Phase III Hydrogeologic Investigation

RS10A – Hydrogeological – Drill Hole Monitoring and Data Collection – Phase 3

PolyMet Mining, Inc.

March 2007

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NorthMet Mine Site
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Table of Contents

List of Tables

List of Figures

List of Appendices

Supplemental Electronic Data

Aquifer Test Groundwater Elevation Data (available upon request)

Groundwater Analytical Data Reports (available upon request)

List of RS Documents Referenced

RS02 Hydrogeological – Drill hole monitoring and data collection – Phase 1

RS10 Hydrogeological – Drill hole monitoring and data collection – Phase 2

RS44 Wetlands Hydrology Study (baseline)

1.0 Introduction

This report was prepared for PolyMet Mining Inc (PolyMet) by Barr Engineering Company (Barr) to document the results of the Phase III Hydrogeologic Investigation that was conducted at PolyMet's NorthMet mine site (the Mine Site)(Figure 1). The objectives of this work were to evaluate the possible effects of mine dewatering on the wetland areas in the vicinity of the Mine Site, to gather additional specific-capacity data for wells completed in the Virginia Formation, and to gather additional water-quality data for groundwater within the surficial deposits, the Virginia Formation, and the Duluth Complex.

1.1 Background

A scoping Environmental Assessment Worksheet (EAW) was submitted in June 2005 for PolyMet's proposed NorthMet Mine and Ore Processing Facility, located near Hoyt Lakes, Minnesota. The NorthMet deposit is in the Duluth Complex, a large mafic intrusion that was emplaced into flood basalts along a portion of the Middle Proterozoic Midcontinent Rift System. Underlying the Duluth Complex at NorthMet is the sedimentary Lower Proterozoic Virginia Formation, which in turn, is underlain by the Biwabik Iron-Formation. The Biwabik Iron-Formation will not be intersected during mining operations. The Virginia Formation will likely form a portion of the footwall of the proposed mine pits.

Based on coring data collected by PolyMet, the bedrock surface appears to be hummocky at the Mine Site. Much of the Mine Site is covered by peat/wetland deposits, with the remaining area covered by rolling to undulating topography formed from Wisconsin Rainey Lobe drift. Rainey Lobe drift is generally a bouldery till with high clay content. In the region, only the Embarrass River basin northwest of the Mine Site and the Dunka River basins northeast of the Mine Site appear to have significant quantities of outwash (sand and gravel), with thicknesses greater than 100 feet (Olcott and Siegel, 1978). Elsewhere in the region, including the Mine Site, the surficial deposits form a thin cover over the bedrock.

Two phases of hydrogeologic investigations were previously performed at the Mine Site (RS02 and RS10). The Phase I Hydrogeologic Investigation (Barr, 2006a) studied the hydrogeologic properties and water quality of the Duluth Complex and the surficial deposits. The Phase II Hydrogeologic Investigation (Barr, 2006b) studied the hydrogeologic properties and water quality of the Virginia Formation.

A baseline wetland hydrology study has been implemented at the Mine Site (RS44) and will continue into the future. The objective of this study is to gain a better understanding of the wetland hydrology at the Mine Site, collect baseline hydrology data, and determine the potential for indirect wetland impacts resulting from the project. As part of this work, 24 shallow wetland monitoring wells were installed at the Mine Site. The Phase III Hydrogeologic Investigation was designed, in part, to help determine the potential interaction between the wetlands and the bedrock, which will assist in predicting the potential for indirect wetland impacts resulting from the dewatering of the proposed mine pits.

1.2 Scope of Work

Three main activities were conducted during this phase of investigation at the Mine Site:

- pumping test to evaluate the connectivity of the bedrock and the surficial deposits;
- specific capacity tests to evaluate potential vertical variability of hydraulic conductivity in the Virginia Formation; and
- groundwater sampling to further characterize water quality within the surficial deposits, the Virginia Formation, and the Duluth Complex.

All work was performed in accordance with the Work Plan (Appendix A) unless noted otherwise. The most significant change to the work plan that was made was the duration of pumping for the pumping test, which was increased from 10 days to 30 days. This change was made at the request of the Minnesota Department of Natural Resources.

1.3 Report Organization

This report is organized into four sections, including this introduction. Section 2 summarizes the field activities, data collection methodology, and results from the aquifer performance tests. Section 3 presents the groundwater sampling methodology and results. A summary of the investigation and conclusions are presented in Section 4.

2.0 Aquifer Performance Testing

2.1 Field Activities and Data Collection Methodology

2.1.1 Pumping Test

A 30-day aquifer performance test (i.e., pumping test) was conducted in pumping well P-2. Water levels in pumping well P-2 and six observation wells, Ob-2, 20, 20P, 2P, 12, and 12P, were monitored using pressure transducers and data loggers for 10 days prior to pumping, 30 days during pumping, and 10 days after pumping. Pumping and observation well locations are shown on Figure 2.

Pumping well P-2, completed within the Virginia Formation, and observation well Ob-2, completed within the Duluth Complex, were previously installed during the Phase II Investigation. Observation wells 20, 20P, 2P, 12, and 12P were previously installed in the muck/peat layer in the wetland north of P-2 as part of the Wetland Hydrology Study, which was conducted concurrently with this investigation. Pumping well P-2 is 610 feet deep, observation well Ob-2 is 100 feet deep, observation wells 20P, 2P, and 12P are approximately 7.5 feet deep, and observation wells 20 and 12 are 2.4 and 3 feet deep, respectively.

Water levels were measured using LevelTroll and miniTroll data logging probes, both manufactured by In Situ, Inc. The probes automatically measured and recorded water levels in the wells and also automatically corrected for changes in atmospheric pressure. Background water levels in the pumping well were measured and recorded by the Trolls every hour for 10 days prior to pumping, every 30 minutes during the 30-day pumping test, and every 30 minutes during the 10-day recovery. Additionally, manual water levels were measured at least twice daily during the 30-day pumping test.

A submersible pump was placed in pumping well P-2 at a depth of 302 feet below ground surface (bgs). An inline flowmeter was used to measure pumping rates. In order to avoid hydraulic interference with the pumping test, discharge water was routed via hoses 3000 feet to a down-slope upland (i.e. non-wetland) area shown in Figure 2.

Pumping began on October 19, 2006 at a flow rate of 25 gallons per minute (gpm). After pumping for 4 hours, the flow rate was decreased to 23 gpm. Because the water level continued to drop for the next two days, on October 21, 2006 the flow rate was again decreased to approximately 22 gpm. On November 1, 2006, pumping was briefly interrupted to change generators. With the change in

generators, the pumping rate changed to approximately 20 gpm. Two days later, on November 3, 2006, the flow rate was increased to approximately 21.5 gpm; pumping continued at that flow rate until the pump was turned off on November 18, 2006.

The pump was pulled from pumping well P-2 two days after pumping ended and the pump, drop pipe, and cable were cleaned with Liquinox after use. Trolls in all seven wells were left in place to monitor the recovery and were pulled ten days after pumping ended. Water level data from the logging probes is included as supplemental electronic data.

2.1.2 Specific Capacity Tests

Specific capacity tests were conducted in isolated vertical intervals in pumping wells P-3 and P-4 (Figure 2), using a packer assembly and a submersible pump. In order to isolate the upper half of the well from the lower half, a 2.5 foot long packer was set at approximately the midpoint of the well and the pump was set above the packer assembly. The upper half of the well was pumped at a steady rate until the water level became relatively stable. The pumping rate was then increased and the test ran until the water level again stabilized. Both tests lasted approximately four hours.

Water levels were monitored both above and below the packer assembly, using LevelTroll data logging probes, manufactured by In Situ, Inc. The probes automatically measured and recorded water levels in the wells and also automatically corrected for changes in atmospheric pressure; however the Troll below the packer at pumping well P-4 did not correct for changes in atmospheric pressure. Trolls above the packer recorded water levels on a log cycle with a maximum of 10 minutes between readings. Trolls below the packer recorded water levels every 5 minutes. Additionally, manual water levels were recorded during the tests at least every 20 minutes for the zone above the packer assembly. Discharge water was routed via hoses 1,000 feet to a down-slope upland (i.e. non-wetland) area. An in-line flowmeter was used to measure pumping rates. Water level data from the logging probes are included as supplemental electronic data.

Pumping well P-3, installed during the Phase II Investigation, is 610 feet deep and is completed within the Virginia Formation. The packer assembly was placed in the well at an approximate depth of 301.5 – 304 feet below ground surface (bgs). The packer was inflated to 290 psi at 13:39 on October 17, 2006. Pumping began at 13:44 at a flow rate of 27 gpm. At 13:47, three minutes after beginning the test, the pumping rate was turned down to 19.2-19.4 gpm. At 16:08, after 2.4 hours of pumping, the water level was relatively stable and the pumping rate was increased to 25 gpm. Because a higher pumping rate was desired, the pumping rate was again increased at 16:09 to 37.5-

39.5 gpm. At 17:43, after 1.6 hours of pumping at the increased rate, the water level again stabilized and the test was terminated. Packer deflation and pump removal began shortly thereafter. The pump, drop pipe, and cable were cleaned with Liquinox after use.

Pumping well P-4, installed during the Phase II Investigation, is 485 feet deep and is completed within the Virginia Formation. The packer assembly was intended to be placed in this well at an approximate depth of 242 feet bgs. However, an obstruction was encountered approximately 207 feet bgs. As a result, the packer was placed at an approximate depth interval of 198.8 – 201.3 feet bgs. The packer was inflated to 290 psi at 15:38 on November 21, 2006. Pumping began at 15:50 at a flow rate of 17 gpm. At 15:52, two minutes after beginning the test, the pumping rate was increased. At 15:55, three minutes later, the pumping rate was again increased to 19.2-20.6 gpm. At 17:52, after 2.0 hours of pumping, the water level was relatively stable and the pumping rate was increased to 37 gpm. At 19:49, after 2.0 hours of pumping at the increased rate, the water level again stabilized and the test was terminated. Packer deflation and pump removal began shortly thereafter.

2.2 Field Investigation Observations and Results

2.2.1 Pumping Tests

Data collected prior to pumping are shown on Figure 3. Overall, water levels rose during the pre-pumping test period at each of the monitoring locations. Throughout the pre-test period, the responses of piezometers 12 and 20 (both screened in the shallow wetland deposits) are strongly correlated, with a gradual fall in water levels for the first 5 days of monitoring. Both appear to respond with an increase in water levels following a precipitation event on October 11. Following this, water levels at both locations generally fall until an abrupt rise in water levels on October 16. This rise does not correlate with a known precipitation event. Following the abrupt rise, the water levels at these locations generally drop for the last 2 days of the pre-test monitoring period. The responses of the three wetland piezometers screened deeper in the wetland deposits (2P, 12P, and 20P) appear to correlate reasonably well throughout the pre-test period. Water levels in P-2 and Ob-2, completed in the bedrock aquifer, both show a general rise throughout the pre-test monitoring period. Superimposed on this overall rise are shorter period water-level fluctuations (on the scale of hours) that may be the result of "earth tides." Earth tides are caused by elastic deformation of the Earth as it rotates within the gravitational field of the Sun and Moon.

Pumping at P-2 commenced on October 19. During the pumping period, which lasted until November 18, most of the wetland piezometer locations showed a general decrease in water levels

(Figure 4). Water levels in wetland piezometer 2P fluctuated during the pumping period, but did not display the overall downward trend that was observed in the other piezometers. With the exception of 20P, the deep piezometer located closest to the pumping well, the decrease in water levels in the piezometers are not attributed to pumping. The decrease in water levels in the piezometers generally began on October 17, two days before the pump was turned on, and continued without a discernable change in trend following the start of pumping. When the pump was turned off, water levels in piezometers 2P, 12, 12P, and 20 continued to decrease for the remaining 10 days of the test. In contrast, the water level in piezometer 20P began to increase after the pump was turned off. Because water levels in piezometer 2P appeared to be unaffected by the pumping, data from piezometer 2P were used to filter out the background changes in water levels and to determine which portions of the observed drawdown at piezometers 20P were related to pumping. Results of this analysis are shown on Figure 5.

Pumping test data from P-2 and Ob-2 were evaluated using conventional time-drawdown analysis techniques. The aquifer testing software AQTESOLV (Hydrosolve, 2000) was used to perform the analysis. The pumping test data were analyzed using the Moench method (1984) for drawdown in an unconfined, fractured aquifer with slab shaped blocks (Figure 6). The Moench method is an analytical solution for predicting water-level displacements in response to pumping in a fractured aquifer assuming a dual-porosity model with slab-shaped matrix blocks, fracture skin, and wellbore skin. The Moench method assumes that the aquifer is of infinite areal extent, uniform thickness, and consists of a dual-porosity system with low-permeability, primary porosity blocks and high-permeability, secondary porosity fissures. The skin parameter allows for modeling of variable resistance to flow between the blocks and fractures and between the wellbore and fractures. The effects of wellbore storage, partial penetration, and variable pumping rates are included in the analysis. An aquifer thickness equal to the depth of the pumping well was assumed. The Moench method solves for the hydraulic conductivity and storage for both the fractures and the rock matrix and provides information on the wellbore skin and fracture skin.

The hydraulic conductivity of the fractures estimate obtained from this analysis is 0.047 feet/day. This value is consistent with results obtained during the Phase II Hydrogeologic Investigation (Barr 2006b) which estimated a hydraulic conductivity of 0.072 feet/day at pumping well P-2.

2.2.2 Specific Capacity Tests

The specific capacity test data were analyzed using the Moench method (1984) for drawdown in an unconfined, fractured aquifer with slab shaped blocks. This is the same method that was used to

analyze pumping test data as part of the Phase II Hydrogeologic Investigation (RS10). For the test of pumping well P-3, a single set of aquifer parameters was able to match the drawdown data from both steps of the test (Figure 7). Analysis of this test data results in a value of hydraulic conductivity for the fractures in the upper 300 feet of the formation of 0.63 ft/day. The pumping test conducted using the entire 600 foot well had an average hydraulic conductivity value for the fractures of 0.4 ft/day. Each step from the test conducted in pumping well P-4 was analyzed separately and the results are shown on Figures 8 and 9. The calculated average hydraulic conductivity value for the upper 200 feet of the aquifer at P-4 was 0.7 ft/day. The pumping test conducted using the entire 485 foot well had an average hydraulic conductivity value of the fractures of 0.33 ft/day.

3.0 Groundwater Sampling

3.1 Sampling Methodology

Groundwater samples for water-quality analyses were collected from the following permanent wells: monitoring wells MW-05-02, MW-05-08, MW-05-09, observation wells Ob-1, Ob-2, Ob-3, Ob-4, Ob-5, and pumping well P-2. Sampling locations are shown on Figure 10. Analytical reports from NTS are provided as supplemental data.

Monitoring wells MW-05-02, MW-05-08, and MW-05-09 were sampled in October and November 2006. These wells were installed during the Phase I Investigation and are screened in unconsolidated material. Observation wells Ob-1, Ob-2, Ob-3, Ob-4, and Ob-5 were sampled in October 2006. These wells were installed during the Phase II Investigation and are completed as open hole bedrock wells. All wells were developed after well construction. All wells were purged prior to sampling; purging was considered complete when the field measurements stabilized or when six borehole volumes of groundwater were evacuated. However, because MW-05-09 recovered very slowly, only one well volume was purged from the well, the well was allowed to recover, and the sample was collected. Field sampling data sheets are included in Appendix B. Groundwater samples were collected and placed into laboratory-supplied containers and submitted to Northeast Technical Services of Virginia, Minnesota (NTS) for laboratory analysis of general chemistry parameters, dissolved metals, and total metals.

