-1112	VS61A	11/27/12
13	LMW-11-1112	VS61B	11/27/12
14	LMW-6-1112	VS61C	11/27/12

ALL RUNS ARE DUAL COLUMN

FORM IV PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A **Sample ID: MB-111912**
Extraction Method: SW3510C **METHOD BLANK**

Lab Sample ID: MB-111912
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: NA
Date Received: NA

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 16:35
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	75.0%

6F

8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Instrument ID: ECD5

Calibration Date: 11/02/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	4.35- 4.55	1.7463	1.7366	1.7919	1.6885	1.5990	1.4618	1.6707	7.3
DCB	12.76-12.96	1.4419	1.3542	1.3255	1.1568	1.0372	0.9164	1.2053	16.9

Aroclor-1016 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	6.00- 6.20	0.0526	0.0492	0.0480	0.0431	0.0399	0.0355	0.0447	14.3
2	6.40- 6.60	0.1677	0.1545	0.1513	0.1334	0.1220	0.1073	0.1394	16.2
3	6.55- 6.75	0.0718	0.0670	0.0652	0.0578	0.0527	0.0464	0.0601	15.9
4	6.66- 6.86	0.0505	0.0471	0.0462	0.0417	0.0385	0.0340	0.0430	14.2

AROCLOR AVERAGE %RSD = 15.1

Aroclor-1260 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	9.90-10.10	0.0536	0.0493	0.0479	0.0428	0.0388	0.0345	0.0445	12.5
2	10.21-10.41	0.0532	0.0494	0.0483	0.0433	0.0394	0.0351	0.0448	11.6
3	10.59-10.79	0.1298	0.1173	0.1141	0.1011	0.0918	0.0821	0.1060	13.3
4	10.99-11.19	0.0754	0.0665	0.0648	0.0581	0.0527	0.0471	0.0608	13.6
5	11.18-11.38	0.0346	0.0319	0.0317	0.0292	0.0269	0.0244	0.0298	9.5

AROCLOR AVERAGE %RSD = 12.1

6F

8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Instrument ID: ECD5

Calibration Date: 11/02/12

SURROGATES

RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX 4.36- 4.56	1.1947	1.1506	1.1889	1.1588	1.1066	1.0428	1.1404	5.0
DCB 13.15-13.35	1.2887	1.1842	1.1439	1.0432	0.9699	0.8923	1.0871	13.5

Aroclor-1016 Peak RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1 6.11- 6.31	0.0541	0.0496	0.0481	0.0428	0.0390	0.0352	0.0448	15.8
2 6.75- 6.95	0.1119	0.1025	0.1010	0.0916	0.0847	0.0773	0.0948	13.4
3 7.13- 7.33	0.0277	0.0264	0.0263	0.0242	0.0226	0.0209	0.0247	10.6
4 7.24- 7.44	0.0325	0.0303	0.0296	0.0268	0.0247	0.0226	0.0277	13.5

AROCLOR AVERAGE %RSD = 13.3

Aroclor-1260 Peak RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1 10.20-10.40	0.0510	0.0463	0.0455	0.0410	0.0379	0.0345	0.0427	14.1
2 10.65-10.85	0.0605	0.0575	0.0561	0.0509	0.0468	0.0427	0.0524	13.0
3 10.93-11.13	0.1180	0.1138	0.1111	0.1016	0.0945	0.0868	0.1043	11.6
4 11.45-11.65	0.0395	0.0332	0.0327	0.0299	0.0279	0.0254	0.0314	15.7

AROCLOR AVERAGE %RSD = 13.6

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1221			
Peak	RT	RT WIN	Cal Factor
1	4.817	4.72- 4.92	0.01953
2	4.995	4.89- 5.09	0.01337
3	5.101	5.00- 5.20	0.04356

Aroclor-1232			
Peak	RT	RT WIN	Cal Factor
1	6.094	5.99- 6.19	0.01822
2	6.497	6.40- 6.60	0.05697
3	6.647	6.55- 6.75	0.02485
4	7.901	7.80- 8.00	0.03114

Aroclor-1242			
Peak	RT	RT WIN	Cal Factor
1	6.097	6.00- 6.20	0.03480
2	6.500	6.40- 6.60	0.10781
3	6.650	6.55- 6.75	0.04681
4	7.902	7.80- 8.00	0.05490

Aroclor-1248			
Peak	RT	RT WIN	Cal Factor
1	6.497	6.40- 6.60	0.07048
2	7.474	7.37- 7.57	0.07420
3	7.902	7.80- 8.00	0.09369
4	8.138	8.04- 8.24	0.07222

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	8.223	8.12- 8.32	0.09552
2	8.597	8.50- 8.70	0.06279
3	8.731	8.63- 8.83	0.12204
4	9.080	8.98- 9.18	0.13358
5	9.440	9.34- 9.54	0.08400

Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	9.996	9.90-10.10	0.06957
2	10.312	10.21-10.41	0.05282
3	10.687	10.59-10.79	0.13695
4	11.202	11.10-11.30	0.05159
5	11.275	11.18-11.38	0.05664

Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	11.203	11.10-11.30	0.13880
2	11.275	11.17-11.37	0.13349
3	11.661	11.56-11.76	0.11731
4	12.449	12.35-12.55	0.33525

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1221			
Peak	RT	RT WIN	Cal Factor
1	5.141	5.04- 5.24	0.01355
2	5.393	5.29- 5.49	0.00798
3	5.507	5.41- 5.61	0.02510
4	5.576	5.48- 5.68	0.00433

Aroclor-1232			
Peak	RT	RT WIN	Cal Factor
1	6.210	6.11- 6.31	0.01985
2	6.841	6.74- 6.94	0.03912
3	7.050	6.95- 7.15	0.01635
4	8.276	8.18- 8.38	0.01389

Aroclor-1242			
Peak	RT	RT WIN	Cal Factor
1	6.210	6.11- 6.31	0.03416
2	6.842	6.74- 6.94	0.07272
3	7.051	6.95- 7.15	0.03022
4	8.276	8.18- 8.38	0.02545

Aroclor-1248			
Peak	RT	RT WIN	Cal Factor
1	6.841	6.74- 6.94	0.04749
2	7.747	7.65- 7.85	0.03939
3	8.276	8.18- 8.38	0.04070
4	8.622	8.52- 8.72	0.05034

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	8.341	8.24- 8.44	0.03474
2	8.515	8.41- 8.61	0.04387
3	9.037	8.94- 9.14	0.03370
4	9.188	9.09- 9.29	0.07393
5	9.971	9.87-10.07	0.04454

Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	10.302	10.20-10.40	0.06977
2	10.752	10.65-10.85	0.06199
3	11.025	10.92-11.12	0.13603
4	11.547	11.45-11.65	0.05505
5	12.347	12.25-12.45	0.05291

Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	11.547	11.45-11.65	0.13895
2	11.613	11.51-11.71	0.13513
3	12.011	11.91-12.11	0.11296
4	12.834	12.73-12.93	0.33487

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1254 Time Analyzed :1556

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1254-1	8.22	8.12	8.32	251.7	250.0	0.7
Aroclor-1254-2	8.60	8.50	8.70	213.6	250.0	-14.6
Aroclor-1254-3	8.73	8.63	8.83	255.7	250.0	2.3
Aroclor-1254-4	9.08	8.98	9.18	260.1	250.0	4.0
Aroclor-1254-5	9.44	9.34	9.54	259.1	250.0	3.6

AVERAGE %D = 5.0

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1254 Time Analyzed :1556

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1254-1	8.34	8.24	8.44	280.0	250.0	12.0
Aroclor-1254-2	8.51	8.41	8.61	280.9	250.0	12.4
Aroclor-1254-3	9.04	8.94	9.14	301.1	250.0	20.4
Aroclor-1254-4	9.19	9.09	9.29	273.0	250.0	9.2
Aroclor-1254-5	9.97	9.87	10.07	284.1	250.0	13.6

AVERAGE %D = 13.5

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660 Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.09	6.00	6.20	238.2	250.0	-4.7
Aroclor-1016-2	6.50	6.40	6.60	247.3	250.0	-1.1
Aroclor-1016-3	6.65	6.55	6.75	244.5	250.0	-2.2
Aroclor-1016-4	6.76	6.66	6.86	251.1	250.0	0.4

AVERAGE %D = 2.1

Date Analyzed :11/27/12

Lab Standard ID: AR1660 Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	265.9	250.0	6.3
Aroclor-1260-2	10.31	10.21	10.41	266.6	250.0	6.6
Aroclor-1260-3	10.69	10.59	10.79	264.1	250.0	5.6
Aroclor-1260-4	11.09	10.99	11.19	256.7	250.0	2.7
Aroclor-1260-5	11.28	11.18	11.38	260.4	250.0	4.2

AVERAGE %D = 5.1

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660 Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	252.5	250.0	1.0
Aroclor-1016-2	6.84	6.75	6.95	223.6	250.0	-10.6
Aroclor-1016-3	7.23	7.13	7.33	259.4	250.0	3.8
Aroclor-1016-4	7.33	7.24	7.44	256.7	250.0	2.7

AVERAGE %D = 4.5

Date Analyzed :11/27/12

Lab Standard ID: AR1660 Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	280.7	250.0	12.3
Aroclor-1260-2	10.75	10.65	10.85	284.5	250.0	13.8
Aroclor-1260-3	11.02	10.93	11.13	284.9	250.0	14.0
Aroclor-1260-4	11.55	11.45	11.65	279.6	250.0	11.8

AVERAGE %D = 13.0

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1248 Time Analyzed :2038

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1248-1	6.50	6.40	6.60	258.6	250.0	3.4
Aroclor-1248-2	7.47	7.37	7.57	266.8	250.0	6.7
Aroclor-1248-3	7.90	7.80	8.00	262.1	250.0	4.8
Aroclor-1248-4	8.14	8.04	8.24	268.9	250.0	7.5

AVERAGE %D = 5.6

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1248 Time Analyzed :2038

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1248-1	6.84	6.74	6.94	247.5	250.0	-1.0
Aroclor-1248-2	7.75	7.65	7.85	275.3	250.0	10.1
Aroclor-1248-3	8.28	8.18	8.38	275.7	250.0	10.3
Aroclor-1248-4	8.62	8.52	8.72	279.5	250.0	11.8

AVERAGE %D = 8.3

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660 Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.10	6.00	6.20	236.0	250.0	-5.6
Aroclor-1016-2	6.50	6.40	6.60	245.4	250.0	-1.8
Aroclor-1016-3	6.65	6.55	6.75	243.2	250.0	-2.7
Aroclor-1016-4	6.76	6.66	6.86	253.7	250.0	1.5

AVERAGE %D = 2.9

Date Analyzed :11/27/12

Lab Standard ID: AR1660 Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	256.3	250.0	2.5
Aroclor-1260-2	10.31	10.21	10.41	257.1	250.0	2.8
Aroclor-1260-3	10.69	10.59	10.79	255.3	250.0	2.1
Aroclor-1260-4	11.09	10.99	11.19	248.0	250.0	-0.8
Aroclor-1260-5	11.28	11.18	11.38	256.4	250.0	2.5

AVERAGE %D = 2.1

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660 Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	249.8	250.0	-0.1
Aroclor-1016-2	6.84	6.75	6.95	221.9	250.0	-11.2
Aroclor-1016-3	7.23	7.13	7.33	259.1	250.0	3.6
Aroclor-1016-4	7.34	7.24	7.44	255.4	250.0	2.2

AVERAGE %D = 4.3

Date Analyzed :11/27/12

Lab Standard ID: AR1660 Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	268.9	250.0	7.6
Aroclor-1260-2	10.75	10.65	10.85	273.2	250.0	9.3
Aroclor-1260-3	11.03	10.93	11.13	275.4	250.0	10.1
Aroclor-1260-4	11.55	11.45	11.65	272.7	250.0	9.1

AVERAGE %D = 9.0

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1242 Time Analyzed :0102

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1242-1	6.10	6.00	6.20	223.2	250.0	-10.7
Aroclor-1242-2	6.50	6.40	6.60	229.9	250.0	-8.0
Aroclor-1242-3	6.65	6.55	6.75	227.2	250.0	-9.1
Aroclor-1242-4	7.90	7.80	8.00	229.8	250.0	-8.1

AVERAGE %D = 9.0

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB35
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1242
Time Analyzed :0102

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1242-1	6.21	6.11	6.31	251.8	250.0	0.7
Aroclor-1242-2	6.84	6.74	6.94	252.7	250.0	1.1
Aroclor-1242-3	7.05	6.95	7.15	255.6	250.0	2.2
Aroclor-1242-4	8.28	8.18	8.38	260.7	250.0	4.3

AVERAGE %D = 2.1

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1660 Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.10	6.00	6.20	235.8	250.0	-5.7
Aroclor-1016-2	6.50	6.40	6.60	246.1	250.0	-1.5
Aroclor-1016-3	6.65	6.55	6.75	246.5	250.0	-1.4
Aroclor-1016-4	6.76	6.66	6.86	257.4	250.0	3.0

AVERAGE %D = 2.9

Date Analyzed :11/28/12

Lab Standard ID: AR1660 Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	267.6	250.0	7.0
Aroclor-1260-2	10.31	10.21	10.41	264.7	250.0	5.9
Aroclor-1260-3	10.69	10.59	10.79	266.8	250.0	6.7
Aroclor-1260-4	11.09	10.99	11.19	254.7	250.0	1.9
Aroclor-1260-5	11.28	11.18	11.38	264.6	250.0	5.8

AVERAGE %D = 5.5

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1660 Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	250.5	250.0	0.2
Aroclor-1016-2	6.84	6.75	6.95	221.8	250.0	-11.3
Aroclor-1016-3	7.23	7.13	7.33	259.0	250.0	3.6
Aroclor-1016-4	7.34	7.24	7.44	255.6	250.0	2.2

AVERAGE %D = 4.3

Date Analyzed :11/28/12

Lab Standard ID: AR1660 Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	278.3	250.0	11.3
Aroclor-1260-2	10.75	10.65	10.85	280.5	250.0	12.2
Aroclor-1260-3	11.03	10.93	11.13	285.1	250.0	14.0
Aroclor-1260-4	11.55	11.45	11.65	278.1	250.0	11.2

AVERAGE %D = 12.2

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	31244918	2.274	64198300	13.214
	UPPER LIMIT	62489836	2.374	128396600	13.314
	LOWER LIMIT	15622459	2.174	32099150	13.114

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01	ZZZZZ	ZZZZZ	11/02/12	2017	32121330	2.277	65627042	13.214
02		0.25PPMAR166	11/02/12	2037	31244918	2.274	64198300	13.214
03		0.02PPMAR166	11/02/12	2058	31736267	2.277	66012881	13.214
04		0.05PPMAR166	11/02/12	2118	31079093	2.275	64685135	13.214
05		1PPMAR1660	11/02/12	2138	32560778	2.275	67466235	13.214
06		0.1PPMAR1660	11/02/12	2158	31562437	2.274	66063497	13.214
07		0.5PPMAR1660	11/02/12	2218	32469455	2.273	67388285	13.214
08		AR1242	11/02/12	2238	32779971	2.273	67800793	13.214
09		AR1248	11/02/12	2259	33486089	2.279	68805737	13.214
10		AR1254	11/02/12	2319	32866846	2.276	67839772	13.214
11		AR2162	11/02/12	2340	32037907	2.280	66658077	13.215
12		AR3268	11/03/12	0000	33288564	2.280	69153536	13.215
13	ZZZZZ	ZZZZZ	11/03/12	0020	32275358	2.276	69016020	13.215
14	ZZZZZ	ZZZZZ	11/03/12	0041	34992364	2.279	71027100	13.215
15	ZZZZZ	ZZZZZ	11/03/12	0101	33719935	2.275	69100267	13.214
16	ZZZZZ	ZZZZZ	11/03/12	0121	34274216	2.277	70290566	13.215
17	ZZZZZ	ZZZZZ	11/03/12	0142	33531129	2.274	69260863	13.214
18	ZZZZZ	ZZZZZ	11/03/12	0202	33384825	2.277	69841459	13.214
19		AR1254	11/27/12	1556	31355840	2.277	60463087	13.216
20		AR1660	11/27/12	1616	26380762	2.277	49251705	13.215
21	VS45MBW1	VS45MBW1	11/27/12	1635	37850879	2.276	66730789	13.215
22	VS45LCSW1	VS45LCSW1	11/27/12	1655	38471396	2.277	68058410	13.216
23	VS45LCSDW1	VS45LCSDW1	11/27/12	1716	37775632	2.277	66976674	13.215
24	LMW-3-1112	VS45A	11/27/12	1736	38352102	2.276	69679975	13.216
25	LMW-EB-1112	VS45B	11/27/12	1756	37735670	2.278	69060343	13.215
26	LMW-8-1112	VS45C	11/27/12	1816	38759189	2.276	69292543	13.216
27	LMW-5-1112	VS45D	11/27/12	1836	39096740	2.277	72571060	13.215
28	LMW-7-1112	VS45E	11/27/12	1857	39936132	2.278	72905231	13.214
29	LMW-7-1112-D	VS45F	11/27/12	1917	40386717	2.277	73249886	13.216
30	LMW-2-1112	VS80A	11/27/12	1937	40659775	2.277	73156003	13.216
31	LMW-4-1112	VS80B	11/27/12	1957	39866227	2.279	73286301	13.216
32	LMW-10-1112	VS80C	11/27/12	2018	39622809	2.278	72195861	13.216

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	31244918	2.274	64198300	13.214
	UPPER LIMIT	62489836	2.374	128396600	13.314
	LOWER LIMIT	15622459	2.174	32099150	13.114

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
33		AR1248	11/27/12	2038	32375111	2.277	64181082	13.216
34		AR1660	11/27/12	2059	28784889	2.279	56853217	13.216
35	LMW-9-1112	VS61A	11/27/12	2119	43481965	2.277	75432143	13.217
36	LMW-11-1112	VS61B	11/27/12	2139	51607223	2.276	75467547	13.216
37	LMW-6-1112	VS61C	11/27/12	2159	41685341	2.278	76685668	13.216
38		AR1242	11/28/12	0102	35209545	2.279	58213591	13.217
39		AR1660	11/28/12	0122	30334360	2.280	54319976	13.216

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	14536489	2.761	15789428	14.115
	UPPER LIMIT	29072978	2.861	31578856	14.215
	LOWER LIMIT	7268244	2.661	7894714	14.015

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01	ZZZZZ	ZZZZZ	11/02/12	2017	14713535	2.764	16088294	14.115
02		0.25PPMAR166	11/02/12	2037	14536489	2.761	15789428	14.115
03		0.02PPMAR166	11/02/12	2058	14662512	2.763	16195930	14.116
04		0.05PPMAR166	11/02/12	2118	14425871	2.761	15804667	14.115
05		1PPMAR1660	11/02/12	2138	14668819	2.761	16259905	14.115
06		0.1PPMAR1660	11/02/12	2158	14552241	2.763	15974909	14.115
07		0.5PPMAR1660	11/02/12	2218	14811515	2.761	16169446	14.114
08		AR1242	11/02/12	2238	14876946	2.761	16149950	14.115
09		AR1248	11/02/12	2259	15137931	2.765	16358718	14.115
10		AR1254	11/02/12	2319	14737446	2.762	15955858	14.116
11		AR2162	11/02/12	2340	14169986	2.766	15683025	14.116
12		AR3268	11/03/12	0000	14704019	2.765	16219252	14.116
13	ZZZZZ	ZZZZZ	11/03/12	0020	14465214	2.762	15841317	14.116
14	ZZZZZ	ZZZZZ	11/03/12	0041	15000485	2.765	16204591	14.116
15	ZZZZZ	ZZZZZ	11/03/12	0101	14278309	2.762	15675954	14.116
16	ZZZZZ	ZZZZZ	11/03/12	0121	14593306	2.764	15921593	14.117
17	ZZZZZ	ZZZZZ	11/03/12	0142	14012549	2.762	15630049	14.116
18	ZZZZZ	ZZZZZ	11/03/12	0202	13930274	2.762	15765289	14.115
19		AR1254	11/27/12	1556	12425950	2.764	13269271	14.114
20		AR1660	11/27/12	1616	10294938	2.763	10779495	14.114
21	VS45MBW1	VS45MBW1	11/27/12	1635	14010375	2.764	14342194	14.116
22	VS45LCSW1	VS45LCSW1	11/27/12	1655	14340389	2.762	14500145	14.115
23	VS45LCSDW1	VS45LCSDW1	11/27/12	1716	13859133	2.762	14355147	14.115
24	LMW-3-1112	VS45A	11/27/12	1736	13963437	2.762	14774249	14.115
25	LMW-EB-1112	VS45B	11/27/12	1756	13664823	2.763	14406035	14.115
26	LMW-8-1112	VS45C	11/27/12	1816	14104559	2.761	14466522	14.115
27	LMW-5-1112	VS45D	11/27/12	1836	13928838	2.762	15102344	14.114
28	LMW-7-1112	VS45E	11/27/12	1857	14712002	2.763	15203722	14.115
29	LMW-7-1112-D	VS45F	11/27/12	1917	14432514	2.762	15247833	14.116
30	LMW-2-1112	VS80A	11/27/12	1937	14550770	2.761	15198767	14.115
31	LMW-4-1112	VS80B	11/27/12	1957	14205014	2.763	15183526	14.115
32	LMW-10-1112	VS80C	11/27/12	2018	14178574	2.762	14929328	14.115

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	14536489	2.761	15789428	14.115
	UPPER LIMIT	29072978	2.861	31578856	14.215
	LOWER LIMIT	7268244	2.661	7894714	14.015

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
33		AR1248	11/27/12	2038	12131754	2.762	13445167	14.116
34		AR1660	11/27/12	2059	10710635	2.763	11900024	14.116
35	LMW-9-1112	VS61A	11/27/12	2119	14650549	2.762	15642227	14.116
36	LMW-11-1112	VS61B	11/27/12	2139	14516755	2.763	15551439	14.116
37	LMW-6-1112	VS61C	11/27/12	2159	14713616	2.763	15747089	14.116
38		AR1242	11/28/12	0102	12073846	2.764	11517474	14.115
39		AR1660	11/28/12	0122	10935659	2.763	11044707	14.115

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

HCID Analysis
Report and Summary QC Forms

ARI Job ID: VS61, VS63

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Extraction Method: SW3510C

QC Report No: VS61-Golder Associates
Project:

Matrix: Water

Data Release Authorized:
Reported: 11/16/12

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-111512	Method Blank	11/15/12	11/16/12	1.0	Gas	< 0.25 U
12-22879					Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	101%
VS61A	LMW-9-1112	11/15/12	11/16/12	1.0	Gas	< 0.25 U
12-22879	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	105%
VS61B	LMW-11-1112	11/15/12	11/16/12	1.0	Gas	< 0.25 U
12-22880	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	108%
VS61C	LMW-6-1112	11/15/12	11/16/12	1.0	Gas	< 0.25 U
12-22881	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	107%

Reported in mg/L (ppm)

Gas value based on total peaks in the range from Toluene to C12.
Diesel value based on the total peaks in the range from C12 to C24.
Oil value based on the total peaks in the range from C24 to C38.

ANALYTICAL RESOURCES INCORPORATED

HCID SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS61-Golder Associates
Project:

Client ID	O-TER	TOT OUT
MB-111512	101%	0
LCS-111512	89.5%	0
LCSD-111512	96.8%	0
LMW-9-1112	105%	0
LMW-11-1112	108%	0
LMW-6-1112	107%	0

	LCS/MB LIMITS	QC LIMITS
(O-TER) = o-Terphenyl	(55-110)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-22879 to 12-22881

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Page 1 of 1

Sample ID: LCS-111512
LCS/LCSD

Lab Sample ID: LCS-111512
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 11/16/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Date Extracted LCS/LCSD: 11/15/12

Date Analyzed LCS: 11/16/12 02:14
LCSD: 11/16/12 02:36
Instrument/Analyst LCS: FID/PKC
LCSD: FID/PKC

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2.73	3.00	91.0%	2.62	3.00	87.3%	4.1%

HCID Surrogate Recovery

	LCS	LCSD
o-Terphenyl	89.5%	96.8%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

TPH METHOD BLANK SUMMARY

BLANK NO.

VS61MBW1

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOC

SDG No.: VS61 Project No.:

Date Extracted: 11/15/12 Matrix: LIQUID

Date Analyzed : 11/16/12 Instrument ID : FID4A

Time Analyzed : 0153

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS45LCSW1	VS45LCSW1	11/15/12
02	VS45LCSDW1	VS45LCSDW1	11/15/12
03	LMW-3-1112	VS45A	11/15/12
04	LMW-EB-1112	VS45B	11/15/12
05	LMW-8-1112	VS45C	11/15/12
06	LMW-5-1112	VS45D	11/15/12
07	LMW-7-1112	VS45E	11/15/12
08	LMW-7-1112-D	VS45F	11/16/12
09	VS61LCSW1	VS61LCSW1	11/16/12
10	VS61LCSDW1	VS61LCSDW1	11/16/12
11	LMW-9-1112	VS61A	11/16/12
12	LMW-11-1112	VS61B	11/16/12
13	LMW-6-1112	VS61C	11/16/12
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOC

SDG No.: VS61 Project:

Instrument ID: FID4A GC Column: RTX-1

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 5.99 TRIAC: 8.88

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01	ZZZZZ	ZZZZZ	11/15/12	1326	6.00	8.90
02	ZZZZZ	ZZZZZ	11/15/12	1349	5.99	8.87
03	RT	RT	11/15/12	1411	5.99	8.88
04	IB	IB	11/15/12	1433	5.99	8.88
05	ZZZZZ	ZZZZZ	11/15/12	1455	5.99	8.88
06	ZZZZZ	ZZZZZ	11/15/12	1517	5.99	8.86
07	ZZZZZ	ZZZZZ	11/15/12	1539	5.99	8.86
08	ZZZZZ	ZZZZZ	11/15/12	1601	6.00	8.86
09	ZZZZZ	ZZZZZ	11/15/12	1622	6.00	8.87
10	ZZZZZ	ZZZZZ	11/15/12	1644	5.99	8.87
11	ZZZZZ	ZZZZZ	11/15/12	1707	5.99	8.86
12	ZZZZZ	ZZZZZ	11/15/12	1729	5.99	8.86
13	ZZZZZ	ZZZZZ	11/15/12	1751	5.99	8.86
14	ZZZZZ	ZZZZZ	11/15/12	1813	5.99	8.86
15	ZZZZZ	ZZZZZ	11/15/12	1835	5.99	8.86
16	ZZZZZ	ZZZZZ	11/15/12	1858	5.99	8.86
17	ZZZZZ	ZZZZZ	11/15/12	1920	5.99	8.87
18	ZZZZZ	ZZZZZ	11/15/12	1942	5.99	8.89
19	ZZZZZ	ZZZZZ	11/15/12	2004	5.99	8.87
20	ZZZZZ	ZZZZZ	11/15/12	2026	5.99	8.86
21	ZZZZZ	ZZZZZ	11/15/12	2048	5.99	8.86
22	ZZZZZ	ZZZZZ	11/15/12	2110	5.99	8.86
23	ZZZZZ	ZZZZZ	11/15/12	2132	6.00	8.86
24	ZZZZZ	ZZZZZ	11/15/12	2153	6.00	8.86
25	ZZZZZ	ZZZZZ	11/15/12	2215	5.99	8.87
26	ZZZZZ	ZZZZZ	11/15/12	2237	5.99	8.86
27	ZZZZZ	ZZZZZ	11/15/12	2259	5.99	8.86
28	ZZZZZ	ZZZZZ	11/15/12	2321	5.99	8.86
29	ZZZZZ	ZZZZZ	11/15/12	2342	5.99	8.86
30	ZZZZZ	ZZZZZ	11/16/12	0004	5.99	8.86
31		DIESEL#3	11/16/12	0026	5.99	8.88
32		MOIL#3	11/16/12	0048	5.99	8.86

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

FORM VIII TPH

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TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOC

SDG No.: VS61 Project:

Instrument ID: FID4A GC Column: RTX-1

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 5.99 TRIAC: 8.88

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01	GDHCIDW	GDHCIDW	11/16/12	0109	5.99	8.89
02	MHCIDW	MHCIDW	11/16/12	0131	6.00	8.86
03	VS61MBW1	VS61MBW1	11/16/12	0153	5.99	8.86
04	VS61LCSW1	VS61LCSW1	11/16/12	0214	6.00	8.86
05	VS61LCSDW1	VS61LCSDW1	11/16/12	0236	6.00	8.86
06	LMW-9-1112	VS61A	11/16/12	0257	5.99	8.86
07	LMW-11-1112	VS61B	11/16/12	0319	5.99	8.86
08	LMW-6-1112	VS61C	11/16/12	0340	5.99	8.86
09		DIESEL#4	11/16/12	0402	5.99	8.89
10		MOIL#4	11/16/12	0424	5.99	8.86

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

Metals Analysis
Report and Summary QC Forms

ARI Job ID: VS61, VS63

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS61

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-9-1112	VS61A	12-22879	
LMW-9-1112D	VS61ADUP	12-22879	
LMW-9-1112S	VS61ASPK	12-22879	
LMW-11-1112	VS61B	12-22880	
PBW	VS61MB1	12-22880	
LCSW	VS61MB1SPK	12-22880	
LMW-6-1112	VS61C	12-22881	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 11/30/12 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-9-1112
SAMPLE

Lab Sample ID: VS61A
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/28/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	**7440-38-2**	**Arsenic**	0.048	0.2	**0.4**	
3010A	11/19/12	6010C	11/28/12	**7440-39-3**	**Barium**	1.33	3	**297**	
3010A	11/19/12	6010C	11/28/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/28/12	**7440-70-2**	**Calcium**	11.3	50	**82,400**	
3010A	11/19/12	6010C	11/28/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/28/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/28/12	**7439-89-6**	**Iron**	7.5	50	**1,550**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/28/12	**7439-95-4**	**Magnesium**	9.6	50	**46,200**	
3010A	11/19/12	6010C	11/28/12	**7439-96-5**	**Manganese**	0.28	1	**165**	
3010A	11/19/12	6010C	11/28/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/28/12	**7440-09-7**	**Potassium**	65.7	500	**2,550**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/28/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/28/12	**7440-23-5**	**Sodium**	11.4	500	**16,100**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-11-1112**
Page 1 of 1 **SAMPLE**

Lab Sample ID: VS61B
LIMS ID: 12-22880
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/28/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	**7440-38-2**	**Arsenic**	0.048	0.2	**8.9**	
3010A	11/19/12	6010C	11/28/12	**7440-39-3**	**Barium**	1.33	3	**310**	
3010A	11/19/12	6010C	11/28/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/28/12	**7440-70-2**	**Calcium**	11.3	50	**54,800**	
3010A	11/19/12	6010C	11/28/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/28/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/28/12	**7439-89-6**	**Iron**	7.5	50	**2,040**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/28/12	**7439-95-4**	**Magnesium**	9.6	50	**27,900**	
3010A	11/19/12	6010C	11/28/12	**7439-96-5**	**Manganese**	0.28	1	**128**	
3010A	11/19/12	6010C	11/28/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/28/12	**7440-09-7**	**Potassium**	65.7	500	**2,040**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/28/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/28/12	**7440-23-5**	**Sodium**	11.4	500	**28,600**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-6-1112**
Page 1 of 1 **SAMPLE**

Lab Sample ID: VS61C
LIMS ID: 12-22881
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/28/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	**7440-39-3**	**Barium**	1.33	3	**112**	
3010A	11/19/12	6010C	11/28/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/28/12	**7440-70-2**	**Calcium**	11.3	50	**26,300**	
3010A	11/19/12	6010C	11/28/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/28/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/28/12	**7439-89-6**	**Iron**	7.5	50	**2,170**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/28/12	**7439-95-4**	**Magnesium**	9.6	50	**13,800**	
3010A	11/19/12	6010C	11/28/12	**7439-96-5**	**Manganese**	0.28	1	**31**	
3010A	11/19/12	6010C	11/28/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/28/12	**7440-09-7**	**Potassium**	65.7	500	**690**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/28/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/28/12	**7440-23-5**	**Sodium**	11.4	500	**6,850**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-9-1112
MATRIX SPIKE

Lab Sample ID: VS61A
LIMS ID: 12-22879
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: 11/14/12
Date Received: 11/14/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Aluminum	6010C	50 U	2,010	2,000	100%	
Antimony	200.8	0.2 U	24.2	25.0	96.8%	
Arsenic	200.8	0.4	25.5	25.0	100%	
Barium	6010C	297	2,290	2,000	99.6%	
Beryllium	6010C	1 U	488	500	97.6%	
Cadmium	6010C	2 U	505	500	101%	
Calcium	6010C	82,400	92,300	10,000	99.0%	H
Chromium	6010C	5 U	495	500	99.0%	
Cobalt	6010C	3 U	474	500	94.8%	
Copper	6010C	2 U	508	500	102%	
Iron	6010C	1,550	3,610	2,000	103%	
Lead	200.8	0.1 U	22.8	25.0	91.2%	
Magnesium	6010C	46,200	54,300	10,000	81.0%	H
Manganese	6010C	165	633	500	93.6%	
Nickel	6010C	10 U	480	500	96.0%	
Potassium	6010C	2,550	12,600	10,000	100%	
Selenium	200.8	0.5 U	78.3	80.0	97.9%	
Silver	6010C	3 U	524	500	105%	
Sodium	6010C	16,100	26,200	10,000	101%	
Thallium	200.8	0.2 U	22.1	25.0	88.4%	
Vanadium	6010C	3 U	499	500	99.8%	
Zinc	6010C	10 U	480	500	96.0%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked
NR-Not Recovered

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-9-1112**
Page 1 of 1 **DUPLICATE**

Lab Sample ID: VS61A QC Report No: VS61-Golder Associates
LIMS ID: 12-22879 Project:
Matrix: Water
Data Release Authorized:
Reported: 11/30/12 Date Sampled: 11/14/12
Date Received: 11/14/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Aluminum	6010C	50 U	50 U	0.0%	+/- 50	L
Antimony	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Arsenic	200.8	0.4	0.4	0.0%	+/- 0.2	L
Barium	6010C	297	298	0.3%	+/- 20%	
Beryllium	6010C	1 U	1 U	0.0%	+/- 1	L
Cadmium	6010C	2 U	2 U	0.0%	+/- 2	L
Calcium	6010C	82,400	83,000	0.7%	+/- 20%	
Chromium	6010C	5 U	5 U	0.0%	+/- 5	L
Cobalt	6010C	3 U	3 U	0.0%	+/- 3	L
Copper	6010C	2 U	2 U	0.0%	+/- 2	L
Iron	6010C	1,550	1,560	0.6%	+/- 20%	
Lead	200.8	0.1 U	0.1 U	0.0%	+/- 0.1	L
Magnesium	6010C	46,200	46,500	0.6%	+/- 20%	
Manganese	6010C	165	167	1.2%	+/- 20%	
Nickel	6010C	10 U	10 U	0.0%	+/- 10	L
Potassium	6010C	2,550	2,570	0.8%	+/- 20%	
Selenium	200.8	0.5 U	0.5 U	0.0%	+/- 0.5	L
Silver	6010C	3 U	3 U	0.0%	+/- 3	L
Sodium	6010C	16,100	16,200	0.6%	+/- 20%	
Thallium	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Vanadium	6010C	3 U	3 U	0.0%	+/- 3	L
Zinc	6010C	10 U	10 U	0.0%	+/- 10	L

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: VS61LCS
LIMS ID: 12-22880
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	2030	2000	102%	
Antimony	200.8	23.7	25.0	94.8%	
Arsenic	200.8	24.4	25.0	97.6%	
Barium	6010C	2040	2000	102%	
Beryllium	6010C	504	500	101%	
Cadmium	6010C	516	500	103%	
Calcium	6010C	9890	10000	98.9%	
Chromium	6010C	505	500	101%	
Cobalt	6010C	503	500	101%	
Copper	6010C	520	500	104%	
Iron	6010C	2030	2000	102%	
Lead	200.8	25.2	25.0	101%	
Magnesium	6010C	10300	10000	103%	
Manganese	6010C	498	500	99.6%	
Nickel	6010C	500	500	100%	
Potassium	6010C	10000	10000	100%	
Selenium	200.8	79.0	80.0	98.8%	
Silver	6010C	531	500	106%	
Sodium	6010C	10000	10000	100%	
Thallium	200.8	23.7	25.0	94.8%	
Vanadium	6010C	515	500	103%	
Zinc	6010C	500	500	100%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: VS61MB
LIMS ID: 12-22880
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS61-Golder Associates
Project:

Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/28/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-39-3	Barium	1.33	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/28/12	7440-70-2	Calcium	11.3	50	50	U
3010A	11/19/12	6010C	11/28/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/28/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/28/12	7439-89-6	Iron	7.5	50	50	U
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/28/12	7439-95-4	Magnesium	9.6	50	50	U
3010A	11/19/12	6010C	11/28/12	7439-96-5	Manganese	0.28	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/28/12	7440-09-7	Potassium	65.7	500	500	U
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/28/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-23-5	Sodium	11.4	500	500	U
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

UNITS: ug/L

SDG: VS61

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Aluminum	AL	ICP	IP112871	2000.0	2028.43	**101.4**	2000.0	2052.17	**102.6**	2017.57	**100.9**	2068.18	**103.4**				
Antimony	SB	PMS	MS112811	50.0	50.24	**100.5**	50.0	50.81	**101.6**	50.65	**101.3**	50.20	**100.4**	50.07	**100.1**	50.17	**100.3**
Arsenic	AS	PMS	MS112811	50.0	50.55	**101.1**	50.0	50.51	**101.0**	50.43	**100.9**	49.58	**99.2**	50.34	**100.7**	49.91	**99.8**
Barium	BA	ICP	IP112871	1000.0	1018.20	**101.8**	1000.0	1029.30	**102.9**	1024.68	**102.5**	1034.63	**103.5**				
Beryllium	BE	ICP	IP112871	1000.0	996.14	**99.6**	1000.0	1007.38	**100.7**	997.36	**99.7**	1010.17	**101.0**				
Cadmium	CD	ICP	IP112871	1000.0	1015.77	**101.6**	1000.0	1021.32	**102.1**	1018.84	**101.9**	1027.95	**102.8**				
Calcium	CA	ICP	IP112871	2000.0	2069.03	**103.5**	2000.0	2099.35	**105.0**	2075.08	**103.8**	2124.16	**106.2**				
Chromium	CR	ICP	IP112871	1000.0	1005.83	**100.6**	1000.0	1015.42	**101.5**	1009.15	**100.9**	1024.92	**102.5**				
Cobalt	CO	ICP	IP112871	1000.0	987.29	**98.7**	1000.0	997.52	**99.8**	998.87	**99.9**	1007.60	**100.8**				
Copper	CU	ICP	IP112871	1000.0	1019.94	**102.0**	1000.0	1021.93	**102.2**	1029.27	**102.9**	1025.01	**102.5**				
Iron	FE	ICP	IP112871	2000.0	2064.76	**103.2**	2000.0	2086.92	**104.3**	2050.60	**102.5**	2129.80	**106.5**				
Lead	PB	PMS	MS112811	50.0	49.55	**99.1**	50.0	48.78	**97.6**	48.57	**97.1**	47.99	**96.0**	47.91	**95.8**	48.04	**96.1**
Magnesium	MG	ICP	IP112871	2000.0	2051.26	**102.6**	2000.0	2078.93	**103.9**	2026.74	**101.3**	2102.85	**105.1**				
Manganese	MN	ICP	IP112871	1000.0	1011.10	**101.1**	1000.0	1016.26	**101.6**	1008.70	**100.9**	1025.36	**102.5**				
Nickel	NI	ICP	IP112871	1000.0	1012.61	**101.3**	1000.0	1025.59	**102.6**	1016.46	**101.6**	1030.90	**103.1**				
Potassium	K	ICP	IP112871	20000.0	20226.15	**101.1**	20000.0	20313.97	**101.6**	20301.74	**101.5**	20402.04	**102.0**				
Selenium	SE	PMS	MS112811	80.0	81.27	**101.6**	50.0	52.11	**104.2**	51.21	**102.4**	50.84	**101.7**	51.37	**102.7**	51.12	**102.2**
Silver	AG	ICP	IP112871	1000.0	1033.70	**103.4**	1000.0	1034.67	**103.5**	1041.82	**104.2**	1039.63	**104.0**				
Sodium	NA	ICP	IP112871	50000.0	52611.60	**105.2**	50000.0	52309.93	**104.6**	52465.68	**104.9**	52748.74	**105.5**				
Thallium	TL	PMS	MS112811	50.0	47.45	**94.9**	50.0	46.62	**93.2**	46.67	**93.3**	45.84	**91.7**	46.12	**92.2**	45.55	**91.1**
Vanadium	V	ICP	IP112871	1000.0	1020.97	**102.1**	1000.0	1026.16	**102.6**	1032.13	**103.2**	1034.36	**103.4**				
Zinc	ZN	ICP	IP112871	1000.0	1048.52	**104.9**	1000.0	1065.21	**106.5**	1048.34	**104.8**	1073.38	**107.3**				

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

UNITS: ug/L

SDG: VS61

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Aluminum	AL	ICP	IP112871	2000.0												
Antimony	SB	PMS	MS112811	50.0	49.97	**99.9**	50.35	**100.7**	49.56	**99.1**	49.70	**99.4**	50.48	**101.0**		
Arsenic	AS	PMS	MS112811	50.0	49.93	**99.9**	49.80	**99.6**	49.18	**98.4**	50.03	**100.1**	51.10	**102.2**		
Barium	BA	ICP	IP112871	1000.0												
Beryllium	BE	ICP	IP112871	1000.0												
Cadmium	CD	ICP	IP112871	1000.0												
Calcium	CA	ICP	IP112871	2000.0												
Chromium	CR	ICP	IP112871	1000.0												
Cobalt	CO	ICP	IP112871	1000.0												
Copper	CU	ICP	IP112871	1000.0												
Iron	FE	ICP	IP112871	2000.0												
Lead	PB	PMS	MS112811	50.0	47.41	**94.8**	48.43	**96.9**	47.26	**94.5**	47.23	**94.5**	48.64	**97.3**		
Magnesium	MG	ICP	IP112871	2000.0												
Manganese	MN	ICP	IP112871	1000.0												
Nickel	NI	ICP	IP112871	1000.0												
Potassium	K	ICP	IP112871	20000.0												
Selenium	SE	PMS	MS112811	50.0	51.57	**103.1**	51.25	**102.5**	51.63	**103.3**	52.19	**104.4**	53.22	**106.4**		
Silver	AG	ICP	IP112871	1000.0												
Sodium	NA	ICP	IP112871	50000.0												
Thallium	TL	PMS	MS112811	50.0	45.14	**90.3**	46.14	**92.3**	45.45	**90.9**	45.02	**90.0**	46.38	**92.8**		
Vanadium	V	ICP	IP112871	1000.0												
Zinc	ZN	ICP	IP112871	1000.0												