Pumping well P-2 was sampled weekly for the duration of the 30-day pumping test in October and November 2006. Pumping well P-2 was installed during the Phase II Investigation and was completed as an open hole bedrock well. Groundwater samples were collected from a sampling spigot located on the discharge line, at the wellhead. Prior to collecting the sample, the sampling spigot was flushed by allowing it to flow for at least several minutes. Samples were collected by the Barr geologist on-site. Because the first sample from pumping well P-2 was collected after a week of pumping, purging was considered complete at the time the first sample was collected. Field parameters (temperature, conductivity, pH, ORP, and DO) were documented and are included in Table 1. Groundwater samples for laboratory analysis of general chemistry parameters, dissolved metals, and total metals were collected and placed into laboratory-supplied containers and submitted to NTS. Groundwater samples for laboratory analysis of δD, $\delta^{18}O$, tritium, and $\delta^{13}C$ of dissolved

inorganic carbon (DIC) were collected, filtered, and placed into laboratory-supplied containers and submitted to Isotech Laboratories, Inc. (Champaign, Illinois).

3.2 Analytical Results

Isotope analysis results of groundwater samples from pumping well P-2 are presented in Table 2. The data indicate that there was very little variability in water quality with time, with the exception of the delta carbon-13 of dissolved inorganic carbon (δ^{13}C DIC), which increased as pumping progressed. The presence of tritium in the samples (2.77-3.82 TU) suggests that at least a portion of the water pumped is post-1952 water. The water isotope data was plotted with precipitation data from the Marcell Experimental Forest Northern Research Station, located approximately 70 miles west of the Mine Site. The precipitation data was used to estimate a meteoric water line for the Mine Site. The data from pumping well P-2 plots very near this inferred meteoric water line. This suggests that the source of the majority of the water that was pumped was aquifer recharge and not seepage from surface water features, such as the Peter Mitchell Pit or area wetlands. Evaporation from open water enriches the water in the heavier isotopes. Groundwater that is derived from seepage from surface water, as opposed to aquifer recharge, is expected to be enriched in oxygen-18 and deuterium and would not fall on the regional meteoric water line.

Analytical results of groundwater samples from monitoring wells MW-05-02, MW-05-08, MW-05-09, Ob-1, Ob-2, Ob-3, Ob-4, and Ob-5 and pumping well P-2 are presented in Table 3. Analytical results are compared to the Minnesota Surface Water Quality Class 2B Chronic and the Lake Superior Basin Water Quality Class 2B Chronic criteria for comparison. The Minnesota Surface Water Quality Class 2B Chronic standards are designed to be protective of surface water used for recreation and support cool or warm water sport or commercial fish and associated aquatic life. Class 2B surface water is not protected as a drinking water source. The Lake Superior Basin water quality standards protect Class 2B waters within the Lake Superior watershed. A hardness of 100 mg/l was used to derive the criteria.

The groundwater sample from monitoring well MW-05-08 exceeded the nitrogen (ammonia as N) and aluminum criteria, with concentrations of 420 ug/L and 2,620 ug/L, respectively. The sample from monitoring well MW-05-08 had exceedences of aluminum (27,100 ug/L), chromium (55 ug/L), cobalt (8.8 ug/L), copper (99.6 ug/L), and mercury (0.288 ug/L). The sample from observations well Ob-3 exceeded the aluminum and nickel criteria, with concentrations of 368 ug/L and 128 ug/L respectively. The pH criterion was exceeded in the observation well Ob-4 sample (6.1). The sample

from observation well Ob-5 had exceedences of pH (6.0), aluminum (181 ug/L) and mercury (0.0049 ug/L). The samples from well pumping well P-2 that were collected on November 7 and November 14, 2006 exceeded the zinc criteria (125 ug/L and 122 ug/L, respectively). The samples from monitoring well MW-05-08 and observation well Ob-2 exceeded the mercury criteria, with concentrations of 0.0016 ug/L. However, based on the blank data validation procedure, these detections are potential false positive values. There were no other exceedences of water quality criteria.

The groundwater samples collected weekly from pumping well P-2 during the pumping test showed some trends in water quality. In general, concentrations of calcium, magnesium, iron, manganese, potassium and strontium increased during the duration of the pumping test, while the concentrations of sulfate and boron decreased. These data suggest a decreasing redox potential for the source water. The decreasing redox potential is likely associated with the collection of water with longer flow paths or older water (i.e. water that has been in the subsurface longer).

3.3 Quality Assurance

A quality assurance and quality control (QA/QC) review was performed on the analytical results from the sampling event. This review was performed in accordance with the Barr Engineering Standard Operating Procedure for data validation, which is based on *The National Functional Guidelines for Organic and Inorganic Data Review* (EPA 1999/2004). All analyses were performed by NTS, except methyl mercury, cyanide, palladium, platinum, and isotope analysis. All methyl mercury analyses were performed by Frontier Geosciences, Inc. located in Seattle, Washington. Minnesota Valley Testing Laboratories, located in New Ulm, Minnesota, performed all cyanide analyses. All palladium and platinum analyses were performed by Pace Analytical, located in Minneapolis, Minnesota. Isotech Laboratories, Inc., located in Champaign, Illinois performed all isotope analyses.

Technical holding times were evaluated for each sample and target parameter, based on the EPA recommendations listed in *40 CFR SW8-46 Test Methods for Evaluating Hazardous Waste*. For one data package, the date of analysis for sulfate and chloride was reported incorrectly. NTS was contacted and a revised report was issued. All holding times were met for all the samples submitted to all laboratories.

One field blank and one pour blank were collected during the sampling event. Mercury was detected in both blanks at concentrations above the reporting limit. Seven samples had detections of mercury

above the reporting limit and within 5 times the highest blank value. All seven samples were qualified and should be considered potential false positive values. No other qualifiers were applied based on blank data.

NTS indicated that matrix spike recoveries were below laboratory acceptance criteria for antimony (81%) and silver (84%). Because spike levels were not provided and the recoveries were within standard acceptance criteria of 80-120%, no data were qualified for antimony or silver. NTS did not identify any other issues with their QA/QC parameters in the reports provided for the analyzed samples.

One field duplicate from observation well Ob-4 was collected during this sampling event and analyzed for all parameters. The concentration of sulfate was above the reporting limit in the native sample, but below the reporting limit in the duplicate. The native sample and duplicate were both qualified as estimated for sulfate. All other parameters met acceptance criteria for the field duplicate.

All of the data met the data project requirements and is deemed acceptable for the purposes of this project with the above mentioned qualifications.

4.0 Summary and Conclusions

The objectives of this work were to evaluate the possible effects of mine dewatering on the wetland areas in the vicinity of the Mine Site, to gather additional specific capacity data for wells completed in the Virginia Formation, and to gather additional water quality data for groundwater within the surficial deposits, the Virginia Formation and the Duluth Complex. Three main activities were conducted to meet these objectives:

- pumping test to evaluate the connectivity of the bedrock and the surficial deposits;
- specific capacity tests conducted to evaluate potential vertical variability of hydraulic conductivity in the Virginia Formation; and
- groundwater sampling to further characterize water quality within the surficial deposits, the Virginia Formation, and the Duluth Complex.

Data collected during the pumping test at P-2 showed a small amount of drawdown in the nearest deep wetland piezometer (20P) but no detectable drawdown at other water table or deep wetland piezometers, including piezometer 20, the water table piezometer that is nested with piezometer 20P. Based on the results from this test, it is reasonable to expect that dewatering of the proposed mine pits will increase the vertical gradient through the surficial and wetland deposits at the Mine Site, but that significant and widespread drawdown of the water table within these deposits is not anticipated. This is further supported by the analytical and isotope data collected during the pumping test in well P-2. The only water quality trends that were observed in samples collected weekly from pumping well P-2 suggest decreasing redox conditions in the source water. The decreasing redox potential is likely associated with the collection of water with longer flow paths or older water. There were no trends in the amount of tritium.

Data from the specific capacity tests conducted in wells P-3 and P-4, along with data collected during previous pumping tests in these wells (see RS10), indicate that the upper portion of the Virginia Formation is more permeable than the lower portion. This is consistent with what has been reported

for the Duluth Complex, where the upper 200 to 300 feet of the formation is reported to be more permeable due to the increased amount of secondary porosity features such as fractures and joints.[1]

Groundwater samples collected from monitoring wells on site exceeded the Minnesota 2B Chronic water criteria for metals (including mercury, aluminum, cobalt, copper, lead, nickel, and zinc), pH, and Nitrogen (ammonia as N). Samples collected weekly during the pumping of well P-2 showed water quality trends that suggest a decreasing redox potential for the source water. The samples from pumping well P-2 all contained measurable tritium, indicating that at least a portion of the source water is post-1952 water

[1] Siegel, D.I., and D.W. Ericson, 1980. *Hydrology and Water Quality of the Copper-Nickel Study Region, Northeastern Minnesota.* U.S. Geological Survey Water-Resources Investigations Open-File Report 80-739.

Tables

Table 1 Field Parameters for P-2 Sampling

Location	Date	Time	Temp (°C)	Cond. @ 25 (uS/cm)	pH	ORP (mV)	D.O. (mg/L)
P-2	10/24/2006	1025	5.4	150	7.75	*	*
P-2	10/31/2006	1025	5.0	316	9.04	21.0	6.96
P-2	11/7/2006	1027	6.2	228	7.85	114.7	6.42
P-2	11/14/2006	0932	5.4	257	7.98	219.6	5.78

* Not recorded

Table 2 Isotope Data Summary

Sample Name	δD H_2O ‰	$\delta^{18}O$ H_2O ‰	Tritium TU	Std. Dev.	$\delta^{13}C$ DIC ‰
P-2 10/24/2006	-85.4	-12.25	3.27	0.28	-18.85
P-2 10/31/2006	-85.9	-12.28	2.77	0.28	-17.78
P-2 11/07/2006	-85.9	-12.29	2.99	0.26	-16.86
P-2 11/14/2006	-85.4	-12.27	3.82	0.29	-15.79

Table 3
Analytical Data Summary
Polymet Mining, Inc.
(concentrations in ug/L, unless noted otherwise)

Location	MN SW Quality	MW-05-02	MW-05-08	MW-05-09	OB-1	OB-2	OB-3	OB-4
Date	Class 2B	11/20/2006	11/28/2006	10/5/2006	10/5/2006	10/3/2006	10/16/2006	10/4/2006
Lab	Chronic (1)							
Dup	1/31/2000							DUP
Aquifer		**Surficial**	**Surficial**	**Surficial**	**Duluth**	**Duluth**	**Virginia**	**Virginia**
Exceedance Key	Bold							
General Parameters								
Alkalinity, total, mg/L	--	68.3	67.7	26.4	47.4	<10	66.2	17.6
Chemical Oxygen Demand, mg/L	--	<10	<10	<10	10	<10	<10	<10
Chloride, mg/L	230	1.11	1.17	0.69	15.7	0.55	93.1	<0.5
Sulfate, mg/L	--	16.4	11.2	10.4	<37.2	10.9	66.4	8.55 *
Calcium, mg/L	--	18.6	12.1	7.08	29.7	10.8	21	5.48
Magnesium, mg/L	--	5.65	6.47	6.83	7.72	12	21.4	2.52
Phosphorus total, mg/L	--	<0.1	0.14	0.25	<0.1	<0.1	<0.1	<0.1
Fluoride, mg/L	--	<0.1	0.11	<0.1	<0.11	0.22	0.97	<0.1
Hardness, total, mg/L	--	69.7	56.8	45.8	106	76.4	140	24.1
Carbon, total organic, mg/L	--	2.6	1.6	5.2	1.5	1.9	3.2	1.9
Cyanide, ug/L	--	<20	<20	<20	<20	<20	<20	<20
Nitrate + Nitrite, ug/L	--	1420	150	<100	<100	<100	<100	<100
Nitrogen, ammonia as N, ug/L	40	<100	**420**	<100	<100	<100	<100	<100
pH, standard units	6.5-9.0 PH	6.5	6.9	7.5	9.0	7.6	6.6	**5.7**
Metals								
Aluminum	125	31.6	**2620**	**27100**	111	62.4	**368**	62.1
Antimony	31	<3	<3	<3	<3	<3	<3	<3
Arsenic	53	<2	<2	4.8	<2	<2	4.1	<2
Barium	--	<10	28.1	214	<10	<10	<10	<10
Beryllium	--	<0.2	<0.2	0.7	<0.2	<0.2	<0.2	<0.2
Boron	--	<50	<50	<50	<50	93.1	<50	<50
Cadmium	1.1 HD	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	11 CR6	<1	3.2	**55**	1.7	5	<2.5	<1
Cobalt	5.0	<1	<1	**8.8**	<1	<1	4.1	<1
Copper	9.3 HD	2.4	5.7	**99.6**	<2	2.8	2.1	<2
Iron	--	54.3	1860	29800	87.9	334	7040	<50
Lead	3.2 HD	<1	<1	**6.1**	<2	<1	<1	<1
Manganese	--	61.9	152	584	<10	41.6	383	<10
Mercury	0.0013	0.0005 b	**0.0016 b**	**0.0288**	<0.0005	**0.0016 b**	0.0008 b	0.001 b
Mercury methyl	--	<0.000146	<0.000056	0.000130	<0.000056	<0.000056	<0.000056	<0.000056
Molybdenum	--	<5	<5	12.1	<5	<5	<5	<5
Nickel	52 HD	<2	3	40.2	<2	3.6	**128**	<2
Palladium	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Platinum	--	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1
Potassium	--	1.93	1.51	6.87	1.81	1.48	2.33	0.99
Selenium	5.0	<2	<2	<2	<2	<10	<2	<10
Silver	1.0 HD	<2	<2	<1	<1	<1	<1	<1
Sodium	--	5.38	7.3	12	7.38	19.7	6.33	<2
Strontium	--	88.6	32.6	65.1	112	58.7	74.8	18.8
Thallium	0.56	<2	<2	<2	<2	<2	<2	<2
Titanium	--	<20	57	1040	<20	<20	<20	<20
Zinc	106 HD	<25	<25	46.3	<25	<25	<25	<25
Aluminum, dissolved	--	<25	199	430	55.2	<25	<25	<25
Cadmium, dissolved	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium, dissolved	--	1.1	1.2	1.2	<1	<1	<1	<1
Copper, dissolved	--	<2	<2	7.9	2.2	<2	<2	<2
Molybdenum dissolved	--	<5	<5	8.8	<5	<5	<5	<5
Nickel, dissolved	--	<2	<2	3	<2	<2	100	<2
Selenium, dissolved	--	<2	<2	<2	<2	<2	<2	<2
Silver, dissolved	--	<1	<1	<1	<1	<1	<1	<1
Zinc, dissolved	--	<25	<25	<25	<25	<25	<25	<25

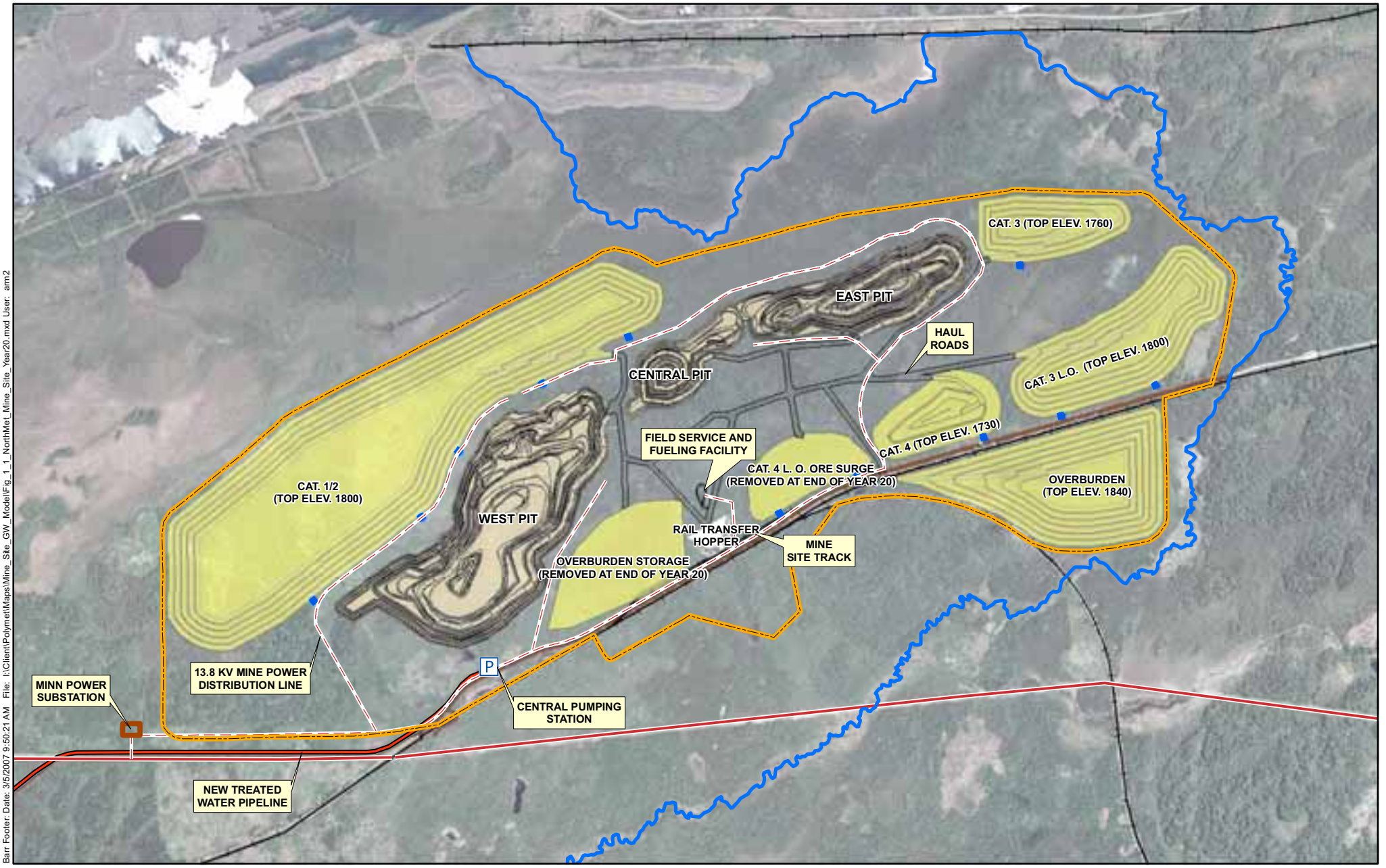
Table 3
Analytical Data Summary
Polymet Mining, Inc.
(concentrations in ug/L, unless noted otherwise)

Location Date Lab Dup	MN SW Quality Class 2B Chronic (1) 1/31/2000	OB-4 10/4/2006	OB-5 10/4/2006	P-2 10/24/2006	P-2 10/31/2006	P-2 11/7/2006	P-2 11/14/2006
Aquifer		**Virginia**	**Virginia**	**Dul.+Virginia**	**Dul.+Virginia**	**Dul.+Virginia**	**Dul.+Virginia**
Exceedance Key	Bold						
General Parameters							
Alkalinity, total, mg/L	--	17.6	25.5	101	105	74	108
Chemical Oxygen Demand, mg/L	--	<10	<10	<10	<10	<10	<10
Chloride, mg/L	230	0.5	<0.5	1.29	1.4	1.35	1.3
Sulfate, mg/L	--	<1 *	8.24	9.06	7.88	6.53	5.76
Calcium, mg/L	--	5.4	7.66	12.8	13.5	15.5	16.7
Magnesium, mg/L	--	2.48	2.81	7.67	8.48	9.41	10
Phosphorus total, mg/L	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoride, mg/L	--	<0.1	<0.1	0.31	0.15	0.13	0.37
Hardness, total, mg/L	--	23.7	30.7	63.5	68.6	77.4	82.9
Carbon, total organic, mg/L	--	2.2	2.0	3.3	3.9	4.5	5.3
Cyanide, ug/L	--	<20	<20	<20	<20	<20	<20
Nitrate + Nitrite, ug/L	--	<100	<100	<100	<100	<100	<100
Nitrogen, ammonia as N, ug/L	40	<100	<100	<100	<100	<100	<100
pH, standard units	6.5-9.0 PH	**6.1**	**6.0**	7.7	7.1	8.4	7.5
Metals							
Aluminum	125	55.4	**181**	<25	<25	<25	<25
Antimony	31	<3	<3	<3	<3	<3	<3
Arsenic	53	<2	<2	<2	<2	<2	<2
Barium	--	<10	<10	<10	<10	<10	<10
Beryllium	--	<0.2	<0.2	<0.2	0.2	0.2	<0.2
Boron	--	<50	<50	194	168	153	148
Cadmium	1.1 HD	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	11 CR6	<1	2.2	<1	<1	1.1	<1
Cobalt	5.0	<1	<1	<1	<1	<1	<1
Copper	9.3 HD	<2	3.5	<2	<2	<2	<2
Iron	--	<50	548	253	271	325	351
Lead	3.2 HD	<1	<1	<5	<1	<1	<1
Manganese	--	<10	<10	21.7	23.6	26.2	27.3
Mercury	0.0013	0.0009 b	**0.0049**	<0.0005	<0.0005	0.0005 b	<0.0005
Mercury methyl	--	<0.000056	<0.000056	<0.000056	0.000070	<0.000056	<0.000056
Molybdenum	--	<5	<5	<5	<5	<5	<5
Nickel	52 HD	<2	4.6	<2	<2	<2	<2
Palladium	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Platinum	--	<0.1	<0.1	<0.02	<0.02	<0.02	<0.02
Potassium	--	0.98	1.26	1.03	1.04	1.04	1.1
Selenium	5.0	<10	<10	<2	4	<2	<4
Silver	1.0 HD	<1	<1	<1	<1	<1	<1
Sodium	--	<2	<2	24.4	23.2	23.3	23.9
Strontium	--	18.5	19.3	56.5	60.7	69.7	74.9
Thallium	0.56	<2	<2	<2	<2	<2	<2
Titanium	--	<20	<20	<20	<20	<20	<20
Zinc	106 HD	<25	<25	65.4	67.7	**125**	**122**
Aluminum, dissolved	--	<25	<25	<25	<25	<25	<25
Cadmium, dissolved	--	<0.2	<0.2	<0.2	0.2	<0.2	<0.2
Chromium, dissolved	--	<1	<1	<1	<1	<1	<1
Copper, dissolved	--	<2	2.3	<2	<2	<2	<2
Molybdenum dissolved	--	<5	<5	<5	<5	<5	<5
Nickel, dissolved	--	<2	5.9	<2	<2	<2	<2
Selenium, dissolved	--	<2	<2	<2	<2	<2	<2
Silver, dissolved	--	<1	<1	<1	<1	<1	<1
Zinc, dissolved	--	<25	<25	59.1	68.2	134	122

Table 3
Analytical Data Summary
Polymet Mining, Inc.
Footnotes

--	No criteria.
(1)	Criteria represents most conservative value as noted in Minnesota Rules Chapter 7050.0222 and 7052.0100.
*	Estimated value, QA/QC criteria not met.
b	Potential false positive value based on blank data validation procedure.
CR6	Value represents the criteria for Chromium, hexavalent.
DUP	Duplicate sample.
HD	Hardness dependent. The specific analyte should be referenced in Minnesota Rules Chapter 7050.0222 for specific exp. calculations. The value reported is assuming a hardness of 100 mg/L.
PH	Not less than 6.5 nor greater than 9.0.

Figures



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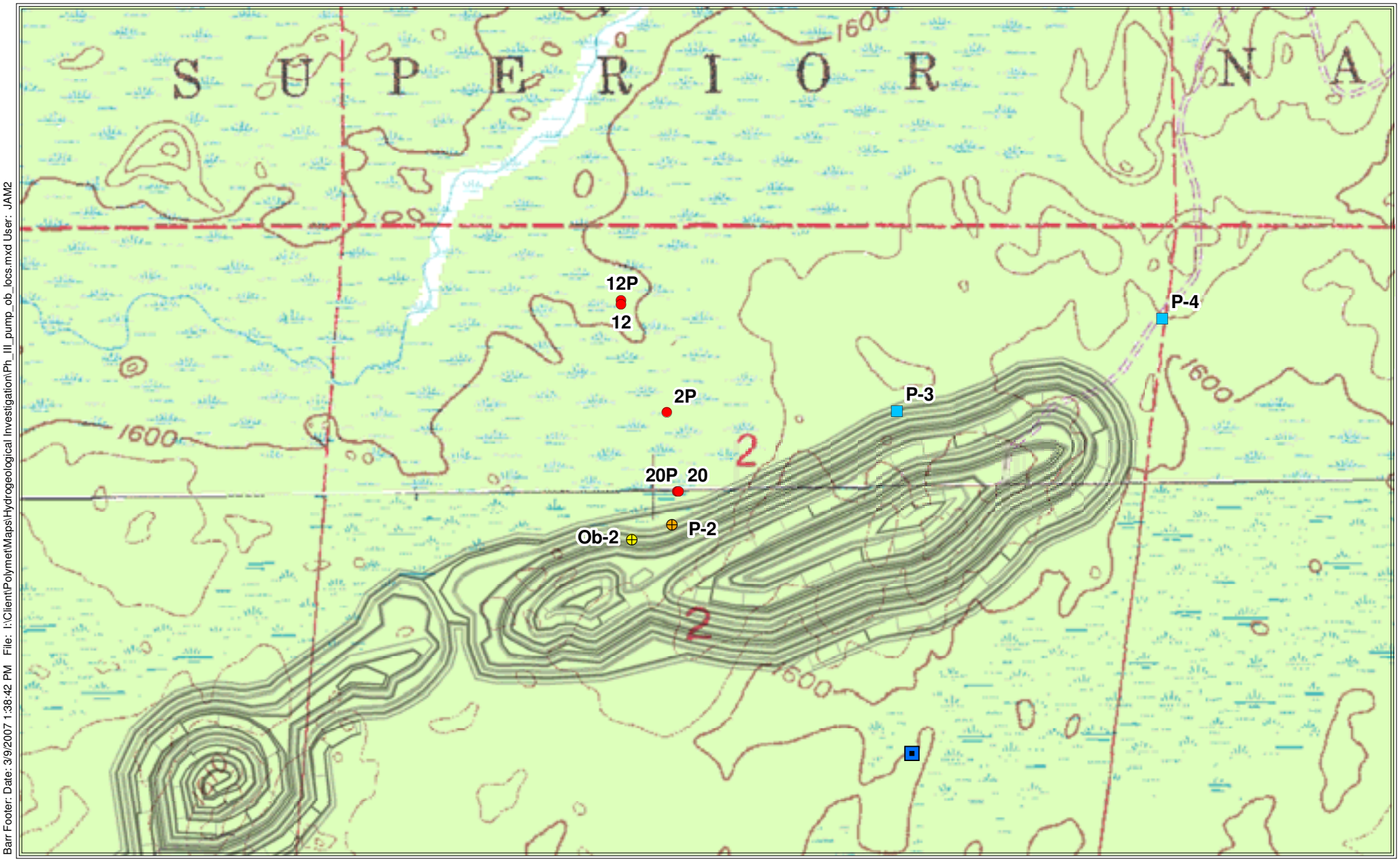
Mine Site
Partridge River - North Branch
Central Pumping Station
Mine to Plant Pipeline
Stockpile Sumps
Stockpiles
Pits
138KV Transmission Line
13.8KV Mine Power Distribution

0 1,500 3,000 6,000
Feet

Figure 1
NORTHMET MINE SITE IN YEAR 20
PolyMet Mining Inc.
Hoyt Lakes, MN



20 Year mine plan
Pumping well
Bedrock observation well
Specific capacity test location
Wetland piezometer monitoring location
Pumping test discharge point

0 500 1,000 Feet

Figure 2

PUMPING AND OBSERVATION LOCATIONS
PHASE III HYDROGEOLOGIC INVESTIGATION
PolyMet Mining, Inc.
Hoyt Lakes, Minnesota