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

UNITS: ug/L

SDG: VS61

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Aluminum	AL	ICP	IP112871	50.0	58.11	**116.2**	47.73	**95.5**	56.10	**112.2**	44.45	**88.9**				
Antimony	SB	PMS	MS112811	0.2	0.21	**105.0**										
Arsenic	AS	PMS	MS112811	0.2	0.21	**105.0**										
Barium	BA	ICP	IP112871	3.0	3.11	**103.7**	2.88	**96.0**	3.31	**110.3**	3.26	**108.7**				
Beryllium	BE	ICP	IP112871	1.0	1.02	**102.0**	0.99	**99.0**	1.04	**104.0**	0.96	**96.0**				
Cadmium	CD	ICP	IP112871	2.0	2.22	**111.0**	2.21	**110.5**	2.11	**105.5**	2.00	**100.0**				
Calcium	CA	ICP	IP112871	50.0	48.26	**96.5**	48.44	**96.9**	51.74	**103.5**	50.55	**101.1**				
Chromium	CR	ICP	IP112871	5.0	4.65	**93.0**	4.69	**93.8**	5.23	**104.6**	5.27	**105.4**				
Cobalt	CO	ICP	IP112871	3.0	3.40	**113.3**	3.32	**110.7**	3.44	**114.7**	3.49	**116.3**				
Copper	CU	ICP	IP112871	2.0	2.03	**101.5**	2.21	**110.5**	2.17	**108.5**	1.86	**93.0**				
Iron	FE	ICP	IP112871	50.0	50.45	**100.9**	52.20	**104.4**	52.68	**105.4**	51.91	**103.8**				
Lead	PB	PMS	MS112811	0.1	0.11	**110.0**										
Magnesium	MG	ICP	IP112871	50.0	53.14	**106.3**	50.83	**101.7**	54.60	**109.2**	57.30	**114.6**				
Manganese	MN	ICP	IP112871	1.0	1.11	**111.0**	1.08	**108.0**	1.23	**123.0**	1.13	**113.0**				
Nickel	NI	ICP	IP112871	10.0	9.52	**95.2**	8.97	**89.7**	9.23	**92.3**	9.58	**95.8**				
Potassium	K	ICP	IP112871	500.0	488.88	**97.8**	494.97	**99.0**	522.09	**104.4**	488.10	**97.6**				
Selenium	SE	PMS	MS112811	0.5	0.56	**112.0**										
Silver	AG	ICP	IP112871	3.0	3.06	**102.0**	2.91	**97.0**	3.25	**108.3**	3.05	**101.7**				
Sodium	NA	ICP	IP112871	500.0	485.81	**97.2**	484.83	**97.0**	498.10	**99.6**	490.65	**98.1**				
Thallium	TL	PMS	MS112811	0.2	0.21	**105.0**										
Vanadium	V	ICP	IP112871	3.0	3.27	**109.0**	3.19	**106.3**	3.24	**108.0**	3.20	**106.7**				
Zinc	ZN	ICP	IP112871	10.0	9.82	**98.2**	9.69	**96.9**	10.02	**100.2**	9.86	**98.6**				

VS61 - 0017

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

UNITS: ug/L

SDG: VS61

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Aluminum	AL	ICP	IP112871	200.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U				
Antimony	SB	PMS	MS112811	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Arsenic	AS	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Barium	BA	ICP	IP112871	200.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U				
Beryllium	BE	ICP	IP112871	5.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U				
Cadmium	CD	ICP	IP112871	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U				
Calcium	CA	ICP	IP112871	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U				
Chromium	CR	ICP	IP112871	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U				
Cobalt	CO	ICP	IP112871	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U				
Copper	CU	ICP	IP112871	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U				
Iron	FE	ICP	IP112871	100.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U				
Lead	PB	PMS	MS112811	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Magnesium	MG	ICP	IP112871	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U				
Manganese	MN	ICP	IP112871	15.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U				
Nickel	NI	ICP	IP112871	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U				
Potassium	K	ICP	IP112871	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U				
Selenium	SE	PMS	MS112811	5.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Silver	AG	ICP	IP112871	10.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U				
Sodium	NA	ICP	IP112871	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U				
Thallium	TL	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vanadium	V	ICP	IP112871	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U				
Zinc	ZN	ICP	IP112871	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U				

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

UNITS: ug/L

SDG: VS61

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Aluminum	AL	ICP	IP112871	200.0	50.0												
Antimony	SB	PMS	MS112811	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U		
Arsenic	AS	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U		
Barium	BA	ICP	IP112871	200.0	3.0												
Beryllium	BE	ICP	IP112871	5.0	1.0												
Cadmium	CD	ICP	IP112871	5.0	2.0												
Calcium	CA	ICP	IP112871	5000.0	50.0												
Chromium	CR	ICP	IP112871	10.0	5.0												
Cobalt	CO	ICP	IP112871	50.0	3.0												
Copper	CU	ICP	IP112871	25.0	2.0												
Iron	FE	ICP	IP112871	100.0	50.0												
Lead	PB	PMS	MS112811	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U		
Magnesium	MG	ICP	IP112871	5000.0	50.0												
Manganese	MN	ICP	IP112871	15.0	1.0												
Nickel	NI	ICP	IP112871	40.0	10.0												
Potassium	K	ICP	IP112871	5000.0	500.0												
Selenium	SE	PMS	MS112811	5.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U		
Silver	AG	ICP	IP112871	10.0	3.0												
Sodium	NA	ICP	IP112871	5000.0	500.0												
Thallium	TL	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U		
Vanadium	V	ICP	IP112871	50.0	3.0												
Zinc	ZN	ICP	IP112871	20.0	10.0												

VS61 : 09173

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: NA

RUNID: IP112871

SDG: VS61

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	200611.9	199598.5	**99.8**	202877.0	201105.3	**100.6**			
Antimony		1000	12.3	1030.6	**103.1**	11.1	1044.6	**104.5**			
Arsenic		1000	11.6	1009.9	**101.0**	13.3	1025.3	**102.5**			
Barium		1000	-2.6	1011.0	**101.1**	-3.9	1020.4	**102.0**			
Beryllium		1000	0.1	1000.3	**100.0**	0.1	1009.3	**100.9**			
Boron			-5.0	-3.7		-5.8	-3.8				
Cadmium		1000	0.0	1009.5	**101.0**	0.0	1020.5	**102.1**			
Calcium	100000	100000	100626.5	100815.7	**100.8**	101973.8	101811.2	**101.8**			
Chromium		1000	-1.6	1009.9	**101.0**	-2.2	1017.2	**101.7**			
Cobalt		1000	-1.1	939.3	**93.9**	-0.9	951.5	**95.2**			
Copper		1000	0.0	1030.0	**103.0**	0.1	1044.8	**104.5**			
Iron	200000	200000	198126.1	197483.0	**98.7**	199699.4	199139.0	**99.6**			
Lead		1000	-4.8	988.4	**98.8**	-4.9	1001.6	**100.2**			
Magnesium	100000	100000	99876.0	100211.6	**100.2**	101185.5	101145.1	**101.1**			
Manganese		1000	1.5	955.2	**95.5**	1.4	963.3	**96.3**			
Molybdenum			2.2	1.8		2.4	2.2				
Nickel		1000	-2.7	981.7	**98.2**	-1.3	989.4	**98.9**			
Potassium			10.1	-43.4		-0.8	-31.4				
Selenium		1000	14.4	1001.5	**100.2**	15.7	1012.0	**101.2**			
Silicon			-1.7	1.0		-0.2	0.3				
Silver		1000	-1.3	1048.1	**104.8**	-1.4	1062.0	**106.2**			
Sodium			13.3	30.0		17.1	29.1				
Strontium			4.1	4.1		4.1	4.1				
Thallium		1000	-2.3	925.8	**92.6**	-4.5	939.8	**94.0**			
Tin			-5.5	-6.8		-7.4	-6.5				
Titanium			1.6	1.1		1.6	1.3				
Vanadium		1000	4.9	997.8	**99.8**	4.7	1011.5	**101.2**			
Zinc		1000	2.6	979.1	**97.9**	1.9	987.5	**98.8**			

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: NA

RUNID: MS112811

SDG: VS61

INSTRUMENT ID: NEXION 300D

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Antimony			0.1	0.1							
Arsenic		20	0.1	20.0	**100.0**						
Cadmium		20	0.1	19.8	**99.0**						
Chromium		20	0.7	20.8	**104.0**						
Cobalt		20	0.0	20.6	**103.0**						
Copper		20	0.9	21.5	**107.5**						
Manganese		20	0.1	19.5	**97.5**						
Molybdenum	400	400	434.3	401.0	**100.3**						
Nickel		20	0.4	21.1	**105.5**						
Selenium			-0.2	-0.2							
Silver		20	0.0	21.1	**105.5**						
Thorium			0.2	0.1							
Zinc		20	0.9	20.3	**101.5**						

VS61 : 001 75

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

ANALYSIS METHOD: ICP

SDG: VS61

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Aluminum	LMW-9-1112L	VS61A-L	Water	IP112871	50.00	U	250.00	U		
Barium	LMW-9-1112L	VS61A-L	Water	IP112871	297.27		297.20	B	0.0	
Beryllium	LMW-9-1112L	VS61A-L	Water	IP112871	1.00	U	5.00	U		
Cadmium	LMW-9-1112L	VS61A-L	Water	IP112871	2.00	U	10.00	U		
Calcium	LMW-9-1112L	VS61A-L	Water	IP112871	82403.01		82406.55		0.0	
Chromium	LMW-9-1112L	VS61A-L	Water	IP112871	5.00	U	25.00	U		
Cobalt	LMW-9-1112L	VS61A-L	Water	IP112871	3.00	U	15.00	U		
Copper	LMW-9-1112L	VS61A-L	Water	IP112871	2.00	U	10.00	U		
Iron	LMW-9-1112L	VS61A-L	Water	IP112871	1550.20		1568.55		1.2	
Magnesium	LMW-9-1112L	VS61A-L	Water	IP112871	46185.25		45508.15		1.5	
Manganese	LMW-9-1112L	VS61A-L	Water	IP112871	165.29		173.65		5.1	
Nickel	LMW-9-1112L	VS61A-L	Water	IP112871	10.00	U	50.00	U		
Potassium	LMW-9-1112L	VS61A-L	Water	IP112871	2552.87	B	2500.00	U	100.0	
Silver	LMW-9-1112L	VS61A-L	Water	IP112871	3.00	U	15.00	U		
Sodium	LMW-9-1112L	VS61A-L	Water	IP112871	16083.79		15670.30	B	2.6	
Vanadium	LMW-9-1112L	VS61A-L	Water	IP112871	3.00	U	15.00	U		
Zinc	LMW-9-1112L	VS61A-L	Water	IP112871	10.00	U	50.00	U		

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

ANALYSIS METHOD: PMS

SDG: VS61

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Antimony	LMW-9-1112L	VS61A-L	Water	MS112811	0.01	U	0.10	B		
Arsenic	LMW-9-1112L	VS61A-L	Water	MS112811	0.41	B	0.45	B	9.8	
Lead	LMW-9-1112L	VS61A-L	Water	MS112811	0.01	U	0.10	B		
Selenium	LMW-9-1112L	VS61A-L	Water	MS112811	0.24	U	0.10	B		
Thallium	LMW-9-1112L	VS61A-L	Water	MS112811	0.01	U	0.00	B		

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS61 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Aluminum	AL	ICP	OPTIMA ICP 2	308.22		200	50.0	4/1/2012	250000.0	7/30/2012
Antimony	SB	PMS	NEXION 300D MS	0.00		60	0.2	4/1/2012		
Arsenic	AS	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2012		
Barium	BA	ICP	OPTIMA ICP 2	455.50		200	3.0	4/1/2012	100000.0	7/30/2012
Beryllium	BE	ICP	OPTIMA ICP 2	313.04		5	1.0	4/1/2012	5000.0	7/30/2012
Cadmium	CD	ICP	OPTIMA ICP 2	228.80		5	2.0	4/1/2012	20000.0	7/30/2012
Calcium	CA	ICP	OPTIMA ICP 2	317.93		5000	50.0	4/1/2012	500000.0	7/30/2012
Chromium	CR	ICP	OPTIMA ICP 2	267.72		10	5.0	4/1/2012	100000.0	7/30/2012
Cobalt	CO	ICP	OPTIMA ICP 2	228.62		50	3.0	4/1/2012	80000.0	7/30/2012
Copper	CU	ICP	OPTIMA ICP 2	324.75		25	2.0	4/1/2012	40000.0	7/30/2012
Iron	FE	ICP	OPTIMA ICP 2	259.94		100	50.0	4/1/2012	250000.0	7/30/2012
Lead	PB	PMS	NEXION 300D MS	0.00		3	0.1	4/1/2012		
Magnesium	MG	ICP	OPTIMA ICP 2	279.08		5000	50.0	4/1/2012	500000.0	7/30/2012
Manganese	MN	ICP	OPTIMA ICP 2	257.61		15	1.0	4/1/2012	30000.0	7/30/2012
Nickel	NI	ICP	OPTIMA ICP 2	231.60		40	10.0	4/1/2012	100000.0	7/30/2012
Potassium	K	ICP	OPTIMA ICP 2	766.49		5000	500.0	4/1/2012	500000.0	7/30/2012
Selenium	SE	PMS	NEXION 300D MS	0.00		5	0.5	4/1/2012		
Silver	AG	ICP	OPTIMA ICP 2	328.07		10	3.0	4/1/2012	5000.0	7/30/2012
Sodium	NA	ICP	OPTIMA ICP 2	589.00		5000	500.0	4/1/2012	5000000.0	7/30/2012
Thallium	TL	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2012		
Vanadium	V	ICP	OPTIMA ICP 2	292.40		50	3.0	4/1/2012	50000.0	7/30/2012
Zinc	ZN	ICP	OPTIMA ICP 2	213.86		20	10.0	4/1/2012	100000.0	7/30/2012

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS61

IEC DATE: 11/12/2012

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	9.1050360	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0581760	0.0000000	-0.8953680	1.5607750	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1763230	0.0000000	0.0000000	0.1637240
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	6.5458340	0.0000000	0.0000000	0.0000000	0.0000000	0.1152580	0.0000000	0.0000000	0.0095100
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0295099	0.0000000	0.0091790	0.0000000	-0.0348880	0.0000000	0.0000000	-0.0392710
Cobalt	228.62	0.0000000	0.0000000	0.0788170	0.0000000	0.0000000	0.0000000	0.0000000	-0.0346500	0.0000000	0.0130090
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1608400	0.0000000	0.0000000	-0.0442360
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.4437390	0.0000000	0.0000000
Lead	220.35	-0.2393490	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1467250	-1.7804540	1.4264890	0.0412430
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.4396410	-1.1694080	0.0000000	0.5321920
Manganese	257.61	0.0046450	0.0000000	0.0000000	0.0000000	0.0019080	0.0000000	0.0000000	0.0000000	0.0000000	-0.0054280
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0108090	0.0000000	0.0000000	0.0540880	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.4883700	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.5902270	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	5.5577350	0.3891400	0.0000000	-0.1069480
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1236770	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0477260	0.0000000	0.0000000	0.1988470	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-4.2880510	0.0000000	0.0349450
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0645950	0.0000000	0.0000000

VS61-0917S

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS61

IEC DATE: 11/12/2012

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	17.2648390	0.0000000	0.0000000	0.0000000	2.1534780	0.0000000	14.6676620	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	-0.3171320	0.0000000	0.0000000	-1.6488050	0.0000000	-2.7828430	0.0000000
Arsenic	188.98	0.0000000	0.0000000	3.5824010	0.0000000	0.0000000	0.0000000	-28.6279570	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.1006020	0.0000000	0.0000000	0.0000000	0.0000000	0.2160840	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0120420	0.0000000	0.1997240	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.9709640	0.0000000	0.0000000	0.0000000	0.0000000	0.6837900	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0863140	0.0880780	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.3314250	0.0362000
Cobalt	228.62	0.0000000	0.0000000	-0.1203920	0.1624660	0.0000000	0.0000000	1.9337740	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0084630	0.0000000	0.4010840	0.0000000	0.0000000	0.0000000	0.2064430	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	8.4794020	0.0000000
Lead	220.35	0.0000000	0.0000000	-0.4099510	-0.1101090	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-5.5537550	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	-0.2086980	0.0000000	0.0000000	0.0000000	-0.0242310	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5468870	0.0000000	0.4309940	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5703720	0.0000000
Silicon	288.16	-0.1197150	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0400098	0.0000000	-2.8848200	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	-0.8464030	-0.9915990	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	3.4340400	0.0000000
Tin	189.93	0.0000000	0.0000000	0.8648230	0.0000000	-0.0322750	-0.4551870	-0.1436590	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.8648230	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1521530	0.5765370	0.0000000	0.0000000	0.0000000	0.5629710	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2677330	0.0000000	-0.0519400	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

VS61 : 09180

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS61

ANALYSIS METHOD: ICP

ARI PREP CODE: TWC

PREPDATE: 11/19/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-9-1112	VS61A	0.000	50.0	50.0
LMW-9-1112D	VS61ADUP	0.000	50.0	50.0
LMW-9-1112S	VS61ASPK	0.000	50.0	50.0
LMW-11-1112	VS61B	0.000	50.0	50.0
LMW-6-1112	VS61C	0.000	50.0	50.0
PBW	VS61MB1	0.000	50.0	50.0
LCSW	VS61MB1SPK	0.000	50.0	50.0

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS61

ANALYSIS METHOD: PMS

ARI PREP CODE: REN

PREPDATE: 11/16/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-9-1112	VS61A	0.000	50.0	25.0
LMW-9-1112D	VS61ADUP	0.000	50.0	25.0
LMW-9-1112S	VS61ASPK	0.000	50.0	25.0
LMW-11-1112	VS61B	0.000	50.0	25.0
LMW-6-1112	VS61C	0.000	50.0	25.0
PBW	VS61MB1	0.000	50.0	25.0
LCSW	VS61MB1SPK	0.000	50.0	25.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS61

INSTRUMENT ID: OPTIMA ICP 2

RUNID: IP112871 METHOD: ICP

START DATE: 11/28/2012

END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09271		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
S2	S2	1.00	09312						X			X	X	X	X					X												X	
S3	S3	1.00	09331		X					X													X										X
S4	S4	1.00	09354																														
S5	S5	1.00	09380			X					X					X		X	X			X											
ICV	ICV	1.00	09414		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICB	ICB	1.00	09450		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRII	1.00	09492		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAI	1.00	09533		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABI	1.00	09574		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV1	1.00	10024		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB1	1.00	10070		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
PBW	VS61MB1	1.00	10112		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-11-1112	VS61B	1.00	10154		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-6-1112	VS61C	1.00	10195		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-9-1112L	VS61A-L	5.00	10241		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-9-1112	VS61A	1.00	10283		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-9-1112D	VS61ADUP	1.00	10324		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-9-1112S	VS61ASPK	1.00	10370		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	ZZZZZZ	1.00	10410																														
LCSW	VS61MB1SPK	1.00	10451		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV2	1.00	10491		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB2	1.00	10533		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRIF	1.00	10575		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAF	1.00	11020		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABF	1.00	11061		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV3	1.00	11101		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB3	1.00	11143		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS61 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09160				X																	X	X	X				X			
S1	S1	1.00	09200				X																	X	X	X				X			
S2	S2	1.00	09240				X																	X	X	X				X			
S3	S3	1.00	09280				X																	X	X	X				X			
S4	S4	1.00	09330				X																	X	X	X				X			
S5	S5	1.00	09390																														
ZZZZZZ	Rinse sampl	1.00	09460																														
ICV	MICV	1.00	10010				X																	X	X	X				X			
ICB	ICB	1.00	10080				X																	X	X	X				X			
CCV	MCCV1	1.00	10120				X																	X	X	X				X			
CCB	CCB1	1.00	10190				X																	X	X	X				X			
CRI	MCRI	1.00	10230				X																	X	X	X				X			
ICSA	ICSAI	1.00	10270				X																	X	X	X				X			
ICSAB	ICSABI	1.00	10340				X																	X	X	X				X			
ZZZZZZ	LR200	1.00	10410																														
ZZZZZZ	LR300	1.00	10470																														
ZZZZZZ	B1	1.00	10540																														
ZZZZZZ	B2	1.00	11000																														
ZZZZZZ	B3	1.00	11060																														
CCV	MCCV2	1.00	11100				X																	X	X	X				X			
CCB	CCB2	1.00	11170				X																	X	X	X				X			
ZZZZZZ	VT84MB1	2.00	11350																														
ZZZZZZ	VT84MB2	2.00	11390																														
ZZZZZZ	VT84MB2SPK	2.00	11430																														
ZZZZZZ	VT84MB1SPK	2.00	11470																														
ZZZZZZ	VT84A	2.00	11510																														
ZZZZZZ	VT84B	2.00	11550																														
CCV	MCCV3	1.00	12060				X																	X	X	X				X			
CCB	CCB3	1.00	12130				X																	X	X	X				X			
ZZZZZZ	VS20MB1	20.00	12220																														
ZZZZZZ	VS20MB1SPK	20.00	12260																														
ZZZZZZ	VR88MB2SPK	2.00	12310																														
ZZZZZZ	VR88J	5.00	12360																														
ZZZZZZ	VS20B	20.00	12400																														
ZZZZZZ	VS20C	20.00	12440																														

FORM XIV

VS61-091811

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS61 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS20D	20.00	12480																														
ZZZZZZ	VS20E	20.00	12520																														
ZZZZZZ	VS20G	20.00	12560																														
ZZZZZZ	VS20H	20.00	13000																														
CCV	MCCV4	1.00	13050				X																	X	X	X				X			
CCB	CCB4	1.00	13120				X																	X	X	X				X			
ZZZZZZ	VS21MB1	20.00	13220																														
ZZZZZZ	VS21MB1SPK	20.00	13260																														
ZZZZZZ	VS21A-L	100.00	13300																														
ZZZZZZ	VS21A	20.00	13340																														
ZZZZZZ	VS21ADUP	20.00	13380																														
ZZZZZZ	VS21ASPK	20.00	13420																														
ZZZZZZ	ZZZZZZ	20.00	13470																														
ZZZZZZ	VS21B	20.00	13510																														
ZZZZZZ	VS20I	20.00	13550																														
ZZZZZZ	VS20D	100.00	13590																														
CCV	MCCV5	1.00	14030				X																	X	X	X				X			
CCB	CCB5	1.00	14100				X																	X	X	X				X			
ZZZZZZ	VS21C	20.00	14170																														
ZZZZZZ	VS21D	20.00	14210																														
ZZZZZZ	VS21E	20.00	14260																														
ZZZZZZ	VS21F	20.00	14300																														
ZZZZZZ	VS21G	20.00	14340																														
ZZZZZZ	VS21H	20.00	14390																														
ZZZZZZ	VS21I	20.00	14430																														
ZZZZZZ	VS21J	20.00	14470																														
ZZZZZZ	VS21K	20.00	14510																														
ZZZZZZ	VS21L	20.00	14550																														
CCV	MCCV6	1.00	14590				X																	X	X	X				X			
CCB	CCB6	1.00	15060				X																	X	X	X				X			
ZZZZZZ	VS22MB1	20.00	15130																														
ZZZZZZ	VS22MB1SPK	20.00	15180																														
ZZZZZZ	VS22A-L	100.00	15230																														
ZZZZZZ	VS22A	20.00	15270																														
ZZZZZZ	VS22ADUP	20.00	15310																														

VS61-SDG

FORM XIV

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

INSTRUMENT ID: NEXION 300D MS

START DATE: 11/28/2012

SDG: VS61

RUNID: MS112811 METHOD: PMS

END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS22ASPK	20.00	15350																														
ZZZZZZ	VS22APOST	20.00	15390																														
ZZZZZZ	VS22B	20.00	15430																														
ZZZZZZ	VS22C	20.00	15470																														
ZZZZZZ	VS21B	100.00	15520																														
CCV	MCCV7	1.00	15560				X																	X	X	X				X			
CCB	CCB7	1.00	16030				X																	X	X	X				X			
ZZZZZZ	VS22D	20.00	16160																														
ZZZZZZ	VS22E	20.00	16200																														
ZZZZZZ	VS22F	20.00	16250																														
ZZZZZZ	VS22G	20.00	16290																														
ZZZZZZ	VS22H	20.00	16330																														
ZZZZZZ	VS22I	20.00	16370																														
ZZZZZZ	VS22J	20.00	16420																														
ZZZZZZ	VS22K	20.00	16460																														
ZZZZZZ	VS22L	20.00	16500																														
ZZZZZZ	VS45B	2.00	16540																														
CCV	MCCV8	1.00	16580				X																	X	X	X				X			
CCB	CCB8	1.00	17050				X																	X	X	X				X			
ZZZZZZ	VS45MB1	2.00	17090																														
ZZZZZZ	VS45MB1SPK	2.00	17130																														
ZZZZZZ	VS45A-L	10.00	17180																														
ZZZZZZ	VS45A	2.00	17230																														
ZZZZZZ	VS45ADUP	2.00	17270																														
ZZZZZZ	VS45ASPK	2.00	17310																														
ZZZZZZ	ZZZZZZ	2.00	17350																														
ZZZZZZ	VS45C	2.00	17390																														
ZZZZZZ	VS45D	2.00	17430																														
ZZZZZZ	VS45E	2.00	17470																														
CCV	MCCV9	1.00	17510				X																	X	X	X				X			
CCB	CCB9	1.00	17580				X																	X	X	X				X			
PBW	VS61MB1	2.00	18020				X																	X	X	X				X			
LCSW	VS61MB1SPK	2.00	18070				X																	X	X	X				X			
LMW-9-1112L	VS61A-L	10.00	18120				X																	X	X	X				X			
LMW-9-1112	VS61A	2.00	18160				X																	X	X	X				X			

FORM XIV

VS61_08125

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS61 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
LMW-9-1112D	VS61ADUP	2.00	18200				X																	X	X	X				X			
LMW-9-1112S	VS61ASPK	2.00	18240				X																	X	X	X				X			
ZZZZZZ	ZZZZZZ	2.00	18280																														
ZZZZZZ	VS45F	2.00	18320																														
LMW-11-1112	VS61B	2.00	18370				X																	X	X	X				X			
LMW-6-1112	VS61C	2.00	18410				X																	X	X	X				X			
CCV	MCCV10	1.00	18450				X																	X	X	X				X			
CCB	CCB10	1.00	18520				X																	X	X	X				X			

VS61.00197

Mercury Analysis
Report and Summary QC Forms

ARI Job ID: VS61, VS63

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS63

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-9-1112	VS63A	12-22883	
LMW-9-1112D	VS63ADUP	12-22883	
LMW-9-1112S	VS63ASPK	12-22883	
LMW-11-1112	VS63B	12-22884	
PBW	VS63MB1	12-22884	
LCSW	VS63MB1SPK	12-22884	
LMW-6-1112	VS63C	12-22885	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: _____ Title: Inorganics Director

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

ANALYTICAL RESOURCES INCORPORATED

Data Release Authorized:
Reported: 12/07/12
Date Received: 11/14/12
Page 1 of 1

QC Report No: VS63-Golder Associates
Project:

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
LMW-9-1112 VS63A 12-22883	11/14/12	Water	11/19/12 11/26/12	100	100 U
LMW-11-1112 VS63B 12-22884	11/14/12	Water	11/19/12 11/26/12	100	100 U
LMW-6-1112 VS63C 12-22885	11/14/12	Water	11/19/12 11/26/12	100	100 U
MB-111912 Method Blank	NA	Water	11/19/12 11/26/12	100	100 U

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

FORM-I

1561 00190 AV 12/10/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-9-1112**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: VS63A QC Report No: VS63-Golder Associates
LIMS ID: 12-22883 Project:
Matrix: Water
Data Release Authorized: Date Sampled: 11/14/12
Reported: 12/07/12 Date Received: 11/14/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7470A	100 U	104	100	104%	

Reported in ng/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

VS61:00191 AV 12/10/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-9-1112**
Page 1 of 1 **DUPLICATE**

Lab Sample ID: VS63A QC Report No: VS63-Golder Associates
LIMS ID: 12-22883 Project:
Matrix: Water
Data Release Authorized: Date Sampled: 11/14/12
Reported: 12/07/12 Date Received: 11/14/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7470A	100 U	100 U	0.0%	+/- 100	L

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

VS61:00192 AV 12/10/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: VS63LCS
LIMS ID: 12-22884
Matrix: Water
Data Release Authorized:
Reported: 12/07/12

QC Report No: VS63-Golder Associates
Project:

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	196	200	98.0%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

VS61:00193 AV 12/10/12

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

UNITS: ng/L

SDG: VS63

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Mercury	HG	CVL	HG112601	500.0	458.00	**91.6**	500.0	493.00	**98.6**	490.00	**98.0**						

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

UNITS: ng/L

SDG: VS63

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Mercury	HG	CVL	HG112601		20.0	15.20	**76.0**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

UNITS: ng/L

SDG: VS63

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Mercury	HG	CVL	HG112601	25.0	20.0	20.0	U	20.0	U	20.0	U						

VS63 : 99196

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS63 UNITS: ng/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ng/L)	ICP LR DATE
Mercury	HG	CVL	CETAC MERCURY	253.70		25	20.0	4/1/2012		

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA

SDG: VS63

ANALYSIS METHOD: CVL

ARI PREP CODE: TLM

PREPDATE: 11/19/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-9-1112	VS63A	0.000	20.0	20.0
LMW-9-1112D	VS63ADUP	0.000	20.0	20.0
LMW-9-1112S	VS63ASPK	0.000	20.0	20.0
LMW-11-1112	VS63B	0.000	20.0	20.0
LMW-6-1112	VS63C	0.000	20.0	20.0
PBW	VS63MB1	0.000	20.0	20.0
LCSW	VS63MB1SPK	0.000	20.0	20.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: NA | INSTRUMENT ID: CETAC MERCURY | START DATE: 11/26/2012

SDG: VS63 | RUNID: HG112601 | METHOD: CVL | END DATE: 11/26/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	11000														X																
S20	S20	1.00	11025														X																
S50	S50	1.00	11053														X																
S100	S100	1.00	11081														X																
S200	S200	1.00	11105														X																
S400	S400	1.00	11133														X																
S1000	S1000	1.00	11162														X																
ICV	AICV	1.00	11230														X																
ICB	ICB	1.00	11254														X																
CCV	ACCV1	1.00	11282														X																
CCB	CCB1	1.00	11311														X																
CRA	CRA	1.00	11335														X																
PBW	VS63MB1	1.00	11363														X																
LCSW	VS63MB1SPK	1.00	11391														X																
LMW-9-1112	VS63A	1.00	11415														X																
LMW-9-1112D	VS63ADUP	1.00	11444														X																
LMW-9-1112S	VS63ASPK	1.00	11472														X																
LMW-11-1112	VS63B	1.00	11500														X																
LMW-6-1112	VS63C	1.00	11524														X																
ZZZZZZ	VS81MB1	1.00	11552																														
ZZZZZZ	VS81MB1SPK	1.00	11581																														
CCV	ACCV2	1.00	12005														X																
CCB	CCB2	1.00	12034														X																

VS61.0195

Table of Contents: ARI Job VS80, VS81

Client: Golder Associates

Project: 923-1000-002.R273 Landsburg Mine

_____
Signature

November-30-2012
Date

Table of Contents: ARI Job VS80, VS81

Client: Golder Associates

Project: 923-1000-002.R273 Landsburg Mine

BC
Signature

November-30-2012
Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

December 5, 2012

Doug Morell
Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Client Project Name: Landsburg Mine
Client Project Number: 923-1000-002.R273
ARI ID: VS80, VS81

Dear Mr. Morell:

Please find enclosed the original Chain of Custody record, sample receipt documentation, and the final results for the project referenced above.

Sample receipt and analytical details are addressed in the enclosed Case Narrative.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to call me at any time.

Respectfully,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: VS80, VS81

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: USED	Turn-around Requested: standard	Page: 1 of 1	
ARI Client Company: Golder Associates	Phone: 425-883-0777	Date: 11/15/2012	Ice Present? Y
Client Contact: Doug Morell / Jill Lamberts		No. of Coolers: 4	Cooler Temps: 3.4, 3.9, 4.7, 5.2
Client Project Name: Landsburg Mine			
Client Project #: 923-1000-002.R273	Samplers: J. Lamberts, C. Wilder		

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: VOCs client list	PCBs/pest.	SVOCs 8270D client list	TPH-HCID	TAL Total Metals	TAL * Diss. Metals			Notes/Comments
Trip Blank	11/15/12	—	DI	6	X			X					* Field Filtered w/ 0.45 µm filter Please analyze under existing MSA btwn Golder + ARI
LMW-2-1112		0942	W	17	X	X	X	X	X	HOLD			
LMW-4-1112		1045	W	17	X	X	X	X	X				
LMW-10-1112		1150	W	17	X	X	X	X	X				

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by: (Signature)	Received by: (Signature)
Please cc. klongley@golder.com jlamberts@golder.com dmorell@golder.com Ecology EIM EDD	Printed Name: CLARK WILDER	Printed Name: Jennifer Millsap	Printed Name:	Printed Name
	Company: GOLDER	Company: ARI	Company	Company
	Date & Time: 11/15/12 1310	Date & Time: 11/15/12 1310	Date & Time	Date & Time

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Associates
Project Name: Landsburg Mine
COC No(s): _____ (NA)
Delivered by: Fed-Ex UPS Courier Hand Delivered Other _____
Assigned ARI Job No: VS80
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)	3.4 3.9 4.7 5.2	
If cooler temperature is out of compliance fill out form 00070F	Temp Gun ID# 90877952	

Cooler Accepted by: JM Date: 11/15/12 Time: 1310

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	10-30-12	

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

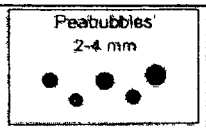
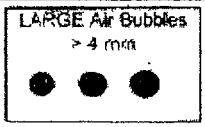
Samples Logged by: TJ Date: 11-15-12 Time: 1430

*** 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 Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
		

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 11/15/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **VS80**

Inquiry Number: NONE
Analysis Requested: 11/15/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: TS
Sample Set Used: Yes-119
Validatable Package: Lv4
Deliverables:

PC: Kelly
VTSR: 11/15/12

Project #: 923-1000-002.R273
Project: Landsburg Mines
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-23023 **VS80A**	LMW-2-1112						TOT P															
12-23024 **VS80B**	LMW-4-1112						TOT P															
12-23025 **VS80C**	LMW-10-1112						TOT P															

P=Pass

VS80 SOGS

Checked By TS Date 11-15-12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client Golder Associates Project Name: Landsburg Mine

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

Assigned ARI Job No _____ 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)	3.4 3.9 4.7 5.2	
If cooler temperature is out of compliance fill out form 00070F	Temp Gun ID# 90877952	

Cooler Accepted by JM Date 11/15/12 Time 1310

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		

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

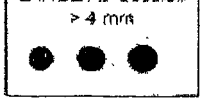
Samples Logged by: _____ Date: _____ Time: _____

*** 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 Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
		

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 11/15/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **VS81**

Inquiry Number: NONE
Analysis Requested: 11/15/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: TS
Sample Set Used: Yes-119
Validatable Package: Lv4
Deliverables:

PC: Kelly
VTSR: 11/15/12

Project #: 923-1000-002.R273
Project: Landsburg Mine
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-23011 **VS81A**	LMW-2-1112						TOT															
12-23012 **VS81B**	LMW-4-1112						TOT															
12-23013 **VS81C**	LMW-10-1112						TOT															

VS81 0001

Checked By TS Date 11.15.12

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: VS80, VS81

Case Narrative
Project: Landsburg Mine
ARI ID: VS80, VS81
December 5, 2012

Sample Receipt:

Analytical Resources, Inc. (ARI) accepted three water samples and a trip blank in good condition on November 15, 2012 under ARI Sample Delivery Groups (SDGs) VS80 and VS81. The samples were received with cooler temperatures between 3.4 and 5.2°C.

For further details regarding sample receipt please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for Volatile Organics, Semivolatile Organics, Pesticides, PCBs, HCID and Total Metals, as requested on the Chain of Custody. The dissolved metals were placed on hold pending further instructions. All HCID samples were non-detect and did not require follow up analyses.

Volatile Organics by Method 8260C:

The samples were analyzed on 11/23/12 - within the method recommended holding times. All samples had a pH of <2.0.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The percent differences for several compounds were high for the CCALs that bracketed the analyses of these samples. All positive results for these analytes have been flagged with a "Q" qualifier. No further corrective action was taken.

Surrogates: All surrogates are in control.

Method Blank(s): A small amount of hexachlorobutadiene was detected in the method blank associated with these samples. Since this compound was not detected in any sample associated with this blank, no corrective actions were taken.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): The percent recoveries for hexechlorobutadiene were high following the analyses of the LCS/LCSD analyzed on 11/23/12. Since this compound was not detected in any sample associated with this LCS/LCSD, except as noted above, the high bias does not compromise any RL. No corrective actions were taken.

Semivolatile Organics by Method 8270D:

The samples were extracted between 11/19/12 and 11/27/12 and analyzed between 11/22/12 and 11/22/12 - within the method recommended holding times except as noted below.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Case Narrative
Project: Landsburg Mine
ARI ID: VS80, VS81
December 5, 2012

Continuing calibration(s): The percent differences for pentachlorophenol were low for the CCALs that bracketed the analyses of these samples. All positive results for this analyte have been flagged with a "Q" qualifier. No further corrective action was taken.

Surrogates: The percent recoveries for four surrogates were low following the analysis of sample LMW-2-1112. This sample was re-extracted and re-analyzed. The percent recoveries for all surrogates were within established QC limits for the re-extraction. Since the re-extraction was not performed within holding time, the results for both analyses for this sample have been submitted for comparison.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

Pesticides by Method 8081B:

The samples were extracted on 11/20/12 and analyzed on 11/21/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The percent differences (%Ds) for several compounds were not within QC limits for the CCALs that bracketed the analyses of these samples. Since no target compounds were detected in any sample bracketed by these CCALs, the high bias does not compromise any RL. No corrective action were taken.

Surrogates: All surrogates are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

PCBs by Method 8082A:

The samples were extracted on 11/19/12 and analyzed on 11/27/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Case Narrative
Project: Landsburg Mine
ARI ID: VS80, VS81
December 5, 2012

Method Blank(s): The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): All percent recoveries and RPDs are in control.

HCID by NWTPH:

The samples were extracted on 11/16/12 and analyzed on 11/17/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Method Blank: The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): The LCS and LCSD were in control.

Total Metals by EPA Methods 6010C, 200.8, and 7471A

The samples were digested between 11/16/12 and 11/19/12. The digests were analyzed between 11/26/12 and 11/28/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Samples: No anomalies were encountered for these samples.

Lab Control(s): The LCS recoveries were within control limits.

Method Blank(s): The method blanks were free of contamination.

Matrix spike(s)/ RPD(s): The percent recoveries for calcium and magnesium were low following the analysis of the MS associated with sample LMW-2-1112. Since the percent recoveries for all elements were within acceptable QC limits for the corresponding LCS, it was concluded that the sample matrix was the cause of the low percent recoveries. No corrective actions were taken.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VS80
Client: Golder Associates
Project Event: 923-1000-002.R273
Project Name: Landsburg Mine

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-2-1112	VS80A	12-23023	Water	11/15/12 09:42	11/15/12 13:10
2.	LMW-4-1112	VS80B	12-23024	Water	11/15/12 10:45	11/15/12 13:10
3.	LMW-10-1112	VS80C	12-23025	Water	11/15/12 11:50	11/15/12 13:10
4.	Trip Blanks	VS80D	12-23026	Water	11/15/12	11/15/12 13:10

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: VS81
Client: Golder Associates
Project Event: 923-1000-002.R273
Project Name: Landsburg Mine

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-2-1112	VS81A	12-23011	Water	11/15/12 09:42	11/15/12 13:10
2.	LMW-4-1112	VS81B	12-23012	Water	11/15/12 10:45	11/15/12 13:10
3.	LMW-10-1112	VS81C	12-23013	Water	11/15/12 11:50	11/15/12 13:10

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
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).

S	Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
NA	The flagged analyte was not analyzed for
NR	Spiked compound recovery is not reported due to chromatographic interference
NS	The flagged analyte was not spiked into the sample
M	Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters This flag is used only for GC-MS analyses
M2	The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
Y	The analyte is not detected at or above the reported concentration The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit
EMPC	Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
C	The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
P	The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference
X	Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
Z	Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
Chloromethane	0.095	0.25	**0.5**	77 – 122	≤ 40
Vinyl Chloride	0.057	0.1	**0.2**	74 – 123	≤ 40
Bromomethane	0.252	0.5	**1.0**	68 – 130	≤ 40
Chloroethane	0.086	0.1	**0.2**	68 – 133	≤ 40
Trichlorofluoromethane	0.037	0.1	**0.2**	74 – 135	≤ 40
Acrolein	2.476	2.5	**5.0**	60 – 124	≤ 40
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.043	0.1	**0.2**	76 – 124	≤ 40
Acetone	2.057	2.5	**5.0**	64 – 125	≤ 40
1,1-Dichloroethene	0.054	0.1	**0.2**	74 – 120	≤ 40
Bromoethane	0.041	0.1	**0.2**	77 – 122	≤ 40
Iodomethane (Methyl Iodide)	0.227	0.5	**1.0**	76 – 123	≤ 40
Methylene Chloride	0.485	0.5	**1.0**	71 – 125	≤ 40
Acrylonitrile	0.604	1.0	**1.0**	76 – 123	≤ 40
Carbon Disulfide	0.037	0.1	**0.2**	77 – 124	≤ 40
trans-1,2-Dichloroethene	0.048	0.1	**0.2**	75 – 120	≤ 40
Vinyl Acetate	0.069	0.1	**0.2**	74 – **120**	≤ 40
1,1-Dichloroethane	0.053	0.1	**0.2**	80 – 120	≤ 40
2-Butanone	0.814	2.5	**5.0**	73 – 123	≤ 40
2,2-Dichloropropane	0.052	0.1	**0.2**	72 – 133	≤ 40
cis-1,2-Dichloroethene	0.043	0.1	**0.2**	78 – 120	≤ 40
Chloroform	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Bromochloromethane	0.061	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1-Trichloroethane	0.041	0.1	**0.2**	79 – 124	≤ 40
1,1-Dichloropropene	0.034	0.1	**0.2**	**80 – 120**	≤ 40
Carbon Tetrachloride	0.044	0.1	**0.2**	71 – 139	≤ 40
1,2-Dichloroethane	0.072	0.1	**0.2**	**80** – 121	≤ 40
Benzene	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Trichloroethene	0.049	0.1	**0.2**	**80 – 120**	≤ 40
1,2-Dichloropropane	0.035	0.1	**0.2**	**80 – 120**	≤ 40
Bromodichloromethane	0.051	0.1	**0.2**	**80** – 122	≤ 40
Dibromomethane	0.145	0.2	**0.2**	**80 – 120**	≤ 40
2-Chloroethylvinyl Ether	0.250	0.5	**1.0**	62 – 130	≤ 40
4-Methyl-2-Pentanone	0.974	2.5	**5.0**	**80** – 125	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
cis 1,3-dichloropropene	0.061	0.1	**0.2**	**80** – 127	≤ 40
Toluene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
trans 1,3-Dichloropropene	0.081	0.1	**0.2**	79 – 132	≤ 40
2-Hexanone	0.902	2.5	**5.0**	80 – 129	≤ 40
1,1,2-Trichloroethane	0.129	0.2	**0.2**	**80 – 120**	≤ 40
1,3-Dichloropropane	0.062	0.1	**0.2**	**80 – 120**	≤ 40
Tetrachloroethene	0.047	0.1	**0.2**	**80 – 120**	≤ 40
Dibromochloromethane	0.048	0.1	**0.2**	**80** – 120	≤ 40
1,2-Dibromoethane (Ethylene Dibromide)	0.075	0.1	**0.2**	**80 – 120**	≤ 40
Chlorobenzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Ethyl Benzene	0.037	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1,2-Tetrachloroethane	0.040	0.1	**0.2**	**80** – 128	≤ 40
m,p-xylene	0.052	0.2	**0.4**	**80 – 120**	≤ 40
o-Xylene	0.035	0.1	**0.2**	**80** – 120	≤ 40
Styrene	0.045	0.1	**0.2**	**80** – 121	≤ 40
Bromoform	0.062	0.1	**0.2**	62 – 149	≤ 40
1,1,2,2-Tetrachloroethane	0.060	0.1	**0.2**	**80 – 120**	≤ 40
1,2,3-Trichloropropane	0.131	0.25	**0.5**	**80 – 120**	≤ 40
trans-1,4-Dichloro 2-Butene	0.324	0.5	**1.0**	47 – 147	≤ 40
n-Propyl Benzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Bromobenzene	0.060	0.1	**0.2**	**80 – 120**	≤ 40
iso-propyl Benzene	0.021	0.1	**0.2**	**80 – 120**	≤ 40
2-Chloro Toluene	0.024	0.1	**0.2**	**80 – 120**	≤ 40
4-Chloro Toluene	0.016	0.1	**0.2**	**80 – 120**	≤ 40
tert-Butyl Benzene	0.026	0.1	**0.2**	**80** – 121	≤ 40
1,3,5-Trimethyl Benzene	0.015	0.1	**0.2**	**80 – 120**	≤ 40
1,2,4-Trimethylbenzene	0.024	0.1	**0.2**	**80** – 122	≤ 40
sec-Butyl Benzene	0.024	0.1	**0.2**	**80** – 121	≤ 40
4-Isopropyl Toluene	0.026	0.1	**0.2**	**80** – 124	≤ 40
1,3-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40
1,4-Dichlorobenzene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
n-Butyl Benzene	0.025	0.1	**0.2**	**80** – 125	≤ 40
1,2-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
1,2-Dibromo 3-Chloropropane	0.366	0.5	**0.5**	79 – 129	≤ 40
1,2,4-Trichlorobenzene	0.107	0.25	**0.5**	77 – 127	≤ 40
Hexachloro-1,3-Butadiene	0.073	0.25	**0.5**	80 – 135	≤ 40
Naphthalene	0.118	0.25	**0.5**	**80** – 128	≤ 40
1,2,3-Trichlorobenzene	0.110	0.25	**0.5**	**80** - 125	≤ 40
Dichlorodifluoromethane	0.052	0.1	**0.2**	68 – 133	≤ 40
Methyl-*tert*-butyl ether	0.073	0.25	**0.5**	79 – 121	≤ 40
Surrogate Standards			**MB / LCS**	**Samples**	**RPD**
1,2-Dichloroethane-d_4			**80 – 120**	**80** – 130	≤ 40
1,2-Dichlorobenzene-d_4			**80 – 120**	**80 – 120**	≤ 40
Toluene-d_8			**80 – 120**	**80 – 120**	≤ 40
4-Bromofluorobenzene			**80 – 120**	**80 – 120**	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Control limits calculated using all data from 1/1/12 through 5/31/12.
(3) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(4) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that:
a. ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit or
b. Control limits for analyzes with no separate preparation procedure are adjusted to reflect the minimum uncertainty in the calibration of the instrument allowed by the referenced analytical method.