Figure 3 Pre-Pumping Test Water Levels

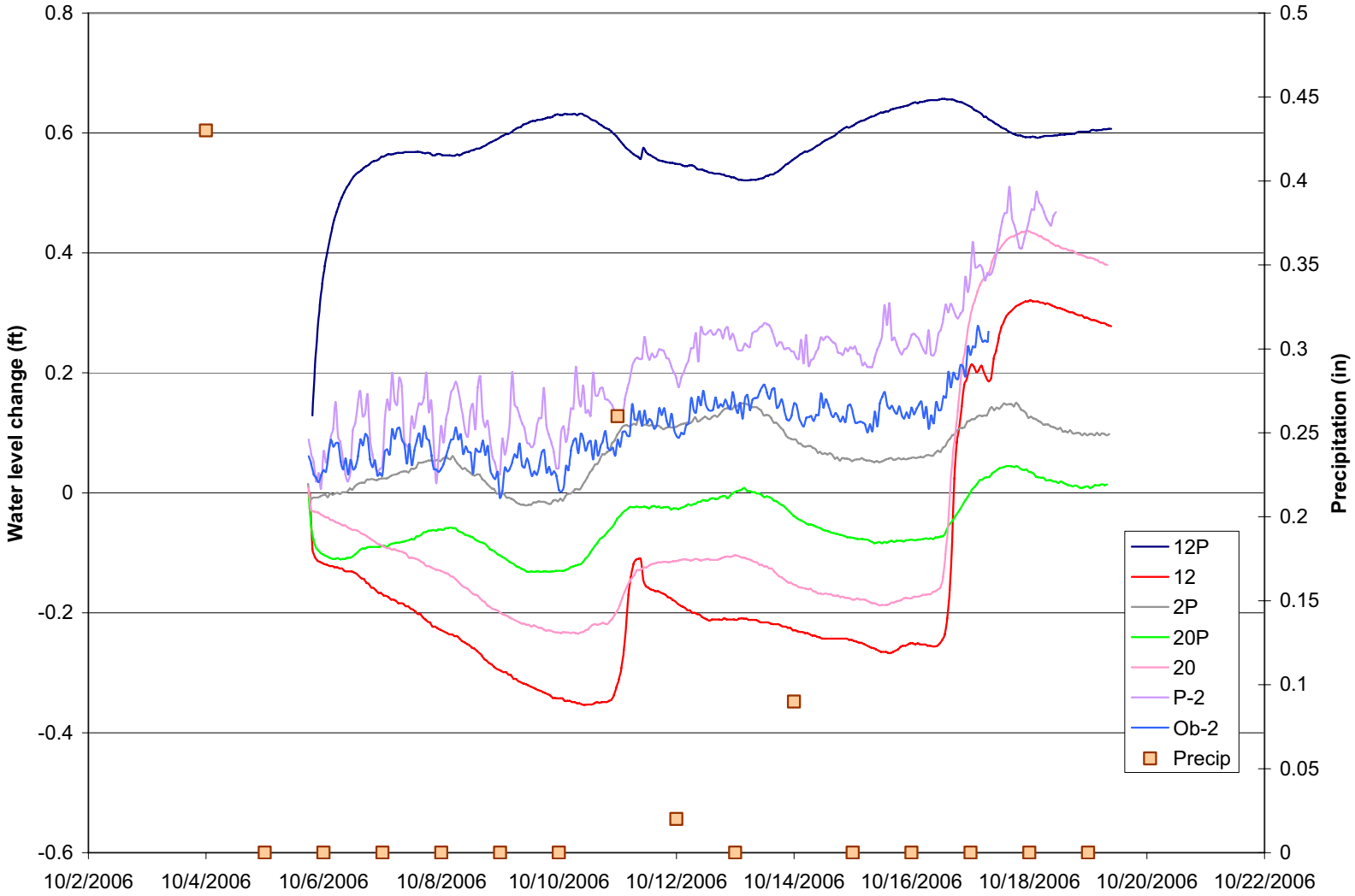


Figure 4 Observed Drawdown and Recovery in Wetland Piezometers

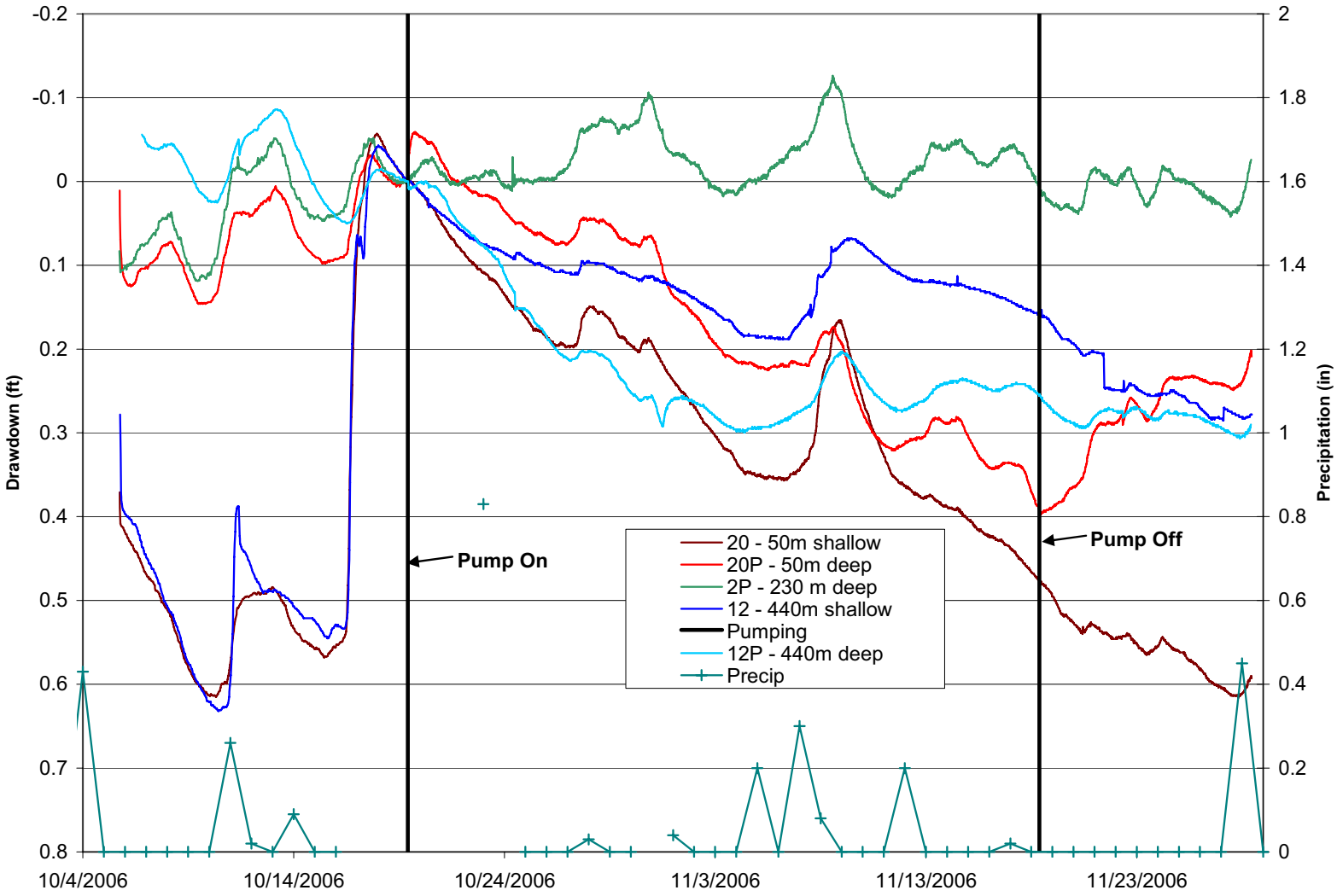


Figure 5 Drawdown and Recovery in 20P Corrected for Regional Water Level Changes

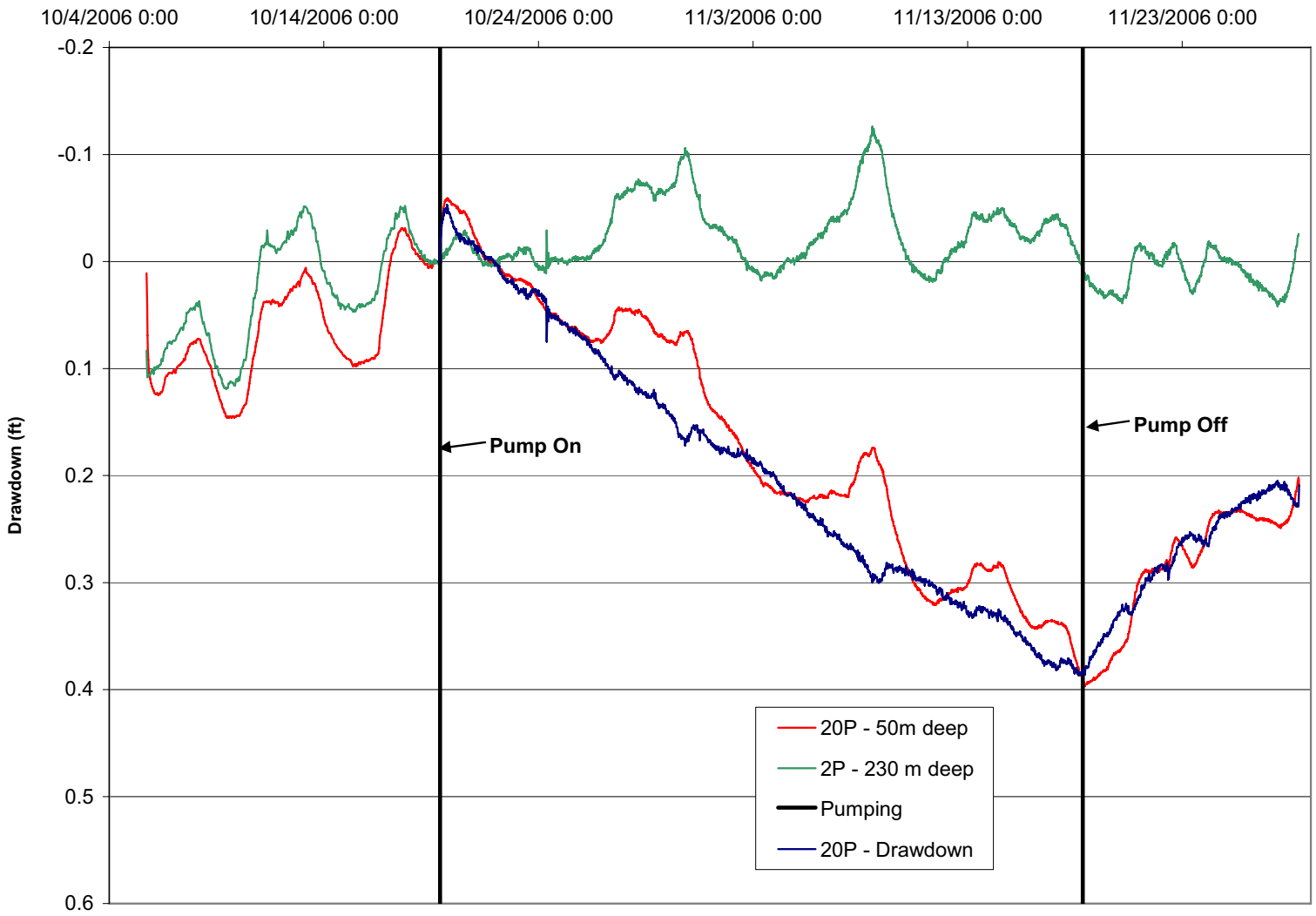


Figure 6 Pumping Test Analysis of Bedrock Wells

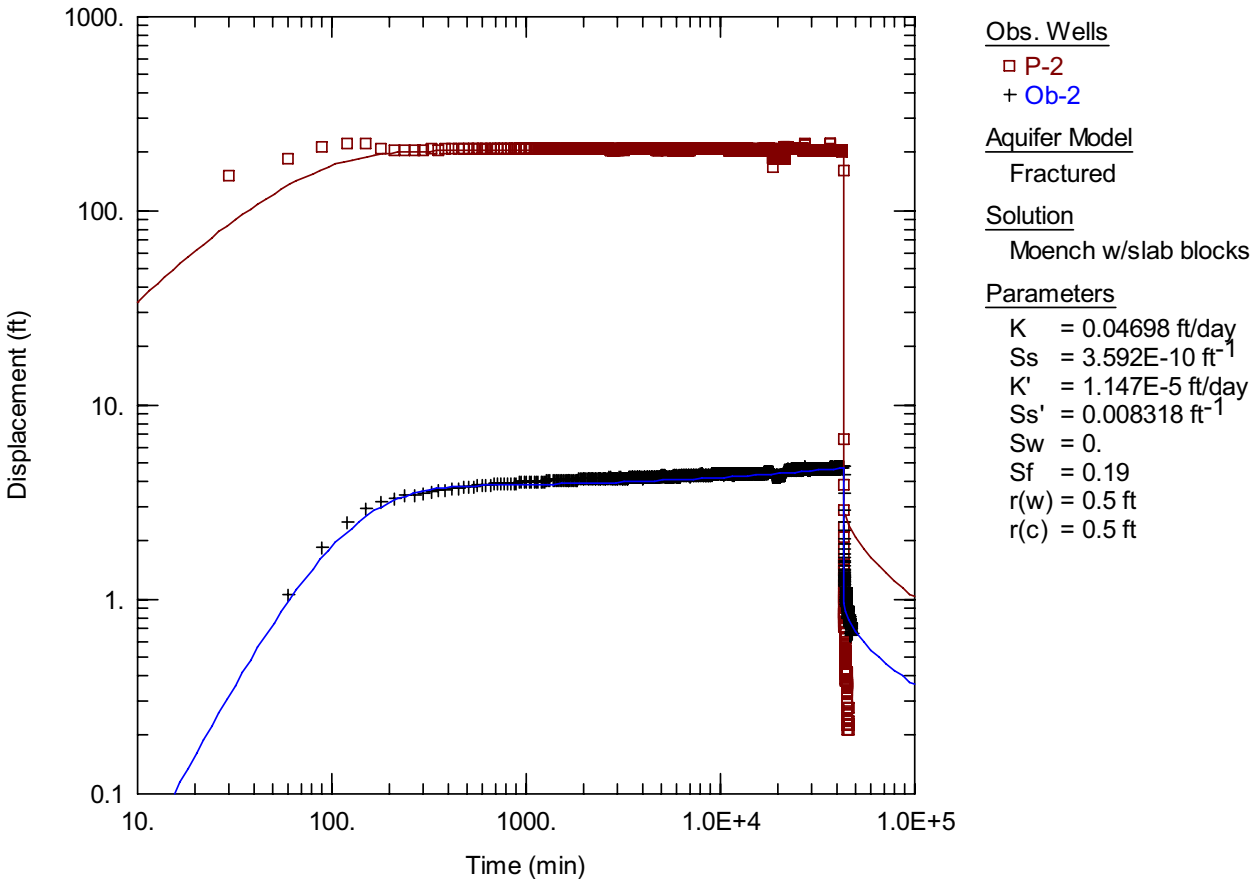


Figure 7 Specific Capacity Test Analysis – P-3

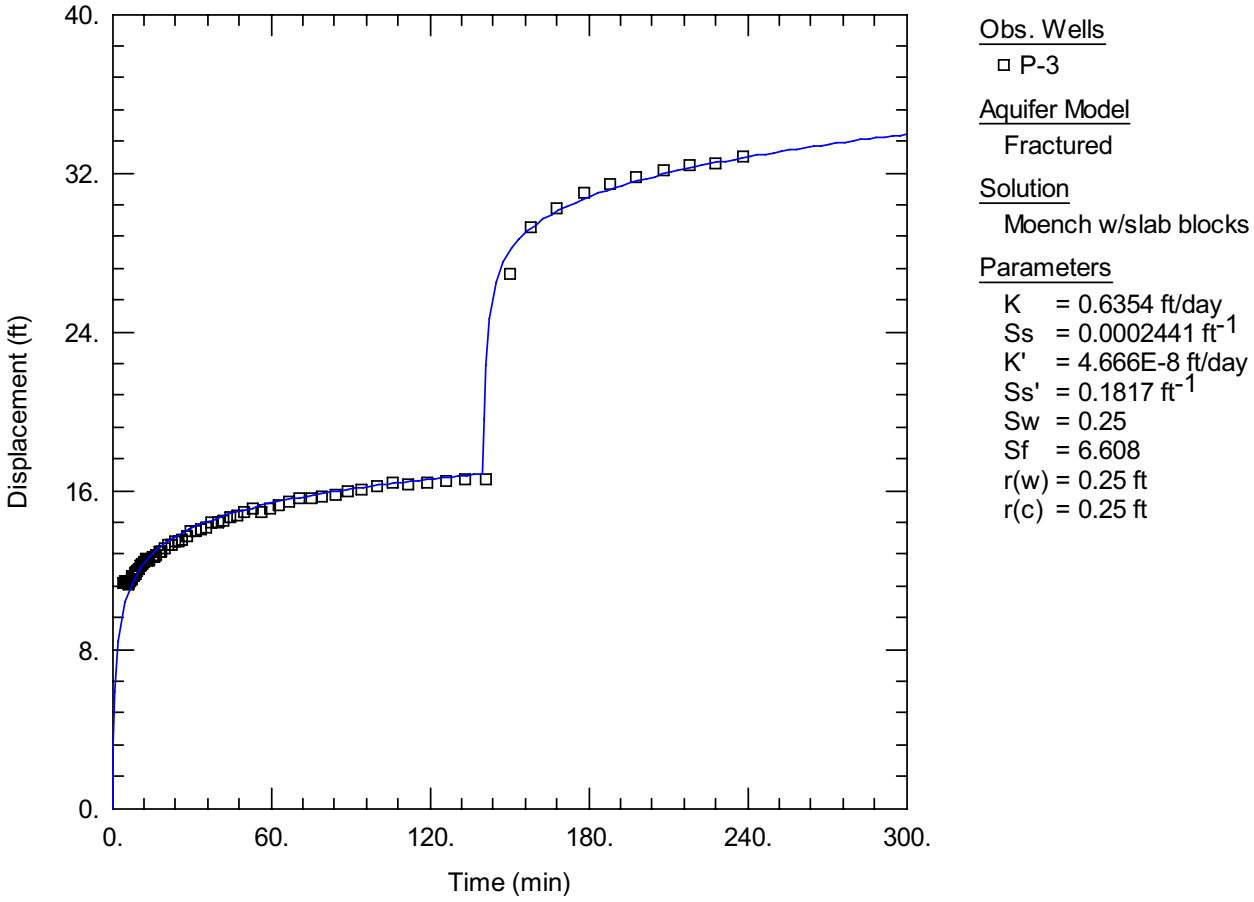


Figure 8 Specific Capacity Test Analysis – P-4 Step 1

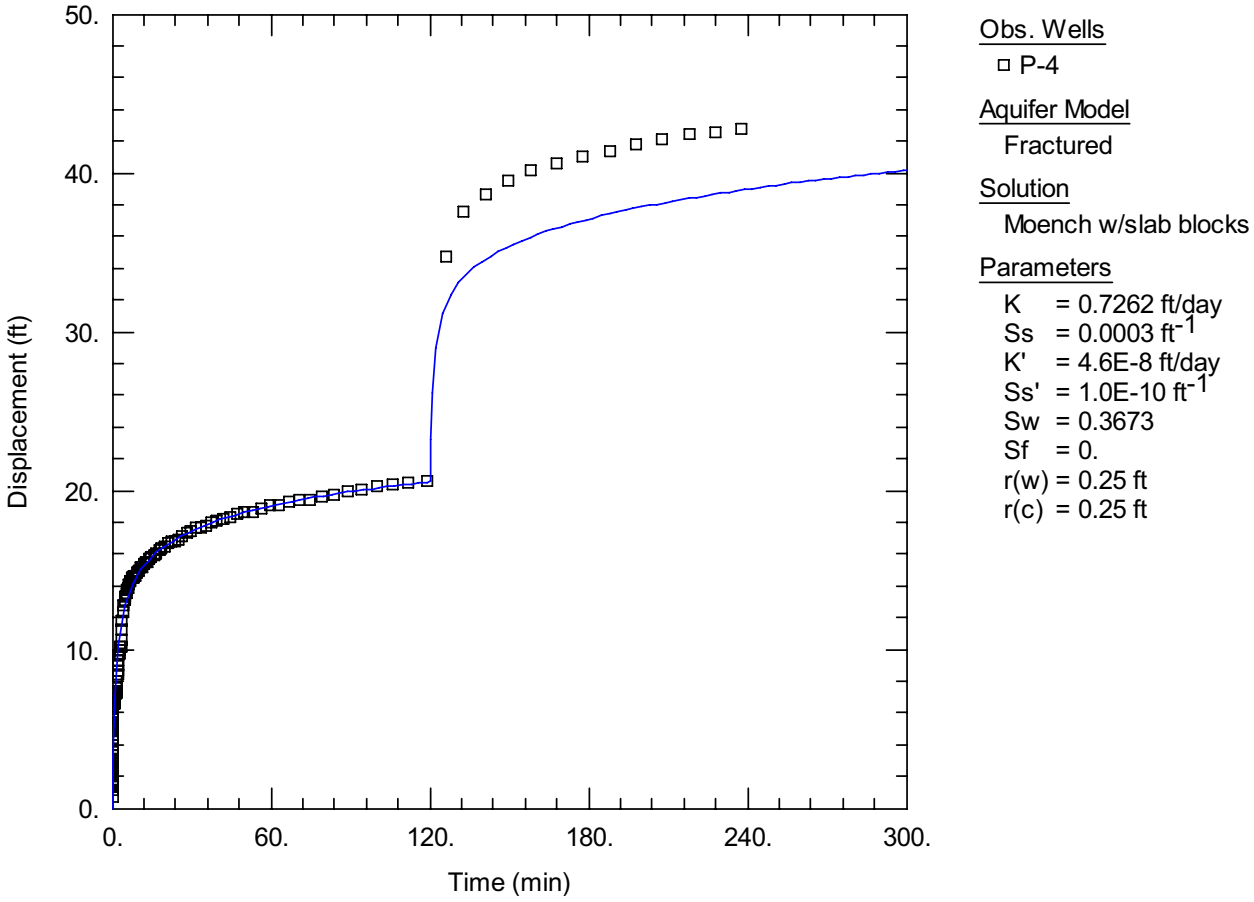
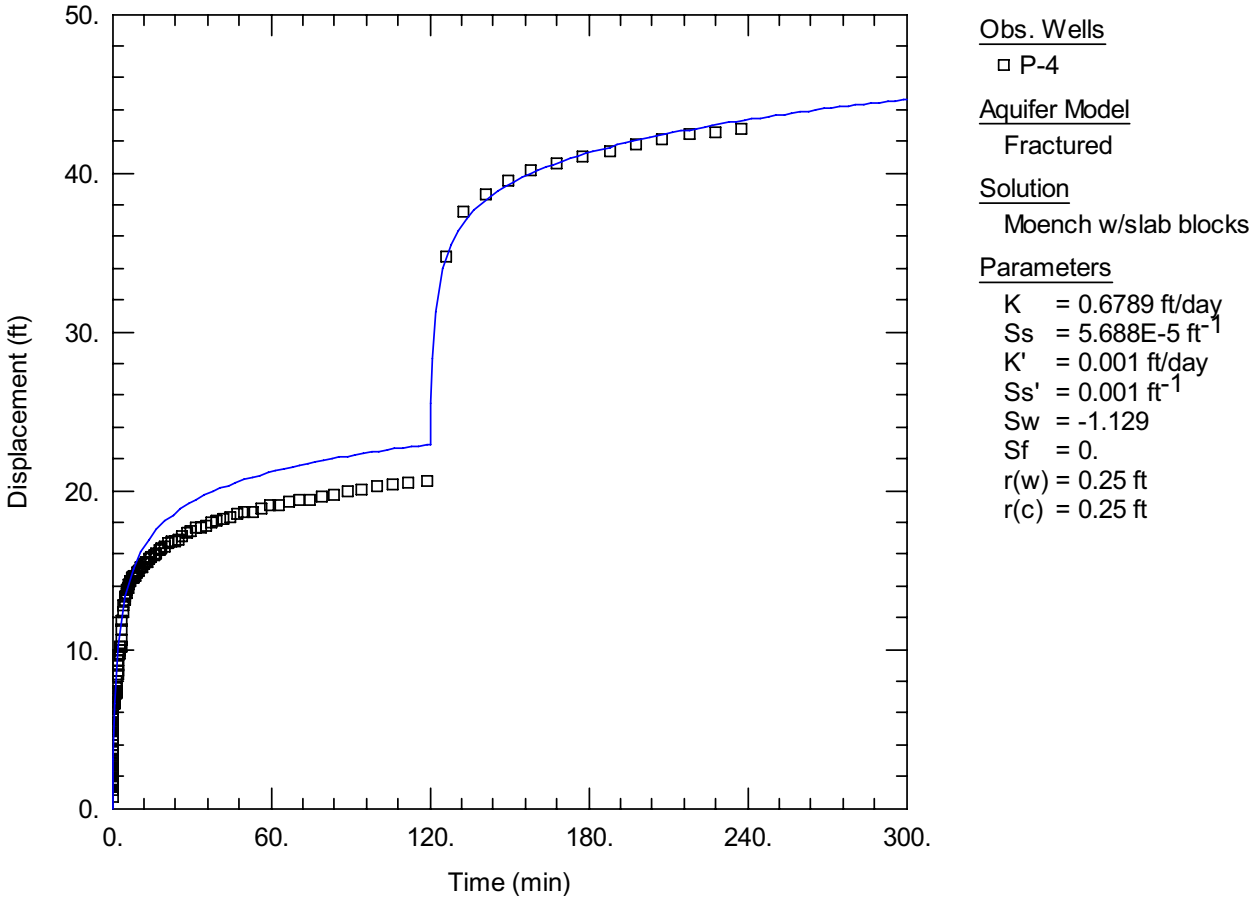
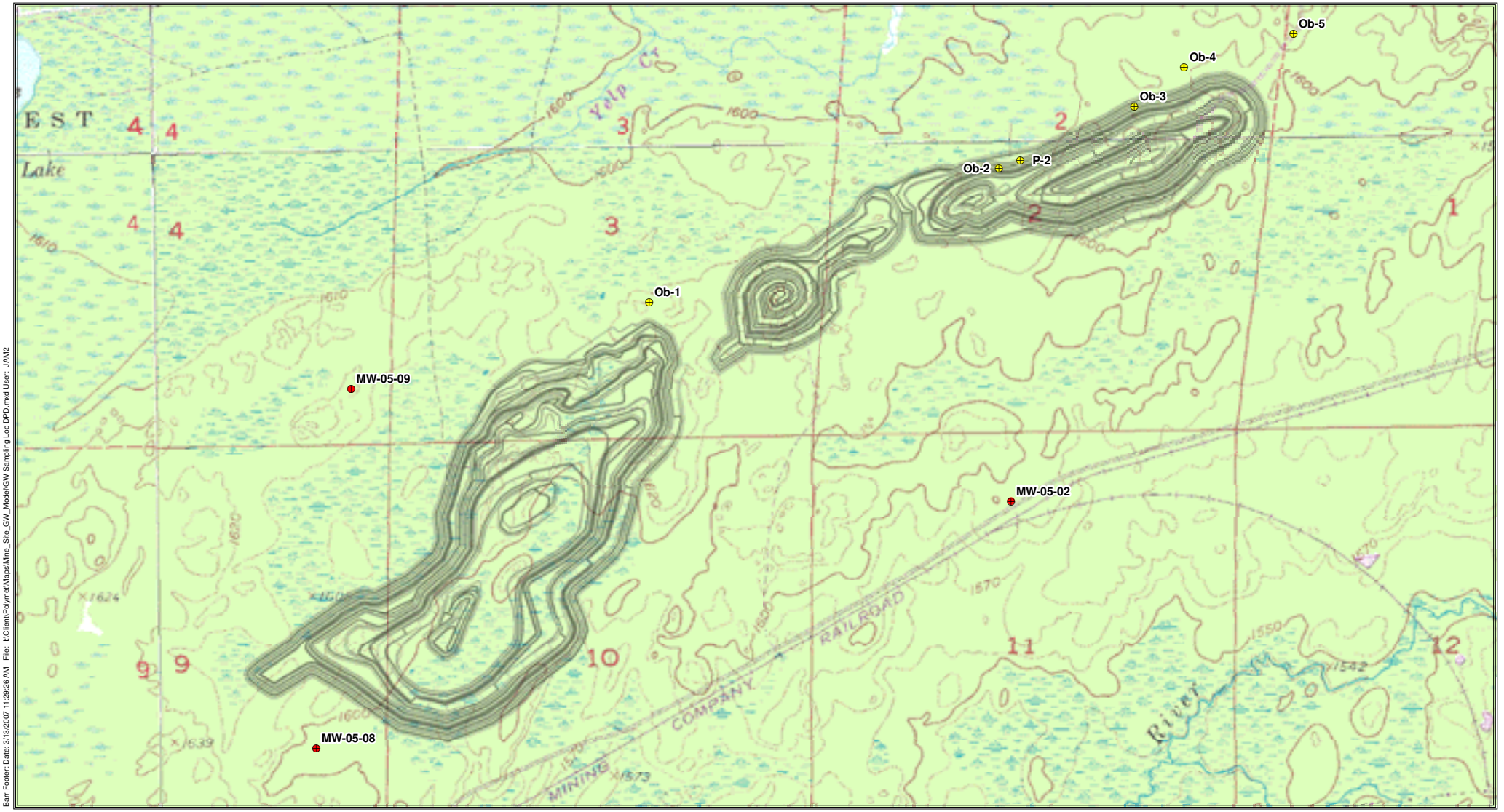


Figure 9 Specific Capacity Test Analysis – P-4 Step 2





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20 Year mine plan

Groundwater sampling locations

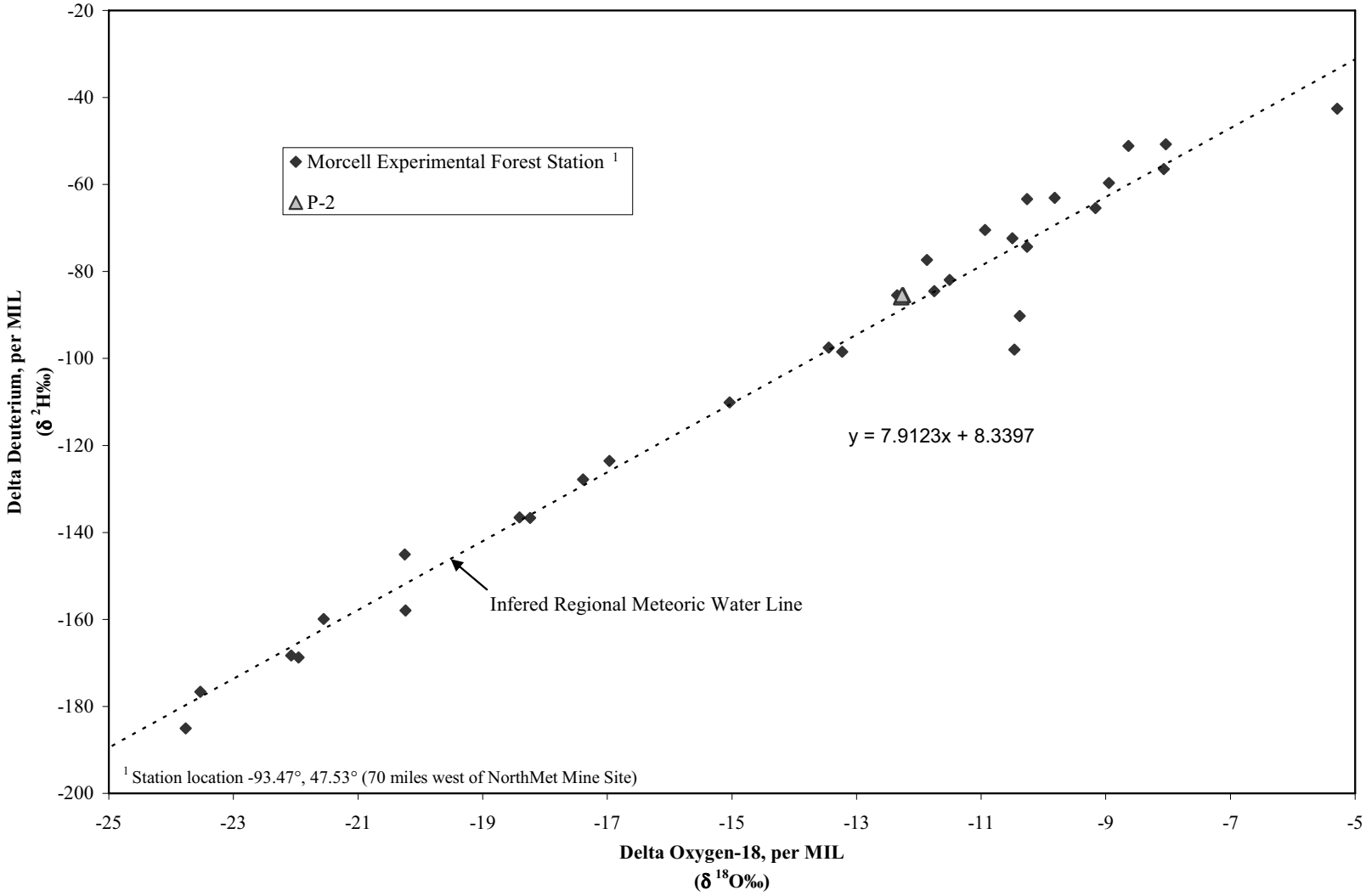
- Bedrock pumping/observation well
- Surficial aquifer monitoring well

0 1,000 2,000 Feet

Figure 10

GROUNDWATER SAMPLING LOCATIONS
PHASE III HYDROGEOLOGIC INVESTIGATION
PolyMet Mining, Inc.
Hoyt Lakes, Minnesota

Figure 11 P-2 Isotope Data Compared to Regional Precipitation Data



Appendix A

Barr Engineering Company
4700 West 77th Street • Minneapolis, MN 55435-4803
Phone: 952-832-2600 • Fax: 952-832-2601 • www.barr.com *An EEO Employer*

Minneapolis, MN • Hibbing, MN • Duluth, MN • Ann Arbor, MI • Jefferson City, MO

July 6, 2006

Stuart Arkley
Ecological Services Division
MN DNR
500 Lafayette Road N.
St. Paul, MN 55155

Re: Hydrogeologic Investigation – Phase III
PolyMet NorthMet Mine Site
Babbitt, Minnesota

Dear Stuart Arkley:

As discussed at the EIS kick-off meeting in May, further hydrogeologic investigative work is proposed for the NorthMet Mine Site, in order to better understand the possible effects of mine dewatering in the bedrock aquifer on the wetland areas in the vicinity of the Mine Site. Pumping tests performed during Phases I and II of the Hydrogeologic Investigation were not designed to investigate the nature of the hydraulic connection between the bedrock aquifer and adjacent wetland areas. This letter describes the proposed scope and schedule of Phase III of the Hydrogeologic Investigation. Phase III will consist of conducting and analyzing the results from a pumping test. The results from the test will be used to better understand the response of water levels within the wetland areas to pumping groundwater (dewatering) at the Mine Site.

The Phase III Investigation will also include focused specific-capacity testing in two of the wells that were installed during the Phase II Investigation. This specific-capacity testing is a follow-up to work conducted in Phase II and is intended to evaluate the relative water supply vs. depth in the bedrock aquifer at the Mine Site. In addition, a round of groundwater samples will be collected from Mine Site monitoring wells.

Objective

The primary objective of the proposed Phase III Hydrogeologic Investigation is to conduct a pumping test to evaluate the response of the wetland areas to future pumping related to mine dewatering at PolyMet's proposed NorthMet Mine located near Babbitt, Minnesota.

The Phase I Hydrologic Investigation completed by Barr Engineering Company (Barr) in June 2005 (RS02) provided information about the surficial aquifer system and the Duluth Complex. The Phase II Hydrologic Investigation completed by Barr in January 2006 (RS10) provided information about the ability of the Virginia Formation to transmit water to the proposed NorthMet pit and to characterize the quality of the water found in this formation. During Phase II, multiple pumping tests were conducted in order to characterize the Virginia Formation at the Mine Site. However, the effects on the adjacent wetland due to pumping at the Mine Site have yet to be quantified. Phase III

will provide data to determine the connection between the bedrock aquifers and the surficial aquifer in the adjacent wetland.

A secondary objective of the proposed work will be to evaluate whether the majority of the water in the bedrock aquifer moves through near-surface fractured and weathered zones, or if there may also be one or more deeper zones with significant amounts of groundwater flow. Most evidence leads to the assumption that the primary source of water is the near-surface bedrock. However, during the Phase II drilling activities, there was some indication of a possible void space in the bedrock at depth in well P-4. In order to confirm whether or not there is a high transmissivity zone at depth in the bedrock aquifer (in the eastern portion of the mine site), specific-capacity testing will be conducted in isolated portions of pumping wells P-3 and P-4.

Scope of Work - Aquifer Performance Testing

An aquifer performance test (i.e., pumping test) will be performed in pumping well P-2. The pumping phase of the test will run for 10 days. Pressure transducers and data loggers will be temporarily installed in the pumping well P-2 and in five observation wells in the vicinity of the pumping well (Figure 1). Water level data will be measured "continuously" (approximately one measurement every 10 minutes) for all six wells being monitored.

The installation of pumping well P-2 and observation well Ob-2 was completed during the Phase II Investigation. Piezometers 2P, 12P, 20, and 20P will be installed in the peat/muck layer in the wetland north of P-2 as part of the Wetland Hydrology Study, which is being conducted concurrently with this investigation. Pumping well P-2 is 610 feet deep, observation well Ob-2 is 100 feet deep, piezometers 2P, 12P, and 20P will be 6 feet deep, and piezometer 20 will be 1.5 feet deep.

Water levels from pumping and observation wells will be measured using data logging probes. The probes automatically measure and record water levels in the wells and also automatically correct for changes in barometric pressure. Probes will be installed in pumping well P-2 and in the five observation wells 10 days prior to pumping, in order to record background conditions. The probes will monitor water levels in the piezometers for the 10 days prior to the pumping test, during the test, and during the recovery.

The pumping rate for the test will be established so that the pumping well maintains a stable water column equal to approximately one-third of the original water column height. Based on the results from the pumping test conducted at well P-2 during the Phase II Investigation, a pumping rate of 20 gallons per minute (gpm) is proposed for the Phase III Investigation. Water levels collected by the data loggers will be verified with manual measurements as often as practical. The pumping well will be pumped at a constant rate for 10 days. After reaching this time limit, the pump will be turned off and the water level in the well will be allowed to recover for up to10 days.

Water extracted during the pumping tests will be discharged at the site. In order to avoid hydraulic interference with the pumping test, the chosen discharge location will be approximately 3000 feet from the pumping well and in an upland (non-wetland) area. Water will be pumped directly to the discharge location.

The data collected during the pumping and recovery portions of the tests from both the pumping and observation wells will be analyzed using conventional analytical techniques.

Scope of Work – Specific-Capacity Testing

Specific-capacity tests will be conducted in isolated vertical intervals in pumping wells P-3 and P-4, using a packer assembly and submersible pump. For each of the tests, the packer will be set at an

approximate depth of 300 feet, to isolate the upper portion of the aquifer from the deeper portion. The pump will be placed either above or below the packer, depending on the drilling contractor's capabilities. Once the pump is installed in the isolated interval, a short-term (3 to 4 hour) specific-capacity test will be run. The pump will be run at a fixed discharge rate for approximately 2 hours until the water level is relatively stable. The discharge rate will then be increased slightly and pumping will continue until the water level is again relatively stable, at which time the test will be terminated. If possible, water levels will be monitored in both of the isolated zones (i.e., pumped and non-pumped) during the duration of the test. Whether this is possible will depend on the equipment supplied by the drilling contractor. It is anticipated that the specific-capacity testing will be conducted during the two days immediately prior to the start of the pumping phase of the pumping test at well P-2.

The data collected during the specific-capacity tests will be analyzed using conventional analytical techniques.

Scope of Work – Groundwater Sampling

Groundwater samples will be collected from the five bedrock observations wells installed as part of the Phase II Hydrogeologic Investigation (Ob-1 through Ob-5) and the three surficial monitoring wells installed as part of the Phase I Hydrogeologic Investigation (MW-05-02, MW-05-08 and MW-05-09). All wells will be purged and allowed to stabilize before collection of the samples. Groundwater samples will be analyzed for the parameters listed in Table 1.

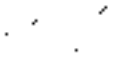
Investigation Report and Schedule

The results from the pumping test and specific-capacity tests will be summarized and incorporated into a report. The report will include field data, aquifer performance test analysis, pumping and observation well locations, conclusions and recommendations. Documentation supporting the discussion of the results will be included in tables, figures, and appendices, as appropriate.

Based on the assumption that this scope of work is approved by August 4, 2006, it is anticipated that the field work can be initiated by mid-August. Field work will last approximately four to five weeks. It is anticipated that data analysis and preparation of a draft Phase III Hydrogeologic Investigation Report will be completed within approximately four weeks after the end of field work. Based on these assumptions, it is anticipated that the draft report will be completed by late October to mid November, 2006.

Please contact Tina Pint at (952) 832-2692 or Mark Hagley at (218) 529-8206 with any questions or comments related to this proposed scope of work.

Sincerely,

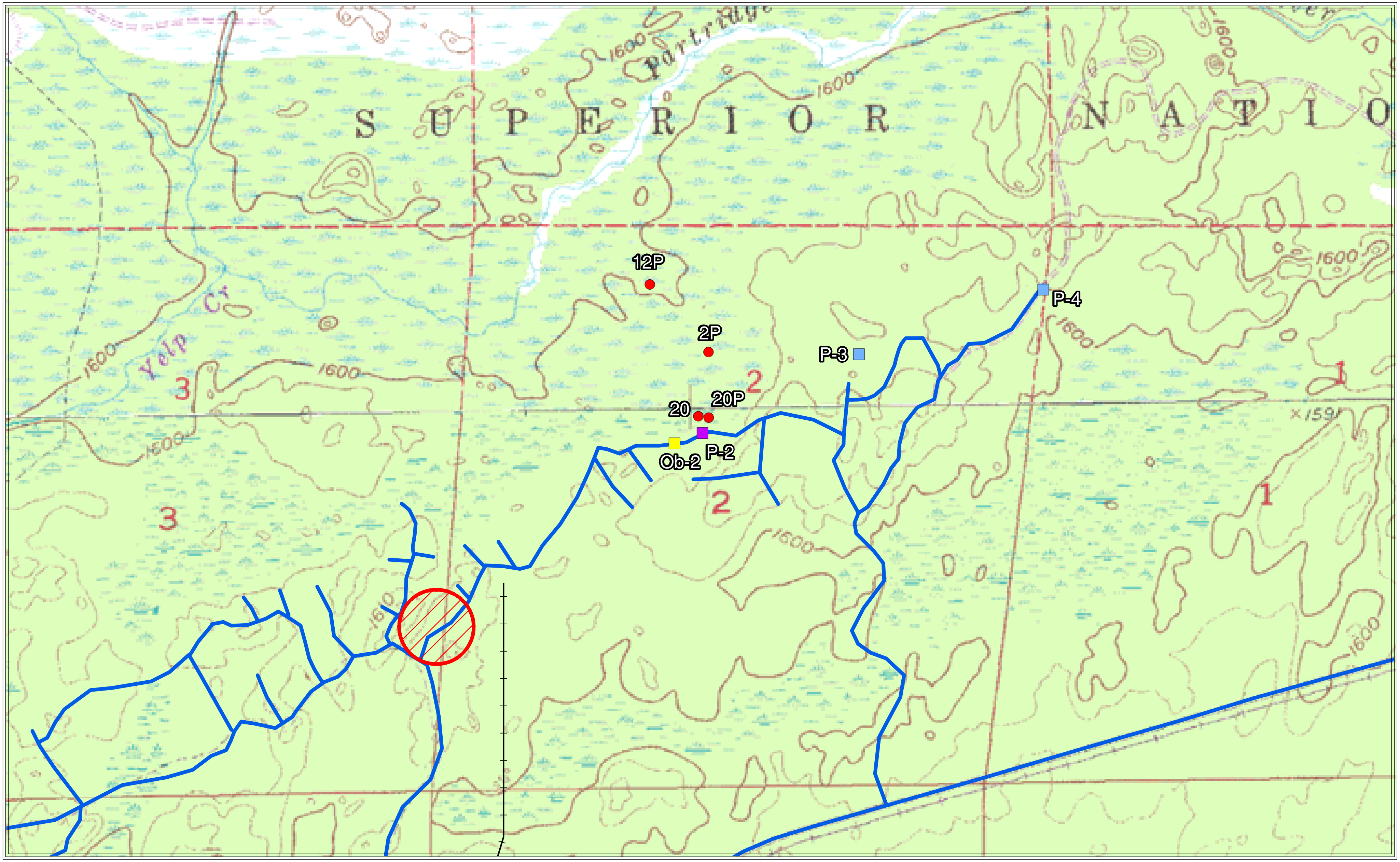


John Borovsky
Vice President

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10



- Pumping well
- Specific capacity test well
- Bedrock observation well
- Wetland observation well
- Water discharge area
- Roads

0 250 500 1,000 1,500 Feet

0 125 250 500 750 Meters

Figure 1

PUMPING AND OBSERVATION
WELL LOCATIONS - PHASE III
PolyMet Mining, Inc.
Hoyt Lakes, Minnesota

Appendix B

Barr Engineering Company
Field Log Data Sheet

Client: PolyMet Mining	**Monitoring Point:** MW-05-02
Location: NorthMet	**Date:** 11/20/06
Project #: 23/69-862 004 009	**Sample Time:** 1202-1230

GENERAL DATA	
Barr lock:	yes
Casing diameter:	2" pvc
Total well depth:*	10.34
Static water level:*	9.83
Water depth:*	0.5
Well volume: (gal)	0.083
Purge method:	peristaltic
Sample method:	peristaltic
Start time:	11:24
Stop time:	12:30
Duration: (minutes)	66
Rate, gpm:	11:24-11:32 0.13 gpm 11:32-12:30 0.09 gpm
Volume, purged:	6.1 gal
Duplicate collected?	no
Sample collection by:	LMG

STABILIZATION TEST

Time/ Volume	Temp. °C	Cond. @ 25	pH	ORP ~~Eh~~	D.O.	Turbidity Appearance
1125/0.1 gal	4.6	356	7.37	8.7	7.38	Cloudy
1127/0.4 gal	5.9	347	7.17	63	4.51	clear
~~1127~~ 1132/1.0 gal	5.6	342	7.17	72	4.65	"
1136/1.4 gal	5.6	313	7.06	86	4.18	"
1140/1.7 gal	5.7	275	6.89	97	3.15	"
1144/2.1 gal	5.6	241	6.74	113	3.47	"
1147/2.4 gal	5.6	214	6.59	131	3.98	"
1151/2.7 gal	5.8	196	6.55	139	4.39	"
1154/3.0 gal	5.7	180	6.50	138	5.00	"
1157/3.2 gal	5.8	173	6.47	145	4.79	"
1200/3.5 gal	5.8	165	6.50	148	4.95	"

Odor: none detected

Purge Appearance: clear

Sample Appearance: clear

Comments:

CO2- Mn2- Fe(T)- Fe2-

Others present: —

Well Condition: good

(MW) groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- semi-volatile- general- / nutrient- / cyanide- / DRO- Sulfide-

oil,grease- bacteria- total metal- 2 filtered metal- / methane- filter-

Others: TOC-1, LLHg-1, Methyl Hg-1

*Measurements are referenced from top of riser pipe, unless otherwise indicated.

Barr Engineering Company
Field Log Data Sheet

Client: PolyMet Mining	**Monitoring Point:** MW-05-08
Location: NorthMet	**Date:** 11/28/06
Project #: 23/69-862 004 009	**Sample Time:** 0920-0931

GENERAL DATA		STABILIZATION TEST						
Barr lock:	yes							
Casing diameter:	2" pvc	Time/ Volume	Temp. °C	Cond. @ 25	pH	ORP ~~Eh~~	D.O.	Turbidity Appearance
Total well depth:*	20.9	0845/2.6gal	6.7	125	7.30	86	0.75	clear
Static water level:*	4.02	0855/5.2 gal	6.7	119	7.31	52	0.77	"
Water depth:*	16.88	0905/7.8gal	6.8	117	7.28	49	0.69	"
Well volume: (gal)	2.75	0915/10.4gal	6.8	115	7.27	47	0.70	"
Purge method:	peristaltic							
Sample method:	peristaltic							
Start time:	08:35	Odor: none detected						
Stop time:	09:31	Purge Appearance: clear						
Duration: (minutes)	56	Sample Appearance: clear						
Rate, gpm:	0.26	Comments:						
Volume, purged:	14.6 gal							
Duplicate collected?	no							
Sample collection by:	LMG, JAM2	CO2-	Mn2-	Fe(T)-	Fe2-			
Others present:	—	Well Condition: good						

MW: groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- semi-volatile- general- 1 nutrient- 1 cyanide- 1 DRO- Sulfide-

oil,grease- bacteria- total metal- 2 filtered metal- 1 methane- filter-

Others: TOC-1, LLHg-1, Methyl Hg-1

*Measurements are referenced from top of riser pipe, unless otherwise indicated.

Barr Engineering Company
Field Log Data Sheet

Client: PolyMet Mining	**Monitoring Point:** MW-05-09
Location: NorthMet	**Date:** 10/5/06
Project #: 23/69-862 004 009	**Sample Time:** 1400

GENERAL DATA		STABILIZATION TEST						
Barr lock:	yes							
Casing diameter:	2" pvc	Time/ Volume	Temp. °C	Cond. @ 25	pH	ORP ~~Eh~~	D.O.	Turbidity Appearance
Total well depth:*	16.5	1033	9.6	73	6.78	89	1.80	slightly cloudy
Static water level:*	12.65							
Water depth:*	3.9							
Well volume: (gal)	0.6							
Purge method:	peristaltic							
Sample method:	"							
Start time:	10:25	Odor: none detected						
Stop time:		Purge Appearance: begin- clear, end- slightly cloudy						
Duration: (minutes)		Sample Appearance: Slightly Cloudy						
Rate, gpm:	0.1	Comments: Well purged dry after 1 well volume. Extremely slow recharge. Sampled at 14:00.						
Volume, purged:	~0.6 gal							
Duplicate collected?	no							
Sample collection by:	KSJ	CO2- Mn2- Fe(T)- Fe2-						
Others present:	—	Well Condition: good						

(MW) groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- semi-volatile- general- 1/2 nutrient- cyanide- DRO- Sulfide-

oil,grease- bacteria- total metal- 1 filtered metal- 1 methane- filter-

Others: TOC-1, LLHg-1, Methyl Hg-1

*Measurements are referenced from top of riser pipe, unless otherwise indicated.