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
Phenol	**0.445**	**0.5**	**1**	26 – 112	≤ 40
Bis(2-Chloroethyl)ether	**0.257**	**0.5**	**1**	51 – **100**	≤ 40
2-Chlorophenol	**0.246**	**0.5**	**1**	50 – **100**	≤ 40
1,3-Dichlorobenzene	**0.499**	**0.5**	**1**	27 – **100**	≤ 40
1,4-Dichlorobenzene	**0.470**	**0.5**	**1**	29 – **100**	≤ 40
1,2-Dichlorobenzene	**0.436**	**0.5**	**1**	32 – **100**	≤ 40
Benzyl alcohol	**0.409**	**1.0**	**2**	**10** - 128	≤ 40
2,2'-oxybis(1-Chloropropane)	**0.221**	**0.5**	**1**	39 - 101	≤ 40
2-Methylphenol	**0.329**	**0.5**	**1**	47 – **100**	≤ 40
Hexachloroethane	**0.610**	**1.0**	**2**	19 – **100**	≤ 40
N-Nitroso-di-n-propylamine	**0.365**	**0.5**	**1**	46 – **100**	≤ 40
4-Methylphenol	**0.536**	**1.0**	**2**	46 – **100**	≤ 40
Nitrobenzene	**0.490**	**0.5**	**1**	46 – 103	≤ 40
Isophorone	**0.258**	**0.5**	**1**	62 – 105	≤ 40
2-Nitrophenol	**0.979**	**1.5**	**3**	32 – 116	≤ 40
2,4-Dimethylphenol	**0.627**	**1.5**	**3**	15 – **100**	≤ 40
Bis(2-Chloroethoxy)methane	**0.252**	**0.5**	**1**	44 – **100**	≤ 40
2,4-Dichlorophenol	**1.109**	**1.5**	**3**	35 – 114	≤ 40
1,2,4-Trichlorobenzene	**0.495**	**0.5**	**1**	34 – **100**	≤ 40
Naphthalene	**0.326**	**0.5**	**1**	48 – **100**	≤ 40
Benzoic acid	**8.647**	**10**	**20**	**10** - 172	≤ 40
4-Chloroaniline	**1.733**	**2.5**	**5**	**10** - 153	≤ 40
2,6-Dinitrotoluene	**1.300**	**1.5**	**3**	32 – 129	≤ 40
Hexachlorobutadiene	**0.604**	**1.5**	**3**	22 – **100**	≤ 40
4-Chloro-3-methylphenol	**0.919**	**1.5**	**3**	33 – 123	≤ 40
Hexachlorocyclopentadiene	**1.862**	**2.5**	**5**	**10** – **100**	≤ 40
2,4,6-Trichlorophenol	**1.235**	**1.5**	**3**	37 – 120	≤ 40
2,4,5-Trichlorophenol	**1.706**	**2.5**	**5**	37 – 124	≤ 40
2-Chloronaphthalene	**0.340**	**0.5**	**1**	49 – **100**	≤ 40
2-Nitroaniline	**0.784**	**1.5**	**3**	18 – 140	≤ 40
Acenaphthylene	**0.274**	**0.5**	**1**	47 – 110	≤ 40
Dimethylphthalate	**0.264**	**0.5**	**1**	60 – 106	≤ 40
Acenaphthene	**0.347**	**0.5**	**1**	55 – 101	≤ 40

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
3-Nitroaniline	1.140	1.5	3	10 – 208	≤ 40
2-Methylnaphthalene	0.241	0.5	1	38 – 100	≤ 40
2,4-Dinitrophenol	5.474	10	20	10 – 224	≤ 40
Dibenzofuran	0.198	0.5	1	46 – 108	≤ 40
4-Nitrophenol	2.895	5.0	10	10 – 103	≤ 40
2,4-Dinitrotoluene	1.277	1.5	3	33 – 134	≤ 40
Fluorene	0.266	0.5	1	59 – 108	≤ 40
4-Chlorophenyl-phenylether	0.342	0.5	1	54 – 104	≤ 40
Diethylphthalate	0.407	0.5	1	60 - 108	≤ 40
4-Nitroaniline	1.366	1.5	3	13 – 144	≤ 40
4,6-Dinitro-2-methylphenol	4.928	5.0	10	10 – 190	≤ 40
N-Nitrosodiphenylamine	0.392	0.5	1	39 – 100	≤ 40
4-Bromophenyl-phenylether	0.262	0.5	1	56 – 105	≤ 40
Hexachlorobenzene	0.335	0.5	1	54 – 108	≤ 40
Pentachlorophenol	2.746	5.0	10	25 – 144	≤ 40
Phenanthrene	0.283	0.5	1	64 – 115	≤ 40
Anthracene	0.303	0.5	1	59 – 107	≤ 40
Carbazole	0.251	0.5	1	36 – 123	≤ 40
Di-n-butylphthalate	0.304	0.5	1	62 – 110	≤ 40
Fluoranthene	0.290	0.5	1	63 – 119	≤ 40
Pyrene	0.379	0.5	1	57 – 117	≤ 40
Butylbenzylphthalate	0.402	0.5	1	49 – 118	≤ 40
Benzo(a)anthracene	0.373	0.5	1	61 – 113	≤ 40
3,3'-Dichlorobenzidine	1.553	2.5	5	10 – 151	≤ 40
Chrysene	0.397	0.5	1	62 – 115	≤ 40
bis(2-Ethylhexyl)phthalate	1.050	1.5	3	47 – 127	≤ 40
Di-n-octylphthalate	0.331	0.5	1	60 – 106	≤ 40
Benzo(b)fluoranthene	0.298	0.5	1	61 – 120	≤ 40
Benzo(k)fluoranthene	0.487	0.5	1	59 – 120	≤ 40
Benzo(a)pyrene	0.425	0.5	1	46 – 105	≤ 40
Indeno(1,2,3-cd)pyrene	0.435	0.5	1	42 – 134	≤ 40
Dibenzo(a,h)anthracene	0.437	0.5	1	46 – 132	≤ 40
Benzo(g,h,i)perylene	0.464	0.5	1	33 – 135	≤ 40
N-Nitrosodimethylamine	1.209	1.5	3	17 - 106	≤ 40

LOD, LOQ and Control Limits Summary
GC - MS – SVOA Analysis of Aqueous Samples
EPA Method 8270D
ARI Analysis: BANWLI & BANWSI

Continuous Liquid-Liquid (EPA Method 3520C, Bench Sheet 3006F) or Separatory Funnel (EPA method 3510C, Bench Sheet 3010F) extraction using 500mL sample concentrated to 0.5 mL final extract volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS, MS Recovery[2,3]	Replicate RPD[4]
Aniline	**0.470**	**0.5**	**1**	**10** – 113	≤ 40
1-methylnaphthalene	**0.199**	**0.5**	**1**	43 – **100**	≤ 40
Azobenzene (1,2-DP-Hydrazine)	**0.214**	**0.5**	**1**	52 – 111	≤ 40
Benzofluoranthenes, Total	**2.317**	**2.5**	**5**	60 – 130[5]	≤ 40
Surrogate Standard Recovery			**MB / LCS**	**Samples**	**RPD**
2-Fluorophenol			33 – 100	23 – **100**	≤ 40
Phenol-d_5			15 - 121	16 – 106	≤ 40
2-Chlorophenol-d_4			46 – 102	33 – 100	≤ 40
1,2-Dichlorobenzene-d_4			40 – **100**	27 – **100**	≤ 40
Nitrobenzene-d_5			50 – **100**	34 – 101	≤ 40
2-Fluorobiphenyl			51 – **100**	38 – **100**	≤ 40
2,4,6-Tribromophenol			46 – 125	31 – 128	≤ 40
p-Terphenyl-d_{14}			54 – 117	27 – 122	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Control limits calculated using all data from 8/1/10 through 7/31/11.
(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(5) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits.

DL[1], LOD[1], LOQ[1] and Control Limits Summary
Analysis of Water Samples for Chlorinated Pesticides
EPA Method 8081B

Separatory Funnel (EPA Method 3510C) Extraction using 500 mL sample with extract concentrated to 5 mL final volume. ARI Bench Sheet 3038F

LOD Spike level = LOQ Concentration

Analyte	DL[1,2] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Control Limit[3,4]	Replicate RPD[5]
alpha-BHC	0.0085	0.025	**0.05**	51 – 120	≤ 40
beta-BHC	0.0098	0.025	**0.05**	44 – 134	≤ 40
gamma-BHC (Lindane)	0.0159	0.025	**0.05**	59 – 131	≤ 40
delta-BHC	0.0087	0.025	**0.05**	44 – 156	≤ 40
Heptachlor	0.0113	0.025	**0.05**	47 – 110	≤ 40
Aldrin	0.0103	0.025	**0.05**	47 – 106	≤ 40
Heptachlor Epoxide	0.0079	0.025	**0.05**	62 – 121	≤ 40
trans-Chlordane (*beta*-Chlordane, *gamma*-Chlordane)	0.0082	0.025	**0.05**	63 – 125	≤ 40
cis-Chlordane (*alpha*-chlordane)	0.0082	0.025	**0.05**	62 – 123	≤ 40
Endosulfan I	0.0089	0.025	**0.05**	**10** – 110	≤ 40
4,4'-DDE	0.0184	0.05	**0.10**	61 – 138	≤ 40
Dieldrin	0.0168	0.05	**0.10**	64 – 123	≤ 40
Endrin	0.0167	0.05	**0.10**	53 – 127	≤ 40
Endosulfan II	0.0139	0.05	**0.10**	23 – 102	≤ 40
4,4'-DDD	0.0186	0.05	**0.10**	53 – 133	≤ 40
Endrin Aldehyde	0.0163	0.05	**0.10**	28 – 107	≤ 40
4,4'-DDT	0.0169	0.05	**0.10**	49 – 127	≤ 40
Endosulfan Sulfate	0.0235	0.05	**0.10**	49 – 121	≤ 40
Endrin Ketone	0.0151	0.05	**0.10**	45 – 126	≤ 40
Methoxychlor	0.0744	0.25	**0.50**	48 – 118	≤ 40
Hexachlorobutadiene	0.0123	0.05	**0.10**	23 – **100**	≤ 40
Hexachlorobenzene	0.0101	0.05	**0.10**	44 – 101	≤ 40
Surrogate Standard Recovery			**MB / LCS**	**Samples**	**RPD**
Tetrachloro-*m*-xylene (TCMX)			38 – 103	30 – 105	≤ 40
Decachlorobiphenyl			37 – 125	11 – 144	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation as defined in ARI SOP 1018S.
(2) MDL study QD48
(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(4) Control limits calculated using all data from 1/1/12 through 7/31/12.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

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Quality Control Criteria for Analysis of Aqueous and Tissue Samples for Aroclors (Polychlorinated Biphenyls – PCB) EPA Method 8082B

Analysis Code	Extraction	DL[1]	LOD[1]	LOQ[1]	Analyte	Spike Recovery Control Limits (%)[2,3]			RPD[4]
						LCS	MB/LCS Surrogate	Sample Surrogate	
Aqueous Samples (Separatory Funnel Extraction – EPA Method 3510C)									
PCBWSI 01-3018F	500 to 5 mL	0.130 µg/L	0.5 µg/L	1 µg/L	Aroclor 1016	45 – 121	--	--	≤ 40
		0.147 µg/L	0.5 µg/L	1 µg/L	Aroclor 1260	54 – 129	--	--	
		--	--	--	TCMX	--	40 – 118	38 – 118	
		--	--	--	DCBP	--	41 – 111	29 – 118	
PCBWSM 02-3021F	500 to 1 mL	0.0175 µg/L	0.05 µg/L	0.1 µg/L	Aroclor 1016	36 – **100**	--	--	≤ 40
		0.0174 µg/L	0.05 µg/L	0.1 µg/L	Aroclor 1260	41 – 113	--	--	
		--	--	--	TCMX	--	29 – **100**	25 – **100**	
		--	--	--	DCBP	--	39 – 116	**10** – 128	
PCBWLS	1000 to 0.5 mL[5]	0.00248 µg/L	0.005 µg/L	0.01 µg/L	Aroclor 1016	44 – 117	--	--	≤ 40
		0.00276 µg/L	0.005 µg/L	0.01 µg/L	Aroclor 1260	46 – 131	--	--	
		--	--	--	TCMX	--	31 – **100**	21 – **100**	
		--	--	--	DCBP	--	32 – 108	19 – 111	
TCLP Extract (Separatory Funnel Extraction – EPA Method 3510C)									
PCBWST	100 to 10 mL	0.130 µg/L[8]	5 µg/L	10 µg/L	Aroclor 1016	30 – 160	--	--	≤ 40
		0.147 µg/L[8]	5 µg/L	10 µg/L	Aroclor 1260	30 – 160	--	--	
		--	--	--	TCMX	--	30 – 160	30 – 160	
		--	--	--	DCBP	--	30 – 160	30 – 160	
Tissue Samples (Tissuemizer / Blender Extraction – EPA Method 3550C Modified) – Concentrations in µg/kg as received (wet weight)									
PCBUZI 09-3029F	10 g to 5 mL	2.92 µg/kg[6]	25 µg/kg	50 µg/kg	Aroclor 1016	30 – 160			≤ 40
		3.91 µg/kg[6]	25 µg/kg	50 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	
PCBUZM 10-3027F	25 g to 5 mL	2.37 µg/kg[7]	10 µg/kg	20 µg/kg	Aroclor 1016	30 – 160			≤ 40
		1.06 µg/kg[7]	10 µg/kg	20 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	
PCBUZL 11-3030F	25 g to 1 mL	2.37[7] µg/kg	2 µg/kg	4 µg/kg	Aroclor 1016	30 – 160			≤ 40
		1.06[7] µg/kg	2 µg/kg	4 µg/kg	Aroclor 1260	30 – 160			
		--	--	--	TCMX		30 – 160	30 – 160	
		--	--	--	DCBP		30 – 160	30 – 160	

(1) Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) are defined in ARI SOP 1018S.
(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(3) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(5) Low level extraction solvent is hexane instead of Methylene Chloride.
(6) LOD Study SM10
(7) MDL Study QZ25
(8) Based on PCBWSI until sufficient TCLP data is collected to calculate LOD.

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Quality Control Criteria
Total Petroleum Hydrocarbons
(Diesel & Motor Oil)

Analysis Code	Analyte[5]	DL[1] ppm	LOD[1] ppm	LOQ[2] ppm	Spike % Recovery Control Limits[3]			RPD[4]
					LCS	MB/LCS Surrogate	Sample Surrogate	
HCIWVX	NWTPH-HCID – Water Samples	--	--	0.50 [7]	--	--	50-150	≤ 40
HCISVX	NWTPH-HCID – Solid Samples	--	--	50 [7]	--	--	50-150	
Aqueous Samples – No Extract Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.022	0.05	0.1	64-112	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.022	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.044	0.1	0.2	60 – 130 [8]	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [9]	0.1	0.2	60-120 [6]	60-120	50-150	
Aqueous Samples – With Acid and/or Silica Gel Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.039	0.05	0.1	61-104	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.042	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.010	0.1	0.2	60 – 130 [8]	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [8]	0.1	0.2	60-120 [6]	60-120	50-150	
Solid Matrix Samples – No Extract Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.35	2.5	5	62-119	50-150	50-150	≤ 40
DIESMI	DRO – NWTPH-Dext Jet A	2.22 [11]	2.5	5	60 – 130 [8]	50-150	50-150	
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.43	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	2.48	5	10	60 – 130 [8]	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [9]	5	10	60-120 [6]	60-120	50-150	
Solid Matrix Samples – With Acid and/or Silica Gel Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.28	2.5	5	60-108	50-150	50-150	≤ 40
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.06	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	1.57	5	10	60 – 130 [8]	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [10]	5	10	60-120 [6]	60-120	50-150	

(1) DL (Detection Limit) and LOD (Limit of Detection) as defined in ARI SOP 1018S.
(2) Limit of Quantitation as defined in ARI SOP 1018S. The spike concentration used to determine the DL and the concentration of the lowest standard used to calibrate the GC-FID instrument.
(3) All surrogate recovery limits are specified in the published methods (AK102, AK103 & NWTPH-Dext). The surrogate standard is *o*-Terphenyl.
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$
(5) DRO = Diesel Range Organics and RRO = Residual Range Organics as defined in the methods referenced in footnote 3.
(6) Method specified LCS acceptance limits.
(7) Method specified reporting limits
(8) Default LCS control limits pending calculation of historic limits
(9) MDL study QD55 completed 2/12/10
(10) MDL study QD35 completed 1/29/10
(11) LOD Study UI44 completed 2/28/12

Quality Control Parameters for Metals Analysis-ICP-OES 200.7/6010C

	Aqueous Samples[2]			Spike Recovery		RPD[5]	Solids[3]	Tissue[4]
Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ mg/kg	LOQ mg/kg
Aluminum	7.57	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Antimony	6.28	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Arsenic	3.33	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Barium	1.33	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Beryllium	0.16	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Boron	7.39	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Cadmium	0.18	0.5	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Calcium	11.27	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Chromium	1.24	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Cobalt	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Copper	0.92	1.0	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Iron	7.50	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Lead	1.55	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Magnesium	9.61	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Manganese	0.28	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Molybdenum	0.79	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Nickel	3.86	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Potassium	65.70	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Selenium	4.99	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Silicon	8.17	30	**60**	75 – 125	80 – 120	≤ 20	**(6)**	**(6)**
Silver	0.43	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Sodium	11.35	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Strontium	0.09	1.0	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Thallium	3.10	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Tin	1.41	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Titanium	2.11	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.01**
Vanadium	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Zinc	1.45	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Tissue is reported on an "as received" (wet weight) basis using 2.5 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$
(6) ARI does not analyze for Silicon in solids or tissue samples

Quality Control Parameters for Metals Analysis ICP-MS 200.8/6020A

Analyte	Mass	Aqueous Samples[2]			Spike Recovery		RPD[4]	Solids[3]
		DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ[1] mg/kg
Aluminum	27	1.601	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Antimony	121	0.010	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
	123	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #1	75	0.048	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #2	75	0.092	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Barium	135	0.020	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	137	0.019	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Beryllium	9	0.021	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Cadmium	111	0.010	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
	114	0.005	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Calcium	43	3.983	25	**50.0**	75 – 125	80 – 120	≤ 20	**50.0**
Chromium	52	0.045	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	53	0.118	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Cobalt	59	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Copper	63	0.158	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	65	0.236	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Iron	54	5.753	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
	57	3.876	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Lead	208	0.046	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Magnesium	24	0.297	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Manganese	55	0.022	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Molybdenum	98	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Nickel	60	0.079	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	62	0.089	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Potassium	39	2.944	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Selenium	82	0.127	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	78	0.324	0.25	**2.0**	75 – 125	80 – 120	≤ 20	**2.0**
Silver	107	0.008	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Sodium	23	2.833	50	**100.0**	75 – 125	80 – 120	≤ 20	**100.0**
Thorium[5]	232	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Thallium	205	0.004	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Uranium[5]	238	0.003	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Vanadium	51	0.043	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Zinc	66	0.497	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	67	0.531	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	68	0.524	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(5) ARI has no accreditation for these elements.

Quality Control Parameters for Mercury Analysis using CVAA

	Aqueous Samples[2]			Spike Recovery		RPD[5]
	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS	
Mercury	0.0069	0.05	**0.10**[2]	75 – 125	80 – 120	≤ 20
Mercury (low level)	0.0026	0.01	**0.02**[2]	75 – 125	80 – 120	≤ 20
	Soil / Sediment Samples			**Spike Recovery**		**RPD**[5]
	DL[1] mg/kg	LOD[1] mg/kg	LOQ[1] mg/kg	Matrix Spike	LCS	
Mercury	0.0021	0.0125	0.025[3]	75 – 125	80 – 120	≤ 20
	Tissue Samples			**Spike Recovery**		**RPD**[5]
	DL[1] mg/kg	LOD[1] mg/kg	LOQ[1] mg/kg	Matrix Spike	LCS	
Mercury	0.0021	0.0125	0.005[4]	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 20 mL sample with 20 mL final volume
(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.
(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

Volatile Analysis
Report and Summary QC Forms

ARI Job ID: VS80, VS81

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-2-1112**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized: MW
Reported: 11/26/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 20:01

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Date Analyzed: 11/23/12 20:01

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	99.6%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	106%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-4-1112**
 SAMPLE

Lab Sample ID: VS80B
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 20:28

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-4-1112**
 SAMPLE

Lab Sample ID: VS80B
LIMS ID: 12-23024
Matrix: Water
Date Analyzed: 11/23/12 20:28

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	112%
d8-Toluene	99.0%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	107%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-10-1112**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS80C
LIMS ID: 12-23025
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 20:54

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS80C
LIMS ID: 12-23025
Matrix: Water
Date Analyzed: 11/23/12 20:54

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	114%
d8-Toluene	98.9%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	107%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
Page 1 of 2 **SAMPLE**

Lab Sample ID: VS80D
LIMS ID: 12-23026
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 17:20

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: VS80D
LIMS ID: 12-23026
Matrix: Water
Date Analyzed: 11/23/12 17:20

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	Hexachlorobutadiene	0.07	0.20	< 0.20 U
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	109%
d8-Toluene	100%
Bromofluorobenzene	99.9%
d4-1,2-Dichlorobenzene	106%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-112312A	Method Blank	10	110%	99.9%	104%	105%	0
LCS-112312A	Lab Control	10	108%	101%	109%	106%	0
LCSD-112312A	Lab Control Dup	10	105%	102%	107%	105%	0
VS80A	LMW-2-1112	10	110%	99.6%	102%	106%	0
VS80B	LMW-4-1112	10	112%	99.0%	104%	107%	0
VS80C	LMW-10-1112	10	114%	98.9%	102%	107%	0
VS80D	Trip Blanks	10	109%	100%	99.9%	106%	0

	LCS/MB LIMITS	QC LIMITS
SW8260C		
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-130)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 12-23023 to 12-23026

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-112312A**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-112312A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT2/PKC
LCSD: NT2/PKC
Date Analyzed LCS: 11/23/12 14:11
LCSD: 11/23/12 14:38

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS		Spike Added-LCS	LCS Recovery	LCSD		Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	9.75		10.0	97.5%	10.5		10.0	105%	7.4%
Bromomethane	11.2		10.0	112%	11.5		10.0	115%	2.6%
Vinyl Chloride	10.6		10.0	106%	11.5		10.0	115%	8.1%
Chloroethane	10.7		10.0	107%	11.1		10.0	111%	3.7%
Methylene Chloride	9.96		10.0	99.6%	10.4		10.0	104%	4.3%
Acetone	56.2		50.0	112%	60.6		50.0	121%	7.5%
Carbon Disulfide	10.5		10.0	105%	12.1		10.0	121%	14.2%
1,1-Dichloroethene	10.9		10.0	109%	11.6		10.0	116%	6.2%
1,1-Dichloroethane	10.4		10.0	104%	10.8		10.0	108%	3.8%
trans-1,2-Dichloroethene	10.3		10.0	103%	10.7		10.0	107%	3.8%
cis-1,2-Dichloroethene	10.5		10.0	105%	10.9		10.0	109%	3.7%
Chloroform	10.9		10.0	109%	11.1		10.0	111%	1.8%
1,2-Dichloroethane	11.6	Q	10.0	116%	11.5	Q	10.0	115%	0.9%
2-Butanone	55.7		50.0	111%	55.1		50.0	110%	1.1%
1,1,1-Trichloroethane	11.5		10.0	115%	11.9		10.0	119%	3.4%
Carbon Tetrachloride	12.6	Q	10.0	126%	13.2	Q	10.0	132%	4.7%
Vinyl Acetate	8.65		10.0	86.5%	8.43		10.0	84.3%	2.6%
Bromodichloromethane	11.8	Q	10.0	118%	11.7	Q	10.0	117%	0.9%
1,2-Dichloropropane	10.6		10.0	106%	10.4		10.0	104%	1.9%
cis-1,3-Dichloropropene	11.3		10.0	113%	11.4		10.0	114%	0.9%
Trichloroethene	10.6		10.0	106%	10.9		10.0	109%	2.8%
Dibromochloromethane	9.46		10.0	94.6%	9.39		10.0	93.9%	0.7%
1,1,2-Trichloroethane	11.0		10.0	110%	11.3		10.0	113%	2.7%
Benzene	10.6		10.0	106%	10.8		10.0	108%	1.9%
trans-1,3-Dichloropropene	10.3		10.0	103%	10.2		10.0	102%	1.0%
2-Chloroethylvinylether	8.50		10.0	85.0%	7.96		10.0	79.6%	6.6%
Bromoform	7.78		10.0	77.8%	7.73		10.0	77.3%	0.6%
4-Methyl-2-Pentanone (MIBK)	60.8	Q	50.0	122%	60.5	Q	50.0	121%	0.5%
2-Hexanone	53.2		50.0	106%	53.5		50.0	107%	0.6%
Tetrachloroethene	11.0		10.0	110%	10.9		10.0	109%	0.9%
1,1,2,2-Tetrachloroethane	9.77		10.0	97.7%	9.98		10.0	99.8%	2.1%
Toluene	11.0		10.0	110%	10.8		10.0	108%	1.8%
Chlorobenzene	10.7		10.0	107%	10.8		10.0	108%	0.9%
Ethylbenzene	11.1		10.0	111%	11.0		10.0	110%	0.9%
Styrene	12.0	Q	10.0	120%	11.7	Q	10.0	117%	2.5%
Trichlorofluoromethane	11.8	Q	10.0	118%	12.3	Q	10.0	123%	4.1%
1,1,2-Trichloro-1,2,2-trifluoroetha	10.6		10.0	106%	12.5		10.0	125%	16.5%
m,p-Xylene	22.8		20.0	114%	22.7		20.0	114%	0.4%

Lab Sample ID: LCS-112312A QC Report No: VS80-Golder Associates
LIMS ID: 12-23023 Project: Landsburg Mines
Matrix: Water 923-1000-002.R273

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
o-Xylene	11.7	10.0	117%	11.6	10.0	116%	0.9%
1,2-Dichlorobenzene	11.4	10.0	114%	11.1	10.0	111%	2.7%
1,3-Dichlorobenzene	10.6	10.0	106%	10.6	10.0	106%	0.0%
1,4-Dichlorobenzene	10.6	10.0	106%	10.5	10.0	105%	0.9%
Acrolein	45.0	50.0	90.0%	48.0	50.0	96.0%	6.5%
Iodomethane	10.2	10.0	102%	12.0	10.0	120%	16.2%
Acrylonitrile	9.31	10.0	93.1%	9.77	10.0	97.7%	4.8%
1,1-Dichloropropene	11.0	10.0	110%	11.4	10.0	114%	3.6%
Dibromomethane	11.3	10.0	113%	11.7	10.0	117%	3.5%
1,1,1,2-Tetrachloroethane	12.0	10.0	120%	12.0 Q	10.0	120%	0.0%
1,2-Dibromo-3-chloropropane	10.1	10.0	101%	9.68	10.0	96.8%	4.2%
1,2,3-Trichloropropane	9.76	10.0	97.6%	10.5	10.0	105%	7.3%
trans-1,4-Dichloro-2-butene	8.33	10.0	83.3%	9.00	10.0	90.0%	7.7%
1,3,5-Trimethylbenzene	11.1	10.0	111%	11.1	10.0	111%	0.0%
1,2,4-Trimethylbenzene	11.3	10.0	113%	11.1	10.0	111%	1.8%
Hexachlorobutadiene	15.2 Q	10.0	152%	14.6 Q	10.0	146%	4.0%
1,2-Dibromoethane	11.8 Q	10.0	118%	12.0 Q	10.0	120%	1.7%
Bromochloromethane	10.8	10.0	108%	11.1	10.0	111%	2.7%
2,2-Dichloropropane	11.4	10.0	114%	12.3	10.0	123%	7.6%
1,3-Dichloropropane	10.8	10.0	108%	10.5	10.0	105%	2.8%
Isopropylbenzene	10.1	10.0	101%	10.2	10.0	102%	1.0%
n-Propylbenzene	10.0	10.0	100%	10.1	10.0	101%	1.0%
Bromobenzene	9.52	10.0	95.2%	9.58	10.0	95.8%	0.6%
2-Chlorotoluene	10.4	10.0	104%	10.1	10.0	101%	2.9%
4-Chlorotoluene	9.93	10.0	99.3%	9.96	10.0	99.6%	0.3%
tert-Butylbenzene	11.2	10.0	112%	11.0	10.0	110%	1.8%
sec-Butylbenzene	11.6	10.0	116%	11.4	10.0	114%	1.7%
4-Isopropyltoluene	12.3 Q	10.0	123%	12.0 Q	10.0	120%	2.5%
n-Butylbenzene	12.5 Q	10.0	125%	12.2 Q	10.0	122%	2.4%
1,2,4-Trichlorobenzene	14.0	10.0	140%	12.9	10.0	129%	8.2%
Naphthalene	12.8	10.0	128%	12.0	10.0	120%	6.5%
1,2,3-Trichlorobenzene	14.6	10.0	146%	14.1	10.0	141%	3.5%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	108%	105%
d8-Toluene	101%	102%
Bromofluorobenzene	109%	107%
d4-1,2-Dichlorobenzene	106%	105%

4A
VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB1123

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS61

Project: LANDSBURG MINE

Lab File ID: MB1123A

Lab Sample ID: MB1123

Date Analyzed: 11/23/12

Time Analyzed: 1532

Instrument ID: NT2

Heated Purge: (Y/N) N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS1123	LCS1123	LCS1123A	1411
02	LCS1123	LCS1123	LCS1123B	1438
03	TRIP BLANKS	VS61D	VS61D	1653
04	TRIP BLANKS	VS80D	VS80D	1720
05	LMW-9-1112	VS61A	VS61A	1842
06	LMW-11-1112	VS61B	VS61B	1908
07	LMW-6-1112	VS61C	VS61C	1935
08	LMW-2-1112	VS80A	VS80A	2001
09	LMW-4-1112	VS80B	VS80B	2028
10	LMW-10-1112	VS80C	VS80C	2054
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COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-112312A**
 METHOD BLANK

Lab Sample ID: MB-112312A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT2/PKC
Date Analyzed: 11/23/12 15:32

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	DL	LOQ	Result
74-87-3	Chloromethane	0.10	0.50	< 0.50 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.10	< 0.10 U
75-00-3	Chloroethane	0.09	0.20	< 0.20 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.20	< 0.20 U
75-35-4	1,1-Dichloroethene	0.05	0.20	< 0.20 U
75-34-3	1,1-Dichloroethane	0.05	0.20	< 0.20 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.20	< 0.20 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.20	< 0.20 U
67-66-3	Chloroform	0.03	0.20	< 0.20 U
107-06-2	1,2-Dichloroethane	0.07	0.20	< 0.20 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.20	< 0.20 U
56-23-5	Carbon Tetrachloride	0.04	0.20	< 0.20 U
108-05-4	Vinyl Acetate	0.07	0.20	< 0.20 U
75-27-4	Bromodichloromethane	0.05	0.20	< 0.20 U
78-87-5	1,2-Dichloropropane	0.04	0.20	< 0.20 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.20	< 0.20 U
79-01-6	Trichloroethene	0.05	0.20	< 0.20 U
124-48-1	Dibromochloromethane	0.05	0.20	< 0.20 U
79-00-5	1,1,2-Trichloroethane	0.13	0.20	< 0.20 U
71-43-2	Benzene	0.03	0.20	< 0.20 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.20	< 0.20 U
110-75-8	2-Chloroethylvinylether	0.25	0.50	< 0.50 U
75-25-2	Bromoform	0.06	0.20	< 0.20 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.20	< 0.20 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.10	< 0.10 U
108-88-3	Toluene	0.04	0.20	< 0.20 U
108-90-7	Chlorobenzene	0.02	0.20	< 0.20 U
100-41-4	Ethylbenzene	0.04	0.20	< 0.20 U
100-42-5	Styrene	0.04	0.20	< 0.20 U
75-69-4	Trichlorofluoromethane	0.04	0.20	< 0.20 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.20	< 0.20 U
179601-23-1	m,p-Xylene	0.05	0.40	< 0.40 U
95-47-6	o-Xylene	0.04	0.20	< 0.20 U
95-50-1	1,2-Dichlorobenzene	0.04	0.20	< 0.20 U
541-73-1	1,3-Dichlorobenzene	0.04	0.20	< 0.20 U
106-46-7	1,4-Dichlorobenzene	0.04	0.20	< 0.20 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Iodomethane	0.23	0.50	< 0.50 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.10	< 0.10 U
74-95-3	Dibromomethane	0.14	0.20	< 0.20 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.20	< 0.20 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.50	< 0.50 U
96-18-4	1,2,3-Trichloropropane	0.13	0.20	< 0.20 U

Lab Sample ID: MB-112312A
LIMS ID: 12-23023
Matrix: Water
Date Analyzed: 11/23/12 15:32

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.20	< 0.20 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.20	< 0.20 U
87-68-3	**Hexachlorobutadiene**	**0.07**	**0.20**	**0.38**
106-93-4	1,2-Dibromoethane	0.08	0.10	< 0.10 U
74-97-5	Bromochloromethane	0.06	0.20	< 0.20 U
594-20-7	2,2-Dichloropropane	0.05	0.10	< 0.10 U
142-28-9	1,3-Dichloropropane	0.06	0.10	< 0.10 U
98-82-8	Isopropylbenzene	0.02	0.20	< 0.20 U
103-65-1	n-Propylbenzene	0.02	0.20	< 0.20 U
108-86-1	Bromobenzene	0.06	0.20	< 0.20 U
95-49-8	2-Chlorotoluene	0.02	0.10	< 0.10 U
106-43-4	4-Chlorotoluene	0.02	0.20	< 0.20 U
98-06-6	tert-Butylbenzene	0.03	0.20	< 0.20 U
135-98-8	sec-Butylbenzene	0.02	0.20	< 0.20 U
99-87-6	4-Isopropyltoluene	0.03	0.10	< 0.10 U
104-51-8	n-Butylbenzene	0.02	0.20	< 0.20 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.50	< 0.50 U
91-20-3	Naphthalene	0.12	0.50	< 0.50 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.20	< 0.20 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	110%
d8-Toluene	99.9%
Bromofluorobenzene	104%
d4-1,2-Dichlorobenzene	105%

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: VS97 Case No.: LANDSBURG MINE SDG No.: VS61

Lab File ID: BFB1116 BFB Injection Date: 11/16/12

Instrument ID: NT2 BFB Injection Time: 0714

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.9
75	30.0 - 60.0% of mass 95	48.7
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.6 (0.7)1
174	50.0 - 100.0% of mass 95	83.5
175	5.0 - 9.0% of mass 174	6.3 (7.5)1
176	95.0 - 101.0% of mass 174	80.3 (96.1)1
177	5.0 - 9.0% of mass 176	6.0 (7.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD1	IC1116	0011116	11/16/12	0822
02	VSTD2	IC1116	0021116	11/16/12	0849
03	VSTD5	IC1116	0051116	11/16/12	0915
04	VSTD10	IC1116	0101116	11/16/12	0942
05	VSTD2	IC1116	0201116	11/16/12	1008
06	VSTD10	IC1116	1001116	11/16/12	1034
07	VSTD20	IC1116	2001116	11/16/12	1101
08	VSTD40	IC1116	4001116	11/16/12	1128
09	VSTD60	IC1116	6001116	11/16/12	1155
10	ICV1116	ICV1116	ICV1116	11/16/12	1438
11					
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5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: VS97 Case No.: LANDSBURG MINE SDG No.: VS61

Lab File ID: BFB1123 BFB Injection Date: 11/23/12

Instrument ID: NT2 BFB Injection Time: 1241

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0% of mass 95	17.3	
75	30.0 - 60.0% of mass 95	49.9	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0% of mass 95	6.9	
173	Less than 2.0% of mass 174	0.0	(0.0)1
174	50.0 - 100.0% of mass 95	85.6	
175	5.0 - 9.0% of mass 174	6.3	(7.4)1
176	95.0 - 101.0% of mass 174	83.4	(97.5)1
177	5.0 - 9.0% of mass 176	5.3	(6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1123	CC1123	CC1123A	11/23/12	1344
02	LCS1123	LCS1123	LCS1123A	11/23/12	1411
03	LCS1123	LCS1123	LCS1123B	11/23/12	1438
04	MB1123	MB1123	MB1123A	11/23/12	1532
05	TRIP BLANKS	VS61D	VS61D	11/23/12	1653
06	TRIP BLANKS	VS80D	VS80D	11/23/12	1720
07	LMW-9-1112	VS61A	VS61A	11/23/12	1842
08	LMW-11-1112	VS61B	VS61B	11/23/12	1908
09	LMW-6-1112	VS61C	VS61C	11/23/12	1935
10	LMW-2-1112	VS80A	VS80A	11/23/12	2001
11	LMW-4-1112	VS80B	VS80B	11/23/12	2028
12	LMW-10-1112	VS80C	VS80C	11/23/12	2054
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FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
Chloromethane		0.496	0.568	0.583	0.483
Vinyl Chloride	0.463	0.363	0.531	0.502	0.410
Bromomethane		0.216	0.289	0.278	0.214
Chloroethane		0.270	0.332	0.310	0.238
Trichlorofluoromethane		0.506	0.700	0.624	0.507
Acrolein			0.034	0.036	0.029
112Trichloro122Trifluoroetha		0.351	0.415	0.466	0.332
Acetone			0.052	0.056	0.041
1,1-Dichloroethene		0.377	0.423	0.437	0.376
Bromoethane		0.298	0.326	0.324	0.287
Iodomethane		0.664	0.672	0.809	0.638
Methylene Chloride		0.496	0.522	0.527	0.404
Acrylonitrile			0.065	0.076	0.055
Carbon Disulfide		1.199	1.260	1.355	1.128
Trans-1,2-Dichloroethene		0.426	0.505	0.544	0.416
Vinyl Acetate		0.223	0.323	0.364	0.271
1,1-Dichloroethane		0.696	0.872	0.884	0.665
2-Butanone		0.077	0.086	0.093	0.069
2,2-Dichloropropane	0.456	0.476	0.537	0.568	0.440
Cis-1,2-Dichloroethene		0.372	0.515	0.552	0.417
Chloroform		0.686	0.800	0.901	0.684
Bromochloromethane		0.147	0.216	0.225	0.180
1,1,1-Trichloroethane		0.611	0.747	0.751	0.570
1,1-Dichloropropene	0.392	0.377	0.423	0.480	0.333
Carbon Tetrachloride		0.350	0.387	0.436	0.322
1,2-Dichloroethane		0.298	0.322	0.378	0.282
Benzene		1.072	1.262	1.335	1.006
Trichloroethene		0.271	0.349	0.368	0.279
1,2-Dichloropropane		0.220	0.241	0.299	0.216
Bromodichloromethane		0.240	0.342	0.359	0.279
Dibromomethane		0.084	0.137	0.138	0.107
2-Chloroethyl Vinyl Ether			0.081	0.089	0.076
4-Methyl-2-Pentanone		0.040	0.051	0.056	0.049
Cis 1,3-dichloropropene		0.304	0.329	0.378	0.289
Toluene		0.591	0.688	0.778	0.584
Trans 1,3-Dichloropropene		0.202	0.273	0.320	0.248
2-Hexanone			0.090	0.104	0.081

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
1,1,2-Trichloroethane		0.139	0.168	0.192	0.143
1,3-Dichloropropane	0.298	0.304	0.353	0.391	0.297
Tetrachloroethene		0.333	0.374	0.406	0.306
Chlorodibromomethane		0.167	0.207	0.233	0.179
1,2-Dibromoethane	0.120	0.130	0.163	0.194	0.145
Chlorobenzene		0.711	0.859	0.881	0.697
Ethyl Benzene		0.388	0.446	0.497	0.382
1,1,1,2-Tetrachloroethane		0.242	0.271	0.317	0.256
m,p-xylene		0.447	0.562	0.630	0.481
o-Xylene		0.452	0.543	0.580	0.472
Styrene		0.589	0.799	0.841	0.702
Bromoform		0.217	0.247	0.286	0.217
1,1,2,2-Tetrachloroethane	0.318	0.386	0.456	0.492	0.365
1,2,3-Trichloropropane		0.101	0.165	0.162	0.131
Trans-1,4-Dichloro 2-Butene			0.107	0.148	0.101
N-Propyl Benzene		2.403	2.942	3.342	2.388
Bromobenzene		0.615	0.753	0.802	0.596
Isopropyl Benzene		2.159	2.708	3.093	2.322
2-Chloro Toluene	2.070	1.748	2.208	2.358	1.746
4-Chloro Toluene		1.671	2.022	2.223	1.640
T-Butyl Benzene		1.338	1.732	1.963	1.488
1,3,5-Trimethyl Benzene		1.665	2.088	2.347	1.776
1,2,4-Trimethylbenzene		1.565	2.156	2.330	1.704
S-Butyl Benzene		1.938	2.442	2.697	2.033
4-Isopropyl Toluene	1.736	1.530	1.855	2.073	1.619
1,3-Dichlorobenzene		1.127	1.219	1.289	1.039
1,4-Dichlorobenzene		1.124	1.281	1.345	1.017
N-Butyl Benzene		1.331	1.451	1.655	1.283
1,2-Dichlorobenzene		0.856	1.037	1.086	0.832
1,2-Dibromo 3-Chloropropane			0.070	0.045	0.032
1,2,4-Trichlorobenzene			0.394	0.413	0.332
Hexachloro 1,3-Butadiene		0.192	0.245	0.223	0.173
Naphthalene			0.577	0.576	0.449
1,2,3-Trichlorobenzene		0.160	0.272	0.242	0.224
Dichlorodifluoromethane		0.329	0.440	0.429	0.376
Methyl tert butyl ether		0.973	1.124	1.204	0.944

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF0.1: 0011116 RF0.2: 0021116 RF0.5: 0051116
RF1: 0101116 RF2: 0201116

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
d4-1,2-Dichloroethane	0.465	0.483	0.473	0.474	0.486
d8-Toluene	1.095	1.113	1.093	1.125	1.126
4-Bromofluorobenzene	0.497	0.500	0.480	0.493	0.497
d4-1,2-Dichlorobenzene	0.793	0.782	0.789	0.791	0.784
Dibromofluoromethane	0.460	0.456	0.460	0.460	0.457