Barr Engineering Company
Field Log Data Sheet

Client: PolyMet Mining Corp.	**Monitoring Point:** Ob-1
Location: NorthMet Mine Site	**Date:** 10/5/06
Project #: 23/69-862 004 009	**Sample Time:** 1340

GENERAL DATA		STABILIZATION TEST						
Barr lock:	Yes							
Casing diameter:	4"	Time/ Volume	Temp. °C	Cond. @ 25	pH	Eh	D.O.	Turbidity Appearance
Total well depth:*	94.4	1134/142	5.96	170	9.73	-14	0.65	cloudy
Static water level:*	13.22	1215/186	6.90	173	9.93	-53	9.51	clear
Water depth:*	81.2	1256/215	7.16	163	9.75	-48	11.29	clear
Well volume: (gal)	53	1337/262	6.96	158	9.73	-47	9.59	clear
Purge method:	submersible							
Sample method:	submersible							
Start time:	0815	Odor: None detected						
Stop time:	1340	Purge Appearance: clear, then cloudy, then clear						
Duration: (minutes)	325	Sample Appearance: clear						
Rate, gpm:	~~0815-0900 1.5~~ ~~0900~~ see right	Comments: pumping rates (gpm): 0815-0900 1.5; 0900-0945 0.5; 0945-1054 0; 1054-1200 1.3; 1200-1340 0.7						
Volume, purged:	262							
Duplicate collected?	NO							
Sample collection by: LMG		CO2- Mn2- Fe(T)- Fe2-						

Others present: —

Well Condition:

MW: groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- semi-volatile- general- 1 nutrient- 1 cyanide- 1 DRO- Sulfide-

oil,grease- bacteria- total metal- 2 filtered metal- 1 methane- filter-

Others: LL Hg-1, Methyl Hg-1, TOC-1

*Measurements are referenced from top of riser pipe, unless otherwise indicated.

Barr Engineering Company
Field Log Data Sheet

Client: PolyMet Mining	**Monitoring Point:** 06-2
Location: NorthMet	**Date:** 10/3/06
Project #: 23/69-862 004 009	**Sample Time:** 1200

GENERAL DATA		STABILIZATION TEST						
Barr lock:	yes							
Casing diameter:	~~2"~~ 4"	Time/ Volume	Temp. °C	Cond. @ 25	pH	ORP ~~Eh~~	D.O.	Turbidity Appearance
Total well depth:*	101.1	1059/ 60 gal	5.6	187	7.90	-132	2.80	clear
Static water level:*	8.86	1123/ 120 gal	5.5	189	8.11	-160	2.14	"
Water depth:*	92.2	1147/ 180 gal	5.6	187	8.09	-148	2.15	"
Well volume: (gal)	60							
Purge method:	Submersible							
Sample method:	Submersible & peristaltic							
Start time:	10:35	Odor: none detected						
Stop time:	11:47	Purge Appearance: clear						
Duration: (minutes)	72	Sample Appearance: clear						
Rate, gpm:	2.5	Comments:						
Volume, purged:	180 gal							
Duplicate collected?	no							
Sample collection by: KSJ, LMG		CO2- Mn2- Fe(T)- Fe2-						
Others present: —		Well Condition: good						

(MW): groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- semi-volatile- general- 1 nutrient- 1 cyanide- 1 DRO- Sulfide-

oil,grease- bacteria- total metal- 2 & filtered metal- 1 methane- filter-

Others: TOC-1, LLHg-1, Methyl Hg-1

*Measurements are referenced from top of riser pipe, unless otherwise indicated.

Barr Engineering Company
Field Log Data Sheet

Client: PolyMet Mining	**Monitoring Point:** 06-3
Location: NorthMet	**Date:** 10/16/06
Project #: 23/69-862 004 009	**Sample Time:** 1215

GENERAL DATA		STABILIZATION TEST						
Barr lock:	Yes							
Casing diameter:	4"	Time/ Volume	Temp. °C	Cond. @ 25	pH	ORP ~~Eh~~	D.O.	Turbidity Appearance
Total well depth:*	104.0	0952/ 61 gal	8.4	209	9.44	-69	1.12	Cloudy
Static water level:*	10.65	1010/ 122 gal	8.3	206	7.45	-63	0.86	clear
Water depth:*	93.4	1041/ 183 gal	8.4	205	6.95	-60	1.18	"
Well volume: (gal)	61.1	1111/ 244 gal	8.2	199	6.81	-63	0.82	"
Purge method:	Submersible	1142/ 306 gal	8.3	199	6.72	-63	0.81	"
Sample method:	Submersible	1212/ 367 gal	8.3	198	6.72	-63	0.80	"
Start time:	0909	Odor: none detected						
Stop time:	1215	Purge Appearance: Cloudy, then clear						
Duration: (minutes)	186	Sample Appearance: Clear						
Rate, gpm:	2.0	Comments:						
Volume, purged:	372 gal							
Duplicate collected?	no							
Sample collection by:	LMG	CO2-	Mn2-	Fe(T)-	Fe2-			
Others present:	—	Well Condition: good						

MW: groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- semi-volatile- general- / nutrient- / cyanide- / DRO- Sulfide-

oil,grease- bacteria- total metal- 2 filtered metal- / methane- filter-

Others: TOC-1, LL Hg-1, Methyl Hg-1

*Measurements are referenced from top of riser pipe, unless otherwise indicated.

Barr Engineering Company
Field Log Data Sheet

Client: PolyMet Mining	**Monitoring Point:** 06-4
Location: NorthMet	**Date:** 10/4/06
Project #: 23/69-862 004 009	**Sample Time:** 1210

GENERAL DATA		STABILIZATION TEST						
Barr lock:	yes							
Casing diameter:	4"	Time/ Volume	Temp. °C	Cond. @ 25	pH	ORP ~~Eh~~	D.O.	Turbidity Appearance
Total well depth:*	100.2	0902/ 55gal	7.9	47	6.20	185	6.17	clear
Static water level:*	15.68	0938/ 110gal	7.9	48	9.55	202	5.91	"
Water depth:*	84.5	1014/ 166gal	7.9	49	7.66	205	5.77	"
Well volume: (gal)	55	1051/ 221gal	7.9	49	6.18	191	5.63	"
Purge method:	Submersible	1126/ 276gal	7.9	51	5.87	147	5.57	"
Sample method:	Submersible & peristaltic	1203/ 331gal	8.0	49	5.80	119	5.47	"
Start time:	08:25	Odor: none detected						
Stop time:	12:03	Purge Appearance: clear						
Duration: (minutes)	221	Sample Appearance: clear						
Rate, gpm:	1.5	Comments:						
Volume, purged:	331 gal							
Duplicate collected?	M-1							
Sample collection by: KSJ, LMG		CO2- Mn2- Fe(T)- Fe2-						
Others present: —		Well Condition: good						

MW: groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- semi-volatile- general- 1+1 nutrient- 1+1 cyanide- 1+1 DRO- Sulfide-

oil,grease- bacteria- total metal- 2+2 filtered metal- 1+1 methane- filter-

Others: TOC- 1+1, LL Hg- 1+1, Methyl Hg - 1+1

*Measurements are referenced from top of riser pipe, unless otherwise indicated.

Barr Engineering Company
Field Log Data Sheet

Client: PolyMet Mining	**Monitoring Point:** 06-5
Location: NorthMet	**Date:** 10/4/06
Project #: 23/69-862 004 009	**Sample Time:** 1030

GENERAL DATA		STABILIZATION TEST						
Barr lock:	yes							
Casing diameter:	4"	Time/ Volume	Temp. °C	Cond. @ 25	pH	ORP ~~Eh~~	D.O.	Turbidity Appearance
Total well depth:*	99.6	0758/ 16.1 gal	8.8	44	7.43	186	7.16	clear
Static water level:*	12.34	0821/ 32 gal	8.3	44	6.51	182	7.50	"
Water depth:*	87.3	0843/ 48 gal	8.7	45	6.32	189	7.38	"
Well volume: (gal)	57	0905/ 63 gal	8.6	45	6.20	190	7.25	"
Purge method:	submersible	0927/ 78 gal	8.6	46	6.18	186	7.21	"
Sample method:	submersible & peristaltic	1030/ 123 gal	8.3	45	6.24	183	7.04	"
Start time:	07:35	Odor: none detected						
Stop time:	10:30	Purge Appearance: clear						
Duration: (minutes)	175	Sample Appearance: all but LLHg & Methyl Hg - clear; LLHg & Methyl Hg - cloudy						
Rate, gpm:	0.7	Comments: Used submersible pump to purge, then sample. Pulled ~~peristaltic~~ submersible pump, put in peristaltic pump. Flow cloudy; flow started clearing; LLHg & Methyl Hg samples collected before completely clear.						
Volume, purged:	123							
Duplicate collected?	no							
Sample collection by: KSJ, LMG		CO2- Mn2- Fe(T)- Fe2-						
Others present: —		Well Condition: good						

MW: groundwater monitoring well WS: water supply well SW: surface water SE: sediment other:

VOC- semi-volatile- general- 1 nutrient- 1 cyanide- 1 DRO- Sulfide-

oil,grease- bacteria- total metal- 2 filtered metal- 1 methane- filter-

Others: TOC-1, LLHg-1, Methyl Hg-1

*Measurements are referenced from top of riser pipe, unless otherwise indicated.

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

MDH Certification: 027-137-157

Laboratory Results

NTS COC: 72433
Received: 10/3/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Approved by: Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

NTS Sample: 116041
Description: OB-2
Sample Date: 10/3/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	10/25/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 116215
Description: OB-2
Sample Date: 10/3/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72433
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Notes: No Field Blank was received with this sample. A Field Blank is required for all samples analyzed for Mercury by EPA Method

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	62.4	µg/L	25	EPA 200.7	10/13/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	10/13/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	10/7/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	10/13/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	10/17/2006	KJD	
Boron	93.1	µg/L	50	EPA 200.7	10/13/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/17/2006	KJD	
Calcium	10.8	mg/L	1	EPA 200.7	10/13/2006	CSD	
Chromium	5	µg/L	1	EPA 218.2	10/20/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	10/13/2006	KJD	
Copper	2.8	µg/L	2	EPA 220.2	10/11/2006	KJD	
Iron	334	µg/L	50	EPA 200.7	10/13/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	10/13/2006	KJD	
Magnesium	12	mg/L	1	EPA 200.7	10/13/2006	CSD	
Manganese	41.6	µg/L	10	EPA 200.7	10/13/2006	CSD	
Mercury, Low Level	1.6	ng/L	0.5	EPA 1631E	10/20/2006	RH	
Molybdenum	<5	µg/L	5	EPA 246.2	10/12/2006	KJD	
Nickel	3.6	µg/L	2	EPA 249.2	10/11/2006	KJD	
Potassium	1.48	mg/L	0.25	EPA 200.7	10/13/2006	CSD	
Selenium	<10	µg/L	2	EPA 270.2	10/6/2006	KJD	c
Silver	<1	µg/L	1	EPA 272.2	10/17/2006	KJD	
Sodium	19.7	mg/L	2	EPA 200.7	10/13/2006	CSD	
Strontium	58.7	µg/L	5	EPA 200.7	10/13/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	10/11/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	10/19/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	10/13/2006	CSD	
TOC	1.9	mg/L	1	EPA 415.1	10/11/2006	CSD	
Alkalinity, Total	<10	mg/L as CaCO3	10	EPA 310.1	10/6/2006	JLC	
Chloride	0.55	mg/L	0.5	EPA 300.0 ATP	10/4/2006	LXP	
COD	<10	mg/L	10	SM 18th Ed 5220D	10/16/2006	JLC	
Fluoride	0.22	mg/L	0.1	EPA 300.0	10/4/2006	LXP	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	10/4/2006	DB	
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/10/2006	LL	
pH	7.6	Std Units	0.1	EPA 150.1	10/4/2006	LXP	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	10/6/2006	DB	
Sulfate	10.9	mg/L	1	EPA 300.0 ATP	10/4/2006	LXP	
Hardness, Total (calc)	76.4	mg/L	3	EPA 200.7	10/31/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116215
Description: OB-2
Sample Date: 10/3/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72433
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Notes: No Field Blank was received with this sample. A Field Blank is required for all samples analyzed for Mercury by EPA Method

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.2	10/11/2006	SUB	S2
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4
Platinum	<0.02	µg/L	0.02	EPA 200.8	10/23/2006	SUB	S4

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116218
Description: OB-2
Sample Date: 10/3/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 72433
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	10/9/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/21/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	10/10/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	10/7/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	10/6/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	10/7/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	10/6/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	10/10/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	10/9/2006	CSD

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

07 November 2006

Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Cahn For Kristina Spadafora
Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc. **SDG:**

Client: Northeast Technical Services Inc. **Project:** Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
116041	0610008-01	Water	03-Oct-06 12:00	04-Oct-06 12:30

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

Work Order Number: 0610008:

SAMPLE RECEIPT
One (1) water sample was received on October 4, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 1.2 degrees Celsius.

Upon receipt, the water sample for methyl mercury was preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottle for methyl mercury analysis was stored in a refrigerator until distillation and analysis.

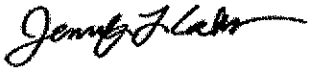
SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits.

Frontier GeoSciences, Inc.



Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

NORTHEAST TECHNICAL SERVICES
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
(218)741-4290 Fax (218)742-1010

#0610008

PM= KS

CHAIN OF CUSTODY RECORD
PAGE____ OF____
COC#________

CLIENT NAME	INVOICE TO:	REPORT TO:	SPECIAL INSTRUCTIONS:
NORTHEAST TECHNICAL SERVICES 315 Chestnut Street PO Box 1142 Virginia, MN 55792 (218)741-4290 Fax (218)742-1010	Renee Stone @ NTS	Renee Stone @ NTS	

PO NUMBER: 72433/3933

DESCRIPTION:	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	MATRIX LIQ.	MATRIX SOL.	filter	CONTAINERS	ANALYSIS:
116041	10/3/2006	12:00 p.m.		X	X			1	Methyl Hg

SAMPLED BY:	DATE: TIME:	RELINQUISHED BY:	DATE: TIME:	RELINQUISHED TO NTS SAMPLE LOCK-UP:	DATE: TIME:
RELINQUISHED BY: [signature] NTS	DATE: 10/3 TIME: 1600	RECEIVED BY: [signature] Kat... FGS	DATE: 10/4/06 TIME: 1230	RECEIVED FROM NTS SAMPLE LOCK-UP:	DATE: TIME:
RECEIVED BY:	DATE: TIME:	RELINQUISHED BY: Temp Blank: 1.2°C Temp 0.8 COC: Yes VTSR: 910	DATE: TIME:	RECEIVED FOR LAB BY: DATE: TIME:	SAMPLE TEMP: °
CUSTODY SEALS INTACT: YES____ NO____		COMMENTS: VPS		SAMPLES RECEIVED ON ICE: YES____ NO____	

Frontier GeoSciences, Inc.