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
Chloromethane	0.598	0.570	0.609	0.556
Vinyl Chloride	0.560	0.532	0.565	0.517
Bromomethane	0.300	0.267	0.269	0.251
Chloroethane	0.322	0.289	0.298	0.254
Trichlorofluoromethane	0.726	0.672	0.700	0.627
Acrolein	0.038	0.042	0.047	0.049
112Trichloro122Trifluoroetha	0.429	0.391	0.446	0.371
Acetone	0.055	0.058	0.060	0.062
1,1-Dichloroethene	0.446	0.420	0.430	0.395
Bromoethane	0.332	0.364	0.393	0.357
Iodomethane	0.726	0.690	0.805	0.641
Methylene Chloride	0.498	0.501	0.530	0.493
Acrylonitrile	0.085	0.093	0.096	0.099
Carbon Disulfide	1.341	1.247	1.283	1.151
Trans-1,2-Dichloroethene	0.542	0.528	0.561	0.522
Vinyl Acetate	0.388	0.432	0.453	0.472
1,1-Dichloroethane	0.883	0.871	0.920	0.864
2-Butanone	0.095	0.105	0.103	0.107
2,2-Dichloropropane	0.567	0.529	0.579	0.492
Cis-1,2-Dichloroethene	0.542	0.539	0.564	0.529
Chloroform	0.877	0.868	0.897	0.838
Bromochloromethane	0.236	0.235	0.244	0.232
1,1,1-Trichloroethane	0.794	0.764	0.788	0.722
1,1-Dichloropropene	0.456	0.456	0.462	0.431
Carbon Tetrachloride	0.427	0.421	0.436	0.397
1,2-Dichloroethane	0.359	0.370	0.359	0.348
Benzene	1.314	1.291	1.300	1.215
Trichloroethene	0.348	0.351	0.355	0.338
1,2-Dichloropropane	0.279	0.282	0.289	0.281
Bromodichloromethane	0.374	0.393	0.400	0.391
Dibromomethane	0.142	0.149	0.147	0.147
2-Chloroethyl Vinyl Ether	0.100	0.121	0.123	0.131
4-Methyl-2-Pentanone	0.068	0.071	0.068	0.066
Cis 1,3-dichloropropene	0.408	0.437	0.450	0.446
Toluene	0.734	0.764	0.766	0.740
Trans 1,3-Dichloropropene	0.344	0.368	0.361	0.368
2-Hexanone	0.113	0.122	0.121	0.119

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
1,1,2-Trichloroethane	0.182	0.198	0.196	0.199
1,3-Dichloropropane	0.389	0.410	0.428	0.422
Tetrachloroethene	0.394	0.390	0.397	0.361
Chlorodibromomethane	0.274	0.292	0.304	0.299
1,2-Dibromoethane	0.194	0.205	0.202	0.207
Chlorobenzene	0.896	0.890	0.913	0.857
Ethyl Benzene	0.522	0.511	0.514	0.483
1,1,1,2-Tetrachloroethane	0.351	0.349	0.355	0.336
m,p-xylene	0.635	0.618	0.613	0.557
o-Xylene	0.633	0.622	0.623	0.588
Styrene	1.020	1.038	1.038	0.985
Bromoform	0.301	0.346	0.382	0.374
1,1,2,2-Tetrachloroethane	0.467	0.494	0.509	0.506
1,2,3-Trichloropropane	0.163	0.166	0.173	0.163
Trans-1,4-Dichloro 2-Butene	0.139	0.151	0.166	0.159
N-Propyl Benzene	3.137	3.267	3.327	3.155
Bromobenzene	0.750	0.785	0.829	0.784
Isopropyl Benzene	3.021	3.164	3.256	3.084
2-Chloro Toluene	2.253	2.299	2.360	2.278
4-Chloro Toluene	2.089	2.212	2.289	2.184
T-Butyl Benzene	1.881	1.944	1.881	1.871
1,3,5-Trimethyl Benzene	2.317	2.365	2.337	2.276
1,2,4-Trimethylbenzene	2.303	2.337	2.337	2.288
S-Butyl Benzene	2.605	2.662	2.571	2.560
4-Isopropyl Toluene	2.133	2.151	2.093	2.116
1,3-Dichlorobenzene	1.293	1.316	1.360	1.308
1,4-Dichlorobenzene	1.304	1.326	1.360	1.316
N-Butyl Benzene	1.737	1.757	1.774	1.770
1,2-Dichlorobenzene	1.084	1.073	1.117	1.100
1,2-Dibromo 3-Chloropropane	0.049	0.048	0.054	0.058
1,2,4-Trichlorobenzene	0.454	0.446	0.501	0.511
Hexachloro 1,3-Butadiene	0.229	0.209	0.196	0.201
Naphthalene	0.675	0.669	0.781	0.818
1,2,3-Trichlorobenzene	0.294	0.273	0.284	0.290
Dichlorodifluoromethane	0.554	0.526	0.551	0.497
Methyl tert butyl ether	1.211	1.220	1.266	1.212

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

LAB FILE ID: RF10: 1001116 RF20: 2001116 RF40: 4001116
RF60: 6001116

COMPOUND	RF10	RF20	RF40	RF60
d4-1,2-Dichloroethane	0.479	0.479	0.468	0.470
d8-Toluene	1.107	1.131	1.135	1.148
4-Bromofluorobenzene	0.511	0.499	0.497	0.489
d4-1,2-Dichlorobenzene	0.783	0.779	0.782	0.806
Dibromofluoromethane	0.473	0.468	0.467	0.455

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	0.558	8.2
Vinyl Chloride	AVRG	0.494	14.0
Bromomethane	AVRG	0.260	12.1
Chloroethane	AVRG	0.289	11.5
Trichlorofluoromethane	AVRG	0.633	13.5
Acrolein	AVRG	0.039	18.7
112Trichloro122Trifluoroetha	AVRG	0.400	11.7
Acetone	AVRG	0.055	12.3
1,1-Dichloroethene	AVRG	0.413	6.6
Bromoethane	AVRG	0.335	10.4
Iodomethane	AVRG	0.706	9.7
Methylene Chloride	AVRG	0.496	8.1
Acrylonitrile	LINR		0.9988
Carbon Disulfide	AVRG	1.246	6.6
Trans-1,2-Dichloroethene	AVRG	0.505	10.8
Vinyl Acetate	LINR		0.9979
1,1-Dichloroethane	AVRG	0.832	11.5
2-Butanone	AVRG	0.092	14.8
2,2-Dichloropropane	AVRG	0.516	10.0
Cis-1,2-Dichloroethene	AVRG	0.504	13.9
Chloroform	AVRG	0.819	10.8
Bromochloromethane	AVRG	0.214	15.8
1,1,1-Trichloroethane	AVRG	0.718	11.6
1,1-Dichloropropene	AVRG	0.423	11.2
Carbon Tetrachloride	AVRG	0.397	10.6
1,2-Dichloroethane	AVRG	0.340	10.3
Benzene	AVRG	1.224	9.9
Trichloroethene	AVRG	0.332	11.0
1,2-Dichloropropane	AVRG	0.263	12.4
Bromodichloromethane	AVRG	0.347	16.8
Dibromomethane	AVRG	0.131	17.9
2-Chloroethyl Vinyl Ether	LINR		0.9964
4-Methyl-2-Pentanone	AVRG	0.058	19.2
Cis 1,3-dichloropropene	AVRG	0.380	17.2
Toluene	AVRG	0.706	11.0
Trans 1,3-Dichloropropene	LINR		0.9996
2-Hexanone	AVRG	0.107	15.3

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.177	13.9
1,3-Dichloropropane	AVRG	0.366	14.8
Tetrachloroethene	AVRG	0.370	9.4
Chlorodibromomethane	LINR		0.9994
1,2-Dibromoethane	AVRG	0.173	19.8
Chlorobenzene	AVRG	0.838	10.1
Ethyl Benzene	AVRG	0.468	12.0
1,1,1,2-Tetrachloroethane	AVRG	0.310	14.9
m,p-xylene	AVRG	0.568	12.5
o-Xylene	AVRG	0.564	12.3
Styrene	AVRG	0.877	19.5
Bromoform	LINR		0.9979
1,1,2,2-Tetrachloroethane	AVRG	0.444	15.7
1,2,3-Trichloropropane	AVRG	0.153	15.9
Trans-1,4-Dichloro 2-Butene	AVRG	0.139	18.2
N-Propyl Benzene	AVRG	2.995	13.1
Bromobenzene	AVRG	0.739	11.7
Isopropyl Benzene	AVRG	2.851	14.4
2-Chloro Toluene	AVRG	2.147	11.3
4-Chloro Toluene	AVRG	2.041	12.3
T-Butyl Benzene	AVRG	1.762	13.0
1,3,5-Trimethyl Benzene	AVRG	2.146	13.0
1,2,4-Trimethylbenzene	AVRG	2.128	14.7
S-Butyl Benzene	AVRG	2.439	11.9
4-Isopropyl Toluene	AVRG	1.923	12.6
1,3-Dichlorobenzene	AVRG	1.244	8.8
1,4-Dichlorobenzene	AVRG	1.259	9.7
N-Butyl Benzene	AVRG	1.595	13.0
1,2-Dichlorobenzene	AVRG	1.023	11.0
1,2-Dibromo 3-Chloropropane	LINR		0.9936
1,2,4-Trichlorobenzene	AVRG	0.436	14.3
Hexachloro 1,3-Butadiene	AVRG	0.208	11.0
Naphthalene	AVRG	0.649	19.6
1,2,3-Trichlorobenzene	AVRG	0.255	17.8
Dichlorodifluoromethane	AVRG	0.463	17.9
Methyl tert butyl ether	AVRG	1.144	10.6

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Calibration Date: 11/16/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.475	1.5
d8-Toluene	AVRG	1.119	1.6
4-Bromofluorobenzene	AVRG	0.496	1.7
d4-1,2-Dichlorobenzene	AVRG	0.788	1.0
Dibromofluoromethane	AVRG	0.462	1.3

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Cont. Calib. Date: 11/23/12

Init. Calib. Date: 11/16/12 Cont. Calib. Time: 1344

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	0.558	0.5666	0.100	AVRG	1.5	
Vinyl Chloride	0.494	0.5524	0.010	AVRG	11.8	
Bromomethane	0.260	0.2906	0.010	AVRG	11.8	
Chloroethane	0.289	0.3254	0.010	AVRG	12.6	
Trichlorofluoromethane	0.633	0.7726	0.010	AVRG	22.0	<-
Acrolein	0.039	0.0342	0.010	AVRG	-12.3	
112Trichloro122Trifluoroetha	0.400	0.4390	0.010	AVRG	9.8	
Acetone	0.055	0.0642	0.010	AVRG	16.7	
1,1-Dichloroethene	0.413	0.4510	0.010	AVRG	9.2	
Bromoethane	0.335	0.3697	0.010	AVRG	10.4	
Iodomethane	0.706	0.7487	0.010	AVRG	6.0	
Methylene Chloride	0.496	0.5119	0.010	AVRG	3.2	
Acrylonitrile	10.000	9.564	0.010	LINR	-4.4	
Carbon Disulfide	1.246	1.3394	0.010	AVRG	7.5	
Trans-1,2-Dichloroethene	0.506	0.5333	0.010	AVRG	5.4	
Vinyl Acetate	10.000	8.590	0.010	LINR	-14.1	
1,1-Dichloroethane	0.832	0.8929	0.100	AVRG	7.3	
2-Butanone	0.092	0.1000	0.010	AVRG	8.7	
2,2-Dichloropropane	0.516	0.6150	0.010	AVRG	19.2	
Cis-1,2-Dichloroethene	0.504	0.5342	0.010	AVRG	6.0	
Chloroform	0.819	0.9064	0.010	AVRG	10.7	
Bromochloromethane	0.214	0.2422	0.010	AVRG	13.2	
1,1,1-Trichloroethane	0.718	0.8423	0.010	AVRG	17.3	
1,1-Dichloropropene	0.423	0.4897	0.010	AVRG	15.8	
Carbon Tetrachloride	0.397	0.5167	0.010	AVRG	30.2	<-
1,2-Dichloroethane	0.340	0.4120	0.010	AVRG	21.2	<-
Benzene	1.224	1.3476	0.010	AVRG	10.1	
Trichloroethene	0.332	0.3703	0.010	AVRG	11.5	
1,2-Dichloropropane	0.263	0.2880	0.010	AVRG	9.5	
Bromodichloromethane	0.347	0.4259	0.010	AVRG	22.7	<-
Dibromomethane	0.131	0.1506	0.010	AVRG	15.0	
2-Chloroethyl Vinyl Ether	10.000	8.887	0.010	LINR	-11.1	
4-Methyl-2-Pentanone	0.059	0.0729	0.010	AVRG	23.6	<-
Cis 1,3-dichloropropene	0.380	0.4504	0.010	AVRG	18.5	
Toluene	0.706	0.8038	0.010	AVRG	13.8	
Trans 1,3-Dichloropropene	10.000	10.943	0.010	LINR	9.4	
2-Hexanone	0.107	0.1159	0.010	AVRG	8.3	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT2 Cont. Calib. Date: 11/23/12

Init. Calib. Date: 11/16/12 Cont. Calib. Time: 1344

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
1,1,2-Trichloroethane	0.177	0.2031	0.010	AVRG	14.7	
1,3-Dichloropropane	0.366	0.4112	0.010	AVRG	12.3	
Tetrachloroethene	0.370	0.4290	0.010	AVRG	15.9	
Chlorodibromomethane	10.000	10.005	0.010	LINR	0.0	
1,2-Dibromoethane	0.173	0.2120	0.010	AVRG	22.5	<-
Chlorobenzene	0.838	0.9350	0.300	AVRG	11.6	
Ethyl Benzene	0.468	0.5428	0.010	AVRG	16.0	
1,1,1,2-Tetrachloroethane	0.310	0.3860	0.010	AVRG	24.5	<-
m,p-xylene	0.568	0.6590	0.010	AVRG	16.0	
o-Xylene	0.564	0.6635	0.010	AVRG	17.6	
Styrene	0.876	1.0585	0.010	AVRG	20.8	<-
Bromoform	10.000	8.869	0.100	LINR	-11.3	
1,1,2,2-Tetrachloroethane	0.444	0.4635	0.300	AVRG	4.4	
1,2,3-Trichloropropane	0.153	0.1721	0.010	AVRG	12.5	
Trans-1,4-Dichloro 2-Butene	0.139	0.1307	0.010	AVRG	-6.0	
N-Propyl Benzene	2.995	3.3141	0.010	AVRG	10.6	
Bromobenzene	0.739	0.7783	0.010	AVRG	5.3	
Isopropyl Benzene	2.851	3.1765	0.010	AVRG	11.4	
2-Chloro Toluene	2.147	2.3522	0.010	AVRG	9.6	
4-Chloro Toluene	2.041	2.2202	0.010	AVRG	8.8	
T-Butyl Benzene	1.762	2.0534	0.010	AVRG	16.5	
1,3,5-Trimethyl Benzene	2.146	2.5270	0.010	AVRG	17.8	
1,2,4-Trimethylbenzene	2.128	2.4785	0.010	AVRG	16.5	
S-Butyl Benzene	2.438	2.8912	0.010	AVRG	18.6	
4-Isopropyl Toluene	1.923	2.3843	0.010	AVRG	24.0	<-
1,3-Dichlorobenzene	1.244	1.3897	0.010	AVRG	11.7	
1,4-Dichlorobenzene	1.259	1.3963	0.010	AVRG	10.9	
N-Butyl Benzene	1.595	1.9497	0.010	AVRG	22.2	<-
1,2-Dichlorobenzene	1.023	1.1504	0.010	AVRG	12.4	
1,2-Dibromo 3-Chloropropane	10.000	8.919	0.010	LINR	-10.8	
1,2,4-Trichlorobenzene	0.436	0.4876	0.010	AVRG	11.8	
Hexachloro 1,3-Butadiene	0.208	0.2684	0.010	AVRG	29.0	<-
Naphthalene	0.649	0.6540	0.010	AVRG	0.8	
1,2,3-Trichlorobenzene	0.255	0.2947	0.010	AVRG	15.6	
Dichlorodifluoromethane	0.463	0.5049	0.010	AVRG	9.0	
Methyl tert butyl ether	1.144	1.2774	0.010	AVRG	11.7	

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS61 | Project: LANDSBURG MINE

Instrument ID: NT2 | Cont. Calib. Date: 11/23/12

Init. Calib. Date: 11/16/12 | Cont. Calib. Time: 1344

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.475	0.5021	0.010	AVRG	5.7
d8-Toluene	1.119	1.1354	0.010	AVRG	1.5
4-Bromofluorobenzene	0.496	0.5135	0.010	AVRG	3.5
d4-1,2-Dichlorobenzene	0.788	0.8033	0.010	AVRG	1.9
Dibromofluoromethane	0.462	0.4644	0.010	AVRG	0.5

<- Exceeds QC limit of 20% D
* RF less than minimum RF

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS61 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 | Ical Date: 11/16/12

Instrument ID: NT2 | Project Run Date: 11/16/12

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	215240	5.41	307975	5.80	276465	7.88
	UPPER LIMIT	430480	5.91	615950	6.30	552930	8.38
	LOWER LIMIT	107620	4.91	153988	5.30	138232	7.38
	Sample ID						
01	ICV1116	237707	5.41	356472	5.80	310639	7.88
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS61 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 | Ical Date: 11/16/12

Instrument ID: NT2 | Project Run Date: 11/16/12

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	136856	9.58				
	UPPER LIMIT	273712	10.08				
	LOWER LIMIT	68428	9.08				
	Sample ID						
01	ICV1116	159421	9.58				
02							
03							
04							
05							
06							
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS61 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 | Ical Date: 11/16/12

Instrument ID: NT2 | Project Run Date: 11/23/12

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	215240	5.41	307975	5.80	276465	7.88
	UPPER LIMIT	430480	5.91	615950	6.30	552930	8.38
	LOWER LIMIT	107620	4.91	153988	5.30	138232	7.38
	Sample ID						
01	LCS1123	192435	5.41	281644	5.80	255482	7.88
02	LCS1123	184957	5.40	266897	5.80	241733	7.88
03	MB1123	180319	5.40	257693	5.80	236509	7.88
04	TRIP BLANKS	178297	5.40	255482	5.80	234437	7.88
05	TRIP BLANKS	184264	5.40	259658	5.80	238130	7.88
06	LMW-9-1112	170851	5.40	248215	5.80	224454	7.88
07	LMW-11-1112	167571	5.40	242610	5.80	218084	7.88
08	LMW-6-1112	175784	5.40	249510	5.80	226576	7.88
09	LMW-2-1112	164416	5.40	235436	5.80	217567	7.88
10	LMW-4-1112	171593	5.40	249056	5.80	223837	7.88
11	LMW-10-1112	158984	5.40	230280	5.80	213068	7.88
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS61 | Project: LANDSBURG MINE

Ical Midpoint ID: 0101116 | Ical Date: 11/16/12

Instrument ID: NT2 | Project Run Date: 11/23/12

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	136856	9.58				
	UPPER LIMIT	273712	10.08				
	LOWER LIMIT	68428	9.08				
	Sample ID						
01	LCS1123	158558	9.58				
02	LCS1123	146882	9.57				
03	MB1123	131709	9.57				
04	TRIP BLANKS	129126	9.57				
05	TRIP BLANKS	128139	9.57				
06	LMW-9-1112	127462	9.57				
07	LMW-11-1112	128161	9.57				
08	LMW-6-1112	127952	9.57				
09	LMW-2-1112	125090	9.57				
10	LMW-4-1112	124147	9.57				
11	LMW-10-1112	123672	9.57				
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

Semivolatile Analysis
Report and Summary QC Forms

ARI Job ID: VS80, VS81

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-2-1112
SAMPLE

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/19/12
Date Analyzed: 11/22/12 01:26
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: LMW-2-1112**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Date Analyzed: 11/22/12 01:26

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	27.2%	2-Fluorobiphenyl	51.6%
d14-p-Terphenyl	84.0%	d4-1,2-Dichlorobenzene	9.4%
d5-Phenol	41.9%	2-Fluorophenol	19.9%
2,4,6-Tribromophenol	80.3%	d4-2-Chlorophenol	27.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 2

Sample ID: LMW-2-1112
REEXTRACT

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/27/12
Date Analyzed: 11/29/12 18:14
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-2-1112
REEXTRACT

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Date Analyzed: 11/29/12 18:14

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.4%	2-Fluorobiphenyl	69.6%
d14-p-Terphenyl	87.6%	d4-1,2-Dichlorobenzene	62.4%
d5-Phenol	66.7%	2-Fluorophenol	60.0%
2,4,6-Tribromophenol	74.1%	d4-2-Chlorophenol	66.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-4-1112
SAMPLE

Lab Sample ID: VS80B
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 12/07/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/19/12
Date Analyzed: 11/22/12 02:01
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

VS80: 00068 *W 12/10/12

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: LMW-4-1112
SAMPLE

Lab Sample ID: VS80B
LIMS ID: 12-23024
Matrix: Water
Date Analyzed: 11/22/12 02:01

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.2%	2-Fluorobiphenyl	68.4%
d14-p-Terphenyl	82.0%	d4-1,2-Dichlorobenzene	67.6%
d5-Phenol	72.0%	2-Fluorophenol	65.1%
2,4,6-Tribromophenol	81.6%	d4-2-Chlorophenol	71.2%

VS80:00069 AV 12/10/12

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C
Page 1 of 2

Sample ID: LMW-10-1112
SAMPLE

Lab Sample ID: VS80C
LIMS ID: 12-23025
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/19/12
Date Analyzed: 11/22/12 02:35
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: LMW-10-1112**
Extraction Method: SW3520C **SAMPLE**

Lab Sample ID: VS80C
LIMS ID: 12-23025
Matrix: Water
Date Analyzed: 11/22/12 02:35

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	53.6%	2-Fluorobiphenyl	52.4%
d14-p-Terphenyl	79.2%	d4-1,2-Dichlorobenzene	50.0%
d5-Phenol	54.7%	2-Fluorophenol	49.3%
2,4,6-Tribromophenol	68.8%	d4-2-Chlorophenol	53.6%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
MB-112712	62.8%	62.8%	82.8%	56.8%	62.9%	56.5%	66.1%	63.2%	0
LCS-112712	58.4%	66.8%	95.2%	54.0%	60.8%	51.5%	88.8%	58.1%	0
LCSD-112712	65.2%	71.2%	87.6%	58.4%	68.3%	56.5%	85.9%	64.5%	0
LMW-2-1112	27.2%*	51.6%	84.0%	9.4%*	41.9%	19.9%*	80.3%	27.5%*	4
LMW-2-1112 RE	68.4%	69.6%	87.6%	62.4%	66.7%	60.0%	74.1%	66.1%	0
MB-111912	73.2%	66.4%	82.8%	63.6%	70.4%	64.0%	80.5%	72.5%	0
LCS-111912	77.2%	75.6%	86.4%	69.6%	83.7%	73.1%	97.3%	79.5%	0
LCSD-111912	73.2%	71.6%	83.6%	64.4%	76.8%	65.6%	97.6%	73.1%	0
LMW-4-1112	71.2%	68.4%	82.0%	67.6%	72.0%	65.1%	81.6%	71.2%	0
LMW-10-1112	53.6%	52.4%	79.2%	50.0%	54.7%	49.3%	68.8%	53.6%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(50-100)	(34-101)
(FBP) = 2-Fluorobiphenyl	(51-100)	(38-100)
(TPH) = d14-p-Terphenyl	(54-117)	(27-122)
(DCB) = d4-1,2-Dichlorobenzene	(40-100)	(27-100)
(PHL) = d5-Phenol	(15-121)	(16-106)
(2FP) = 2-Fluorophenol	(33-100)	(23-100)
(TBP) = 2,4,6-Tribromophenol	(46-125)	(31-128)
(2CP) = d4-2-Chlorophenol	(46-102)	(33-100)

Prep Method: SW3520C
Log Number Range: 12-23023 to 12-23025

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: LCS-111912
LCS/LCSD

Lab Sample ID: LCS-111912
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted LCS/LCSD: 11/19/12

Date Analyzed LCS: 11/21/12 22:36
LCSD: 11/21/12 23:10
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ
GPC Cleanup: NO

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	20.0	25.0	80.0%	19.4	25.0	77.6%	3.0%
Bis-(2-Chloroethyl) Ether	18.9	25.0	75.6%	17.5	25.0	70.0%	7.7%
2-Chlorophenol	19.4	25.0	77.6%	18.1	25.0	72.4%	6.9%
1,3-Dichlorobenzene	17.5	25.0	70.0%	16.6	25.0	66.4%	5.3%
1,4-Dichlorobenzene	18.1	25.0	72.4%	17.2	25.0	68.8%	5.1%
Benzyl Alcohol	15.7	25.0	62.8%	14.9	25.0	59.6%	5.2%
1,2-Dichlorobenzene	18.4	25.0	73.6%	17.4	25.0	69.6%	5.6%
2-Methylphenol	18.0	25.0	72.0%	17.8	25.0	71.2%	1.1%
2,2'-Oxybis(1-Chloropropane)	19.1	25.0	76.4%	18.1	25.0	72.4%	5.4%
4-Methylphenol	37.9	50.0	75.8%	36.4	50.0	72.8%	4.0%
N-Nitroso-Di-N-Propylamine	17.8	25.0	71.2%	16.9	25.0	67.6%	5.2%
Hexachloroethane	17.1	25.0	68.4%	16.5	25.0	66.0%	3.6%
Nitrobenzene	18.3	25.0	73.2%	17.8	25.0	71.2%	2.8%
Isophorone	20.5	25.0	82.0%	20.2	25.0	80.8%	1.5%
2-Nitrophenol	20.2	25.0	80.8%	18.9	25.0	75.6%	6.6%
2,4-Dimethylphenol	36.0	75.0	48.0%	42.4	75.0	56.5%	16.3%
Benzoic Acid	116	138	84.1%	118	138	85.5%	1.7%
bis(2-Chloroethoxy) Methane	17.6	25.0	70.4%	17.1	25.0	68.4%	2.9%
2,4-Dichlorophenol	58.7	75.0	78.3%	56.8	75.0	75.7%	3.3%
1,2,4-Trichlorobenzene	18.6	25.0	74.4%	17.7	25.0	70.8%	5.0%
Naphthalene	17.3	25.0	69.2%	16.6	25.0	66.4%	4.1%
4-Chloroaniline	72.4	75.0	96.5%	70.2	75.0	93.6%	3.1%
Hexachlorobutadiene	18.3	25.0	73.2%	17.5	25.0	70.0%	4.5%
4-Chloro-3-methylphenol	59.9	75.0	79.9%	60.2	75.0	80.3%	0.5%
2-Methylnaphthalene	16.2	25.0	64.8%	15.8	25.0	63.2%	2.5%
Hexachlorocyclopentadiene	30.1	75.0	40.1%	31.3	75.0	41.7%	3.9%
2,4,6-Trichlorophenol	59.4	75.0	79.2%	58.2	75.0	77.6%	2.0%
2,4,5-Trichlorophenol	60.7	75.0	80.9%	59.4	75.0	79.2%	2.2%
2-Chloronaphthalene	19.4	25.0	77.6%	18.8	25.0	75.2%	3.1%
2-Nitroaniline	48.8	75.0	65.1%	49.5	75.0	66.0%	1.4%
Dimethylphthalate	20.8	25.0	83.2%	20.5	25.0	82.0%	1.5%
Acenaphthylene	18.5	25.0	74.0%	17.9	25.0	71.6%	3.3%
3-Nitroaniline	50.9	75.0	67.9%	52.3	75.0	69.7%	2.7%
Acenaphthene	17.6	25.0	70.4%	17.2	25.0	68.8%	2.3%
2,4-Dinitrophenol	113	138	81.9%	117	138	84.8%	3.5%
4-Nitrophenol	67.0	75.0	89.3%	66.6	75.0	88.8%	0.6%
Dibenzofuran	17.4	25.0	69.6%	17.1	25.0	68.4%	1.7%
2,6-Dinitrotoluene	62.2	75.0	82.9%	61.6	75.0	82.1%	1.0%
2,4-Dinitrotoluene	61.9	75.0	82.5%	62.6	75.0	83.5%	1.1%
Diethylphthalate	20.4	25.0	81.6%	20.4	25.0	81.6%	0.0%
4-Chlorophenyl-phenylether	20.0	25.0	80.0%	20.1	25.0	80.4%	0.5%
Fluorene	18.9	25.0	75.6%	18.4	25.0	73.6%	2.7%
4-Nitroaniline	52.8	75.0	70.4%	52.9	75.0	70.5%	0.2%
4,6-Dinitro-2-Methylphenol	120	138	87.0%	122	138	88.4%	1.7%
N-Nitrosodiphenylamine	17.7	25.0	70.8%	17.9	25.0	71.6%	1.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: LCS-111912**
 LCS/LCSD

Lab Sample ID: LCS-111912 QC Report No: VS80-Golder Associates
LIMS ID: 12-23024 Project: Landsburg Mine
Matrix: Water 923-1000-002.R273
Date Analyzed LCS: 11/21/12 22:36
LCSD: 11/21/12 23:10

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
4-Bromophenyl-phenylether	19.5	25.0	78.0%	19.4	25.0	77.6%	0.5%
Hexachlorobenzene	20.2	25.0	80.8%	19.8	25.0	79.2%	2.0%
Pentachlorophenol	55.6 Q	75.0	74.1%	56.5 Q	75.0	75.3%	1.6%
Phenanthrene	19.4	25.0	77.6%	19.0	25.0	76.0%	2.1%
Carbazole	20.4	25.0	81.6%	19.9	25.0	79.6%	2.5%
Anthracene	18.2	25.0	72.8%	18.0	25.0	72.0%	1.1%
Di-n-Butylphthalate	21.8	25.0	87.2%	21.4	25.0	85.6%	1.9%
Fluoranthene	21.0	25.0	84.0%	20.9	25.0	83.6%	0.5%
Pyrene	17.6	25.0	70.4%	17.6	25.0	70.4%	0.0%
Butylbenzylphthalate	20.1	25.0	80.4%	19.9	25.0	79.6%	1.0%
3,3'-Dichlorobenzidine	44.7	75.0	59.6%	51.0	75.0	68.0%	13.2%
Benzo(a)anthracene	19.2	25.0	76.8%	19.5	25.0	78.0%	1.6%
bis(2-Ethylhexyl)phthalate	19.7	25.0	78.8%	19.8	25.0	79.2%	0.5%
Chrysene	18.7	25.0	74.8%	18.9	25.0	75.6%	1.1%
Di-n-Octyl phthalate	20.4	25.0	81.6%	20.1	25.0	80.4%	1.5%
Benzo(b)fluoranthene	19.0	25.0	76.0%	20.2	25.0	80.8%	6.1%
Benzo(k)fluoranthene	20.0	25.0	80.0%	18.7	25.0	74.8%	6.7%
Benzo(a)pyrene	17.5	25.0	70.0%	17.5	25.0	70.0%	0.0%
Indeno(1,2,3-cd)pyrene	17.5	25.0	70.0%	17.4	25.0	69.6%	0.6%
Dibenz(a,h)anthracene	18.0	25.0	72.0%	18.0	25.0	72.0%	0.0%
Benzo(g,h,i)perylene	18.0	25.0	72.0%	18.0	25.0	72.0%	0.0%
3-,4-Methylphenol	37.9	50.0	75.8%	36.4	50.0	72.8%	4.0%
1-Methylnaphthalene	22.2	25.0	88.8%	21.6	25.0	86.4%	2.7%
Total Benzofluoranthenes	38.3	50.0	76.6%	38.1	50.0	76.2%	0.5%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	77.2%	73.2%
2-Fluorobiphenyl	75.6%	71.6%
d14-p-Terphenyl	86.4%	83.6%
d4-1,2-Dichlorobenzene	69.6%	64.4%
d5-Phenol	83.7%	76.8%
2-Fluorophenol	73.1%	65.6%
2,4,6-Tribromophenol	97.3%	97.6%
d4-2-Chlorophenol	79.5%	73.1%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: LCS-112712
LCS/LCSD

Lab Sample ID: LCS-112712
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted LCS/LCSD: 11/27/12

Date Analyzed LCS: 11/29/12 17:06
LCSD: 11/29/12 17:40
Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ
GPC Cleanup: NO

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	14.6	25.0	58.4%	16.8	25.0	67.2%	14.0%
Bis-(2-Chloroethyl) Ether	14.2	25.0	56.8%	16.0	25.0	64.0%	11.9%
2-Chlorophenol	14.0	25.0	56.0%	15.9	25.0	63.6%	12.7%
1,3-Dichlorobenzene	13.0	25.0	52.0%	14.3	25.0	57.2%	9.5%
1,4-Dichlorobenzene	13.6	25.0	54.4%	15.0	25.0	60.0%	9.8%
Benzyl Alcohol	10.6	25.0	42.4%	12.4	25.0	49.6%	15.7%
1,2-Dichlorobenzene	13.6	25.0	54.4%	14.9	25.0	59.6%	9.1%
2-Methylphenol	13.4	25.0	53.6%	15.3	25.0	61.2%	13.2%
2,2'-Oxybis(1-Chloropropane)	14.0	25.0	56.0%	15.5	25.0	62.0%	10.2%
4-Methylphenol	28.4	50.0	56.8%	31.9	50.0	63.8%	11.6%
N-Nitroso-Di-N-Propylamine	13.6	25.0	54.4%	14.8	25.0	59.2%	8.5%
Hexachloroethane	13.4	25.0	53.6%	14.8	25.0	59.2%	9.9%
Nitrobenzene	14.3	25.0	57.2%	15.9	25.0	63.6%	10.6%
Isophorone	17.0	25.0	68.0%	18.1	25.0	72.4%	6.3%
2-Nitrophenol	15.0	25.0	60.0%	16.8	25.0	67.2%	11.3%
2,4-Dimethylphenol	36.5	75.0	48.7%	38.4	75.0	51.2%	5.1%
Benzoic Acid	89.5	138	64.9%	94.4	138	68.4%	5.3%
bis(2-Chloroethoxy) Methane	13.6	25.0	54.4%	15.2	25.0	60.8%	11.1%
2,4-Dichlorophenol	45.0	75.0	60.0%	50.5	75.0	67.3%	11.5%
1,2,4-Trichlorobenzene	13.8	25.0	55.2%	15.5	25.0	62.0%	11.6%
Naphthalene	13.2	25.0	52.8%	14.7	25.0	58.8%	10.8%
4-Chloroaniline	54.4	75.0	72.5%	63.3	75.0	84.4%	15.1%
Hexachlorobutadiene	13.6	25.0	54.4%	15.0	25.0	60.0%	9.8%
4-Chloro-3-methylphenol	51.7	75.0	68.9%	52.5	75.0	70.0%	1.5%
2-Methylnaphthalene	12.4	25.0	49.6%	13.8	25.0	55.2%	10.7%
Hexachlorocyclopentadiene	29.6	75.0	39.5%	33.4	75.0	44.5%	12.1%
2,4,6-Trichlorophenol	50.6	75.0	67.5%	54.1	75.0	72.1%	6.7%
2,4,5-Trichlorophenol	52.6	75.0	70.1%	53.8	75.0	71.7%	2.3%
2-Chloronaphthalene	16.0	25.0	64.0%	17.5	25.0	70.0%	9.0%
2-Nitroaniline	45.9	75.0	61.2%	45.7	75.0	60.9%	0.4%
Dimethylphthalate	19.3	25.0	77.2%	19.0	25.0	76.0%	1.6%
Acenaphthylene	16.2	25.0	64.8%	16.9	25.0	67.6%	4.2%
3-Nitroaniline	48.1	75.0	64.1%	46.4	75.0	61.9%	3.6%
Acenaphthene	15.3	25.0	61.2%	16.2	25.0	64.8%	5.7%
2,4-Dinitrophenol	107	138	77.5%	108	138	78.3%	0.9%
4-Nitrophenol	58.2	75.0	77.6%	58.6	75.0	78.1%	0.7%
Dibenzofuran	15.5	25.0	62.0%	16.0	25.0	64.0%	3.2%
2,6-Dinitrotoluene	55.5	75.0	74.0%	56.0	75.0	74.7%	0.9%
2,4-Dinitrotoluene	57.8	75.0	77.1%	55.7	75.0	74.3%	3.7%
Diethylphthalate	19.2	25.0	76.8%	18.6	25.0	74.4%	3.2%
4-Chlorophenyl-phenylether	18.0	25.0	72.0%	18.6	25.0	74.4%	3.3%
Fluorene	16.9	25.0	67.6%	17.2	25.0	68.8%	1.8%
4-Nitroaniline	42.8	75.0	57.1%	41.7	75.0	55.6%	2.6%
4,6-Dinitro-2-Methylphenol	122	138	88.4%	120	138	87.0%	1.7%
N-Nitrosodiphenylamine	18.5	25.0	74.0%	18.2	25.0	72.8%	1.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS

Sample ID: LCS-112712
LCS/LCSD

Lab Sample ID: LCS-112712
LIMS ID: 12-23023
Matrix: Water
Date Analyzed LCS: 11/29/12 17:06
LCSD: 11/29/12 17:40

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
4-Bromophenyl-phenylether	18.9	25.0	75.6%	19.2	25.0	76.8%	1.6%
Hexachlorobenzene	19.2	25.0	76.8%	19.6	25.0	78.4%	2.1%
Pentachlorophenol	47.6 Q	75.0	63.5%	48.5 Q	75.0	64.7%	1.9%
Phenanthrene	18.9	25.0	75.6%	18.5	25.0	74.0%	2.1%
Carbazole	19.6	25.0	78.4%	18.4	25.0	73.6%	6.3%
Anthracene	18.3	25.0	73.2%	17.7	25.0	70.8%	3.3%
Di-n-Butylphthalate	21.2	25.0	84.8%	20.2	25.0	80.8%	4.8%
Fluoranthene	19.5	25.0	78.0%	18.4	25.0	73.6%	5.8%
Pyrene	19.8	25.0	79.2%	18.8	25.0	75.2%	5.2%
Butylbenzylphthalate	21.6	25.0	86.4%	20.3	25.0	81.2%	6.2%
3,3'-Dichlorobenzidine	55.4	75.0	73.9%	50.7	75.0	67.6%	8.9%
Benzo(a)anthracene	18.9	25.0	75.6%	18.0	25.0	72.0%	4.9%
bis(2-Ethylhexyl)phthalate	20.6	25.0	82.4%	19.9	25.0	79.6%	3.5%
Chrysene	19.2	25.0	76.8%	18.0	25.0	72.0%	6.5%
Di-n-Octyl phthalate	20.5	25.0	82.0%	19.7	25.0	78.8%	4.0%
Benzo(b)fluoranthene	20.6	25.0	82.4%	20.4	25.0	81.6%	1.0%
Benzo(k)fluoranthene	19.6	25.0	78.4%	18.2	25.0	72.8%	7.4%
Benzo(a)pyrene	17.6	25.0	70.4%	17.0	25.0	68.0%	3.5%
Indeno(1,2,3-cd)pyrene	17.5	25.0	70.0%	17.4	25.0	69.6%	0.6%
Dibenz(a,h)anthracene	17.8	25.0	71.2%	17.9	25.0	71.6%	0.6%
Benzo(g,h,i)perylene	18.9	25.0	75.6%	19.1	25.0	76.4%	1.1%
3-,4-Methylphenol	28.4	50.0	56.8%	31.9	50.0	63.8%	11.6%
1-Methylnaphthalene	17.1	25.0	68.4%	18.8	25.0	75.2%	9.5%
Total Benzofluoranthenes	39.4 U	50.0	78.8%	37.8	50.0	75.6%	4.1%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	58.4%	65.2%
2-Fluorobiphenyl	66.8%	71.2%
d14-p-Terphenyl	95.2%	87.6%
d4-1,2-Dichlorobenzene	54.0%	58.4%
d5-Phenol	60.8%	68.3%
2-Fluorophenol	51.5%	56.5%
2,4,6-Tribromophenol	88.8%	85.9%
d4-2-Chlorophenol	58.1%	64.5%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

VS61MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS61

Project: Landsburg Mine

Lab File ID: 11211211

Date Extracted: 11/19/12

Instrument ID: NT6

Date Analyzed: 11/21/12

Matrix: LIQUID

Time Analyzed: 2202

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	VS61LCSW1	VS61LCSW1	11211212	11/21/12
02	VS61LCSDW1	VS61LCSDW1	11211213	11/21/12
03	LMW-9-1112	VS61A	11211214	11/21/12
04	LMW-11-1112	VS61B	11211215	11/22/12
05	LMW-6-1112	VS61C	11211216	11/22/12
06	LMW-2-1112	VS80A	11211217	11/22/12
07	LMW-4-1112	VS80B	11211218	11/22/12
08	LMW-10-1112	VS80C	11211219	11/22/12
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FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: MB-111912
METHOD BLANK

Lab Sample ID: MB-111912
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted: 11/19/12
Date Analyzed: 11/21/12 22:02
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Extraction Method: SW3520C

Sample ID: MB-111912
METHOD BLANK

Lab Sample ID: MB-111912
LIMS ID: 12-23024
Matrix: Water
Date Analyzed: 11/21/12 22:02

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.2%	2-Fluorobiphenyl	66.4%
d14-p-Terphenyl	82.8%	d4-1,2-Dichlorobenzene	63.6%
d5-Phenol	70.4%	2-Fluorophenol	64.0%
2,4,6-Tribromophenol	80.5%	d4-2-Chlorophenol	72.5%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

VS80MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: VS61

Project: LANDSBURG MINES

Lab File ID: 11291204

Date Extracted: 11/27/12

Instrument ID: NT6

Date Analyzed: 11/29/12

Matrix: LIQUID

Time Analyzed: 1508

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	VS80LCSW1	VS80LCSW1	11291205	11/29/12
02	VS80LCSDW1	VS80LCSDW1	11291206	11/29/12
03	LMW-2-1112	VS80ARE	11291207	11/29/12
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FORM IV SV

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: MB-112712**
Extraction Method: SW3520C **METHOD BLANK**

Lab Sample ID: MB-112712
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 12/03/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted: 11/27/12
Date Analyzed: 11/29/12 15:08
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	DL	LOQ	Result
108-95-2	Phenol	0.52	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	0.58	1.0	< 1.0 U
95-57-8	2-Chlorophenol	0.53	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	0.36	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	0.40	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	2.0	2.0	< 2.0 U
95-50-1	1,2-Dichlorobenzene	0.36	1.0	< 1.0 U
95-48-7	2-Methylphenol	0.53	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	0.62	1.0	< 1.0 U
106-44-5	4-Methylphenol	0.52	2.0	< 2.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	0.56	1.0	< 1.0 U
67-72-1	Hexachloroethane	0.35	2.0	< 2.0 U
98-95-3	Nitrobenzene	0.58	1.0	< 1.0 U
78-59-1	Isophorone	0.48	1.0	< 1.0 U
88-75-5	2-Nitrophenol	2.0	3.0	< 3.0 U
105-67-9	2,4-Dimethylphenol	0.36	3.0	< 3.0 U
65-85-0	Benzoic Acid	5.1	20	< 20 U
111-91-1	bis(2-Chloroethoxy) Methane	0.56	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	2.6	3.0	< 3.0 U
120-82-1	1,2,4-Trichlorobenzene	0.38	1.0	< 1.0 U
91-20-3	Naphthalene	0.52	1.0	< 1.0 U
106-47-8	4-Chloroaniline	2.6	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	0.31	3.0	< 3.0 U
59-50-7	4-Chloro-3-methylphenol	2.4	3.0	< 3.0 U
91-57-6	2-Methylnaphthalene	0.48	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	1.2	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	2.4	3.0	< 3.0 U
95-95-4	2,4,5-Trichlorophenol	2.2	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	0.48	1.0	< 1.0 U
88-74-4	2-Nitroaniline	2.6	3.0	< 3.0 U
131-11-3	Dimethylphthalate	0.53	1.0	< 1.0 U
208-96-8	Acenaphthylene	0.48	1.0	< 1.0 U
99-09-2	3-Nitroaniline	2.3	3.0	< 3.0 U
83-32-9	Acenaphthene	0.55	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	3.5	20	< 20 U
100-02-7	4-Nitrophenol	2.6	10	< 10 U
132-64-9	Dibenzofuran	0.48	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	2.4	3.0	< 3.0 U
121-14-2	2,4-Dinitrotoluene	2.5	3.0	< 3.0 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS **Sample ID: MB-112712**
Extraction Method: SW3520C **METHOD BLANK**

Lab Sample ID: MB-112712 QC Report No: VS80-Golder Associates
LIMS ID: 12-23023 Project: Landsburg Mines
Matrix: Water 923-1000-002.R273
Date Analyzed: 11/29/12 15:08

CAS Number	Analyte	DL	LOQ	Result
84-66-2	Diethylphthalate	0.58	1.0	< 1.0 U
7005-72-3	4-Chlorophenyl-phenylether	0.45	1.0	< 1.0 U
86-73-7	Fluorene	0.56	1.0	< 1.0 U
100-01-6	4-Nitroaniline	2.2	3.0	< 3.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	3.1	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	0.46	1.0	< 1.0 U
101-55-3	4-Bromophenyl-phenylether	0.42	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	0.47	1.0	< 1.0 U
87-86-5	Pentachlorophenol	2.4	10	< 10 U
85-01-8	Phenanthrene	0.56	1.0	< 1.0 U
86-74-8	Carbazole	0.31	1.0	< 1.0 U
120-12-7	Anthracene	0.53	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	0.54	1.0	< 1.0 U
206-44-0	Fluoranthene	0.52	1.0	< 1.0 U
129-00-0	Pyrene	0.55	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	0.56	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	1.5	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	0.52	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.9	3.0	< 3.0 U
218-01-9	Chrysene	0.55	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	0.51	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	0.48	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	0.45	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	0.48	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.48	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	0.48	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	0.55	1.0	< 1.0 U
108-39-4	3-,4-Methylphenol	0.80	2.0	< 2.0 U
90-12-0	1-Methylnaphthalene	0.48	1.0	< 1.0 U
TOTBFA	Total Benzofluoranthenes	0.48	5.0	< 5.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	62.8%	2-Fluorobiphenyl	62.8%
d14-p-Terphenyl	82.8%	d4-1,2-Dichlorobenzene	56.8%
d5-Phenol	62.9%	2-Fluorophenol	56.5%
2,4,6-Tribromophenol	66.1%	d4-2-Chlorophenol	63.2%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 10/19/12 DFTPP Injection Time: 1620

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	38.6
68	Less than 2.0% of mass 69	0.4 (1.0)1
69	Mass 69 relative abundance	39.3
70	Less than 2.0% of mass 69	0.3 (0.8)1
127	10.0 - 80.0% of mass 198	49.1
197	Less than 2.0% of mass 198	0.2
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.5
275	10.0 - 60.0% of mass 198	23.3
365	Greater than 1.0% of mass 198	2.98
441	0.0 - 24.0% of mass 442	11.2 (13.6)2
442	50.0 - 200.0% of mass 198	81.9
443	15.0 - 24.0% of mass 442	14.7 (17.9)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC251019	IC251019	10191201	10/19/12	1620
02	IC021019	IC021019	10191202	10/19/12	1654
03	IC11019	IC11019	10191203	10/19/12	1728
04	IC51019	IC51019	10191204	10/19/12	1803
05	IC101019	IC101019	10191205	10/19/12	1837
06	IC401019	IC401019	10191206	10/19/12	1912
07	IC601019	IC601019	10191207	10/19/12	1946
08	IC801019	IC801019	10191208	10/19/12	2020
09					
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FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 11/21/12 DFTPP Injection Time: 1620

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	42.9
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	42.3
70	Less than 2.0% of mass 69	0.4 (0.9)1
127	10.0 - 80.0% of mass 198	50.0
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 60.0% of mass 198	23.1
365	Greater than 1.0% of mass 198	3.02
441	0.0 - 24.0% of mass 442	12.0 (14.6)2
442	50.0 - 200.0% of mass 198	81.9
443	15.0 - 24.0% of mass 442	15.9 (19.4)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1121	CC1121	11211201	11/21/12	1620
02	VS61MBW1	VS61MBW1	11211211	11/21/12	2202
03	VS61LCSW1	VS61LCSW1	11211212	11/21/12	2236
04	VS61LCSDW1	VS61LCSDW1	11211213	11/21/12	2310
05	LMW-9-1112	VS61A	11211214	11/21/12	2344
06	LMW-11-1112	VS61B	11211215	11/22/12	0018
07	LMW-6-1112	VS61C	11211216	11/22/12	0052
08	LMW-2-1112	VS80A	11211217	11/22/12	0126
09	LMW-4-1112	VS80B	11211218	11/22/12	0201
10	LMW-10-1112	VS80C	11211219	11/22/12	0235
11					
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20					
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22					

FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

Instrument ID: NT6 Project: LANDSBURG MINE

DFTPP Injection Date: 11/29/12 DFTPP Injection Time: 1234

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	42.1
68	Less than 2.0% of mass 69	0.2 (0.5)1
69	Mass 69 relative abundance	41.6
70	Less than 2.0% of mass 69	0.4 (1.0)1
127	10.0 - 80.0% of mass 198	48.1
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.5
275	10.0 - 60.0% of mass 198	23.1
365	Greater than 1.0% of mass 198	3.03
441	0.0 - 24.0% of mass 442	10.9 (13.5)2
442	50.0 - 200.0% of mass 198	80.4
443	15.0 - 24.0% of mass 442	16.3 (20.3)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC1129	CC1129	11291201	11/29/12	1234
02	VS80MBW1	VS80MBW1	11291204	11/29/12	1508
03	VS80LCSW1	VS80LCSW1	11291205	11/29/12	1706
04	VS80LCSDW1	VS80LCSDW1	11291206	11/29/12	1740
05	LMW-2-1112	VS80ARE	11291207	11/29/12	1814
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FORM V SV

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
Phenol	2.003	1.950	1.786	1.643	1.616	1.499	1.620		1.731	10.9
Bis(2-Chloroethyl)ether	1.557	1.598	1.386	1.325	1.320	1.204	1.200		1.370	11.5
2-Chlorophenol	1.651	1.627	1.487	1.378	1.378	1.245	1.270		1.434	11.2
1,3-Dichlorobenzene	1.784	1.874	1.671	1.597	1.541	1.387	1.391		1.606	11.5
1,4-Dichlorobenzene	1.746	1.853	1.648	1.579	1.542	1.362	1.359		1.584	11.7
1,2-Dichlorobenzene	1.737	1.772	1.566	1.498	1.445	1.257	1.293		1.510	13.2
Benzyl alcohol	1.208	1.305	1.082	1.192	1.116	1.061	1.091		1.151	7.6
2,2'-oxybis(1-Chloropropane)	2.221	2.277	1.992	1.873	1.852	1.628	1.608		1.922	13.7
2-Methylphenol	1.463	1.529	1.364	1.252	1.271	1.150	1.127		1.308	11.6
Hexachloroethane	0.696	0.715	0.638	0.622	0.620	0.566	0.567		0.632	9.1
N-Nitroso-di-n-propylamine	1.041	1.143	0.987	0.932	0.937	0.877	0.870		0.970	10.0
4-Methylphenol	1.466	1.580	1.418	1.308	1.313	1.178	1.175		1.348	11.1
Nitrobenzene	0.480	0.483	0.430	0.407	0.385	0.352	0.350		0.412	13.3
Isophorone	0.704	0.743	0.651	0.628	0.600	0.571	0.568		0.638	10.4
2-Nitrophenol	0.199	0.220	0.208	0.204	0.205	0.200	0.200		0.205	3.6
2,4-Dimethylphenol	0.430	0.421	0.380	0.361	0.352	0.328	0.329		0.372	11.1
Bis(2-Chloroethoxy)methane	0.513	0.535	0.468	0.447	0.428	0.404	0.394		0.456	11.7
2,4-Dichlorophenol	0.325	0.348	0.319	0.311	0.301	0.282	0.280		0.309	7.9
1,2,4-Trichlorobenzene	0.394	0.404	0.355	0.355	0.334	0.318	0.312		0.353	10.1
Naphthalene	1.408	1.412	1.262	1.142	1.022	0.828			1.179	19.4
Benzoic acid	0.154	0.240	0.248	0.277	0.289	0.289	0.297		0.256	19.5
4-Chloroaniline	0.660	0.631	0.537	0.522	0.413	0.343	0.296		0.486	0.995
Hexachlorobutadiene	0.232	0.241	0.214	0.217	0.204	0.196	0.195		0.214	8.2
4-Chloro-3-methylphenol	0.300	0.336	0.308	0.302	0.298	0.280	0.284		0.301	6.1
2-Methylnaphthalene	0.834	0.793	0.675	0.705	0.626	0.551	0.531		0.674	17.0
Hexachlorocyclopentadiene	0.296	0.404	0.356	0.388	0.386	0.408	0.385		0.375	10.3
2,4,6-Trichlorophenol	0.392	0.402	0.390	0.380	0.376	0.371	0.376		0.384	2.9
2,4,5-Trichlorophenol	0.374	0.419	0.408	0.410	0.407	0.404	0.398		0.403	3.5
2-Chloronaphthalene	1.388	1.344	1.180	1.095	1.002	0.912	0.892		1.116	17.7
2-Nitroaniline	0.409	0.452	0.406	0.445	0.422	0.416	0.408		0.422	4.5
Acenaphthylene	2.373	2.436	2.158	1.956	1.785	1.511	1.474		1.956	19.9
Dimethylphthalate	1.329	1.412	1.260	1.208	1.154	1.070	1.098		1.219	10.2
2,6-Dinitrotoluene	0.264	0.306	0.287	0.290	0.285	0.276	0.281		0.284	4.6
Acenaphthene	1.540	1.510	1.340	1.240	1.166	1.028	1.032		1.265	16.5
3-Nitroaniline	0.387	0.422	0.371	0.364	0.282				0.365	14.2
2,4-Dinitrophenol		0.069	0.099	0.141	0.155	0.162	0.177		0.134	0.998
Dibenzofuran	2.388	2.202	1.897	1.949	1.703	1.501	1.455		1.871	18.6

<- Outside QC limits: %RSD <20% or R^2 > 0.990

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
4-Nitrophenol	0.143	0.142	0.144	0.159	0.160	0.149	0.146		0.149	5.1
2,4-Dinitrotoluene	0.304	0.394	0.379	0.382	0.373	0.356	0.372		0.366	8.0
Fluorene	1.645	1.614	1.484	1.376	1.283	1.109	1.105		1.374	16.1
4-Chlorophenyl-phenylether	0.748	0.736	0.670	0.642	0.611	0.564	0.564		0.648	11.6
Diethylphthalate	1.488	1.453	1.320	1.253	1.182	1.054	1.062		1.259	13.8
4-Nitroaniline	0.331	0.371	0.342	0.351	0.326	0.319	0.330		0.338	5.2
4,6-Dinitro-2-methylphenol		0.107	0.120	0.133	0.139	0.140	0.143		0.130	10.8
N-Nitrosodiphenylamine (1)	0.703	0.716	0.618	0.590	0.575	0.535	0.506		0.606	13.1
4-Bromophenyl-phenylether	0.270	0.271	0.249	0.236	0.233	0.228	0.219		0.244	8.3
Hexachlorobenzene	0.291	0.284	0.254	0.244	0.239	0.229	0.221		0.252	10.5
Pentachlorophenol	0.105	0.136	0.145	0.151	0.157	0.156	0.158		0.144	13.2
Phenanthrene	1.469	1.446	1.273	1.151	1.090	0.947	0.891		1.181	19.2
Anthracene	1.500	1.479	1.336	1.202	1.122	0.949	0.897		1.212	19.8
Carbazole	1.177	1.177	1.052	0.950	0.891	0.794	0.776		0.974	17.1
Di-n-butylphthalate	1.428	1.476	1.351	1.213	1.130	0.947	0.909		1.208	18.6
Fluoranthene	1.481	1.455	1.346	1.267	1.170	0.988	0.959		1.238	16.9
Pyrene	1.640	1.689	1.460	1.346	1.220	1.063			1.403	17.3
Butylbenzylphthalate	0.579	0.640	0.580	0.566	0.536	0.491	0.482		0.553	10.0
Benzo(a)anthracene	1.400	1.410	1.268	1.187	1.103	1.004	0.946		1.188	15.4
3,3'-Dichlorobenzidine	0.400	0.389	0.346	0.343	0.275	0.252			0.334	17.8
Chrysene	1.420	1.388	1.215	1.166	1.075	0.948	0.889		1.157	17.6
bis(2-Ethylhexyl)phthalate	0.690	0.726	0.645	0.624	0.607	0.566	0.557		0.631	9.8
Di-n-octylphthalate	1.246	1.220	1.104	1.046	0.987	0.893	0.847		1.049	14.5
Benzo(b)fluoranthene	1.232	1.448	1.278	1.180	1.140	1.004	1.006		1.184	13.2
Benzo(k)fluoranthene	1.504	1.434	1.307	1.290	1.107	0.964	0.861		1.210	19.8
Benzo(a)pyrene	1.254	1.306	1.178	1.129	1.040	0.934	0.894		1.105	14.1
Indeno(1,2,3-cd)pyrene	1.708	1.773	1.583	1.529	1.418	1.350	1.305		1.524	11.7
Dibenzo(a,h)anthracene	1.421	1.472	1.314	1.243	1.140	1.042	1.001		1.233	14.7
Benzo(g,h,i)perylene	1.508	1.538	1.377	1.329	1.249	1.197	1.146		1.335	11.2
N-Nitrosodimethylamine	0.937	1.013	0.886	0.857	0.878	0.885	0.862		0.902	6.1
Aniline	2.808	2.795	2.342	2.429	2.225	2.113	1.984		2.385	13.4
Benzidine		0.510	0.422	0.377	0.285	0.246	0.226		0.344	0.994
Pyridine	1.523	1.767	1.536	1.483	1.502	1.496	1.482		1.541	6.6
1-methylnaphthalene	0.566	0.547	0.471	0.504	0.463	0.436	0.424		0.487	11.1
Azobenzene (1,2-DP-Hydrazine	1.505	1.523	1.384	1.282	1.220	1.079	1.085		1.297	14.1
Total Benzofluoranthenes	1.397	1.376	1.228	1.173	1.059	0.926	0.883		1.149	17.7
2-Fluorophenol	1.559	1.408	1.252	1.278	1.263	1.227			1.331	9.6

(1) Cannot be seperated from Diphenylamine

<- Outside QC limits: %RSD <20% or R^2 > 0.990

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Calibration Date: 10/19/12

LAB FILE ID: RRF1 =10191203 RRF5 =10191204 RRF10 =10191205
RRF25 =10191201 RRF40 =10191206 RRF60 =10191207
RRF80 =10191208 RRF0.2=10191202

COMPOUND	RRF 1	RRF 5	RRF 10	RRF 25	RRF 40	RRF 60	RRF 80	RRF 0.2	___ RRF	%RSD /R^2
Phenol-d5	1.864	1.830	1.608	1.563	1.546	1.503			1.652	9.4
2-Chlorophenol-d4	1.543	1.489	1.329	1.306	1.288	1.246			1.367	8.8
1,2-Dichlorobenzene-d4	1.197	1.082	0.944	0.943	0.900	0.818			0.981	13.9
Nitrobenzene-d5	0.465	0.446	0.404	0.414	0.402	0.403			0.422	6.3
2-Fluorobiphenyl	1.615	1.429	1.299	1.270	1.209	1.143			1.328	12.8
2,4,6-Tribromophenol	0.163	0.171	0.165	0.173	0.176	0.175			0.170	3.1
Terphenyl-d14	0.875	0.808	0.703	0.705	0.672	0.653			0.736	11.8

<- Outside QC limits: %RSD <20% or R^2 > 0.990

FORM VI SV-3

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/21/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1620

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Phenol	1.731	1.765	0.800	AVRG	2.0
Bis(2-Chloroethyl)ether	1.370	1.273	0.700	AVRG	-7.1
2-Chlorophenol	1.434	1.453	0.800	AVRG	1.3
1,3-Dichlorobenzene	1.606	1.535	0.010	AVRG	-4.4
1,4-Dichlorobenzene	1.584	1.549	0.010	AVRG	-2.2
1,2-Dichlorobenzene	1.510	1.455	0.010	AVRG	-3.6
Benzyl alcohol	1.151	1.181	0.010	AVRG	2.6
2,2'-oxybis(1-Chloropropane)	1.922	1.948	0.010	AVRG	1.4
2-Methylphenol	1.308	1.331	0.700	AVRG	1.8
Hexachloroethane	0.632	0.594	0.300	AVRG	-6.0
N-Nitroso-di-n-propylamine	0.970	0.919	0.500	AVRG	-5.2
4-Methylphenol	1.348	1.420	0.600	AVRG	5.3
Nitrobenzene	0.412	0.404	0.200	AVRG	-1.9
Isophorone	0.638	0.588	0.400	AVRG	-7.8
2-Nitrophenol	0.205	0.216	0.100	AVRG	5.4
2,4-Dimethylphenol	0.372	0.371	0.200	AVRG	-0.3
Bis(2-Chloroethoxy)methane	0.456	0.422	0.300	AVRG	-7.4
2,4-Dichlorophenol	0.309	0.335	0.200	AVRG	8.4
1,2,4-Trichlorobenzene	0.353	0.350	0.010	AVRG	-0.8
Naphthalene	1.179	1.117	0.700	AVRG	-5.2
Benzoic acid	0.256	0.254	0.010	AVRG	-0.8
4-Chloroaniline	25.00	24.31	0.010	2ORDR	-2.8
Hexachlorobutadiene	0.214	0.218	0.010	AVRG	1.9
4-Chloro-3-methylphenol	0.301	0.316	0.200	AVRG	5.0
2-Methylnaphthalene	0.674	0.709	0.400	AVRG	5.2
Hexachlorocyclopentadiene	0.375	0.318	0.050	AVRG	-15.2
2,4,6-Trichlorophenol	0.384	0.415	0.200	AVRG	8.1
2,4,5-Trichlorophenol	0.403	0.429	0.200	AVRG	6.4
2-Chloronaphthalene	1.116	1.100	0.800	AVRG	-1.4
2-Nitroaniline	0.422	0.421	0.010	AVRG	-0.2
Acenaphthylene	1.956	1.890	0.900	AVRG	-3.4
Dimethylphthalate	1.219	1.122	0.010	AVRG	-8.0
2,6-Dinitrotoluene	0.284	0.273	0.200	AVRG	-3.9
Acenaphthene	1.265	1.183	0.900	AVRG	-6.5
3-Nitroaniline	0.365	0.323	0.010	AVRG	-11.5
2,4-Dinitrophenol	50.00	54.27	0.010	2ORDR	8.5
Dibenzofuran	1.871	1.930	0.800	AVRG	3.2

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/21/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1620

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
4-Nitrophenol	0.149	0.151	0.010	AVRG	1.3	
2,4-Dinitrotoluene	0.366	0.359	0.200	AVRG	-1.9	
Fluorene	1.374	1.307	0.900	AVRG	-4.9	
4-Chlorophenyl-phenylether	0.648	0.623	0.400	AVRG	-3.8	
Diethylphthalate	1.259	1.150	0.010	AVRG	-8.6	
4-Nitroaniline	0.338	0.325	0.010	AVRG	-3.8	
4,6-Dinitro-2-methylphenol	0.130	0.142	0.010	AVRG	9.2	
N-Nitrosodiphenylamine(1)	0.606	0.542	0.010	AVRG	-10.6	
4-Bromophenyl-phenylether	0.244	0.219	0.100	AVRG	-10.2	
Hexachlorobenzene	0.252	0.238	0.100	AVRG	-5.6	
Pentachlorophenol	0.144	0.110	0.050	AVRG	-23.6	<-
Phenanthrene	1.181	1.127	0.700	AVRG	-4.6	
Anthracene	1.212	1.158	0.700	AVRG	-4.4	
Carbazole	0.974	0.888	0.010	AVRG	-8.8	
Di-n-butylphthalate	1.208	1.196	0.010	AVRG	-1.0	
Fluoranthene	1.238	1.296	0.600	AVRG	4.7	
Pyrene	1.403	1.233	0.600	AVRG	-12.1	
Butylbenzylphthalate	0.553	0.514	0.010	AVRG	-7.0	
Benzo(a)anthracene	1.188	1.153	0.800	AVRG	-2.9	
3,3'-Dichlorobenzidine	0.334	0.358	0.010	AVRG	7.2	
Chrysene	1.157	1.097	0.700	AVRG	-5.2	
bis(2-Ethylhexyl)phthalate	0.631	0.560	0.010	AVRG	-11.2	
Di-n-octylphthalate	1.049	0.974	0.010	AVRG	-7.1	
Benzo(b)fluoranthene	1.184	1.218	0.700	AVRG	2.9	
Benzo(k)fluoranthene	1.210	1.128	0.700	AVRG	-6.8	
Benzo(a)pyrene	1.105	1.056	0.700	AVRG	-4.4	
Indeno(1,2,3-cd)pyrene	1.524	1.383	0.500	AVRG	-9.2	
Dibenzo(a,h)anthracene	1.233	1.122	0.400	AVRG	-9.0	
Benzo(g,h,i)perylene	1.335	1.216	0.500	AVRG	-8.9	
N-Nitrosodimethylamine	0.902	0.769	0.010	AVRG	-14.7	
Aniline	2.385	2.207	0.010	AVRG	-7.5	
Benzidine	25.00	0.000	0.010	2ORDR		
Pyridine	1.541	1.339	0.010	AVRG	-13.1	
1-methylnaphthalene	0.487	0.492	0.010	AVRG	1.0	
Azobenzene (1,2-DP-Hydrazine	1.297	1.307	0.010	AVRG	0.8	
Total Benzofluoranthenes	1.149	1.101	0.010	AVRG	-4.2	

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-2

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/21/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1620

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
2-Fluorophenol	1.331	1.223	0.010	AVRG	-8.1
Phenol-d5	1.652	1.604	0.010	AVRG	-2.9
2-Chlorophenol-d4	1.367	1.344	0.010	AVRG	-1.7
1,2-Dichlorobenzene-d4	0.981	0.995	0.010	AVRG	1.4
Nitrobenzene-d5	0.422	0.403	0.010	AVRG	-4.5
2-Fluorobiphenyl	1.328	1.318	0.010	AVRG	-0.8
2,4,6-Tribromophenol	0.170	0.186	0.010	AVRG	9.4
Terphenyl-d14	0.736	0.694	0.010	AVRG	-5.7

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-3

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/29/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1234

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Phenol	1.731	1.716	0.800	AVRG	-0.9
Bis(2-Chloroethyl)ether	1.370	1.288	0.700	AVRG	-6.0
2-Chlorophenol	1.434	1.427	0.800	AVRG	-0.5
1,3-Dichlorobenzene	1.606	1.554	0.010	AVRG	-3.2
1,4-Dichlorobenzene	1.584	1.538	0.010	AVRG	-2.9
1,2-Dichlorobenzene	1.510	1.462	0.010	AVRG	-3.2
Benzyl alcohol	1.151	1.036	0.010	AVRG	-10.0
2,2'-oxybis(1-Chloropropane)	1.922	1.843	0.010	AVRG	-4.1
2-Methylphenol	1.308	1.286	0.700	AVRG	-1.7
Hexachloroethane	0.632	0.592	0.300	AVRG	-6.3
N-Nitroso-di-n-propylamine	0.970	0.864	0.500	AVRG	-10.9
4-Methylphenol	1.348	1.341	0.600	AVRG	-0.5
Nitrobenzene	0.412	0.397	0.200	AVRG	-3.6
Isophorone	0.638	0.566	0.400	AVRG	-11.3
2-Nitrophenol	0.205	0.217	0.100	AVRG	5.8
2,4-Dimethylphenol	0.372	0.370	0.200	AVRG	-0.5
Bis(2-Chloroethoxy)methane	0.456	0.410	0.300	AVRG	-10.1
2,4-Dichlorophenol	0.309	0.329	0.200	AVRG	6.5
1,2,4-Trichlorobenzene	0.353	0.352	0.010	AVRG	-0.3
Naphthalene	1.179	1.119	0.700	AVRG	-5.1
Benzoic acid	0.256	0.222	0.010	AVRG	-13.3
4-Chloroaniline	25.00	26.05	0.010	2ORDR	4.2
Hexachlorobutadiene	0.214	0.224	0.010	AVRG	4.7
4-Chloro-3-methylphenol	0.301	0.297	0.200	AVRG	-1.3
2-Methylnaphthalene	0.674	0.693	0.400	AVRG	2.8
Hexachlorocyclopentadiene	0.375	0.359	0.050	AVRG	-4.3
2,4,6-Trichlorophenol	0.384	0.400	0.200	AVRG	4.2
2,4,5-Trichlorophenol	0.403	0.432	0.200	AVRG	7.2
2-Chloronaphthalene	1.116	1.101	0.800	AVRG	-1.3
2-Nitroaniline	0.422	0.410	0.010	AVRG	-2.8
Acenaphthylene	1.956	1.905	0.900	AVRG	-2.6
Dimethylphthalate	1.219	1.115	0.010	AVRG	-8.5
2,6-Dinitrotoluene	0.284	0.268	0.200	AVRG	-5.6
Acenaphthene	1.265	1.187	0.900	AVRG	-6.2
3-Nitroaniline	0.365	0.330	0.010	AVRG	-9.6
2,4-Dinitrophenol	50.00	45.52	0.010	2ORDR	-9.0
Dibenzofuran	1.871	1.935	0.800	AVRG	3.4

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/29/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1234

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
4-Nitrophenol	0.149	0.140	0.010	AVRG	-6.0	
2,4-Dinitrotoluene	0.366	0.332	0.200	AVRG	-9.3	
Fluorene	1.374	1.288	0.900	AVRG	-6.2	
4-Chlorophenyl-phenylether	0.648	0.614	0.400	AVRG	-5.2	
Diethylphthalate	1.259	1.118	0.010	AVRG	-11.2	
4-Nitroaniline	0.338	0.308	0.010	AVRG	-8.9	
4,6-Dinitro-2-methylphenol	0.130	0.133	0.010	AVRG	2.3	
N-Nitrosodiphenylamine(1)	0.606	0.570	0.010	AVRG	-5.9	
4-Bromophenyl-phenylether	0.244	0.235	0.100	AVRG	-3.7	
Hexachlorobenzene	0.252	0.242	0.100	AVRG	-4.0	
Pentachlorophenol	0.144	0.093	0.050	AVRG	-35.4	<-
Phenanthrene	1.181	1.135	0.700	AVRG	-3.9	
Anthracene	1.212	1.162	0.700	AVRG	-4.1	
Carbazole	0.974	0.847	0.010	AVRG	-13.0	
Di-n-butylphthalate	1.208	1.090	0.010	AVRG	-9.8	
Fluoranthene	1.238	1.170	0.600	AVRG	-5.5	
Pyrene	1.403	1.370	0.600	AVRG	-2.4	
Butylbenzylphthalate	0.553	0.530	0.010	AVRG	-4.2	
Benzo(a)anthracene	1.188	1.162	0.800	AVRG	-2.2	
3,3'-Dichlorobenzidine	0.334	0.368	0.010	AVRG	10.2	
Chrysene	1.157	1.121	0.700	AVRG	-3.1	
bis(2-Ethylhexyl)phthalate	0.631	0.565	0.010	AVRG	-10.4	
Di-n-octylphthalate	1.049	0.988	0.010	AVRG	-5.8	
Benzo(b)fluoranthene	1.184	1.156	0.700	AVRG	-2.4	
Benzo(k)fluoranthene	1.210	1.187	0.700	AVRG	-1.9	
Benzo(a)pyrene	1.105	1.060	0.700	AVRG	-4.1	
Indeno(1,2,3-cd)pyrene	1.524	1.550	0.500	AVRG	1.7	
Dibenzo(a,h)anthracene	1.233	1.257	0.400	AVRG	1.9	
Benzo(g,h,i)perylene	1.335	1.397	0.500	AVRG	4.6	
N-Nitrosodimethylamine	0.902	0.776	0.010	AVRG	-14.0	
Aniline	2.385	2.120	0.010	AVRG	-11.1	
Benzidine	25.00	0.000	0.010	2ORDR		
Pyridine	1.541	1.359	0.010	AVRG	-11.8	
1-methylnaphthalene	0.487	0.475	0.010	AVRG	-2.5	
Azobenzene (1,2-DP-Hydrazine	1.297	1.265	0.010	AVRG	-2.5	
Total Benzofluoranthenes	1.149	1.103	0.010	AVRG	-4.0	

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Instrument ID: NT6 Cont. Calib. Date: 11/29/12

Init. Calib. Date: 10/19/12 Cont. Calib. Time: 1234

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
2-Fluorophenol	1.331	1.239	0.010	AVRG	-6.9
Phenol-d5	1.652	1.568	0.010	AVRG	-5.1
2-Chlorophenol-d4	1.367	1.325	0.010	AVRG	-3.1
1,2-Dichlorobenzene-d4	0.981	0.988	0.010	AVRG	0.7
Nitrobenzene-d5	0.422	0.398	0.010	AVRG	-5.7
2-Fluorobiphenyl	1.328	1.326	0.010	AVRG	-0.2
2,4,6-Tribromophenol	0.170	0.176	0.010	AVRG	3.5
Terphenyl-d14	0.736	0.735	0.010	AVRG	-0.1

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-3

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: VS61 | Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 | Ical Date: 10/19/12

Instrument ID: NT6 | Cont. Cal Date: 11/21/12

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	ICAL MIDPT	735905	8.15	2597762	10.21	1503943	13.09
	UPPER LIMIT	1471810		5195524		3007886	
	LOWER LIMIT	367952		1298881		751972	
	CCAL	577182	7.46	2079664	9.52	1236467	12.37
	UPPER LIMIT		7.96		10.02		12.87
	LOWER LIMIT		6.96		9.02		11.87
01	VS61MBW1	469338	7.46	1696291	9.52	984534	12.37
02	VS61LCSW1	463644	7.46	1678804	9.52	998650	12.37
03	VS61LCSDW1	518209	7.46	1838837	9.52	1112179	12.37
04	LMW-9-1112	457074	7.45	1630916	9.52	968303	12.37
05	LMW-11-1112	475492	7.46	1695926	9.52	987956	12.37
06	LMW-6-1112	473371	7.46	1676502	9.51	972339	12.37
07	LMW-2-1112	447582	7.46	1581630	9.51	952600	12.37
08	LMW-4-1112	445748	7.46	1593560	9.51	948694	12.37
09	LMW-10-1112	478904	7.46	1735060	9.51	1010371	12.37
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IS1 = 1,4-Dichlorobenzene-d4
IS2 = Naphthalene-d8
IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/21/12

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	ICAL MIDPT	2402003	15.48	2331938	19.80	2485610	21.97
	UPPER LIMIT	4804006		4663876		4971220	
	LOWER LIMIT	1201002		1165969		1242805	
	CCAL	2026457	14.74	2201280	19.03	2314156	21.17
	UPPER LIMIT		15.24		19.53		21.67
	LOWER LIMIT		14.24		18.53		20.67
01	VS61MBW1	1607718	14.73	1707331	19.02	1811474	21.16
02	VS61LCSW1	1646733	14.73	1770246	19.02	1862808	21.17
03	VS61LCSDW1	1847673	14.74	1969567	19.02	2072263	21.17
04	LMW-9-1112	1606325	14.73	1662095	19.02	1751041	21.16
05	LMW-11-1112	1604244	14.73	1669599	19.02	1795017	21.16
06	LMW-6-1112	1573913	14.73	1607280	19.02	1729535	21.16
07	LMW-2-1112	1529083	14.73	1606337	19.02	1672861	21.16
08	LMW-4-1112	1551523	14.73	1605833	19.02	1658681	21.16
09	LMW-10-1112	1619568	14.73	1697238	19.02	1790239	21.16
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IS4 = Phenanthrene-d10
IS5 = Chrysene-d12
IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/21/12

		IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	2790605	20.94				
	UPPER LIMIT	5581210					
	LOWER LIMIT	1395302					
	CCAL	2754965	20.23				
	UPPER LIMIT		20.73				
	LOWER LIMIT		19.73				
01	VS61MBW1	2164594	20.22				
02	VS61LCSW1	2161582	20.23				
03	VS61LCSDW1	2406296	20.22				
04	LMW-9-1112	2114360	20.22				
05	LMW-11-1112	2164145	20.22				
06	LMW-6-1112	2050039	20.22				
07	LMW-2-1112	2052564	20.22				
08	LMW-4-1112	2101189	20.22				
09	LMW-10-1112	2174421	20.22				
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IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-3

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/29/12

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	ICAL MIDPT	735905	8.15	2597762	10.21	1503943	13.09
	UPPER LIMIT	1471810		5195524		3007886	
	LOWER LIMIT	367952		1298881		751972	
	CCAL	529757	7.31	1833463	9.37	1046247	12.23
	UPPER LIMIT		7.81		9.87		12.73
	LOWER LIMIT		6.81		8.87		11.73
01	VS80MBW1	731692	7.31	2514452	9.37	1343253	12.22
02	VS80LCSW1	533256	7.31	1835773	9.37	1029757	12.22
03	VS80LCSDW1	643809	7.31	2215168	9.37	1241062	12.22
04	LMW-2-1112	653977	7.31	2217993	9.37	1238161	12.22
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IS1 = 1,4-Dichlorobenzene-d4
IS2 = Naphthalene-d8
IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/29/12

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	ICAL MIDPT	2402003	15.48	2331938	19.80	2485610	21.97
	UPPER LIMIT	4804006		4663876		4971220	
	LOWER LIMIT	1201002		1165969		1242805	
	CCAL	1580017	14.58	1398498	18.87	1495239	21.00
	UPPER LIMIT		15.08		19.37		21.50
	LOWER LIMIT		14.08		18.37		20.50
01	VS80MBW1	2012667	14.58	1655074	18.86	1498843	21.00
02	VS80LCSW1	1568807	14.58	1368897	18.86	1262734	20.99
03	VS80LCSDW1	1868909	14.58	1641537	18.86	1492083	21.00
04	LMW-2-1112	1938794	14.58	1672817	18.85	1581013	21.00
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IS4 = Phenanthrene-d10
IS5 = Chrysene-d12
IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: VS61 Project: LANDSBURG MINE

Ical Midpoint ID: 10191201 Ical Date: 10/19/12

Instrument ID: NT6 Cont. Cal Date: 11/29/12

		IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	2790605	20.94				
	UPPER LIMIT	5581210					
	LOWER LIMIT	1395302					
	CCAL	1782229	20.09				
	UPPER LIMIT		20.59				
	LOWER LIMIT		19.59				
01	VS80MBW1	2216528	20.08				
02	VS80LCSW1	1733314	20.08				
03	VS80LCSDW1	2031453	20.08				
04	LMW-2-1112	2116193	20.08				
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IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-3

Pesticide Analysis
Report and Summary QC Forms

ARI Job ID: VS80, VS81

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-2-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/20/12
Date Analyzed: 11/21/12 18:36
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	80.8%
Tetrachlorometaxylene	67.0%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-4-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS80B
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/20/12
Date Analyzed: 11/21/12 18:53
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	77.0%
Tetrachlorometaxylene	64.5%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LMW-10-1112**
Extraction Method: SW3510C **SAMPLE**

Lab Sample ID: VS80C
LIMS ID: 12-23025
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/20/12
Date Analyzed: 11/21/12 19:11
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	73.0%
Tetrachlorometaxylene	69.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

SW8081/PESTICIDE WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

Client ID	DCBP	TCMX	TOT OUT
MB-112012	66.8%	57.2%	0
LCS-112012	64.5%	65.5%	0
LCSD-112012	64.5%	64.2%	0
LMW-2-1112	80.8%	67.0%	0
LMW-4-1112	77.0%	64.5%	0
LMW-10-1112	73.0%	69.8%	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(37-125)	(11-144)
(TCMX) = Tetrachlorometaxylene	(38-103)	(30-105)

Prep Method: SW3510C
Log Number Range: 12-23023 to 12-23025

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: LCS-112012**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-112012
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted LCS/LCSD: 11/20/12

Sample Amount LCS: 500 mL
LCSD: 500 mL
Date Analyzed LCS: 11/21/12 17:24
LCSD: 11/21/12 17:42
Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL
Instrument/Analyst LCS: ECD6/YZ
LCSD: ECD6/YZ
Dilution Factor LCS: 1.00
LCSD: 1.00
GPC Cleanup: No
Florisil Cleanup: No
Sulfur Cleanup: No
Silica Gel: No

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
alpha-BHC	0.170	0.200	85.0%	0.175	0.200	87.5%	2.9%
beta-BHC	0.172	0.200	86.0%	0.183	0.200	91.5%	6.2%
delta-BHC	0.0813	0.200	40.6%	0.0834	0.200	41.7%	2.6%
gamma-BHC (Lindane)	0.175	0.200	87.5%	0.179	0.200	89.5%	2.3%
Heptachlor	0.161	0.200	80.5%	0.166	0.200	83.0%	3.1%
Aldrin	0.143	0.200	71.5%	0.148	0.200	74.0%	3.4%
Heptachlor Epoxide	0.180	0.200	90.0%	0.183	0.200	91.5%	1.7%
Endosulfan I	0.188	0.200	94.0%	0.191	0.200	95.5%	1.6%
Dieldrin	0.375	0.400	93.8%	0.383	0.400	95.8%	2.1%
4,4'-DDE	0.368	0.400	92.0%	0.374	0.400	93.5%	1.6%
Endrin	0.418	0.400	104%	0.421	0.400	105%	0.7%
Endosulfan II	0.415	0.400	104%	0.420	0.400	105%	1.2%
4,4'-DDD	0.419	0.400	105%	0.423	0.400	106%	1.0%
Endosulfan Sulfate	0.327	0.400	81.8%	0.329	0.400	82.2%	0.6%
4,4'-DDT	0.441	0.400	110%	0.445	0.400	111%	0.9%
Methoxychlor	2.03	2.00	102%	2.05	2.00	102%	1.0%
Endrin Ketone	0.462	0.400	116%	0.469	0.400	117%	1.5%
Endrin Aldehyde	0.411	0.400	103%	0.410	0.400	102%	0.2%
trans-Chlordane	0.176	0.200	88.0%	0.180	0.200	90.0%	2.2%
cis-Chlordane	0.174	0.200	87.0%	0.178	0.200	89.0%	2.3%

Pest/PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	64.5%	64.5%
Tetrachlorometaxylene	65.5%	64.2%

Results reported in µg/L (ppb)
RPD calculated using sample concentrations per SW846.

FORM 4
PESTICIDE METHOD BLANK SUMMARY

BLANK NO.

VS97MBW1

Lab Name: ANALYTICAL RESOURCES INC
Client: INTEGRAL

ARI Job No.: VS80
Project: T117 IMPORT MATERIAL

Lab Sample ID: VS97MBW1
Lab File ID: 1121A011

Date Extracted: 11/20/12
Matrix: LIQUID

Date Analyzed: 11/21/12
Instrument ID: ECD6

Time Analyzed: 1707
GC Columns: STX-CLP1/STX-CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS97LCSW1	VS97LCSW1	11/21/12
02	VS97LCSDW1	VS97LCSDW1	11/21/12
03	LMW-2-1112	VS80A	11/21/12
04	LMW-4-1112	VS80B	11/21/12
05	LMW-10-1112	VS80C	11/21/12

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Pesticides/PCB by GC/ECD Method SW8081B **Sample ID: MB-112012**
Extraction Method: SW3510C **METHOD BLANK**

Lab Sample ID: MB-112012
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted: 11/20/12
Date Analyzed: 11/21/12 17:07
Instrument/Analyst: ECD6/YZ
GPC Cleanup: No
Sulfur Cleanup: No
Florisil Cleanup: No

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No

CAS Number	Analyte	MDL	RL	Result
319-84-6	alpha-BHC	0.0085	0.050	< 0.050 U
319-85-7	beta-BHC	0.0098	0.050	< 0.050 U
319-86-8	delta-BHC	0.0087	0.050	< 0.050 U
58-89-9	gamma-BHC (Lindane)	0.016	0.050	< 0.050 U
76-44-8	Heptachlor	0.011	0.050	< 0.050 U
309-00-2	Aldrin	0.010	0.050	< 0.050 U
1024-57-3	Heptachlor Epoxide	0.0079	0.050	< 0.050 U
959-98-8	Endosulfan I	0.0089	0.050	< 0.050 U
60-57-1	Dieldrin	0.017	0.10	< 0.10 U
72-55-9	4,4'-DDE	0.018	0.10	< 0.10 U
72-20-8	Endrin	0.017	0.10	< 0.10 U
33213-65-9	Endosulfan II	0.014	0.10	< 0.10 U
72-54-8	4,4'-DDD	0.019	0.10	< 0.10 U
1031-07-8	Endosulfan Sulfate	0.024	0.10	< 0.10 U
50-29-3	4,4'-DDT	0.017	0.10	< 0.10 U
72-43-5	Methoxychlor	0.074	0.50	< 0.50 U
53494-70-5	Endrin Ketone	0.015	0.10	< 0.10 U
7421-93-4	Endrin Aldehyde	0.016	0.10	< 0.10 U
5103-74-2	trans-Chlordane	0.0082	0.050	< 0.050 U
5103-71-9	cis-Chlordane	0.0082	0.050	< 0.050 U
8001-35-2	Toxaphene	0.22	5.0	< 5.0 U

Reported in µg/L (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	66.8%
Tetrachlorometaxylene	57.2%

6D
8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	RT OF STANDARDS							MEAN	RT WINDOW	
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT	FROM	TO
alpha-BHC	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.10	4.20
beta-BHC	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.45	4.55
delta-BHC	4.66	4.66	4.66	4.66	4.66	4.66	4.66	4.66	4.61	4.71
gamma-BHC (Lindane)	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.42	4.37	4.47
Heptachlor	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.81	4.91
Aldrin	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.15	5.10	5.20
Heptachlor epoxide b	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.72	5.67	5.77
Endosulfan I	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.05	6.15
Dieldrin	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.32	6.27	6.37
4,4'-DDE	6.03	6.03	6.03	6.03	6.03	6.03	6.03	6.03	5.98	6.08
Endrin	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.54	6.49	6.59
Endosulfan II	6.75	6.75	6.75	6.75	6.75	6.74	6.75	6.75	6.70	6.80
4,4'-DDD	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.53	6.63
Endosulfan sulfate	7.51	7.51	7.51	7.51	7.51	7.51	7.51	7.51	7.46	7.56
4,4'-DDT	6.84	6.84	6.84	6.84	6.84	6.84	6.84	6.84	6.79	6.89
Methoxychlor	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.22	7.32
Endrin ketone	7.77	7.77	7.77	7.77	7.77	7.77	7.77	7.77	7.72	7.82
Endrin aldehyde	7.12	7.12	7.12	7.12	7.12	7.12	7.12	7.12	7.07	7.17
gamma-Chlordane	5.84	5.84	5.84	5.84	5.84	5.84	5.84	5.84	5.79	5.89
alpha-Chlordane	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.92	6.02
Hexachlorobutadiene	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.16	2.26
Hexachlorobenzene	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.95	4.05
Tetrachloro-m-xylene	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.62	3.72
Decachlorobiphenyl	8.61	8.61	8.61	8.61	8.61	8.61	8.61	8.61	8.56	8.66

6D

8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	RT OF STANDARDS							MEAN	RT WINDOW	
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT	FROM	TO
alpha-BHC	4.58	4.58	4.58	4.58	4.58	4.58	4.59	4.58	4.54	4.64
beta-BHC	5.01	5.01	5.01	5.01	5.01	5.01	5.01	5.01	4.96	5.06
delta-BHC	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.31	5.26	5.36
gamma-BHC (Lindane)	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.94	4.89	4.99
Heptachlor	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.35	5.45
Aldrin	5.73	5.73	5.73	5.73	5.74	5.74	5.74	5.73	5.69	5.79
Heptachlor epoxide b	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.24	6.34
Endosulfan I	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.68	6.63	6.73
Dieldrin	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.94	6.89	6.99
4,4'-DDE	6.74	6.74	6.74	6.74	6.74	6.74	6.75	6.74	6.70	6.80
Endrin	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.18	7.28
Endosulfan II	7.42	7.42	7.42	7.42	7.42	7.42	7.42	7.42	7.37	7.47
4,4'-DDD	7.28	7.28	7.28	7.28	7.28	7.28	7.28	7.28	7.23	7.33
Endosulfan sulfate	7.96	7.96	7.96	7.96	7.96	7.96	7.96	7.96	7.91	8.01
4,4'-DDT	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.57	7.52	7.62
Methoxychlor	8.16	8.16	8.16	8.16	8.16	8.16	8.16	8.16	8.11	8.21
Endrin ketone	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.40	8.50
Endrin aldehyde	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.66	7.76
gamma-Chlordane	6.47	6.47	6.47	6.47	6.47	6.47	6.48	6.47	6.43	6.53
alpha-Chlordane	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.56	6.66
Hexachlorobutadiene	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.38	2.33	2.43
Hexachlorobenzene	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.41	4.51
Tetrachloro-m-xylene	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01	3.96	4.06
Decachlorobiphenyl	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.57	9.52	9.62

6E
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	CALIBRATION FACTORS								R^2
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.4836	1.4616	1.4938	1.4882	1.4985	1.4906	1.5199	1.4909	1.2
beta-BHC	0.7515	0.6928	0.6569	0.6074	0.5837	0.5625	0.5568	0.6302	11.6
delta-BHC	1.2027	1.1705	1.1786	1.1878	1.2088	1.2162	1.2478	1.2018	2.2
gamma-BHC (Lindane)	1.4203	1.3736	1.3766	1.3565	1.3552	1.3431	1.3628	1.3697	1.8
Heptachlor	1.3710	1.2938	1.2653	1.2234	1.2040	1.1717	1.1640	1.2419	5.9
Aldrin	1.3883	1.3094	1.2895	1.2509	1.2369	1.2047	1.1979	1.2682	5.3
Heptachlor epoxide b	1.4111	1.3113	1.2616	1.1995	1.1708	1.1149	1.0884	1.2225	9.3
Endosulfan I	1.3006	1.2127	1.1670	1.1114	1.0773	1.0349	1.0155	1.1313	9.0
Dieldrin	1.2696	1.2204	1.2149	1.1719	1.1402	1.0940	1.0752	1.1694	6.1
4,4'-DDE	1.1509	1.1089	1.1091	1.0833	1.0630	1.0274	1.0156	1.0797	4.5
Endrin	1.1855	1.1373	1.1231	1.0879	1.0757	1.0200	1.0221	1.0931	5.6
Endosulfan II	1.1881	1.1269	1.0957	1.0423	1.0170	0.9634	0.9552	1.0555	8.2
4,4'-DDD	1.0319	0.9916	0.9750	0.9474	0.9355	0.8986	0.9012	0.9544	5.1
Endosulfan sulfate	0.9858	0.9374	0.9084	0.8788	0.8558	0.8264	0.8267	0.8885	6.7
4,4'-DDT	1.0119	0.9801	0.9720	0.9504	0.9467	0.9240	0.9327	0.9597	3.2
Methoxychlor	0.5578	0.5238	0.4924	0.4554	0.4308	0.4096	0.4145	0.4692	12.2
Endrin ketone	1.2244	1.1156	1.0606	1.0086	0.9677	0.9416	0.9544	1.0390	9.9
Endrin aldehyde	0.9849	0.9225	0.8807	0.8346	0.8072	0.7659	0.7630	0.8512	9.7
gamma-Chlordane	1.3792	1.2811	1.2367	1.1861	1.1606	1.1322	1.1335	1.2156	7.4
alpha-Chlordane	1.3429	1.2457	1.2000	1.1461	1.1150	1.0849	1.0777	1.1732	8.2
Hexachlorobutadiene	2.0812	1.9402	1.8804	1.7634	1.7036	1.6425	1.6366	1.8068	9.2
Hexachlorobenzene	1.5903	1.4533	1.3696	1.2635	1.1969	1.1324	1.1201	1.3037	13.5
Tetrachloro-m-xylene	1.3460	1.2798	1.2458	1.1734	1.1286	1.0704	1.0536	1.1854	9.3
Decachlorobiphenyl	1.3890	1.2243	1.1239	1.0205	0.9531	0.8948	0.8784	1.0691	17.6

6E
8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

	CALIBRATION FACTORS								R^2
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.7068	1.7328	1.8043	1.7772	1.7612	1.7241	1.7099	1.7452	2.1
beta-BHC	0.7886	0.7507	0.7499	0.7007	0.6746	0.6525	0.6274	0.7063	8.3
delta-BHC	1.3355	1.3664	1.4106	1.3838	1.4129	1.3944	1.3874	1.3844	1.9
gamma-BHC (Lindane)	1.6094	1.6044	1.6375	1.5988	1.5712	1.5315	1.4910	1.5777	3.2
Heptachlor	1.5856	1.5485	1.5510	1.4820	1.4155	1.3165	1.2123	1.4445	9.6
Aldrin	1.5160	1.4979	1.5123	1.4628	1.4083	1.3241	1.2212	1.4204	7.8
Heptachlor epoxide b	1.4476	1.4003	1.3792	1.3046	1.2384	1.1438	1.0491	1.2804	11.3
Endosulfan I	1.2698	1.2439	1.2336	1.1730	1.1176	1.0464	0.9643	1.1498	9.9
Dieldrin	1.3591	1.3384	1.3315	1.2542	1.1663	1.0710	0.9940	1.2164	11.8
4,4'-DDE	1.2998	1.2792	1.2771	1.2008	1.1147	1.0160	0.9308	1.1598	12.4
Endrin	1.5909	1.5373	1.4937	1.4092	1.3284	1.1857	1.1161	1.3802	13.0
Endosulfan II	1.5871	1.5228	1.4855	1.3975	1.3177	1.2030	1.1435	1.3796	12.1
4,4'-DDD	1.4343	1.4084	1.3921	1.3338	1.2712	1.1686	1.1160	1.3035	9.5
Endosulfan sulfate	1.2785	1.2434	1.2172	1.1779	1.1320	1.0535	1.0179	1.1600	8.4
4,4'-DDT	1.3464	1.3100	1.3003	1.2588	1.2128	1.1433	1.1114	1.2404	7.1
Methoxychlor	0.6592	0.6042	0.5527	0.4972	0.4495	0.4126	0.3783	0.5077	17.7
Endrin ketone	1.3456	1.2690	1.2127	1.1525	1.0924	1.0274	1.0120	1.1588	10.8
Endrin aldehyde	1.2587	1.1952	1.1528	1.0937	1.0369	0.9549	0.9102	1.0860	11.7
gamma-Chlordane	1.4955	1.4315	1.4100	1.3398	1.2967	1.2245	1.1522	1.3357	9.1
alpha-Chlordane	1.3740	1.3339	1.3210	1.2563	1.2048	1.1471	1.0808	1.2454	8.6
Hexachlorobutadiene	1.9645	1.8894	1.8576	1.7256	1.6592	1.5549	1.5070	1.7369	10.0
Hexachlorobenzene	1.7774	1.6637	1.6110	1.4932	1.4081	1.3179	1.2412	1.5018	12.9
Tetrachloro-m-xylene	1.6512	1.5834	1.5355	1.4058	1.2945	1.1692	1.0938	1.3905	15.3
Decachlorobiphenyl	1.5427	1.4016	1.2929	1.1902	1.1187	1.0455	1.0196	1.2302	15.7

FORM VI PEST-2

6G

8081 INITIAL CALIBRATION OF SINGLE POINT PCBs and TOXAPHENE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

Toxaphene			
Peak	RT	RT WIN	Cal Factor
1	6.490	6.44- 6.54	0.0183
2	6.843	6.79- 6.89	0.0244
3	7.212	7.16- 7.26	0.0197
4	7.466	7.42- 7.52	0.0242
5	7.745	7.69- 7.79	0.0207
6	7.874	7.82- 7.92	0.0142

6G

8081 INITIAL CALIBRATION OF SINGLE POINT PCBs and TOXAPHENE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 10/03/12

Toxaphene			
Peak	RT	RT WIN	Cal Factor
1	7.158	7.11- 7.21	0.0395
2	7.483	7.43- 7.53	0.0572
3	7.713	7.66- 7.76	0.0618
4	8.180	8.13- 8.23	0.0427
5	8.527	8.48- 8.58	0.0191

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: VS97

Analysis Date: 21-NOV-2012 15:38 Init. Calib. Date: 03-OCT-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.014	43605
Endrin	6.520	5551112
4,4'-DDD	6.570	354347
4,4'-DDT	6.826	4955719
Endrin ketone	7.746	466031
Endrin aldehyde	7.103	54975

DDT Percent Breakdown = 7.4 %
((43605+354347) * 100)/(43605+354347+4955719)

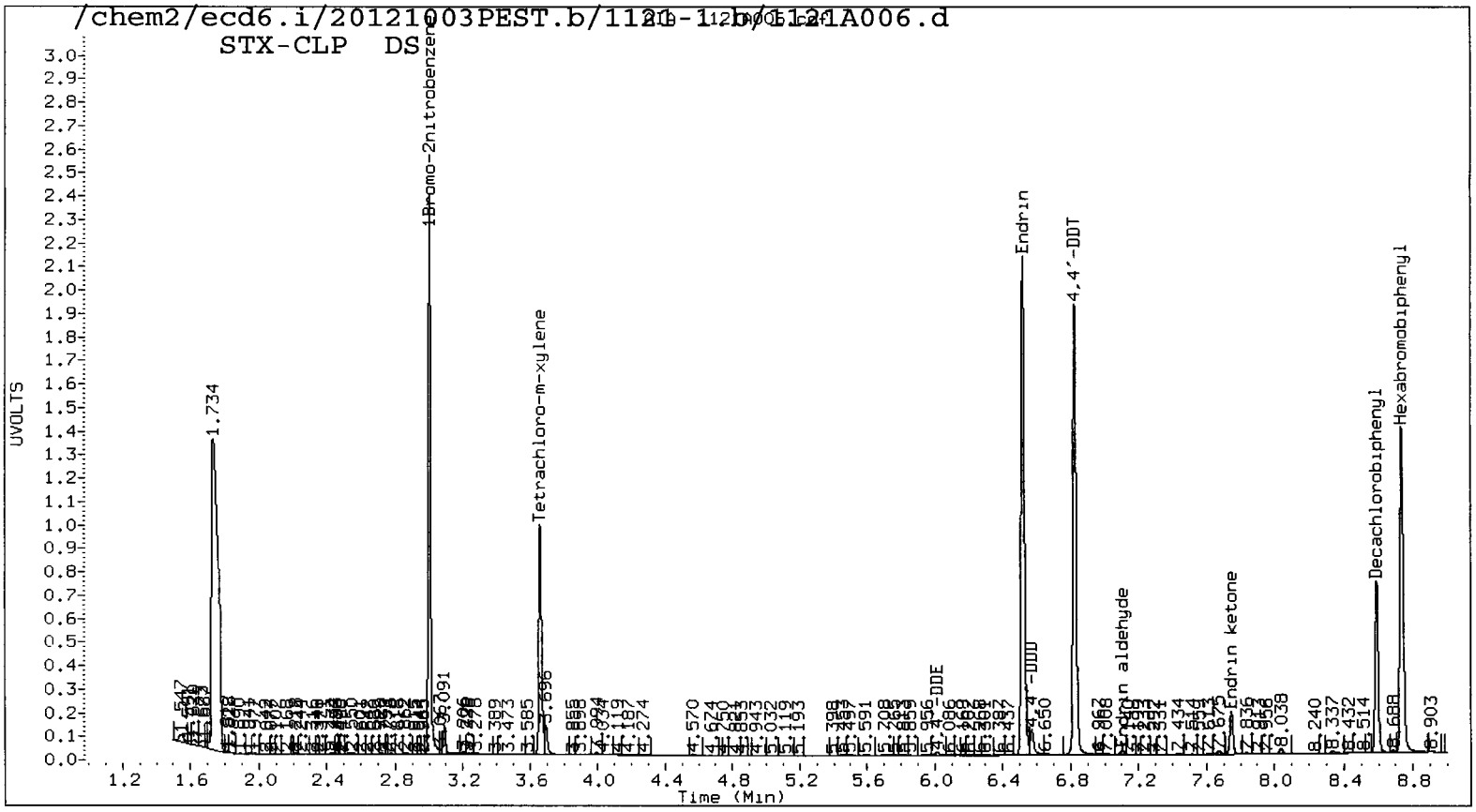
Endrin Percent Breakdown = 8.6 %
((54975+466031) * 100)/(54975+466031+5551112)

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.732	313957
Endrin	7.212	23936417
4,4'-DDD	7.271	1940582
4,4'-DDT	7.558	21484993
Endrin ketone	8.432	2012408
Endrin aldehyde	7.700	343390

DDT Percent Breakdown = 9.5 %
((313957+1940582) * 100)/(313957+1940582+21484993)

Endrin Percent Breakdown = 9.0 %
((343390+2012408) * 100)/(343390+2012408+23936417)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STX-CLP DS
UVOLTS
Time (Min)
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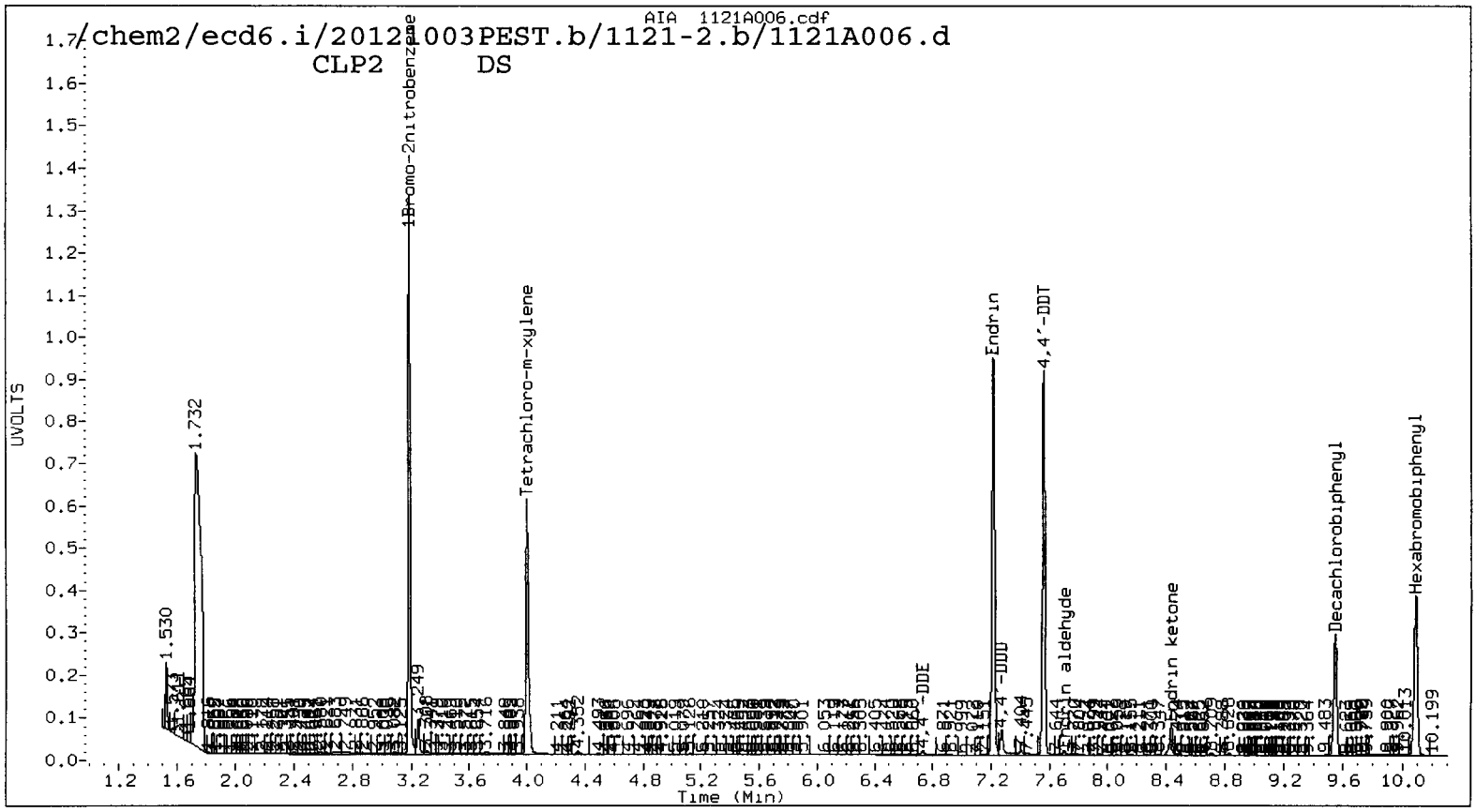
Tetrachloro-m-xylene
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl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CLP2 DS
UVOLTS
Time (Min)
1.530
1.732
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/21/12,1555

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D	
alpha-BHC	4.14	4.10	4.20	21.8	20.0	9.1	
beta-BHC	4.50	4.45	4.55	19.3	20.0	-3.4	
delta-BHC	4.66	4.61	4.71	22.7	20.0	13.6	
gamma-BHC (Lindane)	4.41	4.37	4.47	21.0	20.0	5.0	
Heptachlor	4.85	4.81	4.91	21.1	20.0	5.5	
Aldrin	5.13	5.10	5.20	20.3	20.0	1.7	
Heptachlor epoxide b	5.70	5.67	5.77	19.9	20.0	-0.5	
Endosulfan I	6.08	6.05	6.15	20.7	20.0	3.7	
Dieldrin	6.30	6.27	6.37	41.5	40.0	3.6	
4,4'-DDE	6.01	5.98	6.08	41.0	40.0	2.6	
Endrin	6.52	6.49	6.59	46.9	40.0	17.4	
Endosulfan II	6.73	6.70	6.80	45.3	40.0	13.3	
4,4'-DDD	6.57	6.53	6.63	49.7	40.0	24.1	<-
Endosulfan sulfate	7.49	7.46	7.56	46.6	40.0	16.4	
4,4'-DDT	6.83	6.79	6.89	45.8	40.0	14.5	
Methoxychlor	7.25	7.22	7.32	210.5	200.0	5.2	
Endrin ketone	7.75	7.72	7.82	51.1	40.0	27.8	<-
Endrin aldehyde	7.10	7.07	7.17	45.4	40.0	13.6	
gamma-Chlordane	5.83	5.79	5.89	20.1	20.0	0.4	
alpha-Chlordane	5.95	5.92	6.02	19.7	20.0	-1.5	
Hexachlorobutadiene	2.20	2.16	2.26	21.5	20.0	7.4	
Hexachlorobenzene	4.00	3.95	4.05	20.6	20.0	2.9	
Tetrachloro-m-xylene	3.66	3.62	3.72	37.5	40.0	-6.4	
Decachlorobiphenyl	8.59	8.56	8.66	40.9	40.0	2.2	

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/21/12,1555

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
alpha-BHC	4.57	4.54	4.64	20.7	20.0	3.7	
beta-BHC	5.00	4.96	5.06	19.2	20.0	-4.0	
delta-BHC	5.31	5.26	5.36	21.3	20.0	6.6	
gamma-BHC (Lindane)	4.92	4.89	4.99	19.8	20.0	-1.1	
Heptachlor	5.38	5.35	5.45	19.6	20.0	-1.8	
Aldrin	5.72	5.69	5.79	19.3	20.0	-3.5	
Heptachlor epoxide b	6.28	6.24	6.34	19.0	20.0	-4.9	
Endosulfan I	6.66	6.63	6.73	18.7	20.0	-6.7	
Dieldrin	6.92	6.89	6.99	36.6	40.0	-8.4	
4,4'-DDE	6.73	6.70	6.80	37.7	40.0	-5.7	
Endrin	7.21	7.18	7.28	51.3	40.0	28.3	<-
Endosulfan II	7.40	7.37	7.47	50.4	40.0	25.9	<-
4,4'-DDD	7.27	7.23	7.33	53.7	40.0	34.2	<-
Endosulfan sulfate	7.94	7.91	8.01	49.0	40.0	22.5	<-
4,4'-DDT	7.56	7.52	7.62	47.6	40.0	18.9	
Methoxychlor	8.14	8.11	8.21	211.4	200.0	5.7	
Endrin ketone	8.43	8.40	8.50	53.8	40.0	34.4	<-
Endrin aldehyde	7.70	7.66	7.76	49.8	40.0	24.5	<-
gamma-Chlordane	6.46	6.43	6.53	17.9	20.0	-10.3	
alpha-Chlordane	6.60	6.56	6.66	17.8	20.0	-10.9	
Hexachlorobutadiene	2.37	2.33	2.43	17.3	20.0	-13.3	
Hexachlorobenzene	4.45	4.41	4.51	24.9	20.0	24.3	<-
Tetrachloro-m-xylene	4.00	3.96	4.06	38.9	40.0	-2.8	
Decachlorobiphenyl	9.55	9.52	9.62	49.6	40.0	24.0	<-

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: VS97

Analysis Date: 21-NOV-2012 21:34 Init. Calib. Date: 03-OCT-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.018	62516
Endrin	6.522	5674738
4,4'-DDD	6.574	442605
4,4'-DDT	6.828	5169139
Endrin ketone	7.748	523598
Endrin aldehyde	7.105	97396

DDT Percent Breakdown = 8.9 %
((62516+442605) * 100)/(62516+442605+5169139)

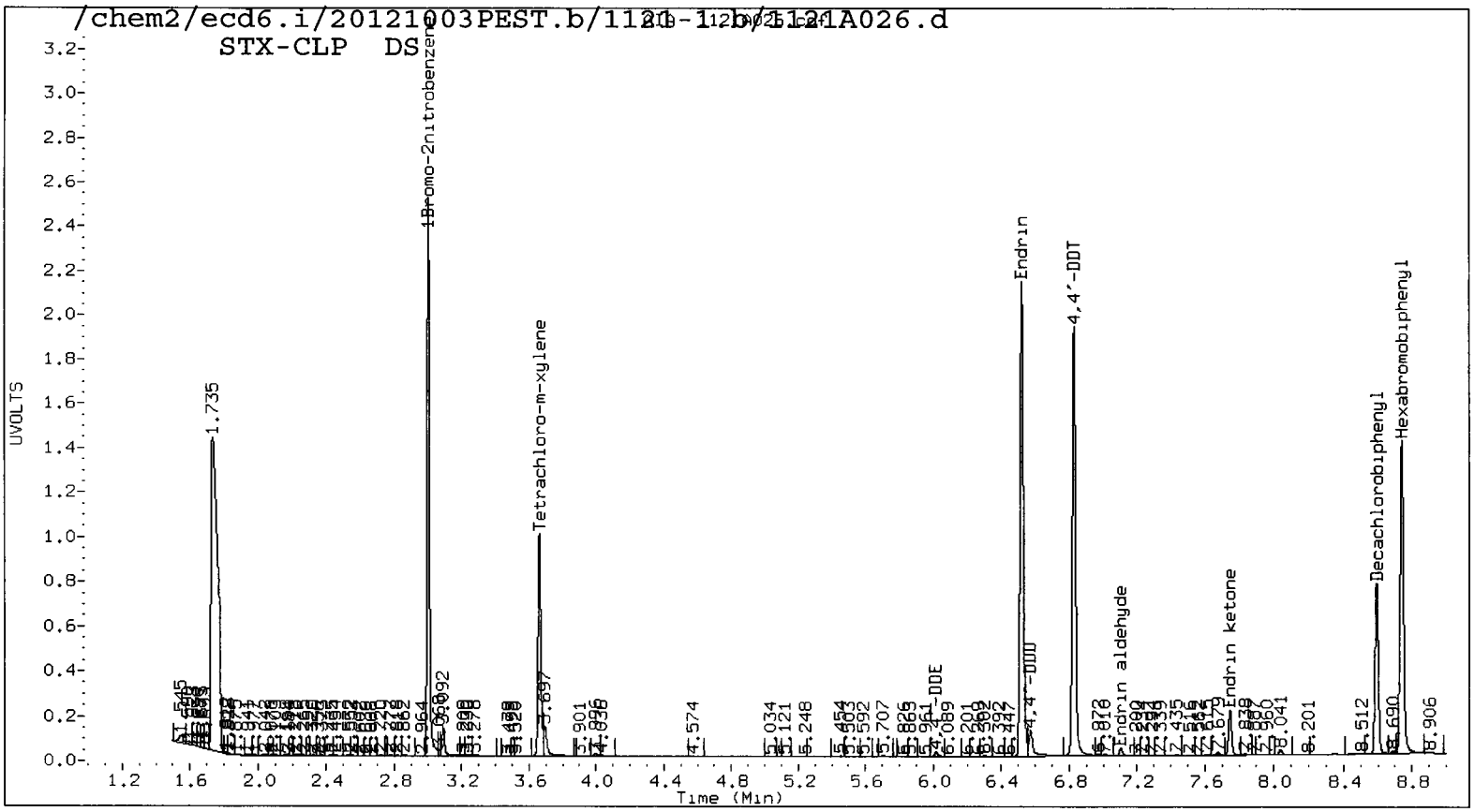
Endrin Percent Breakdown = 9.9 %
((97396+523598) * 100)/(97396+523598+5674738)

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.735	373327
Endrin	7.214	23642511
4,4'-DDD	7.273	2004086
4,4'-DDT	7.560	21941318
Endrin ketone	8.434	2183982
Endrin aldehyde	7.702	500287

DDT Percent Breakdown = 9.8 %
((373327+2004086) * 100)/(373327+2004086+21941318)

Endrin Percent Breakdown = 10.2 %
((500287+2183982) * 100)/(500287+2183982+23642511)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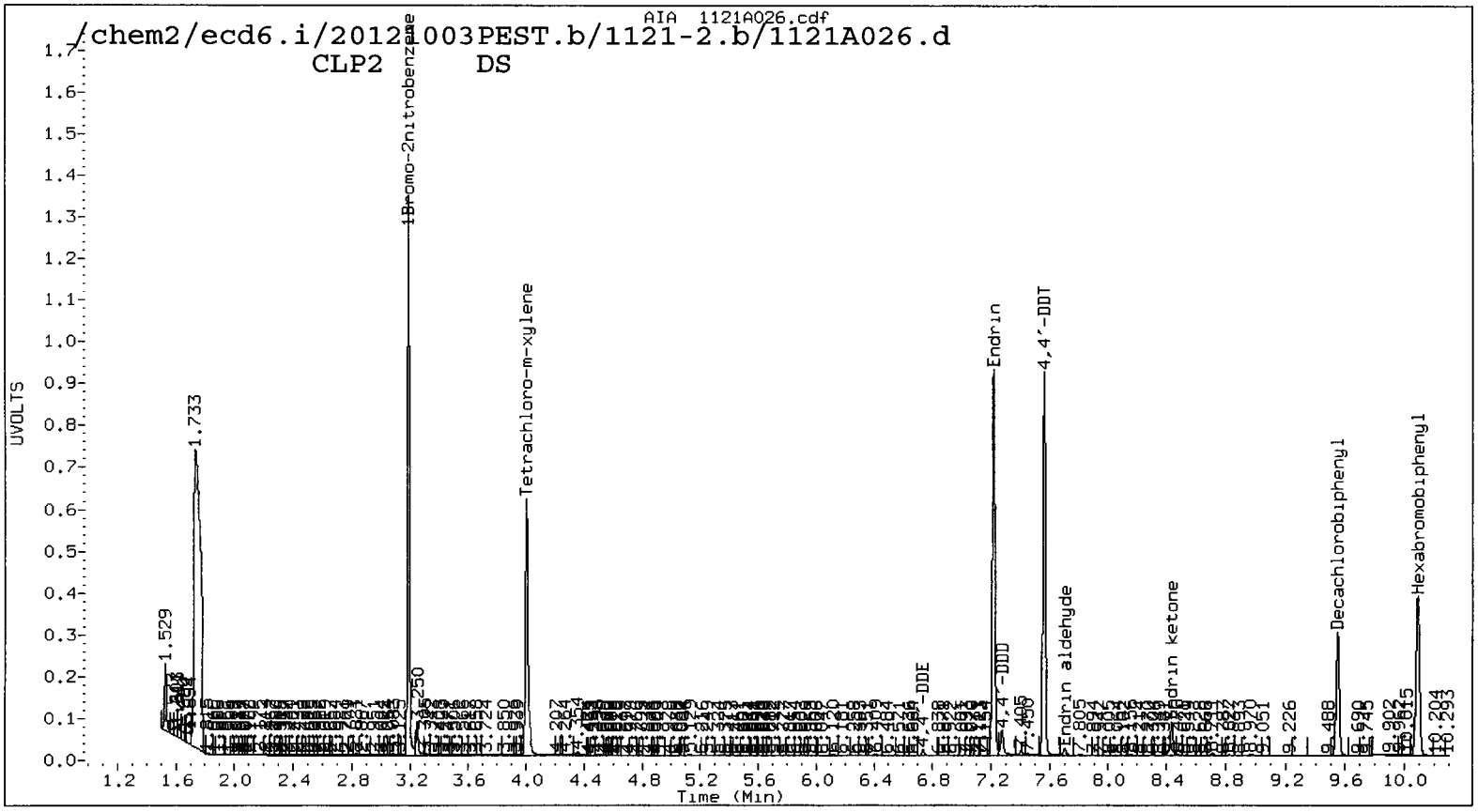
Tetrachloro-m-xylene
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl
4,4'-DDE
4,4'-DDD
1.735
UVOLTS
Time (Min)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CLP2 DS
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl
4,4'-DDE
4,4'-DDD
1.733
1.529
UVOLTS
Time (Min)

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/21/12,2151

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D	
alpha-BHC	4.14	4.10	4.20	21.8	20.0	8.8	
beta-BHC	4.50	4.45	4.55	20.1	20.0	0.5	
delta-BHC	4.66	4.61	4.71	22.3	20.0	11.5	
gamma-BHC (Lindane)	4.41	4.37	4.47	20.8	20.0	4.1	
Heptachlor	4.85	4.81	4.91	21.1	20.0	5.4	
Aldrin	5.13	5.10	5.20	20.2	20.0	1.2	
Heptachlor epoxide b	5.70	5.67	5.77	19.7	20.0	-1.4	
Endosulfan I	6.08	6.05	6.15	20.9	20.0	4.4	
Dieldrin	6.30	6.27	6.37	41.0	40.0	2.5	
4,4'-DDE	6.02	5.98	6.08	40.3	40.0	0.8	
Endrin	6.52	6.49	6.59	45.8	40.0	14.6	
Endosulfan II	6.73	6.70	6.80	44.8	40.0	11.9	
4,4'-DDD	6.57	6.53	6.63	48.8	40.0	22.0	<-
Endosulfan sulfate	7.49	7.46	7.56	45.9	40.0	14.8	
4,4'-DDT	6.83	6.79	6.89	46.0	40.0	14.9	
Methoxychlor	7.26	7.22	7.32	209.0	200.0	4.5	
Endrin ketone	7.75	7.72	7.82	51.2	40.0	27.9	<-
Endrin aldehyde	7.10	7.07	7.17	44.6	40.0	11.4	
gamma-Chlordane	5.83	5.79	5.89	19.9	20.0	-0.5	
alpha-Chlordane	5.95	5.92	6.02	19.5	20.0	-2.4	
Hexachlorobutadiene	2.20	2.16	2.26	21.5	20.0	7.5	
Hexachlorobenzene	4.00	3.95	4.05	20.5	20.0	2.5	
Tetrachloro-m-xylene	3.66	3.62	3.72	37.0	40.0	-7.4	
Decachlorobiphenyl	8.59	8.56	8.66	41.0	40.0	2.4	

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: INDAE Date/Time Analyzed: 11/21/12,2151

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
alpha-BHC	4.57	4.54	4.64	20.8	20.0	4.2	
beta-BHC	5.00	4.96	5.06	19.4	20.0	-2.9	
delta-BHC	5.31	5.26	5.36	21.1	20.0	5.6	
gamma-BHC (Lindane)	4.93	4.89	4.99	20.2	20.0	1.2	
Heptachlor	5.38	5.35	5.45	19.8	20.0	-0.9	
Aldrin	5.72	5.69	5.79	19.2	20.0	-3.8	
Heptachlor epoxide b	6.28	6.24	6.34	18.8	20.0	-5.9	
Endosulfan I	6.67	6.63	6.73	18.4	20.0	-7.9	
Dieldrin	6.92	6.89	6.99	36.0	40.0	-9.9	
4,4'-DDE	6.73	6.70	6.80	37.0	40.0	-7.6	
Endrin	7.21	7.18	7.28	49.9	40.0	24.7	<-
Endosulfan II	7.40	7.37	7.47	50.4	40.0	26.0	<-
4,4'-DDD	7.27	7.23	7.33	52.5	40.0	31.2	<-
Endosulfan sulfate	7.95	7.91	8.01	49.1	40.0	22.8	<-
4,4'-DDT	7.56	7.52	7.62	48.1	40.0	20.4	<-
Methoxychlor	8.14	8.11	8.21	213.8	200.0	6.9	
Endrin ketone	8.43	8.40	8.50	54.7	40.0	36.8	<-
Endrin aldehyde	7.70	7.66	7.76	49.4	40.0	23.4	<-
gamma-Chlordane	6.46	6.43	6.53	17.7	20.0	-11.2	
alpha-Chlordane	6.60	6.56	6.66	17.6	20.0	-12.1	
Hexachlorobutadiene	2.37	2.33	2.43	17.3	20.0	-13.3	
Hexachlorobenzene	4.45	4.41	4.51	25.0	20.0	25.1	<-
Tetrachloro-m-xylene	4.00	3.96	4.06	39.1	40.0	-2.2	
Decachlorobiphenyl	9.55	9.52	9.62	50.1	40.0	25.2	<-

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/21/12,1631

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Toxaphene -1	6.48	6.44	6.54	2750	2500	10.0
Toxaphene -2	6.83	6.79	6.89	2900	2500	16.0
Toxaphene -3	7.20	7.16	7.26	2810	2500	12.4
Toxaphene -4	7.47	7.42	7.52	2330	2500	-6.8
Toxaphene -5	7.73	7.69	7.79	2850	2500	14.0
Toxaphene -6	7.86	7.82	7.92	2960	2500	18.4

AVERAGE %D = 12.9

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/21/12,1631

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
Toxaphene -1	7.15	7.11	7.21	2730	2500	9.2
Toxaphene -2	7.47	7.43	7.53	2730	2500	9.2
Toxaphene -3	7.70	7.66	7.76	2740	2500	9.6
Toxaphene -4	8.17	8.13	8.23	2720	2500	8.8
Toxaphene -5	8.52	8.48	8.58	2790	2500	11.6

AVERAGE %D = 9.7

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/21/12,2227

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Toxaphene -1	6.48	6.44	6.54	2720	2500	8.8
Toxaphene -2	6.83	6.79	6.89	2840	2500	13.6
Toxaphene -3	7.20	7.16	7.26	2780	2500	11.2
Toxaphene -4	7.47	7.42	7.52	2360	2500	-5.6
Toxaphene -5	7.73	7.69	7.79	2860	2500	14.4
Toxaphene -6	7.86	7.82	7.92	2960	2500	18.4

AVERAGE %D = 12.0

FORM VII PEST-3

7F

8081 PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 10/03/12

Lab Ccal ID: TOXAPH Date/Time Analyzed: 11/21/12,2227

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D
Toxaphene -1	7.15	7.11	7.21	2680	2500	7.2
Toxaphene -2	7.47	7.43	7.53	2700	2500	8.0
Toxaphene -3	7.71	7.66	7.76	2750	2500	10.0
Toxaphene -4	8.17	8.13	8.23	2780	2500	11.2
Toxaphene -5	8.52	8.48	8.58	2830	2500	13.2

AVERAGE %D = 9.9

FORM VII PEST-3

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP1 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 10/03/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	4060064	3.015	3748709	8.750
	UPPER LIMIT	8120128	3.065	7497418	8.800
	LOWER LIMIT	2030032	2.965	1874354	8.700

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		INDAE	10/03/12	1639	4060064	3.015	3748709	8.750
02		INDAA	10/03/12	1656	4049993	3.015	3734455	8.750
03		INDAB	10/03/12	1714	4090558	3.015	3771845	8.750
04		INDAC	10/03/12	1732	4021073	3.015	3724289	8.750
05		INDAD	10/03/12	1750	4048036	3.015	3782157	8.750
06		INDAF	10/03/12	1808	4083237	3.015	3825703	8.750
07		INDAG	10/03/12	1826	4094375	3.015	3786416	8.750
08		TOXAPH	10/12/12	1241	5080195	3.009	4970606	8.746
09		DS	11/21/12	1538	4419183	3.004	3750047	8.736
10		INDAE	11/21/12	1555	4912363	3.004	4133848	8.737
11		TOXAPH	11/21/12	1631	4455534	3.004	3829002	8.737
12	VS97MBW1	VS97MBW1	11/21/12	1707	4403774	3.004	3602113	8.737
13	VS97LCSW1	VS97LCSW1	11/21/12	1724	4375529	3.004	3713817	8.737
14	VS97LCSDW1	VS97LCSDW1	11/21/12	1742	4253522	3.004	3632560	8.738
15	LMW-2-1112	VS80A	11/21/12	1836	4209312	3.004	3646263	8.739
16	LMW-4-1112	VS80B	11/21/12	1853	4050641	3.003	3633395	8.738
17	LMW-10-1112	VS80C	11/21/12	1911	4132745	3.004	3437091	8.738
18		DS	11/21/12	2134	4707837	3.004	3981156	8.739
19		INDAE	11/21/12	2151	5119903	3.004	4266606	8.738
20		TOXAPH	11/21/12	2227	4489961	3.004	3847967	8.739

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS80 Project: LANDSBURG MINE

GC Column: STX-CLP2 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 10/03/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	21032891	3.195	14864285	10.105
	UPPER LIMIT	42065782	3.245	29728570	10.155
	LOWER LIMIT	10516446	3.145	7432142	10.055

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		INDAE	10/03/12	1639	21032891	3.195	14864285	10.105
02		INDAA	10/03/12	1656	21107593	3.195	14677423	10.106
03		INDAB	10/03/12	1714	21416427	3.195	15039648	10.106
04		INDAC	10/03/12	1732	21029129	3.195	15016060	10.106
05		INDAD	10/03/12	1750	21297295	3.195	15199043	10.107
06		INDAF	10/03/12	1808	21266311	3.195	15407292	10.106
07		INDAG	10/03/12	1826	21395806	3.195	15257890	10.107
08		TOXAPH	10/12/12	1241	25258671	3.190	15955179	10.098
09		DS	11/21/12	1538	24335736	3.186	12398857	10.085
10		INDAE	11/21/12	1555	26326575	3.186	13332514	10.086
11		TOXAPH	11/21/12	1631	23641762	3.186	11917556	10.086
12	VS97MBW1	VS97MBW1	11/21/12	1707	22094804	3.186	11187344	10.087
13	VS97LCSW1	VS97LCSW1	11/21/12	1724	22365153	3.186	11546311	10.087
14	VS97LCSDW1	VS97LCSDW1	11/21/12	1742	21767264	3.186	11348237	10.086
15	LMW-2-1112	VS80A	11/21/12	1836	21879602	3.187	10988161	10.088
16	LMW-4-1112	VS80B	11/21/12	1853	21507775	3.186	11069301	10.087
17	LMW-10-1112	VS80C	11/21/12	1911	21380288	3.186	10808511	10.088
18		DS	11/21/12	2134	24862437	3.187	12614011	10.088
19		INDAE	11/21/12	2151	26996890	3.187	13671654	10.087
20		TOXAPH	11/21/12	2227	24080802	3.187	12343844	10.087

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

PCB Analysis
Report and Summary QC Forms

ARI Job ID: VS80, VS81

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C

Sample ID: LMW-2-1112
SAMPLE

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 19:37
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	74.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C

Sample ID: LMW-4-1112
SAMPLE

Lab Sample ID: VS80B
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 19:57
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	104%
Tetrachlorometaxylene	80.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C
Page 1 of 1

Sample ID: LMW-10-1112
SAMPLE

Lab Sample ID: VS80C
LIMS ID: 12-23025
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 20:18
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	101%
Tetrachlorometaxylene	74.2%

FORM I

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-111912	106%	32-108	75.0%	31-100	0
LCS-111912	108%	32-108	75.8%	31-100	0
LCSD-111912	101%	32-108	77.0%	31-100	0
LMW-2-1112	106%	19-111	74.5%	21-100	0
LMW-4-1112	104%	19-111	80.2%	21-100	0
LMW-10-1112	101%	19-111	74.2%	21-100	0

Prep Method: SW3510C
Log Number Range: 12-23023 to 12-23025

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A

Sample ID: LCS-111912
LCS/LCSD

Lab Sample ID: LCS-111912
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized: 
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 11/19/12

Date Analyzed LCS: 11/27/12 16:55
LCSD: 11/27/12 17:16
Instrument/Analyst LCS: ECD5/PKC
LCSD: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount LCS: 1000 mL
LCSD: 1000 mL
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	0.041	0.050	82.0%	0.043	0.050	86.0%	4.8%
Aroclor 1260	0.055	0.050	110%	0.058	0.050	116%	5.3%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	108%	101%
Tetrachlorometaxylene	75.8%	77.0%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

PCB METHOD BLANK SUMMARY

BLANK NO.

VS45MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

Lab Sample ID: VS45MBW1

Lab File ID: 1127A008

Date Extracted: 11/19/12

Matrix: LIQUID

Date Analyzed: 11/27/12

Instrument ID: ECD5

Time Analyzed: 1635

GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS45LCSW1	VS45LCSW1	11/27/12
02	VS45LCSDW1	VS45LCSDW1	11/27/12
03	LMW-3-1112	VS45A	11/27/12
04	LMW-EB-1112	VS45B	11/27/12
05	LMW-8-1112	VS45C	11/27/12
06	LMW-5-1112	VS45D	11/27/12
07	LMW-7-1112	VS45E	11/27/12
08	LMW-7-1112-D	VS45F	11/27/12
09	LMW-2-1112	VS80A	11/27/12
10	LMW-4-1112	VS80B	11/27/12
11	LMW-10-1112	VS80C	11/27/12
12	LMW-9-1112	VS61A	11/27/12
13	LMW-11-1112	VS61B	11/27/12
14	LMW-6-1112	VS61C	11/27/12

ALL RUNS ARE DUAL COLUMN

FORM IV PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082A
Extraction Method: SW3510C

Sample ID: MB-111912
METHOD BLANK

Lab Sample ID: MB-111912
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/28/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Date Extracted: 11/19/12
Date Analyzed: 11/27/12 16:35
Instrument/Analyst: ECD5/PKC
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 1000 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Silica Gel: Yes
Acid Cleanup: Yes

CAS Number	Analyte	DL	LOQ	Result
12674-11-2	Aroclor 1016	0.0025	0.010	< 0.010 U
53469-21-9	Aroclor 1242	0.0028	0.010	< 0.010 U
12672-29-6	Aroclor 1248	0.0028	0.010	< 0.010 U
11097-69-1	Aroclor 1254	0.0028	0.010	< 0.010 U
11096-82-5	Aroclor 1260	0.0028	0.010	< 0.010 U
11104-28-2	Aroclor 1221	0.0028	0.010	< 0.010 U
11141-16-5	Aroclor 1232	0.0028	0.010	< 0.010 U

Reported in µg/L (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	106%
Tetrachlorometaxylene	75.0%

6F

8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 Instrument ID: ECD5

Calibration Date: 11/02/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	4.35- 4.55	1.7463	1.7366	1.7919	1.6885	1.5990	1.4618	1.6707	7.3
DCB	12.76-12.96	1.4419	1.3542	1.3255	1.1568	1.0372	0.9164	1.2053	16.9

Aroclor-1016 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	6.00- 6.20	0.0526	0.0492	0.0480	0.0431	0.0399	0.0355	0.0447	14.3
2	6.40- 6.60	0.1677	0.1545	0.1513	0.1334	0.1220	0.1073	0.1394	16.2
3	6.55- 6.75	0.0718	0.0670	0.0652	0.0578	0.0527	0.0464	0.0601	15.9
4	6.66- 6.86	0.0505	0.0471	0.0462	0.0417	0.0385	0.0340	0.0430	14.2

AROCLOR AVERAGE %RSD = 15.1

Aroclor-1260 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	9.90-10.10	0.0536	0.0493	0.0479	0.0428	0.0388	0.0345	0.0445	12.5
2	10.21-10.41	0.0532	0.0494	0.0483	0.0433	0.0394	0.0351	0.0448	11.6
3	10.59-10.79	0.1298	0.1173	0.1141	0.1011	0.0918	0.0821	0.1060	13.3
4	10.99-11.19	0.0754	0.0665	0.0648	0.0581	0.0527	0.0471	0.0608	13.6
5	11.18-11.38	0.0346	0.0319	0.0317	0.0292	0.0269	0.0244	0.0298	9.5

AROCLOR AVERAGE %RSD = 12.1

8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Instrument ID: ECD5

Calibration Date: 11/02/12

SURROGATES

RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX 4.36- 4.56	1.1947	1.1506	1.1889	1.1588	1.1066	1.0428	1.1404	5.0
DCB 13.15-13.35	1.2887	1.1842	1.1439	1.0432	0.9699	0.8923	1.0871	13.5

Aroclor-1016 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	6.11- 6.31	0.0541	0.0496	0.0481	0.0428	0.0390	0.0352	0.0448	15.8
2	6.75- 6.95	0.1119	0.1025	0.1010	0.0916	0.0847	0.0773	0.0948	13.4
3	7.13- 7.33	0.0277	0.0264	0.0263	0.0242	0.0226	0.0209	0.0247	10.6
4	7.24- 7.44	0.0325	0.0303	0.0296	0.0268	0.0247	0.0226	0.0277	13.5

AROCLOR AVERAGE %RSD = 13.3

Aroclor-1260 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	10.20-10.40	0.0510	0.0463	0.0455	0.0410	0.0379	0.0345	0.0427	14.1
2	10.65-10.85	0.0605	0.0575	0.0561	0.0509	0.0468	0.0427	0.0524	13.0
3	10.93-11.13	0.1180	0.1138	0.1111	0.1016	0.0945	0.0868	0.1043	11.6
4	11.45-11.65	0.0395	0.0332	0.0327	0.0299	0.0279	0.0254	0.0314	15.7

AROCLOR AVERAGE %RSD = 13.6

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB5

Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1221			
Peak	RT	RT WIN	Cal Factor
1	4.817	4.72- 4.92	0.01953
2	4.995	4.89- 5.09	0.01337
3	5.101	5.00- 5.20	0.04356

Aroclor-1232			
Peak	RT	RT WIN	Cal Factor
1	6.094	5.99- 6.19	0.01822
2	6.497	6.40- 6.60	0.05697
3	6.647	6.55- 6.75	0.02485
4	7.901	7.80- 8.00	0.03114

Aroclor-1242			
Peak	RT	RT WIN	Cal Factor
1	6.097	6.00- 6.20	0.03480
2	6.500	6.40- 6.60	0.10781
3	6.650	6.55- 6.75	0.04681
4	7.902	7.80- 8.00	0.05490

Aroclor-1248			
Peak	RT	RT WIN	Cal Factor
1	6.497	6.40- 6.60	0.07048
2	7.474	7.37- 7.57	0.07420
3	7.902	7.80- 8.00	0.09369
4	8.138	8.04- 8.24	0.07222

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB5

Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	8.223	8.12- 8.32	0.09552
2	8.597	8.50- 8.70	0.06279
3	8.731	8.63- 8.83	0.12204
4	9.080	8.98- 9.18	0.13358
5	9.440	9.34- 9.54	0.08400

Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	9.996	9.90-10.10	0.06957
2	10.312	10.21-10.41	0.05282
3	10.687	10.59-10.79	0.13695
4	11.202	11.10-11.30	0.05159
5	11.275	11.18-11.38	0.05664

Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	11.203	11.10-11.30	0.13880
2	11.275	11.17-11.37	0.13349
3	11.661	11.56-11.76	0.11731
4	12.449	12.35-12.55	0.33525

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1221			
Peak	RT	RT WIN	Cal Factor
1	5.141	5.04- 5.24	0.01355
2	5.393	5.29- 5.49	0.00798
3	5.507	5.41- 5.61	0.02510
4	5.576	5.48- 5.68	0.00433

Aroclor-1232			
Peak	RT	RT WIN	Cal Factor
1	6.210	6.11- 6.31	0.01985
2	6.841	6.74- 6.94	0.03912
3	7.050	6.95- 7.15	0.01635
4	8.276	8.18- 8.38	0.01389

Aroclor-1242			
Peak	RT	RT WIN	Cal Factor
1	6.210	6.11- 6.31	0.03416
2	6.842	6.74- 6.94	0.07272
3	7.051	6.95- 7.15	0.03022
4	8.276	8.18- 8.38	0.02545

Aroclor-1248			
Peak	RT	RT WIN	Cal Factor
1	6.841	6.74- 6.94	0.04749
2	7.747	7.65- 7.85	0.03939
3	8.276	8.18- 8.38	0.04070
4	8.622	8.52- 8.72	0.05034

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Instrument ID: ECD5

Calibration Date: 11/03/12

Aroclor-1254

Peak	RT	RT WIN	Cal Factor
1	8.341	8.24- 8.44	0.03474
2	8.515	8.41- 8.61	0.04387
3	9.037	8.94- 9.14	0.03370
4	9.188	9.09- 9.29	0.07393
5	9.971	9.87-10.07	0.04454

Aroclor-1262

Peak	RT	RT WIN	Cal Factor
1	10.302	10.20-10.40	0.06977
2	10.752	10.65-10.85	0.06199
3	11.025	10.92-11.12	0.13603
4	11.547	11.45-11.65	0.05505
5	12.347	12.25-12.45	0.05291

Aroclor-1268

Peak	RT	RT WIN	Cal Factor
1	11.547	11.45-11.65	0.13895
2	11.613	11.51-11.71	0.13513
3	12.011	11.91-12.11	0.11296
4	12.834	12.73-12.93	0.33487

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1254
Time Analyzed :1556

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1254-1	8.22	8.12	8.32	251.7	250.0	0.7
Aroclor-1254-2	8.60	8.50	8.70	213.6	250.0	-14.6
Aroclor-1254-3	8.73	8.63	8.83	255.7	250.0	2.3
Aroclor-1254-4	9.08	8.98	9.18	260.1	250.0	4.0
Aroclor-1254-5	9.44	9.34	9.54	259.1	250.0	3.6

AVERAGE %D = 5.0

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1254

Time Analyzed :1556

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1254-1	8.34	8.24	8.44	280.0	250.0	12.0
Aroclor-1254-2	8.51	8.41	8.61	280.9	250.0	12.4
Aroclor-1254-3	9.04	8.94	9.14	301.1	250.0	20.4
Aroclor-1254-4	9.19	9.09	9.29	273.0	250.0	9.2
Aroclor-1254-5	9.97	9.87	10.07	284.1	250.0	13.6

AVERAGE %D = 13.5

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.09	6.00	6.20	238.2	250.0	-4.7
Aroclor-1016-2	6.50	6.40	6.60	247.3	250.0	-1.1
Aroclor-1016-3	6.65	6.55	6.75	244.5	250.0	-2.2
Aroclor-1016-4	6.76	6.66	6.86	251.1	250.0	0.4

AVERAGE %D = 2.1

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	265.9	250.0	6.3
Aroclor-1260-2	10.31	10.21	10.41	266.6	250.0	6.6
Aroclor-1260-3	10.69	10.59	10.79	264.1	250.0	5.6
Aroclor-1260-4	11.09	10.99	11.19	256.7	250.0	2.7
Aroclor-1260-5	11.28	11.18	11.38	260.4	250.0	4.2

AVERAGE %D = 5.1

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB35
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	252.5	250.0	1.0
Aroclor-1016-2	6.84	6.75	6.95	223.6	250.0	-10.6
Aroclor-1016-3	7.23	7.13	7.33	259.4	250.0	3.8
Aroclor-1016-4	7.33	7.24	7.44	256.7	250.0	2.7

AVERAGE %D = 4.5

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :1616

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	280.7	250.0	12.3
Aroclor-1260-2	10.75	10.65	10.85	284.5	250.0	13.8
Aroclor-1260-3	11.02	10.93	11.13	284.9	250.0	14.0
Aroclor-1260-4	11.55	11.45	11.65	279.6	250.0	11.8

AVERAGE %D = 13.0

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1248
Time Analyzed :2038

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1248-1	6.50	6.40	6.60	258.6	250.0	3.4
Aroclor-1248-2	7.47	7.37	7.57	266.8	250.0	6.7
Aroclor-1248-3	7.90	7.80	8.00	262.1	250.0	4.8
Aroclor-1248-4	8.14	8.04	8.24	268.9	250.0	7.5

AVERAGE %D = 5.6

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1248

Time Analyzed :2038

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1248-1	6.84	6.74	6.94	247.5	250.0	-1.0
Aroclor-1248-2	7.75	7.65	7.85	275.3	250.0	10.1
Aroclor-1248-3	8.28	8.18	8.38	275.7	250.0	10.3
Aroclor-1248-4	8.62	8.52	8.72	279.5	250.0	11.8

AVERAGE %D = 8.3

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB5
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.10	6.00	6.20	236.0	250.0	-5.6
Aroclor-1016-2	6.50	6.40	6.60	245.4	250.0	-1.8
Aroclor-1016-3	6.65	6.55	6.75	243.2	250.0	-2.7
Aroclor-1016-4	6.76	6.66	6.86	253.7	250.0	1.5

AVERAGE %D = 2.9

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	256.3	250.0	2.5
Aroclor-1260-2	10.31	10.21	10.41	257.1	250.0	2.8
Aroclor-1260-3	10.69	10.59	10.79	255.3	250.0	2.1
Aroclor-1260-4	11.09	10.99	11.19	248.0	250.0	-0.8
Aroclor-1260-5	11.28	11.18	11.38	256.4	250.0	2.5

AVERAGE %D = 2.1

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No.: VS45
Project: LANDSBURG MINE

GC Column: ZB35
Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	249.8	250.0	-0.1
Aroclor-1016-2	6.84	6.75	6.95	221.9	250.0	-11.2
Aroclor-1016-3	7.23	7.13	7.33	259.1	250.0	3.6
Aroclor-1016-4	7.34	7.24	7.44	255.4	250.0	2.2

AVERAGE %D = 4.3

Date Analyzed :11/27/12

Lab Standard ID: AR1660
Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	268.9	250.0	7.6
Aroclor-1260-2	10.75	10.65	10.85	273.2	250.0	9.3
Aroclor-1260-3	11.03	10.93	11.13	275.4	250.0	10.1
Aroclor-1260-4	11.55	11.45	11.65	272.7	250.0	9.1

AVERAGE %D = 9.0

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB5

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1242

Time Analyzed :0102

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1242-1	6.10	6.00	6.20	223.2	250.0	-10.7
Aroclor-1242-2	6.50	6.40	6.60	229.9	250.0	-8.0
Aroclor-1242-3	6.65	6.55	6.75	227.2	250.0	-9.1
Aroclor-1242-4	7.90	7.80	8.00	229.8	250.0	-8.1

AVERAGE %D = 9.0

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1242

Time Analyzed :0102

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1242-1	6.21	6.11	6.31	251.8	250.0	0.7
Aroclor-1242-2	6.84	6.74	6.94	252.7	250.0	1.1
Aroclor-1242-3	7.05	6.95	7.15	255.6	250.0	2.2
Aroclor-1242-4	8.28	8.18	8.38	260.7	250.0	4.3

AVERAGE %D = 2.1

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB5

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1660

Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.10	6.00	6.20	235.8	250.0	-5.7
Aroclor-1016-2	6.50	6.40	6.60	246.1	250.0	-1.5
Aroclor-1016-3	6.65	6.55	6.75	246.5	250.0	-1.4
Aroclor-1016-4	6.76	6.66	6.86	257.4	250.0	3.0

AVERAGE %D = 2.9

Date Analyzed :11/28/12

Lab Standard ID: AR1660

Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.00	9.90	10.10	267.6	250.0	7.0
Aroclor-1260-2	10.31	10.21	10.41	264.7	250.0	5.9
Aroclor-1260-3	10.69	10.59	10.79	266.8	250.0	6.7
Aroclor-1260-4	11.09	10.99	11.19	254.7	250.0	1.9
Aroclor-1260-5	11.28	11.18	11.38	264.6	250.0	5.8

AVERAGE %D = 5.5

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No.: VS45

Project: LANDSBURG MINE

GC Column: ZB35

Intrument: ECD5

Init. Calib. Date: 11/02/12

Date Analyzed :11/28/12

Lab Standard ID: AR1660

Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	6.21	6.11	6.31	250.5	250.0	0.2
Aroclor-1016-2	6.84	6.75	6.95	221.8	250.0	-11.3
Aroclor-1016-3	7.23	7.13	7.33	259.0	250.0	3.6
Aroclor-1016-4	7.34	7.24	7.44	255.6	250.0	2.2

AVERAGE %D = 4.3

Date Analyzed :11/28/12

Lab Standard ID: AR1660

Time Analyzed :0122

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	10.30	10.20	10.40	278.3	250.0	11.3
Aroclor-1260-2	10.75	10.65	10.85	280.5	250.0	12.2
Aroclor-1260-3	11.03	10.93	11.13	285.1	250.0	14.0
Aroclor-1260-4	11.55	11.45	11.65	278.1	250.0	11.2

AVERAGE %D = 12.2

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	31244918	2.274	64198300	13.214
				UPPER LIMIT	62489836	2.374	128396600	13.314
				LOWER LIMIT	15622459	2.174	32099150	13.114
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01	ZZZZZ	ZZZZZ	11/02/12	2017	32121330	2.277	65627042	13.214
02		0.25PPMAR166	11/02/12	2037	31244918	2.274	64198300	13.214
03		0.02PPMAR166	11/02/12	2058	31736267	2.277	66012881	13.214
04		0.05PPMAR166	11/02/12	2118	31079093	2.275	64685135	13.214
05		1PPMAR1660	11/02/12	2138	32560778	2.275	67466235	13.214
06		0.1PPMAR1660	11/02/12	2158	31562437	2.274	66063497	13.214
07		0.5PPMAR1660	11/02/12	2218	32469455	2.273	67388285	13.214
08		AR1242	11/02/12	2238	32779971	2.273	67800793	13.214
09		AR1248	11/02/12	2259	33486089	2.279	68805737	13.214
10		AR1254	11/02/12	2319	32866846	2.276	67839772	13.214
11		AR2162	11/02/12	2340	32037907	2.280	66658077	13.215
12		AR3268	11/03/12	0000	33288564	2.280	69153536	13.215
13	ZZZZZ	ZZZZZ	11/03/12	0020	32275358	2.276	69016020	13.215
14	ZZZZZ	ZZZZZ	11/03/12	0041	34992364	2.279	71027100	13.215
15	ZZZZZ	ZZZZZ	11/03/12	0101	33719935	2.275	69100267	13.214
16	ZZZZZ	ZZZZZ	11/03/12	0121	34274216	2.277	70290566	13.215
17	ZZZZZ	ZZZZZ	11/03/12	0142	33531129	2.274	69260863	13.214
18	ZZZZZ	ZZZZZ	11/03/12	0202	33384825	2.277	69841459	13.214
19		AR1254	11/27/12	1556	31355840	2.277	60463087	13.216
20		AR1660	11/27/12	1616	26380762	2.277	49251705	13.215
21	VS45MBW1	VS45MBW1	11/27/12	1635	37850879	2.276	66730789	13.215
22	VS45LCSW1	VS45LCSW1	11/27/12	1655	38471396	2.277	68058410	13.216
23	VS45LCSDW1	VS45LCSDW1	11/27/12	1716	37775632	2.277	66976674	13.215
24	LMW-3-1112	VS45A	11/27/12	1736	38352102	2.276	69679975	13.216
25	LMW-EB-1112	VS45B	11/27/12	1756	37735670	2.278	69060343	13.215
26	LMW-8-1112	VS45C	11/27/12	1816	38759189	2.276	69292543	13.216
27	LMW-5-1112	VS45D	11/27/12	1836	39096740	2.277	72571060	13.215
28	LMW-7-1112	VS45E	11/27/12	1857	39936132	2.278	72905231	13.214
29	LMW-7-1112-D	VS45F	11/27/12	1917	40386717	2.277	73249886	13.216
30	LMW-2-1112	VS80A	11/27/12	1937	40659775	2.277	73156003	13.216
31	LMW-4-1112	VS80B	11/27/12	1957	39866227	2.279	73286301	13.216
32	LMW-10-1112	VS80C	11/27/12	2018	39622809	2.278	72195861	13.216

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB5 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	31244918	2.274	64198300	13.214
				UPPER LIMIT	62489836	2.374	128396600	13.314
				LOWER LIMIT	15622459	2.174	32099150	13.114
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
33		AR1248	11/27/12	2038	32375111	2.277	64181082	13.216
34		AR1660	11/27/12	2059	28784889	2.279	56853217	13.216
35	LMW-9-1112	VS61A	11/27/12	2119	43481965	2.277	75432143	13.217
36	LMW-11-1112	VS61B	11/27/12	2139	51607223	2.276	75467547	13.216
37	LMW-6-1112	VS61C	11/27/12	2159	41685341	2.278	76685668	13.216
38		AR1242	11/28/12	0102	35209545	2.279	58213591	13.217
39		AR1660	11/28/12	0122	30334360	2.280	54319976	13.216

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 ID: 0.53 (mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

			IS1 AREA	RT	IS2 AREA	RT
		ICAL MIDPT	14536489	2.761	15789428	14.115
		UPPER LIMIT	29072978	2.861	31578856	14.215
		LOWER LIMIT	7268244	2.661	7894714	14.015

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01	ZZZZZ	ZZZZZ	11/02/12	2017	14713535	2.764	16088294	14.115
02		0.25PPMAR166	11/02/12	2037	14536489	2.761	15789428	14.115
03		0.02PPMAR166	11/02/12	2058	14662512	2.763	16195930	14.116
04		0.05PPMAR166	11/02/12	2118	14425871	2.761	15804667	14.115
05		1PPMAR1660	11/02/12	2138	14668819	2.761	16259905	14.115
06		0.1PPMAR1660	11/02/12	2158	14552241	2.763	15974909	14.115
07		0.5PPMAR1660	11/02/12	2218	14811515	2.761	16169446	14.114
08		AR1242	11/02/12	2238	14876946	2.761	16149950	14.115
09		AR1248	11/02/12	2259	15137931	2.765	16358718	14.115
10		AR1254	11/02/12	2319	14737446	2.762	15955858	14.116
11		AR2162	11/02/12	2340	14169986	2.766	15683025	14.116
12		AR3268	11/03/12	0000	14704019	2.765	16219252	14.116
13	ZZZZZ	ZZZZZ	11/03/12	0020	14465214	2.762	15841317	14.116
14	ZZZZZ	ZZZZZ	11/03/12	0041	15000485	2.765	16204591	14.116
15	ZZZZZ	ZZZZZ	11/03/12	0101	14278309	2.762	15675954	14.116
16	ZZZZZ	ZZZZZ	11/03/12	0121	14593306	2.764	15921593	14.117
17	ZZZZZ	ZZZZZ	11/03/12	0142	14012549	2.762	15630049	14.116
18	ZZZZZ	ZZZZZ	11/03/12	0202	13930274	2.762	15765289	14.115
19		AR1254	11/27/12	1556	12425950	2.764	13269271	14.114
20		AR1660	11/27/12	1616	10294938	2.763	10779495	14.114
21	VS45MBW1	VS45MBW1	11/27/12	1635	14010375	2.764	14342194	14.116
22	VS45LCSW1	VS45LCSW1	11/27/12	1655	14340389	2.762	14500145	14.115
23	VS45LCSDW1	VS45LCSDW1	11/27/12	1716	13859133	2.762	14355147	14.115
24	LMW-3-1112	VS45A	11/27/12	1736	13963437	2.762	14774249	14.115
25	LMW-EB-1112	VS45B	11/27/12	1756	13664823	2.763	14406035	14.115
26	LMW-8-1112	VS45C	11/27/12	1816	14104559	2.761	14466522	14.115
27	LMW-5-1112	VS45D	11/27/12	1836	13928838	2.762	15102344	14.114
28	LMW-7-1112	VS45E	11/27/12	1857	14712002	2.763	15203722	14.115
29	LMW-7-1112-D	VS45F	11/27/12	1917	14432514	2.762	15247833	14.116
30	LMW-2-1112	VS80A	11/27/12	1937	14550770	2.761	15198767	14.115
31	LMW-4-1112	VS80B	11/27/12	1957	14205014	2.763	15183526	14.115
32	LMW-10-1112	VS80C	11/27/12	2018	14178574	2.762	14929328	14.115

IS1 = 1-Bromo-2-Nitrobenzene
IS2 = Hexabromobiphenyl

RT Window = RT +/- 0.1 min

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No.: VS45 Project: LANDSBURG MINE

GC Column: ZB35 ID: 0.53(mm) Instrument ID: ECD5

Init. Calib. Date: 11/02/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	14536489	2.761	15789428	14.115
				UPPER LIMIT	29072978	2.861	31578856	14.215
				LOWER LIMIT	7268244	2.661	7894714	14.015
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
33		AR1248	11/27/12	2038	12131754	2.762	13445167	14.116
34		AR1660	11/27/12	2059	10710635	2.763	11900024	14.116
35	LMW-9-1112	VS61A	11/27/12	2119	14650549	2.762	15642227	14.116
36	LMW-11-1112	VS61B	11/27/12	2139	14516755	2.763	15551439	14.116
37	LMW-6-1112	VS61C	11/27/12	2159	14713616	2.763	15747089	14.116
38		AR1242	11/28/12	0102	12073846	2.764	11517474	14.115
39		AR1660	11/28/12	0122	10935659	2.763	11044707	14.115

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

HCID Analysis
Report and Summary QC Forms

ARI Job ID: VS80, VS81

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Extraction Method: SW3510C

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

Matrix: Water

Data Release Authorized:
Reported: 11/19/12

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-111612	Method Blank	11/16/12	11/17/12	1.0	Gas	< 0.25 U
12-23023					Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	79.5%
VS80A	LMW-2-1112	11/16/12	11/17/12	1.0	Gas	< 0.25 U
12-23023	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	99.9%
VS80B	LMW-4-1112	11/16/12	11/17/12	1.0	Gas	< 0.25 U
12-23024	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	101%
VS80C	LMW-10-1112	11/16/12	11/17/12	1.0	Gas	< 0.25 U
12-23025	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	110%

Reported in mg/L (ppm)

Gas value based on total peaks in the range from Toluene to C12.
Diesel value based on the total peaks in the range from C12 to C24.
Oil value based on the total peaks in the range from C24 to C38.

ANALYTICAL RESOURCES INCORPORATED

HCID SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273

Client ID	O-TER	TOT OUT
MB-111612	79.5%	0
LCS-111612	96.9%	0
LCSD-111612	105%	0
LMW-2-1112	99.9%	0
LMW-4-1112	101%	0
LMW-10-1112	110%	0

	LCS/MB LIMITS	QC LIMITS
(O-TER) = o-Terphenyl	(55-110)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-23023 to 12-23025

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID **Sample ID: LCS-111612**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-111612 QC Report No: VS80-Golder Associates
LIMS ID: 12-23023 Project: Landsburg Mines
Matrix: Water 923-1000-002.R273
Data Release Authorized: Date Sampled: 11/15/12
Reported: 11/19/12 Date Received: 11/15/12

Date Extracted LCS/LCSD: 11/16/12 Sample Amount LCS: 500 mL
LCSD: 500 mL
Date Analyzed LCS: 11/17/12 02:47 Final Extract Volume LCS: 1.0 mL
LCSD: 11/17/12 03:09 LCSD: 1.0 mL
Instrument/Analyst LCS: FID/AAR Dilution Factor LCS: 1.00
LCSD: FID/AAR LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2.77	3.00	92.3%	2.80	3.00	93.3%	1.1%

HCID Surrogate Recovery

	LCS	LCSD
o-Terphenyl	96.9%	105%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

TPH METHOD BLANK SUMMARY

BLANK NO.: VS80MBW1

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

SDG No.: VS80

Project No.: LANDSBURG MINE

Date Extracted: 11/16/12

Matrix: LIQUID

Date Analyzed : 11/17/12

Instrument ID : FID4A

Time Analyzed : 0225

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	VS80LCSW1	VS80LCSW1	11/17/12
02	VS80LCSDW1	VS80LCSDW1	11/17/12
03	LMW-2-1112	VS80A	11/17/12
04	LMW-4-1112	VS80B	11/17/12
05	LMW-10-1112	VS80C	11/17/12
06			
07			
08			
09			
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12			
13			
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30			

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

SDG No.: VS80 Project: LANDSBURG MINE

Instrument ID: FID4A GC Column: RTX-1

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 5.99 TRIAC: 8.88

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01	GDHCIDW	GDHCIDW	11/17/12	0141	5.99	8.86
02	MOHCIDW	MOHCIDW	11/17/12	0203	6.00	8.87
03	VS80MBW1	VS80MBW1	11/17/12	0225	5.99	8.86
04	VS80LCSW1	VS80LCSW1	11/17/12	0247	6.00	8.86
05	VS80LCSDW1	VS80LCSDW1	11/17/12	0309	6.00	8.86
06	LMW-2-1112	VS80A	11/17/12	0331	5.99	8.86
07	LMW-4-1112	VS80B	11/17/12	0354	5.99	8.86
08	LMW-10-1112	VS80C	11/17/12	0416	6.00	8.87

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

Metals Analysis
Report and Summary QC Forms

ARI Job ID: VS80, VS81

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

SDG: VS80

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-2-1112	VS80A	12-23023	
LMW-2-1112D	VS80ADUP	12-23023	
LMW-2-1112S	VS80ASPK	12-23023	
LMW-4-1112	VS80B	12-23024	
PBW	VS80MB1	12-23024	
LCSW	VS80MB1SPK	12-23024	
LMW-10-1112	VS80C	12-23025	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 11/30/12 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-2-1112
SAMPLE

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/28/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	**7440-39-3**	**Barium**	1.33	3	**332**	
3010A	11/19/12	6010C	11/28/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/28/12	**7440-70-2**	**Calcium**	11.3	50	**114,000**	
3010A	11/19/12	6010C	11/28/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/28/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/28/12	**7439-89-6**	**Iron**	7.5	50	**140**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/28/12	**7439-95-4**	**Magnesium**	9.6	50	**71,000**	
3010A	11/19/12	6010C	11/28/12	**7439-96-5**	**Manganese**	0.28	1	**218**	
3010A	11/19/12	6010C	11/28/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/28/12	**7440-09-7**	**Potassium**	65.7	500	**3,630**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/28/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/28/12	**7440-23-5**	**Sodium**	11.4	500	**21,200**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-4-1112**
Page 1 of 1 **SAMPLE**

Lab Sample ID: VS80B
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/28/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	**7440-39-3**	**Barium**	1.33	3	**334**	
3010A	11/19/12	6010C	11/28/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/28/12	**7440-70-2**	**Calcium**	11.3	50	**110,000**	
3010A	11/19/12	6010C	11/28/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/28/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/28/12	**7439-89-6**	**Iron**	7.5	50	**1,100**	
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/28/12	**7439-95-4**	**Magnesium**	9.6	50	**67,800**	
3010A	11/19/12	6010C	11/28/12	**7439-96-5**	**Manganese**	0.28	1	**167**	
3010A	11/19/12	6010C	11/28/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/28/12	**7440-09-7**	**Potassium**	65.7	500	**3,830**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/28/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/28/12	**7440-23-5**	**Sodium**	11.4	500	**28,500**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-10-1112
SAMPLE

Lab Sample ID: VS80C
LIMS ID: 12-23025
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/28/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	**7440-38-2**	**Arsenic**	0.048	0.2	**0.3**	
3010A	11/19/12	6010C	11/28/12	**7440-39-3**	**Barium**	1.33	3	**33**	
3010A	11/19/12	6010C	11/28/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/28/12	**7440-70-2**	**Calcium**	11.3	50	**6,370**	
3010A	11/19/12	6010C	11/28/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/28/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/28/12	7439-89-6	Iron	7.5	50	50	U
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/28/12	**7439-95-4**	**Magnesium**	9.6	50	**2,800**	
3010A	11/19/12	6010C	11/28/12	**7439-96-5**	**Manganese**	0.28	1	**9**	
3010A	11/19/12	6010C	11/28/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/28/12	**7440-09-7**	**Potassium**	65.7	500	**1,260**	
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/28/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/28/12	**7440-23-5**	**Sodium**	11.4	500	**79,600**	
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-2-1112**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Aluminum	6010C	50 U	2,040	2,000	102%	
Antimony	200.8	0.2 U	23.7	25.0	94.8%	
Arsenic	200.8	0.2 U	24.4	25.0	97.6%	
Barium	6010C	332	2,330	2,000	99.9%	
Beryllium	6010C	1 U	513	500	103%	
Cadmium	6010C	2 U	527	500	105%	
Calcium	6010C	114,000	121,000	10,000	70.0%	H
Chromium	6010C	5 U	500	500	100%	
Cobalt	6010C	3 U	490	500	98.0%	
Copper	6010C	2 U	531	500	106%	
Iron	6010C	140	2,150	2,000	100%	
Lead	200.8	0.1 U	21.6	25.0	86.4%	
Magnesium	6010C	71,000	78,100	10,000	71.0%	H
Manganese	6010C	218	696	500	95.6%	
Nickel	6010C	10 U	490	500	98.0%	
Potassium	6010C	3,630	13,900	10,000	103%	
Selenium	200.8	0.5 U	73.5	80.0	91.9%	
Silver	6010C	3 U	546	500	109%	
Sodium	6010C	21,200	31,300	10,000	101%	
Thallium	200.8	0.2 U	21.5	25.0	86.0%	
Vanadium	6010C	3 U	518	500	104%	
Zinc	6010C	10 U	490	500	98.0%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked
NR-Not Recovered

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-2-1112
DUPLICATE

Lab Sample ID: VS80A
LIMS ID: 12-23023
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mines
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Aluminum	6010C	50 U	50 U	0.0%	+/- 50	L
Antimony	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Arsenic	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Barium	6010C	332	328	1.2%	+/- 20%	
Beryllium	6010C	1 U	1 U	0.0%	+/- 1	L
Cadmium	6010C	2 U	2 U	0.0%	+/- 2	L
Calcium	6010C	114,000	113,000	0.9%	+/- 20%	
Chromium	6010C	5 U	5 U	0.0%	+/- 5	L
Cobalt	6010C	3 U	3 U	0.0%	+/- 3	L
Copper	6010C	2 U	2 U	0.0%	+/- 2	L
Iron	6010C	140	140	0.0%	+/- 50	L
Lead	200.8	0.1 U	0.1 U	0.0%	+/- 0.1	L
Magnesium	6010C	71,000	70,500	0.7%	+/- 20%	
Manganese	6010C	218	218	0.0%	+/- 20%	
Nickel	6010C	10 U	10 U	0.0%	+/- 10	L
Potassium	6010C	3,630	3,650	0.5%	+/- 20%	
Selenium	200.8	0.5 U	0.5 U	0.0%	+/- 0.5	L
Silver	6010C	3 U	3 U	0.0%	+/- 3	L
Sodium	6010C	21,200	21,100	0.5%	+/- 20%	
Thallium	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Vanadium	6010C	3 U	3 U	0.0%	+/- 3	L
Zinc	6010C	10 U	10 U	0.0%	+/- 10	L

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: VS80LCS
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	2090	2000	104%	
Antimony	200.8	24.9	25.0	99.6%	
Arsenic	200.8	25.2	25.0	101%	
Barium	6010C	2080	2000	104%	
Beryllium	6010C	520	500	104%	
Cadmium	6010C	520	500	104%	
Calcium	6010C	10200	10000	102%	
Chromium	6010C	521	500	104%	
Cobalt	6010C	508	500	102%	
Copper	6010C	525	500	105%	
Iron	6010C	2100	2000	105%	
Lead	200.8	25.2	25.0	101%	
Magnesium	6010C	10600	10000	106%	
Manganese	6010C	515	500	103%	
Nickel	6010C	520	500	104%	
Potassium	6010C	10300	10000	103%	
Selenium	200.8	82.2	80.0	103%	
Silver	6010C	536	500	107%	
Sodium	6010C	10300	10000	103%	
Thallium	200.8	24.0	25.0	96.0%	
Vanadium	6010C	519	500	104%	
Zinc	6010C	520	500	104%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: VS80MB
LIMS ID: 12-23024
Matrix: Water
Data Release Authorized:
Reported: 11/30/12

QC Report No: VS80-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	11/19/12	6010C	11/28/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	11/16/12	200.8	11/28/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	11/16/12	200.8	11/28/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-39-3	Barium	1.33	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	11/19/12	6010C	11/28/12	7440-70-2	Calcium	11.3	50	50	U
3010A	11/19/12	6010C	11/28/12	7440-47-3	Chromium	1.24	5	5	U
3010A	11/19/12	6010C	11/28/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-50-8	Copper	0.92	2	2	U
3010A	11/19/12	6010C	11/28/12	7439-89-6	Iron	7.5	50	50	U
200.8	11/16/12	200.8	11/28/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	11/19/12	6010C	11/28/12	7439-95-4	Magnesium	9.6	50	50	U
3010A	11/19/12	6010C	11/28/12	7439-96-5	Manganese	0.28	1	1	U
3010A	11/19/12	6010C	11/28/12	7440-02-0	Nickel	3.9	10	10	U
3010A	11/19/12	6010C	11/28/12	7440-09-7	Potassium	65.7	500	500	U
200.8	11/16/12	200.8	11/28/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	11/19/12	6010C	11/28/12	7440-22-4	Silver	0.43	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-23-5	Sodium	11.4	500	500	U
200.8	11/16/12	200.8	11/28/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	11/19/12	6010C	11/28/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	11/19/12	6010C	11/28/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

SDG: VS80

UNITS: ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Aluminum	AL	ICP	IP112871	2000.0	2028.43	**101.4**	2000.0	2052.17	**102.6**	2017.57	**100.9**	2068.18	**103.4**	2072.17	**103.6**	2083.19	**104.2**
Antimony	SB	PMS	MS112811	50.0	50.24	**100.5**	50.0	50.81	**101.6**	50.65	**101.3**	50.20	**100.4**	50.07	**100.1**	50.17	**100.3**
Arsenic	AS	PMS	MS112811	50.0	50.55	**101.1**	50.0	50.51	**101.0**	50.43	**100.9**	49.58	**99.2**	50.34	**100.7**	49.91	**99.8**
Barium	BA	ICP	IP112871	1000.0	1018.20	**101.8**	1000.0	1029.30	**102.9**	1024.68	**102.5**	1034.63	**103.5**	1032.09	**103.2**	1034.29	**103.4**
Beryllium	BE	ICP	IP112871	1000.0	996.14	**99.6**	1000.0	1007.38	**100.7**	997.36	**99.7**	1010.17	**101.0**	1019.64	**102.0**	1027.65	**102.8**
Cadmium	CD	ICP	IP112871	1000.0	1015.77	**101.6**	1000.0	1021.32	**102.1**	1018.84	**101.9**	1027.95	**102.8**	1034.20	**103.4**	1034.27	**103.4**
Calcium	CA	ICP	IP112871	2000.0	2069.03	**103.5**	2000.0	2099.35	**105.0**	2075.08	**103.8**	2124.16	**106.2**	2114.21	**105.7**	2134.84	**106.7**
Chromium	CR	ICP	IP112871	1000.0	1005.83	**100.6**	1000.0	1015.42	**101.5**	1009.15	**100.9**	1024.92	**102.5**	1032.94	**103.3**	1028.43	**102.8**
Cobalt	CO	ICP	IP112871	1000.0	987.29	**98.7**	1000.0	997.52	**99.8**	998.87	**99.9**	1007.60	**100.8**	1006.12	**100.6**	1012.47	**101.2**
Copper	CU	ICP	IP112871	1000.0	1019.94	**102.0**	1000.0	1021.93	**102.2**	1029.27	**102.9**	1025.01	**102.5**	1039.22	**103.9**	1030.55	**103.1**
Iron	FE	ICP	IP112871	2000.0	2064.76	**103.2**	2000.0	2086.92	**104.3**	2050.60	**102.5**	2129.80	**106.5**	2121.44	**106.1**	2150.41	**107.5**
Lead	PB	PMS	MS112811	50.0	49.55	**99.1**	50.0	48.78	**97.6**	48.57	**97.1**	47.99	**96.0**	47.91	**95.8**	48.04	**96.1**
Magnesium	MG	ICP	IP112871	2000.0	2051.26	**102.6**	2000.0	2078.93	**103.9**	2026.74	**101.3**	2102.85	**105.1**	2089.81	**104.5**	2098.69	**104.9**
Manganese	MN	ICP	IP112871	1000.0	1011.10	**101.1**	1000.0	1016.26	**101.6**	1008.70	**100.9**	1025.36	**102.5**	1038.55	**103.9**	1033.76	**103.4**
Nickel	NI	ICP	IP112871	1000.0	1012.61	**101.3**	1000.0	1025.59	**102.6**	1016.46	**101.6**	1030.90	**103.1**	1030.10	**103.0**	1039.37	**103.9**
Potassium	K	ICP	IP112871	20000.0	20226.15	**101.1**	20000.0	20313.97	**101.6**	20301.74	**101.5**	20402.04	**102.0**	20669.29	**103.3**	20596.30	**103.0**
Selenium	SE	PMS	MS112811	80.0	81.27	**101.6**	50.0	52.11	**104.2**	51.21	**102.4**	50.84	**101.7**	51.37	**102.7**	51.12	**102.2**
Silver	AG	ICP	IP112871	1000.0	1033.70	**103.4**	1000.0	1034.67	**103.5**	1041.82	**104.2**	1039.63	**104.0**	1048.90	**104.9**	1044.82	**104.5**
Sodium	NA	ICP	IP112871	50000.0	52611.60	**105.2**	50000.0	52309.93	**104.6**	52465.68	**104.9**	52748.74	**105.5**	53821.20	**107.6**	52921.75	**105.8**
Thallium	TL	PMS	MS112811	50.0	47.45	**94.9**	50.0	46.62	**93.2**	46.67	**93.3**	45.84	**91.7**	46.12	**92.2**	45.55	**91.1**
Vanadium	V	ICP	IP112871	1000.0	1020.97	**102.1**	1000.0	1026.16	**102.6**	1032.13	**103.2**	1034.36	**103.4**	1037.91	**103.8**	1037.65	**103.8**
Zinc	ZN	ICP	IP112871	1000.0	1048.52	**104.9**	1000.0	1065.21	**106.5**	1048.34	**104.8**	1073.38	**107.3**	1064.05	**106.4**	1080.97	**108.1**

VS80S - 0571

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

UNITS: ug/L

SDG: VS80

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Aluminum	AL	ICP	IP112871	2000.0												
Antimony	SB	PMS	MS112811	50.0	49.97	**99.9**	50.35	**100.7**	49.56	**99.1**	49.70	**99.4**	50.48	**101.0**	50.60	**101.2**
Arsenic	AS	PMS	MS112811	50.0	49.93	**99.9**	49.80	**99.6**	49.18	**98.4**	50.03	**100.1**	51.10	**102.2**	50.60	**101.2**
Barium	BA	ICP	IP112871	1000.0												
Beryllium	BE	ICP	IP112871	1000.0												
Cadmium	CD	ICP	IP112871	1000.0												
Calcium	CA	ICP	IP112871	2000.0												
Chromium	CR	ICP	IP112871	1000.0												
Cobalt	CO	ICP	IP112871	1000.0												
Copper	CU	ICP	IP112871	1000.0												
Iron	FE	ICP	IP112871	2000.0												
Lead	PB	PMS	MS112811	50.0	47.41	**94.8**	48.43	**96.9**	47.26	**94.5**	47.23	**94.5**	48.64	**97.3**	48.69	**97.4**
Magnesium	MG	ICP	IP112871	2000.0												
Manganese	MN	ICP	IP112871	1000.0												
Nickel	NI	ICP	IP112871	1000.0												
Potassium	K	ICP	IP112871	20000.0												
Selenium	SE	PMS	MS112811	50.0	51.57	**103.1**	51.25	**102.5**	51.63	**103.3**	52.19	**104.4**	53.22	**106.4**	53.15	**106.3**
Silver	AG	ICP	IP112871	1000.0												
Sodium	NA	ICP	IP112871	50000.0												
Thallium	TL	PMS	MS112811	50.0	45.14	**90.3**	46.14	**92.3**	45.45	**90.9**	45.02	**90.0**	46.38	**92.8**	46.19	**92.4**
Vanadium	V	ICP	IP112871	1000.0												
Zinc	ZN	ICP	IP112871	1000.0												

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

UNITS: ug/L

SDG: VS80

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Aluminum	AL	ICP	IP112871	50.0	58.11	**116.2**	47.73	**95.5**	56.10	**112.2**	44.45	**88.9**				
Antimony	SB	PMS	MS112811	0.2	0.21	**105.0**										
Arsenic	AS	PMS	MS112811	0.2	0.21	**105.0**										
Barium	BA	ICP	IP112871	3.0	3.11	**103.7**	2.88	**96.0**	3.31	**110.3**	3.26	**108.7**				
Beryllium	BE	ICP	IP112871	1.0	1.02	**102.0**	0.99	**99.0**	1.04	**104.0**	0.96	**96.0**				
Cadmium	CD	ICP	IP112871	2.0	2.22	**111.0**	2.21	**110.5**	2.11	**105.5**	2.00	**100.0**				
Calcium	CA	ICP	IP112871	50.0	48.26	**96.5**	48.44	**96.9**	51.74	**103.5**	50.55	**101.1**				
Chromium	CR	ICP	IP112871	5.0	4.65	**93.0**	4.69	**93.8**	5.23	**104.6**	5.27	**105.4**				
Cobalt	CO	ICP	IP112871	3.0	3.40	**113.3**	3.32	**110.7**	3.44	**114.7**	3.49	**116.3**				
Copper	CU	ICP	IP112871	2.0	2.03	**101.5**	2.21	**110.5**	2.17	**108.5**	1.86	**93.0**				
Iron	FE	ICP	IP112871	50.0	50.45	**100.9**	52.20	**104.4**	52.68	**105.4**	51.91	**103.8**				
Lead	PB	PMS	MS112811	0.1	0.11	**110.0**										
Magnesium	MG	ICP	IP112871	50.0	53.14	**106.3**	50.83	**101.7**	54.60	**109.2**	57.30	**114.6**				
Manganese	MN	ICP	IP112871	1.0	1.11	**111.0**	1.08	**108.0**	1.23	**123.0**	1.13	**113.0**				
Nickel	NI	ICP	IP112871	10.0	9.52	**95.2**	8.97	**89.7**	9.23	**92.3**	9.58	**95.8**				
Potassium	K	ICP	IP112871	500.0	488.88	**97.8**	494.97	**99.0**	522.09	**104.4**	488.10	**97.6**				
Selenium	SE	PMS	MS112811	0.5	0.56	**112.0**										
Silver	AG	ICP	IP112871	3.0	3.06	**102.0**	2.91	**97.0**	3.25	**108.3**	3.05	**101.7**				
Sodium	NA	ICP	IP112871	500.0	485.81	**97.2**	484.83	**97.0**	498.10	**99.6**	490.65	**98.1**				
Thallium	TL	PMS	MS112811	0.2	0.21	**105.0**										
Vanadium	V	ICP	IP112871	3.0	3.27	**109.0**	3.19	**106.3**	3.24	**108.0**	3.20	**106.7**				
Zinc	ZN	ICP	IP112871	10.0	9.82	**98.2**	9.69	**96.9**	10.02	**100.2**	9.86	**98.6**				

VS80 : 0051 75

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

SDG: VS80

UNITS:ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Aluminum	AL	ICP	IP112871	200.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Antimony	SB	PMS	MS112811	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Arsenic	AS	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Barium	BA	ICP	IP112871	200.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Beryllium	BE	ICP	IP112871	5.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cadmium	CD	ICP	IP112871	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Calcium	CA	ICP	IP112871	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Chromium	CR	ICP	IP112871	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Cobalt	CO	ICP	IP112871	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Copper	CU	ICP	IP112871	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Iron	FE	ICP	IP112871	100.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Lead	PB	PMS	MS112811	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Magnesium	MG	ICP	IP112871	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Manganese	MN	ICP	IP112871	15.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Nickel	NI	ICP	IP112871	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Potassium	K	ICP	IP112871	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Selenium	SE	PMS	MS112811	5.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Silver	AG	ICP	IP112871	10.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Sodium	NA	ICP	IP112871	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Thallium	TL	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vanadium	V	ICP	IP112871	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Zinc	ZN	ICP	IP112871	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

VS80 : 0017

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

UNITS: ug/L

SDG: VS80

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Aluminum	AL	ICP	IP112871	200.0	50.0												
Antimony	SB	PMS	MS112811	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Arsenic	AS	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Barium	BA	ICP	IP112871	200.0	3.0												
Beryllium	BE	ICP	IP112871	5.0	1.0												
Cadmium	CD	ICP	IP112871	5.0	2.0												
Calcium	CA	ICP	IP112871	5000.0	50.0												
Chromium	CR	ICP	IP112871	10.0	5.0												
Cobalt	CO	ICP	IP112871	50.0	3.0												
Copper	CU	ICP	IP112871	25.0	2.0												
Iron	FE	ICP	IP112871	100.0	50.0												
Lead	PB	PMS	MS112811	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Magnesium	MG	ICP	IP112871	5000.0	50.0												
Manganese	MN	ICP	IP112871	15.0	1.0												
Nickel	NI	ICP	IP112871	40.0	10.0												
Potassium	K	ICP	IP112871	5000.0	500.0												
Selenium	SE	PMS	MS112811	5.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Silver	AG	ICP	IP112871	10.0	3.0												
Sodium	NA	ICP	IP112871	5000.0	500.0												
Thallium	TL	PMS	MS112811	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vanadium	V	ICP	IP112871	50.0	3.0												
Zinc	ZN	ICP	IP112871	20.0	10.0												

VS80 : 9 of 78

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: Landsburg Mines

RUNID: IP112871

SDG: VS80

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	200611.9	199598.5	**99.8**	202877.0	201105.3	**100.6**	204309.7	204056.0	**102.0**
Antimony		1000	12.3	1030.6	**103.1**	11.1	1044.6	**104.5**	12.9	1059.8	**106.0**
Arsenic		1000	11.6	1009.9	**101.0**	13.3	1025.3	**102.5**	12.1	1036.8	**103.7**
Barium		1000	-2.6	1011.0	**101.1**	-3.9	1020.4	**102.0**	-3.8	1030.8	**103.1**
Beryllium		1000	0.1	1000.3	**100.0**	0.1	1009.3	**100.9**	0.1	1029.1	**102.9**
Boron			-5.0	-3.7		-5.8	-3.8		-5.1	-4.9	
Cadmium		1000	0.0	1009.5	**101.0**	0.0	1020.5	**102.1**	-0.2	1027.6	**102.8**
Calcium	100000	100000	100626.5	100815.7	**100.8**	101973.8	101811.2	**101.8**	102827.9	103446.8	**103.4**
Chromium		1000	-1.6	1009.9	**101.0**	-2.2	1017.2	**101.7**	-1.4	1034.5	**103.5**
Cobalt		1000	-1.1	939.3	**93.9**	-0.9	951.5	**95.2**	-1.0	960.5	**96.1**
Copper		1000	0.0	1030.0	**103.0**	0.1	1044.8	**104.5**	0.1	1050.6	**105.1**
Iron	200000	200000	198126.1	197483.0	**98.7**	199699.4	199139.0	**99.6**	202596.4	203343.7	**101.7**
Lead		1000	-4.8	988.4	**98.8**	-4.9	1001.6	**100.2**	-4.8	1011.1	**101.1**
Magnesium	100000	100000	99876.0	100211.6	**100.2**	101185.5	101145.1	**101.1**	102016.8	102772.8	**102.8**
Manganese		1000	1.5	955.2	**95.5**	1.4	963.3	**96.3**	1.3	982.0	**98.2**
Molybdenum			2.2	1.8		2.4	2.2		2.2	2.2	
Nickel		1000	-2.7	981.7	**98.2**	-1.3	989.4	**98.9**	-1.7	1004.5	**100.5**
Potassium			10.1	-43.4		-0.8	-31.4		18.5	-24.0	
Selenium		1000	14.4	1001.5	**100.2**	15.7	1012.0	**101.2**	11.7	1023.8	**102.4**
Silicon			-1.7	1.0		-0.2	0.3		0.8	3.4	
Silver		1000	-1.3	1048.1	**104.8**	-1.4	1062.0	**106.2**	-1.2	1067.9	**106.8**
Sodium			13.3	30.0		17.1	29.1		16.5	31.2	
Strontium			4.1	4.1		4.1	4.1		4.2	4.2	
Thallium		1000	-2.3	925.8	**92.6**	-4.5	939.8	**94.0**	0.4	949.3	**94.9**
Tin			-5.5	-6.8		-7.4	-6.5		-6.2	-7.4	
Titanium			1.6	1.1		1.6	1.3		1.1	1.4	
Vanadium		1000	4.9	997.8	**99.8**	4.7	1011.5	**101.2**	4.9	1018.6	**101.9**
Zinc		1000	2.6	979.1	**97.9**	1.9	987.5	**98.8**	1.9	1003.7	**100.4**

VS80:0051

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

SDG: VS80

ICS SOURCE: I.V.

RUNID: MS112811

INSTRUMENT ID: NEXION 300D

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Antimony			0.1	0.1							
Arsenic		20	0.1	20.0	**100.0**						
Cadmium		20	0.1	19.8	**99.0**						
Chromium		20	0.7	20.8	**104.0**						
Cobalt		20	0.0	20.6	**103.0**						
Copper		20	0.9	21.5	**107.5**						
Manganese		20	0.1	19.5	**97.5**						
Molybdenum	400	400	434.3	401.0	**100.3**						
Nickel		20	0.4	21.1	**105.5**						
Selenium			-0.2	-0.2							
Silver		20	0.0	21.1	**105.5**						
Thorium			0.2	0.1							
Zinc		20	0.9	20.3	**101.5**						

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

ANALYSIS METHOD: ICP

SDG: VS80

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Aluminum	LMW-2-1112L	VS80A-L	Water	IP112871	50.00	U	250.00	U		
Barium	LMW-2-1112L	VS80A-L	Water	IP112871	331.60		334.45	B	0.9	
Beryllium	LMW-2-1112L	VS80A-L	Water	IP112871	1.00	U	5.00	U		
Cadmium	LMW-2-1112L	VS80A-L	Water	IP112871	2.00	U	10.00	U		
Calcium	LMW-2-1112L	VS80A-L	Water	IP112871	113626.57		115112.70		1.3	
Chromium	LMW-2-1112L	VS80A-L	Water	IP112871	5.00	U	25.00	U		
Cobalt	LMW-2-1112L	VS80A-L	Water	IP112871	3.00	U	15.00	U		
Copper	LMW-2-1112L	VS80A-L	Water	IP112871	2.00	U	10.00	U		
Iron	LMW-2-1112L	VS80A-L	Water	IP112871	137.40		250.00	U	100.0	
Magnesium	LMW-2-1112L	VS80A-L	Water	IP112871	70954.39		70500.95		0.6	
Manganese	LMW-2-1112L	VS80A-L	Water	IP112871	218.16		230.60		5.7	
Nickel	LMW-2-1112L	VS80A-L	Water	IP112871	10.00	U	50.00	U		
Potassium	LMW-2-1112L	VS80A-L	Water	IP112871	3630.82	B	3510.70	B	3.3	
Silver	LMW-2-1112L	VS80A-L	Water	IP112871	3.00	U	15.00	U		
Sodium	LMW-2-1112L	VS80A-L	Water	IP112871	21229.22		21008.05	B	1.0	
Vanadium	LMW-2-1112L	VS80A-L	Water	IP112871	3.00	U	15.00	U		
Zinc	LMW-2-1112L	VS80A-L	Water	IP112871	10.00	U	50.00	U		

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

ANALYSIS METHOD: PMS

SDG: VS80

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Antimony	LMW-2-1112L	VS80A-L	Water	MS112811	0.01	U	0.10	B		
Arsenic	LMW-2-1112L	VS80A-L	Water	MS112811	0.12	U	0.20	B		
Lead	LMW-2-1112L	VS80A-L	Water	MS112811	0.00	U	0.10	B		
Selenium	LMW-2-1112L	VS80A-L	Water	MS112811	0.22	U	0.10	B		
Thallium	LMW-2-1112L	VS80A-L	Water	MS112811	0.01	U	0.00	B		

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

SDG: VS80 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Aluminum	AL	ICP	OPTIMA ICP 2	308.22		200	50.0	4/1/2012	250000.0	7/30/2012
Antimony	SB	PMS	NEXION 300D MS	0.00		60	0.2	4/1/2012		
Arsenic	AS	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2012		
Barium	BA	ICP	OPTIMA ICP 2	455.50		200	3.0	4/1/2012	100000.0	7/30/2012
Beryllium	BE	ICP	OPTIMA ICP 2	313.04		5	1.0	4/1/2012	5000.0	7/30/2012
Cadmium	CD	ICP	OPTIMA ICP 2	228.80		5	2.0	4/1/2012	20000.0	7/30/2012
Calcium	CA	ICP	OPTIMA ICP 2	317.93		5000	50.0	4/1/2012	500000.0	7/30/2012
Chromium	CR	ICP	OPTIMA ICP 2	267.72		10	5.0	4/1/2012	100000.0	7/30/2012
Cobalt	CO	ICP	OPTIMA ICP 2	228.62		50	3.0	4/1/2012	80000.0	7/30/2012
Copper	CU	ICP	OPTIMA ICP 2	324.75		25	2.0	4/1/2012	40000.0	7/30/2012
Iron	FE	ICP	OPTIMA ICP 2	259.94		100	50.0	4/1/2012	250000.0	7/30/2012
Lead	PB	PMS	NEXION 300D MS	0.00		3	0.1	4/1/2012		
Magnesium	MG	ICP	OPTIMA ICP 2	279.08		5000	50.0	4/1/2012	500000.0	7/30/2012
Manganese	MN	ICP	OPTIMA ICP 2	257.61		15	1.0	4/1/2012	30000.0	7/30/2012
Nickel	NI	ICP	OPTIMA ICP 2	231.60		40	10.0	4/1/2012	100000.0	7/30/2012
Potassium	K	ICP	OPTIMA ICP 2	766.49		5000	500.0	4/1/2012	500000.0	7/30/2012
Selenium	SE	PMS	NEXION 300D MS	0.00		5	0.5	4/1/2012		
Silver	AG	ICP	OPTIMA ICP 2	328.07		10	3.0	4/1/2012	5000.0	7/30/2012
Sodium	NA	ICP	OPTIMA ICP 2	589.00		5000	500.0	4/1/2012	5000000.0	7/30/2012
Thallium	TL	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2012		
Vanadium	V	ICP	OPTIMA ICP 2	292.40		50	3.0	4/1/2012	50000.0	7/30/2012
Zinc	ZN	ICP	OPTIMA ICP 2	213.86		20	10.0	4/1/2012	100000.0	7/30/2012

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

SDG: VS80

IEC DATE: 11/12/2012

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	9.1050360	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0581760	0.0000000	-0.8953680	1.5607750	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1763230	0.0000000	0.0000000	0.1637240
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	6.5458340	0.0000000	0.0000000	0.0000000	0.0000000	0.1152580	0.0000000	0.0000000	0.0095100
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0295099	0.0000000	0.0091790	0.0000000	-0.0348880	0.0000000	0.0000000	-0.0392710
Cobalt	228.62	0.0000000	0.0000000	0.0788170	0.0000000	0.0000000	0.0000000	0.0000000	-0.0346500	0.0000000	0.0130090
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1608400	0.0000000	0.0000000	-0.0442360
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.4437390	0.0000000	0.0000000
Lead	220.35	-0.2393490	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1467250	-1.7804540	1.4264890	0.0412430
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.4396410	-1.1694080	0.0000000	0.5321920
Manganese	257.61	0.0046450	0.0000000	0.0000000	0.0000000	0.0019080	0.0000000	0.0000000	0.0000000	0.0000000	-0.0054280
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0108090	0.0000000	0.0000000	0.0540880	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.4883700	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.5902270	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	5.5577350	0.3891400	0.0000000	-0.1069480
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.1236770	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0477260	0.0000000	0.0000000	0.1988470	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-4.2880510	0.0000000	0.0349450
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0645950	0.0000000	0.0000000

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

IEC DATE: 11/12/2012

SDG: VS80

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	17.2648390	0.0000000	0.0000000	0.0000000	2.1534780	0.0000000	14.6676620	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	-0.3171320	0.0000000	0.0000000	-1.6488050	0.0000000	-2.7828430	0.0000000
Arsenic	188.98	0.0000000	0.0000000	3.5824010	0.0000000	0.0000000	0.0000000	-28.6279570	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.1006020	0.0000000	0.0000000	0.0000000	0.0000000	0.2160840	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0120420	0.0000000	0.1997240	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0000000	-0.9709640	0.0000000	0.0000000	0.0000000	0.0000000	0.6837900	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0863140	0.0880780	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.3314250	0.0362000
Cobalt	228.62	0.0000000	0.0000000	-0.1203920	0.1624660	0.0000000	0.0000000	1.9337740	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0084630	0.0000000	0.4010840	0.0000000	0.0000000	0.0000000	0.2064430	0.0000000	0.0000000	0.0000000
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	8.4794020	0.0000000
Lead	220.35	0.0000000	0.0000000	-0.4099510	-0.1101090	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-5.5537550	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0000000	0.0000000	-0.2086980	0.0000000	0.0000000	0.0000000	-0.0242310	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.5468870	0.0000000	0.4309940	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.5703720	0.0000000
Silicon	288.16	-0.1197150	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0400098	0.0000000	-2.8848200	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	-0.8464030	-0.9915990	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	3.4340400	0.0000000
Tin	189.93	0.0000000	0.0000000	0.8648230	0.0000000	-0.0322750	-0.4551870	-0.1436590	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.8648230	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1521530	0.5765370	0.0000000	0.0000000	0.0000000	0.5629710	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2677330	0.0000000	-0.0519400	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

VS80 : 001855

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

SDG: VS80

ANALYSIS METHOD: ICP

ARI PREP CODE: TWC

PREPDATE: 11/19/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-2-1112	VS80A	0.000	50.0	50.0
LMW-2-1112D	VS80ADUP	0.000	50.0	50.0
LMW-2-1112S	VS80ASPK	0.000	50.0	50.0
LMW-4-1112	VS80B	0.000	50.0	50.0
LMW-10-1112	VS80C	0.000	50.0	50.0
PBW	VS80MB1	0.000	50.0	50.0
LCSW	VS80MB1SPK	0.000	50.0	50.0

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines

SDG: VS80

ANALYSIS METHOD: PMS

ARI PREP CODE: REN

PREPDATE: 11/16/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-2-1112	VS80A	0.000	50.0	25.0
LMW-2-1112D	VS80ADUP	0.000	50.0	25.0
LMW-2-1112S	VS80ASPK	0.000	50.0	25.0
LMW-4-1112	VS80B	0.000	50.0	25.0
LMW-10-1112	VS80C	0.000	50.0	25.0
PBW	VS80MB1	0.000	50.0	25.0
LCSW	VS80MB1SPK	0.000	50.0	25.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 11/28/2012

SDG: VS80 | RUNID: IP112871 | METHOD: ICP | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09271		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
S2	S2	1.00	09312						X			X	X	X	X					X												X	
S3	S3	1.00	09331		X					X													X										X
S4	S4	1.00	09354																														
S5	S5	1.00	09380			X					X					X		X	X			X											
ICV	ICV	1.00	09414		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICB	ICB	1.00	09450		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRII	1.00	09492		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAI	1.00	09533		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABI	1.00	09574		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV1	1.00	10024		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB1	1.00	10070		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	VS61MB1	1.00	10112																														
ZZZZZZ	VS61B	1.00	10154																														
ZZZZZZ	VS61C	1.00	10195																														
ZZZZZZ	VS61A-L	5.00	10241																														
ZZZZZZ	VS61A	1.00	10283																														
ZZZZZZ	VS61ADUP	1.00	10324																														
ZZZZZZ	VS61ASPK	1.00	10370																														
ZZZZZZ	ZZZZZZ	1.00	10410																														
ZZZZZZ	VS61MB1SPK	1.00	10451																														
CCV	CCV2	1.00	10491		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB2	1.00	10533		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRIF	1.00	10575		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAF	1.00	11020		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABF	1.00	11061		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV3	1.00	11101		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB3	1.00	11143		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
PBW	VS80MB1	1.00	11185		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-4-1112	VS80B	1.00	11230		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-10-1112	VS80C	1.00	11272		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-2-1112L	VS80A-L	5.00	11314		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-2-1112	VS80A	1.00	11355		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-2-1112D	VS80ADUP	1.00	11401		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-2-1112S	VS80ASPK	1.00	11443		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X

VS80 00138

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 11/28/2012

SDG: VS80 | RUNID: IP112871 | METHOD: ICP | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	ZZZZZZ	1.00	11485																														
LCSW	VS80MB1SPK	1.00	11531		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV4	1.00	11571		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB4	1.00	12013		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRIF1	1.00	12055		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAF1	1.00	12100		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABF1	1.00	12141		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV5	1.00	12181		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB5	1.00	12223		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X

VS80 : 60169

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS80 | RUNID: MS112811 | METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09160				X																	X	X	X				X			
S1	S1	1.00	09200				X																	X	X	X				X			
S2	S2	1.00	09240				X																	X	X	X				X			
S3	S3	1.00	09280				X																	X	X	X				X			
S4	S4	1.00	09330				X																	X	X	X				X			
S5	S5	1.00	09390																														
ZZZZZZ	Rinse sampl	1.00	09460																														
ICV	MICV	1.00	10010				X																	X	X	X				X			
ICB	ICB	1.00	10080				X																	X	X	X				X			
CCV	MCCV1	1.00	10120				X																	X	X	X				X			
CCB	CCB1	1.00	10190				X																	X	X	X				X			
CRI	MCRI	1.00	10230				X																	X	X	X				X			
ICSA	ICSAI	1.00	10270				X																	X	X	X				X			
ICSAB	ICSABI	1.00	10340				X																	X	X	X				X			
ZZZZZZ	LR200	1.00	10410																														
ZZZZZZ	LR300	1.00	10470																														
ZZZZZZ	B1	1.00	10540																														
ZZZZZZ	B2	1.00	11000																														
ZZZZZZ	B3	1.00	11060																														
CCV	MCCV2	1.00	11100				X																	X	X	X				X			
CCB	CCB2	1.00	11170				X																	X	X	X				X			
ZZZZZZ	VT84MB1	2.00	11350																														
ZZZZZZ	VT84MB2	2.00	11390																														
ZZZZZZ	VT84MB2SPK	2.00	11430																														
ZZZZZZ	VT84MB1SPK	2.00	11470																														
ZZZZZZ	VT84A	2.00	11510																														
ZZZZZZ	VT84B	2.00	11550																														
CCV	MCCV3	1.00	12060				X																	X	X	X				X			
CCB	CCB3	1.00	12130				X																	X	X	X				X			
ZZZZZZ	VS20MB1	20.00	12220																														
ZZZZZZ	VS20MB1SPK	20.00	12260																														
ZZZZZZ	VR88MB2SPK	2.00	12310																														
ZZZZZZ	VR88J	5.00	12360																														
ZZZZZZ	VS20B	20.00	12400																														
ZZZZZZ	VS20C	20.00	12440																														

VS80 : 09/09

FORM XIV

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS80 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS20D	20.00	12480																														
ZZZZZZ	VS20E	20.00	12520																														
ZZZZZZ	VS20G	20.00	12560																														
ZZZZZZ	VS20H	20.00	13000																														
CCV	MCCV4	1.00	13050				X																	X	X	X				X			
CCB	CCB4	1.00	13120				X																	X	X	X				X			
ZZZZZZ	VS21MB1	20.00	13220																														
ZZZZZZ	VS21MB1SPK	20.00	13260																														
ZZZZZZ	VS21A-L	100.00	13300																														
ZZZZZZ	VS21A	20.00	13340																														
ZZZZZZ	VS21ADUP	20.00	13380																														
ZZZZZZ	VS21ASPK	20.00	13420																														
ZZZZZZ	ZZZZZZ	20.00	13470																														
ZZZZZZ	VS21B	20.00	13510																														
ZZZZZZ	VS20I	20.00	13550																														
ZZZZZZ	VS20D	100.00	13590																														
CCV	MCCV5	1.00	14030				X																	X	X	X				X			
CCB	CCB5	1.00	14100				X																	X	X	X				X			
ZZZZZZ	VS21C	20.00	14170																														
ZZZZZZ	VS21D	20.00	14210																														
ZZZZZZ	VS21E	20.00	14260																														
ZZZZZZ	VS21F	20.00	14300																														
ZZZZZZ	VS21G	20.00	14340																														
ZZZZZZ	VS21H	20.00	14390																														
ZZZZZZ	VS21I	20.00	14430																														
ZZZZZZ	VS21J	20.00	14470																														
ZZZZZZ	VS21K	20.00	14510																														
ZZZZZZ	VS21L	20.00	14550																														
CCV	MCCV6	1.00	14590				X																	X	X	X				X			
CCB	CCB6	1.00	15060				X																	X	X	X				X			
ZZZZZZ	VS22MB1	20.00	15130																														
ZZZZZZ	VS22MB1SPK	20.00	15180																														
ZZZZZZ	VS22A-L	100.00	15230																														
ZZZZZZ	VS22A	20.00	15270																														
ZZZZZZ	VS22ADUP	20.00	15310																														

FORM XIV

VS80.0851

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS80 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS22ASPK	20.00	15350																														
ZZZZZZ	VS22APOST	20.00	15390																														
ZZZZZZ	VS22B	20.00	15430																														
ZZZZZZ	VS22C	20.00	15470																														
ZZZZZZ	VS21B	100.00	15520																														
CCV	MCCV7	1.00	15560				X																	X	X	X				X			
CCB	CCB7	1.00	16030				X																	X	X	X				X			
ZZZZZZ	VS22D	20.00	16160																														
ZZZZZZ	VS22E	20.00	16200																														
ZZZZZZ	VS22F	20.00	16250																														
ZZZZZZ	VS22G	20.00	16290																														
ZZZZZZ	VS22H	20.00	16330																														
ZZZZZZ	VS22I	20.00	16370																														
ZZZZZZ	VS22J	20.00	16420																														
ZZZZZZ	VS22K	20.00	16460																														
ZZZZZZ	VS22L	20.00	16500																														
ZZZZZZ	VS45B	2.00	16540																														
CCV	MCCV8	1.00	16580				X																	X	X	X				X			
CCB	CCB8	1.00	17050				X																	X	X	X				X			
ZZZZZZ	VS45MB1	2.00	17090																														
ZZZZZZ	VS45MB1SPK	2.00	17130																														
ZZZZZZ	VS45A-L	10.00	17180																														
ZZZZZZ	VS45A	2.00	17230																														
ZZZZZZ	VS45ADUP	2.00	17270																														
ZZZZZZ	VS45ASPK	2.00	17310																														
ZZZZZZ	ZZZZZZ	2.00	17350																														
ZZZZZZ	VS45C	2.00	17390																														
ZZZZZZ	VS45D	2.00	17430																														
ZZZZZZ	VS45E	2.00	17470																														
CCV	MCCV9	1.00	17510				X																	X	X	X				X			
CCB	CCB9	1.00	17580				X																	X	X	X				X			
ZZZZZZ	VS61MB1	2.00	18020																														
ZZZZZZ	VS61MB1SPK	2.00	18070																														
ZZZZZZ	VS61A-L	10.00	18120																														
ZZZZZZ	VS61A	2.00	18160																														

FORM XIV

VS80 : 00192

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mines | INSTRUMENT ID: NEXION 300D MS | START DATE: 11/28/2012

SDG: VS80 | RUNID: MS112811 METHOD: PMS | END DATE: 11/28/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	VS61ADUP	2.00	18200																														
ZZZZZZ	VS61ASPK	2.00	18240																														
ZZZZZZ	ZZZZZZ	2.00	18280																														
ZZZZZZ	VS45F	2.00	18320																														
ZZZZZZ	VS61B	2.00	18370																														
ZZZZZZ	VS61C	2.00	18410																														
CCV	MCCV10	1.00	18450				X																	X	X	X				X			
CCB	CCB10	1.00	18520				X																	X	X	X				X			
PBW	VS80MB1	2.00	18560				X																	X	X	X				X			
LCSW	VS80MB1SPK	2.00	19000				X																	X	X	X				X			
LMW-2-1112L	VS80A-L	10.00	19050				X																	X	X	X				X			
LMW-2-1112	VS80A	2.00	19090				X																	X	X	X				X			
LMW-2-1112D	VS80ADUP	2.00	19130				X																	X	X	X				X			
LMW-2-1112S	VS80ASPK	2.00	19180				X																	X	X	X				X			
ZZZZZZ	ZZZZZZ	2.00	19220																														
LMW-4-1112	VS80B	2.00	19260				X																	X	X	X				X			
LMW-10-1112	VS80C	2.00	19300				X																	X	X	X				X			
CCV	MCCV11	1.00	19340				X																	X	X	X				X			
CCB	CCB11	1.00	19410				X																	X	X	X				X			

VS80 : 0001 93

Mercury Analysis
Report and Summary QC Forms

ARI Job ID: VS80, VS81

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS81

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-2-1112	VS81A	12-23011	
LMW-2-1112D	VS81ADUP	12-23011	
LMW-2-1112S	VS81ASPK	12-23011	
LMW-4-1112	VS81B	12-23012	
PBW	VS81MB1	12-23012	
LCSW	VS81MB1SPK	12-23012	
LMW-10-1112	VS81C	12-23013	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 11/26/12 Title: Inorganics Director

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

ANALYTICAL RESOURCES INCORPORATED

Data Release Authorized:
Reported: 12/07/12
Date Received: 11/15/12
Page 1 of 1

QC Report No: VS81-Golder Associates
Project: Landsburg Mine
923-1000-002.R273

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
LMW-2-1112 VS81A 12-23011	11/15/12	Water	11/19/12 11/26/12	100	100 U
LMW-4-1112 VS81B 12-23012	11/15/12	Water	11/19/12 11/26/12	100	100 U
LMW-10-1112 VS81C 12-23013	11/15/12	Water	11/19/12 11/26/12	100	100 U
MB-111912 Method Blank	NA	Water	11/19/12 11/26/12	100	100 U

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

FORM-I

VS80:00196 AV 12/10/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-2-1112**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: VS81A
LIMS ID: 12-23011
Matrix: Water
Data Release Authorized:
Reported: 12/07/12

QC Report No: VS81-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7470A	100 U	100 U	100	90.8%	

Reported in ng/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

FORM-V

VS80C00197 AV 12/10/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LMW-2-1112**
Page 1 of 1 **DUPLICATE**

Lab Sample ID: VS81A
LIMS ID: 12-23011
Matrix: Water
Data Release Authorized:
Reported: 12/07/12

QC Report No: VS81-Golder Associates
Project: Landsburg Mine
923-1000-002.R273
Date Sampled: 11/15/12
Date Received: 11/15/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7470A	100 U	100 U	0.0%	+/- 100	L

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

FORM-VI

VS80:00198 AV 12/10/12

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: VS63LCS
LIMS ID: 12-22884
Matrix: Water
Data Release Authorized:
Reported: 11/26/12

QC Report No: VS63-Golder Associates
Project:

Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	196	200	98.0%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS81

UNITS: ng/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Mercury	HG	CVL	HG112601	500.0	458.00	**91.6**	500.0	493.00	**98.6**	490.00	**98.0**	493.00	**98.6**				

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS81

UNITS: ng/L

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Mercury	HG	CVL	HG112601		20.0	15.20	**76.0**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS81

UNITS:ng/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Mercury	HG	CVL	HG112601	25.0	20.0	20.0	U	20.0	U	20.0	U	20.0	U				

VS81 : 99293

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS81 UNITS: ng/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ng/L)	ICP LR DATE
Mercury	HG	CVL	CETAC MERCURY	253.70		25	20.0	4/1/2012		

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine

SDG: VS81

ANALYSIS METHOD: CVL

ARI PREP CODE: TLM

PREPDATE: 11/19/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-2-1112	VS81A	0.000	20.0	20.0
LMW-2-1112D	VS81ADUP	0.000	20.0	20.0
LMW-2-1112S	VS81ASPK	0.000	20.0	20.0
LMW-4-1112	VS81B	0.000	20.0	20.0
LMW-10-1112	VS81C	0.000	20.0	20.0
PBW	VS81MB1	0.000	20.0	20.0
LCSW	VS81MB1SPK	0.000	20.0	20.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg Mine | INSTRUMENT ID: CETAC MERCURY | START DATE: 11/26/2012

SDG: VS81 | RUNID: HG112601 | METHOD: CVL | END DATE: 11/26/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	11000														X																
S20	S20	1.00	11025														X																
S50	S50	1.00	11053														X																
S100	S100	1.00	11081														X																
S200	S200	1.00	11105														X																
S400	S400	1.00	11133														X																
S1000	S1000	1.00	11162														X																
ICV	AICV	1.00	11230														X																
ICB	ICB	1.00	11254														X																
CCV	ACCV1	1.00	11282														X																
CCB	CCB1	1.00	11311														X																
CRA	CRA	1.00	11335														X																
ZZZZZZ	VS63MB1	1.00	11363																														
ZZZZZZ	VS63MB1SPK	1.00	11391																														
ZZZZZZ	VS63A	1.00	11415																														
ZZZZZZ	VS63ADUP	1.00	11444																														
ZZZZZZ	VS63ASPK	1.00	11472																														
ZZZZZZ	VS63B	1.00	11500																														
ZZZZZZ	VS63C	1.00	11524																														
PBW	VS81MB1	1.00	11552														X																
LCSW	VS81MB1SPK	1.00	11581														X																
CCV	ACCV2	1.00	12005														X																
CCB	CCB2	1.00	12034														X																
LMW-2-1112	VS81A	1.00	12062														X																
LMW-2-1112D	VS81ADUP	1.00	12090														X																
LMW-2-1112S	VS81ASPK	1.00	12114														X																
LMW-4-1112	VS81B	1.00	12142														X																
LMW-10-1112	VS81C	1.00	12170														X																
ZZZZZZ	VS46MB1	1.00	12194																														
ZZZZZZ	VS46MB1SPK	1.00	12223																														
ZZZZZZ	VS46A	1.00	12251																														
ZZZZZZ	VS46ADUP	1.00	12275																														
ZZZZZZ	VS46ASPK	1.00	12303																														
CCV	ACCV3	1.00	12332														X																
CCB	CCB3	1.00	12360														X																

FORM XIV

APPENDIX B
SAMPLE INTEGRITY DATA SHEETS (SIDS)

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-2-1112

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 11/15/2012 **Time** 0942

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 – 7.32 ft below TOC (~~monument~~ PVC (inner) at elev. X) (bottom at 38.1 ft bgs, 4-in casing)

Screen Interval – 27.9-38.1 ft bgs Inner PVC 2.38 ~~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 clear, 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 – ~~1 Liter~~ 500ml, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) Jill Jessen **Date** 11/15/2012

Supervisor (signature) [signature] **Date** 11/16/2012

cc

FIELD PARAMETERS SHEET

Well ID LMW-2
Date 11/15/2012
Time Begin Purge 0837
Time Collect Sample 0942

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
7.32	0941 11/2/12							
	910		7.13		10.7	0.12	0.61	317.2
	915		7.07	719	10.7	0.01	0.40	179.1
	920		7.0	1	10.8	0.00	0.43	167.2
	925		7.07	7	10.7	0.00	0.45	163.7
	930		7.07	712	10.7	0.00	0.42	153.3
	935		7.07	706	10.7	0.00	0.44	151.6

Comments:

Grundfos set @ 80 Hz

PID = 0.0 ppm

5 gal / 3.5 min = 1.4 gpm

30 gal/well vol / 1.4 gpm = 21 min /well vol.

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-3-1112

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 11/13/2012 **Time** 1030

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 – 12.89 ft below TOC (~~monument~~ inner PVC at elev. X) (bottom at 64.8 ft bgs, 4-in casing)

Screen Interval – 49.8-64.8 ft bgs Monument: 3.08 ags inner PVC : 2.35 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, 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 – ~~1 Liter~~ 500 ml, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) [signature] **Date** 11/13/2012

Supervisor (signature) [signature] **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-3
Date 11/13/2012
Time Begin Purge 0921
Time Collect Sample 1030

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
12.89	1047 on 11/12/12							
	0943		7.85	*	10.8	0.08	0.25	585.1
	0948		7.85	*	10.8	0.00	0.38	562.5
	0953		7.85	341	10.8	0.00	0.36	536.8
	0958		7.85	341	10.8	0.00	0.25	538.0
	1003		7.85	344	10.8	0.00	0.23	515.2
	1008		7.85	347	10.8	0.00	0.18	486.4
	1003		7.85	348	10.8	0.00	0.27	463.3
	1008		7.85	348	10.8	0.00	0.25	453.2
	1013		7.85	348	10.8	0.00	0.15	438.0
	1018		7.85	349	10.8	0.00	0.26	440.3
	1023		7.85	349	10.8	0.00	0.10	394.7
	1028		7.85	352	10.8	0.00	0.16	360.8

Comments:
Grundfos 110 Hz. Inflated packer to 110 psi.

$\frac{5\text{gal}}{4\text{min}} = 1.25\text{gpm} \rightarrow \frac{27\text{gal/wellvol.}}{1.25\text{gpm}} = 21.6\text{ min/ wellvolume}$

PID = 0.0 ppm

* Cond. not calibrating.

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-4-1112

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 11/15/2012 **Time** 1045

Media Water **Station** LMW-4

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

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

SWL – 8.80** ft below TOC (~~monument~~ inner PVC at elev. X) (bottom at 209.7 ft bgs, 4-in casing)

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

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

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

(~26.9 gal/total well vol below packer)

** Depths corrected for 70° inclination -uncorrected: 9.36 'btoc.

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 – ~~1 Liter~~ 500mL, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) [signature] **Date** 11/15/2012

Supervisor (signature) [signature] **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-4
Date 11/15/2012
Time Begin Purge 0955
Time Collect Sample ~~0947~~ 1045

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh (pH) Rel mV
9.36 / 8.80*	11/12/12 0951							
	1007		7.13	733	10.7	0.00	0.46	143.7
	1017		7.12	710	10.7	0.00	0.50	131.2
	1027		7.10	670	10.7	0.00	0.40	125.2
	1037		7.10	665	10.7	0.00	0.51	119.8
	1042		7.09	648	10.7	0.00	0.37	117.0

Comments:
* corrected for 70° inclination

Inflated packer to 140 psi
Grundfos set @ 120 Hz.
PID < 0.0 ppm
Sulfur odor

$\frac{5\ gal}{3\ min} = 1.7\ gpm$

$\frac{27\ gal\ (well\ vol)}{1.7\ gpm} = 17\ min / well\ volume.$

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-5-1112

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 11/13/2012 **Time** 1225

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 – 14.43 ft below TOC (~~monument~~ inner PVC at elev. X) (bottom at 241.8 ft bgs, 4-in casing)

Screen Interval – 231.8-241.8 ft bgs Monument: 3.24 ags Inner PVC: 2.64 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 clear, ~~no odor~~ sulphur 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 – ~~1 Liter~~ 500ml, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) [signature] **Date** 11/13/2012

Supervisor (signature) [signature] **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-5
Date 11/13/2012
Time Begin Purge 1135
Time Collect Sample 1225

(pH)

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
14.43	1051 on	11/12/12						
	1145		7.04	856	11.9	0.63	1.02	153.0
	1150		7.04	857	11.9	0.00	1.40	149.0
	1155		7.04	861	11.9	0.00	0.59	144.3
	1200		7.04	861	11.9	0.00	0.56	142.7
	1205		7.01	858	11.0	0.00	0.34	141.1
	1210		7.01	860	11.0	0.00	0.22	139.3
	1215		7.02	858	11.1	0.00	0.27	136.5
	1220		7.02	857	11.1	0.00	0.28	135.0

Comments:
Grundfos @ 160 Hz
Packer inflated to 150 psi

$\frac{5\ gal}{3.5\ min} = 1.4\ gpm$

$\frac{18.7\ gal/well\ vol}{1.4\ gpm} = 13\ min/well\ vol.$

PID = 0.0 ppm

Sampler's Initials JS

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-6-1112

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 11/14/2012 **Time** 1410

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 – 35.76 ft below TOC (~~monument~~ inner PVC at elev. X) (bottom at 105.9 ft bgs, 4-in casing)

Screen Interval – 90.9-105.9 ft bgs Monument: 3.05 ags Inner PVC: 2.58 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, 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 – ~~1 Liter~~ 500mL, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) Jill Lowe **Date** 11/14/2012

Supervisor (signature) [signature] **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-6
Date 11/14/2012
Time Begin Purge 1313
Time Collect Sample 1410

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
35.76	1001 on 11/12/12							
	1325		6.	—	9.9	1.92	3.36	170.0
	1335		7	—	9.8	0.74	0.78	159.4
	1345			—	9.7	0.00	0.58	158.4
	5		7	—	9.8	0.00	0.42	157.3
	1405		7.00	—	9.8	0.00	0.20	156.8

Comments:
Grundfos @ 170HZ
Packer @ 110 psi
PID=0.0ppm
5gal/3min = 1.7gpm
30gal well vol / 1.7 gpm =
* Conductivity meter not working

Sampler's Initials SL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-7-1112, LMW-7-1112-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 11/13/2012 **Time** 1430, 1435 (dup)

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 – 212.79 ** ft below TOC (~~monument~~ inner PVC at elev. X) (bottom at 253.7 ft bgs, 4-in casing)

Screen Interval – 239.6-253.7 ft bgs Monument: 3.09 ags Inner PVC: 2.72 ags

Sand Pack Interval – NA

Packer Depth – NA (~28.3 gal/casing vol) ** Depths corrected for 70° inclination

Sample Description clear, no odor

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 – ~~1 Liter~~ 500mL, 4 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
4 – 1 Liter, 4 – 500 ml	PCBs/Pest	Glass Amber	none
4 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) _____ **Date** 11/13/2012

Supervisor (signature) _____ **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-7
Date 11/13/2012
Time Begin Purge 1328
Time Collect Sample ~~1430~~ 1430, 1435 (dup)

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
226.45 | 212.79*	0921 on 11/12/12							
	1332		7.52	433	12.0	0.15	0.83	137.6
	1342		7.42	497	12.1	0.04	0.84	116.8
	1352		7.31	568	12.1	0.01	0.44	121.9
	1402		7.28	593	12.0	0.00	0.37	122.3
	1412		7.27	602	12.1	0.00	0.34	122.1
	1422		7.27	603	12.2	0.0	0.28	121.5

from pH

Comments:
* corrected depth for 70° inclination
Grundfos set @ 345 Hz
5 gal / 3.5 min = 1.4 gpm
28 gal/well vol / 1.4 gpm = 19.5 min/well vol
PID = 0.0 ppm

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-8-1112 , LMW-EB-1112

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, Bailer for VOC samples

Date 11/13/2012 **Time** 1125 EB @ 1020

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 – 4.53 ft below TOC (PVC at black notch) (bottom at 13 ft bgs, 2-in casing)

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, sulphur odor. Rusty colored water @ start of purge

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 – ~~1 Liter~~ 500mL, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) [signature] **Date** 11/12/12

Supervisor (signature) [signature] **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-8
Date 11/13/12
Time Begin Purge 1051
Time Collect Sample 1115

Water Level feet bmp	Time	Volume Purged	pH (from pH)	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
4.53	1057 on	11/12/12						
	1052		7.85	750	10.8	1.41	14.1	183.1
	1057		7.85	779	10.8	0.54	6.28	150.2
	1102		7.84	786	10.8	0.38	2.09	143.1
	1107		7.84	794	11.7	0.43	1.49	141.7
	1112		7.85	795	11.8	0.50	1.02	143.1
	1117		7.04*	793	11.8	1.51	0.77	151.2
	1122		7.04	790	11.9	1.06	0.54	149.8

Comments:

1020 - collect FB through tubing prior to purge
PID = 0.0 ppm. Turbid @ start of purge.
flow rate = 230 mL/min
* reset pH meter since it didn't seem to be changing & temp was different from other instruments... appears ok.

1020 - Collected field blank prior to purge. Thru tubing (+ filter for diss. metals)
LMW-EB-1112

Sampler's Initials jcl

* Collected VOC + HCID thru a bailer.

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-9-1112

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 11/14/2012 **Time** 1000

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 – 100.20 ft below TOC (PVC at black notch) (bottom at 159 ft bgs, 2-in casing)

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 clear, no odor, 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 – ~~1 Liter~~ 500mL, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) Jill Lunn **Date** 11/14/2012

Supervisor (signature) Dan Wall **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-9
Date 11/14/2012
Time Begin Purge 0906
Time Collect Sample 1000

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
100.20	1105 on 11/12/12							
	915		7.10	—	11.5	0.02	0.28	172.0
	925		7.11	—	11.5	0.00	0.52	167.5
	935		7.11	—	11.5	0.00	0.37	160.1
	945		7.10	—	11.4	0.00	0.21	156.1
	955		7.11	—	11.4	0.00	0.20	154.0

Comments:
Grundfos set @ 28 Hz.
PID = 0.0 ppm

$\frac{5 \text{ gal}}{3.3 \text{ min}} = 1.4 \text{ gpm}$

$\frac{21.6 \text{ gal/well vol}}{1.4 \text{ gpm}} = 15 \text{ min. 1 well vol}$

* Conductivity meter not working

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-10-1112

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 11/15/2012 **Time** 1150

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

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

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

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

Sample Description 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 – ~~1 Liter~~ 500mL, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) [signature] **Date** 11/15/2012

Supervisor (signature) [signature] **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-10
Date 11/15/2012
Time Begin Purge 1108
Time Collect Sample 1150

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
0.00	0953 on	11/12/12						
	1115		8.87	371	10.6	0.07	0.99	91.6
	1120		8.88	370	9.9	0.00	0.79	39.2
	1125		8.88	370	9.9	0.00	0.55	30.9
	1130		8.87	369	10.0	0.00	0.53	14.6
	1135		8.87	368	10.0	0.00	0.46	12.4
	1140		8.88	367	10.0	0.00	0.37	2.9

Comments:
controller throttle : 60psi
tank : 110psi
cycle ID : 50 (20sec/10sec) 2cpm
Flowrate : 730 mls/min
PID = 0.0ppm

Sampler's Initials JL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-11-1112

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 QED Bladder

Date 11/14/2012 **Time** 1150

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 – 158.00 ft below TOC (PVC) (bottom at 707 ft bgs, 4-in casing)

Screen Interval – 696-707 ft bgs PVC stickup: ~~2.70~~ 2.37 ags outer metal casing: 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, 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 – ~~1 Liter~~ 500m, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
2 – 1 Liter, 2 – 500 ml	PCBs/Pest	Glass Amber	none
2 – 500 mL	SVOCs	Glass Amber	none

Sampler (signature) Jill Lin **Date** 11/14/2012

Supervisor (signature) [signature] **Date** 11/16/2012

FIELD PARAMETERS SHEET

Well ID LMW-11
Date 11/14/2012
Time Begin Purge 1059 (Grundfos) 1120 (bladder).
Time Collect Sample 1150

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
								(pH)
158.00	1115 @ 11/12/12							
	1127		7.41	*	10.6	4.02	2.95	155.7
	1132		7.33		10.5	1.90	1.30	143.0
	1137		7.31		10.5	1.24	0.99	137.9
	1142		7.33		10.5	0.71	0.71	131.8
	1147		7.34		10.5	0.53	0.57	127.1

Comments:
1059 began purge of with Grundfos to initialize flow rate/circle well. Pump set @ 170' below TOC, pump controller 330 Hz. Purge rate is ~2.3 gpm.
Purged for 20 min, then started bladder pump. @ 1120
Pump @ 110 psi, 1 cpm
Tank @ 110 psi
Cycle ID @ 30 (30 sec/30 sec)
rate = 340 mls/min
* Cond. meter not working
PID = 0.0 ppm

Sampler's Initials JSL

* Conductivity meter not working