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

[signature]

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL RESULTS

116041

Matrix: Water **Laboratory ID:** 0610008-01

Total Metals

Analyte	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method	Notes
Methyl Mercury	ND	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0610034-01

Matrix: Water
Sequence: 6J30004
Batch: F610163
Lab Number: F610163-DUP1
Preparation: Methyl Hg Distillation for Water

Total Metals

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.021	ND	0.056	ND	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0610034-01

Matrix: Water
Batch: F610163
Preparation: Methyl Hg Distillation for Water
Sequence: 6J30004
Lab Number: F610163-MS/MSD1

Total Metals

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.021	2.008	1.808	89.0	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	2.033	100	11.7	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Sequence: 6J30004
Batch: F610163
Lab Number: F610163-BS/BSD1
Preparation: Methyl Hg Distillation for Water

Total Metals

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.892	94.2	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.920	95.6	1.47	70 - 130	25	FGS-070	

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Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Sequence: 6J30004
Instrument: MeHg-15
Preparation: Methyl Hg Distillation for Water

Total Metals

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F610163-BLK1	Methyl Mercury	0.002	0.056	ng/L	F610163	FGS-070	U
F610163-BLK2	Methyl Mercury	-0.002	0.056	ng/L	F610163	FGS-070	U
F610163-BLK3	Methyl Mercury	0.008	0.056	ng/L	F610163	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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Chain of Custody

BARR

4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Proj# 3933

#12433 COC 1 of 2

Project Number: 23/69 - 862004.009

Project Name: PolyMet

№ 21470

Project Manager: CDP

Project Contact: KDP

Sampled by: KSJ/LMG

Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix:	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Pres.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl)	TOC	1:1 H_2SO_4	Methyl Mercury	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) - 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unpres.) *2	% Moisture (plastic vial, unpres.)			Total No. Of Containers	Remarks
1. 06-2/116041	10/3/06	1200	X			X					1	2	1	1	1						1	1	1									9	Table 1
2. 116215																																	
3. 116218																																	
4.																																	
5.																																	
6.																																	
7.																																	
8.																																	
9.																																	
10.																																	
11.																																	
12.																																	

Common Parameter/Container - Preservation Key

*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice? Y / N	Date	Time	Received by:	Date	Time
Leah Gillen	Y	10/3/06	1:50 pm			
Relinquished By:	On Ice? Y / N	Date	Time	Received by: P. Donahue	Date 10/3/06	Time 1:50 pm

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other

Air Bill Number: rec'd 3.3°C on ice

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

From Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

[redacted]

no samples collected Fri, Sat.

Keely not in office on Tues.

Coc#70433
#373

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Laboratory Results

MDH Certification: 027-137-157

NTS COC: 72484
Received: 10/4/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Approved by: Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

Revision #1

NTS Sample: 116289
Description: 0B-5
Sample Date: 10/4/2006 10:30:00 AM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	10/26/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 116290
Description: OB-4
Sample Date: 10/4/2006 12:10:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	10/26/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 116291
Description: M-1
Sample Date: 10/4/2006

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	10/26/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 116350
Description: 0B-5
Sample Date: 10/4/2006 10:30:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	181	µg/L	25	EPA 200.7	10/13/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	10/13/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	10/7/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	10/13/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	10/17/2006	KJD	
Boron	<50	µg/L	50	EPA 200.7	10/13/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/17/2006	KJD	
Calcium	7.66	mg/L	1	EPA 200.7	10/13/2006	CSD	
Chromium	2.2	µg/L	1	EPA 218.2	10/20/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	10/13/2006	KJD	
Copper	3.5	µg/L	2	EPA 220.2	10/11/2006	KJD	
Iron	548	µg/L	50	EPA 200.7	10/13/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	10/13/2006	KJD	
Magnesium	2.81	mg/L	1	EPA 200.7	10/13/2006	CSD	
Manganese	<10	µg/L	10	EPA 200.7	10/13/2006	CSD	
Mercury, Low Level	4.9	ng/L	2	EPA 1631E	10/20/2006	RH	
Molybdenum	<5	µg/L	5	EPA 246.2	10/12/2006	KJD	
Nickel	4.6	µg/L	2	EPA 249.2	10/11/2006	KJD	
Potassium	1.26	mg/L	0.25	EPA 200.7	10/13/2006	CSD	
Selenium	<10	µg/L	2	EPA 270.2	10/6/2006	KJD	c
Silver	<1	µg/L	1	EPA 272.2	10/17/2006	KJD	
Sodium	<2	mg/L	2	EPA 200.7	10/13/2006	CSD	
Strontium	19.3	µg/L	5	EPA 200.7	10/13/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	10/11/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	10/19/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	10/13/2006	CSD	
TOC	2.0	mg/L	1	EPA 415.1	10/11/2006	CSD	
Alkalinity, Total	25.5	mg/L as CaCO3	10	EPA 310.1	10/6/2006	JLC	
Chloride	<0.5	mg/L	0.5	EPA 300.0 ATP	10/6/2006	DB	
COD	<10	mg/L	10	SM 18th Ed 5220D	10/16/2006	JLC	
Fluoride	<0.1	mg/L	0.1	EPA 300.0	10/6/2006	DB	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	10/12/2006	LL	
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/10/2006	LL	
pH	6.0	Std Units	0.1	EPA 150.1	10/5/2006	JLC	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	10/6/2006	DB	
Sulfate	8.24	mg/L	1	EPA 300.0 ATP	10/6/2006	DB	
Hardness, Total (calc)	30.7	mg/L	3	SM 2340B	10/31/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116350
Description: 0B-5
Sample Date: 10/4/2006 10:30:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.2	10/11/2006	SUB	S2
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4
Platinum	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116351
Description: 0B-5
Sample Date: 10/4/2006 10:30:00 AM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	10/9/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/21/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	10/10/2006	KJD
Copper	2.3	µg/L	2	EPA 220.2	10/7/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	10/6/2006	KJD
Nickel	5.9	µg/L	2	EPA 249.2	10/7/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	10/6/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	10/10/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	10/9/2006	CSD

NTS Sample: 116352
Description: OB-4
Sample Date: 10/4/2006 12:10:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Notes: No Field Blank was received with this sample. A Field Blank is required for all samples anayzed for Mercury by EPA Method 1

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	55.4	µg/L	25	EPA 200.7	10/13/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	10/13/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	10/7/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	10/13/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	10/17/2006	KJD	
Boron	<50	µg/L	50	EPA 200.7	10/13/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/17/2006	KJD	
Calcium	5.4	mg/L	1	EPA 200.7	10/13/2006	CSD	
Chromium	<1	µg/L	1	EPA 218.2	10/20/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	10/13/2006	KJD	
Copper	<2	µg/L	2	EPA 220.2	10/11/2006	KJD	
Iron	<50	µg/L	50	EPA 200.7	10/13/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	10/13/2006	KJD	
Magnesium	2.48	mg/L	1	EPA 200.7	10/13/2006	CSD	
Manganese	<10	µg/L	10	EPA 200.7	10/13/2006	CSD	
Mercury, Low Level	0.9	ng/L	0.5	EPA 1631E	10/20/2006	RH	
Molybdenum	<5	µg/L	5	EPA 246.2	10/12/2006	KJD	
Nickel	<2	µg/L	2	EPA 249.2	10/11/2006	KJD	
Potassium	0.98	mg/L	0.25	EPA 200.7	10/13/2006	CSD	
Selenium	<10	µg/L	2	EPA 270.2	10/6/2006	KJD	c
Silver	<1	µg/L	1	EPA 272.2	10/17/2006	KJD	
Sodium	<2	mg/L	2	EPA 200.7	10/13/2006	CSD	
Strontium	18.5	µg/L	5	EPA 200.7	10/13/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	10/11/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	10/19/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	10/13/2006	CSD	
TOC	2.2	mg/L	1	EPA 415.1	10/11/2006	CSD	
Alkalinity, Total	17.6	mg/L as CaCO3	10	EPA 310.1	10/6/2006	JLC	
Chloride	0.5	mg/L	0.5	EPA 300.0 ATP	10/6/2006	DB	
COD	<10	mg/L	10	SM 18th Ed 5220D	10/16/2006	JLC	
Fluoride	<0.1	mg/L	0.1	EPA 300.0	10/6/2006	DB	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	10/12/2006	LL	
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/10/2006	LL	
pH	6.1	Std Units	0.1	EPA 150.1	10/5/2006	JLC	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	10/6/2006	DB	
Sulfate	<1	mg/L	1	EPA 300.0 ATP	10/6/2006	DB	
Hardness, Total (calc)	23.7	mg/L	3	SM 2340B	10/31/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116352
Description: OB-4
Sample Date: 10/4/2006 12:10:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Notes: No Field Blank was received with this sample. A Field Blank is required for all samples anayzed for Mercury by EPA Method 1

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.2	10/11/2006	SUB	S2
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4
Platinum	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116353
Description: OB-4
Sample Date: 10/4/2006 12:10:00 PM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	10/9/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/21/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	10/10/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	10/7/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	10/6/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	10/7/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	10/6/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	10/10/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	10/9/2006	CSD

NTS Sample: 116354
Description: M-1
Sample Date: 10/4/2006

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Notes: No Field Blank was received with this sample. A Field Blank is required for all samples analyzed for Mercury by EPA Method

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	62.1	µg/L	25	EPA 200.7	10/13/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	10/13/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	10/7/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	10/13/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	10/17/2006	KJD	
Boron	<50	µg/L	50	EPA 200.7	10/13/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/17/2006	KJD	
Calcium	5.48	mg/L	1	EPA 200.7	10/13/2006	CSD	
Chromium	<1	µg/L	1	EPA 218.2	10/20/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	10/13/2006	KJD	
Copper	<2	µg/L	2	EPA 220.2	10/11/2006	KJD	
Iron	<50	µg/L	50	EPA 200.7	10/13/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	10/13/2006	KJD	
Magnesium	2.52	mg/L	1	EPA 200.7	10/13/2006	CSD	
Manganese	<10	µg/L	10	EPA 200.7	10/13/2006	CSD	
Mercury, Low Level	1.0	ng/L	0.5	EPA 1631E	10/20/2006	RH	
Molybdenum	<5	µg/L	5	EPA 246.2	10/12/2006	KJD	
Nickel	<2	µg/L	2	EPA 249.2	10/11/2006	KJD	
Potassium	0.99	mg/L	0.25	EPA 200.7	10/13/2006	CSD	
Selenium	<10	µg/L	2	EPA 270.2	10/6/2006	KJD	c
Silver	<1	µg/L	1	EPA 272.2	10/17/2006	KJD	
Sodium	<2	mg/L	2	EPA 200.7	10/13/2006	CSD	
Strontium	18.8	µg/L	5	EPA 200.7	10/13/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	10/11/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	10/19/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	10/13/2006	CSD	
TOC	1.9	mg/L	1	EPA 415.1	10/11/2006	CSD	
Alkalinity, Total	17.6	mg/L as CaCO3	10	EPA 310.1	10/6/2006	JLC	
Chloride	<0.5	mg/L	0.5	EPA 300.0 ATP	10/6/2006	DB	
COD	<10	mg/L	10	SM 18th Ed 5220D	10/16/2006	JLC	
Fluoride	<0.1	mg/L	0.1	EPA 300.0	10/6/2006	DB	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	10/12/2006	LL	
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/10/2006	LL	
pH	5.7	Std Units	0.1	EPA 150.1	10/5/2006	JLC	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	10/6/2006	DB	
Sulfate	8.55	mg/L	1	EPA 300.0 ATP	10/6/2006	DB	
Hardness, Total (calc)	24.1	mg/L	3	SM 2340B	10/31/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116354
Description: M-1
Sample Date: 10/4/2006

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Notes: No Field Blank was received with this sample. A Field Blank is required for all samples analyzed for Mercury by EPA Method

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.2	10/11/2006	SUB	S2
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4
Platinum	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116355
Description: M-1
Sample Date: 10/4/2006

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 72484
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/14/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	10/9/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/21/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	10/10/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	10/7/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	10/6/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	10/7/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	10/6/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	10/10/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	10/9/2006	CSD

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

07 November 2006

Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Cahn For Kristina Spadafora
Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc.
SDG:
Client: Northeast Technical Services Inc.
Project: Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
116289	0610013-01	Water	04-Oct-06 10:30	05-Oct-06 10:25
116290	0610013-02	Water	04-Oct-06 12:10	05-Oct-06 10:25
116291	0610013-03	Water	04-Oct-06 00:00	05-Oct-06 10:25

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
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CASE NARRATIVE

Work Order Number: 0610013:

SAMPLE RECEIPT
Three (3) water samples were received on October 5, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 0.8 degrees Celsius.

Upon receipt, the water samples for methyl mercury were preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottles for methyl mercury analysis were stored in a refrigerator until distillation and analysis.

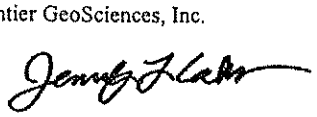
SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits.

Frontier GeoSciences, Inc.



Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

NORTHEAST TECHNICAL SERVICES
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
(218)741-4290 Fax (218)742-1010

#0610013 PM=KS

CHAIN OF CUSTODY RECORD
PAGE 1 OF 1
COC#

CLIENT NAME	INVOICE TO:	REPORT TO:
NORTHEAST TECHNICAL SERVICES 315 Chestnut Street PO Box 1142 Virginia, MN 55792 (218)741-4290 Fax (218)742-1010	Renee Stone @ NTS	Renee Stone @ NTS

PO NUMBER: 72484/3933

SPECIAL INSTRUCTIONS:

DESCRIPTION:	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	MATRIX LIQ.	MATRIX SOL.	Filter	CONTAINERS: GENERAL - NO PRES.	NUTRIENTS - H2SO4	METALS - HNO3	40 ml VOA - HCL	1 L T AMBER - HCL	NAOH	ANALYSES:
116289	10/4/2006	10:30		x	X			1						Methyl Mercury
116290	10/4/2006	12:10		x	X			1						Methyl Mercury
116291	10/4/2006			x	X			1						Methyl Mercury

SAMPLED BY:	DATE: TIME:	RELINQUISHED BY:	DATE: TIME:	RELINQUISHED TO NTS SAMPLE LOCKUP:	DATE: TIME:
RELINQUISHED BY: J A Kosli	DATE: 10-4-06 TIME: 5:10	RECEIVED BY: Kailee Knapa	DATE: TIME:	RECEIVED FROM NTS SAMPLE LOCKUP: VTSE: UPS	DATE: TIME:
RECEIVED BY:	DATE: TIME:	RELINQUISHED BY: FGS 10/[illegible] 1036	DATE: TIME:	RECEIVED FOR LAB BY: DATE: 10/5/06 TIME: 1040	SAMPLE TEMP: 0.8 C
CUSTODY SEALS INTACT: YES____ NO____		COMMENTS:		SAMPLES RECEIVED ON ICE: YES X NO____	

Frontier GeoSciences, Inc.

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

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Methyl Mercury Analytical Results

Matrix: Water

Extraction: Methyl Hg Distillation for Water

Total Metals

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method:	Notes
116289	ND	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	U
116290	ND	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	U
116291	ND	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
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MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0610034-01

Matrix: Water
Batch: F610163
Preparation: Methyl Hg Distillation for Water
Sequence: 6J30004
Lab Number: F610163-DUP1

Total Metals

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.021	ND	0.056	ND	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0610034-01

Matrix: Water
Batch: F610163
Preparation: Methyl Hg Distillation for Water
Sequence: 6J30004
Lab Number: F610163-MS/MSD1

Total Metals

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.021	2.008	1.808	89.0	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	2.033	100	11.7	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
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Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water

Batch: F610163

Preparation: Methyl Hg Distillation for Water

Sequence: 6J30004

Lab Number: F610163-BS/BSD1

Total Metals

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.892	94.2	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.920	95.6	1.47	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Instrument: MeHg-15
Sequence: 6J30004
Preparation: Methyl Hg Distillation for Water

Total Metals

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F610163-BLK1	Methyl Mercury	0.002	0.056	ng/L	F610163	FGS-070	U
F610163-BLK2	Methyl Mercury	-0.002	0.056	ng/L	F610163	FGS-070	U
F610163-BLK3	Methyl Mercury	0.008	0.056	ng/L	F610163	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

Chain of Custody

72484

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

COC 1 of 1

Project Number: 23/69-862004.009

Project Name: PolyMet

№ 22058

Project Manager: CDP

Project Contact: KDP

Sampled by: LMG

Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Matrix:	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Pres.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl)	TDC	LLHg	Method 1 Hg	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) - 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unprcs.) *2	% Moisture (plastic vial, unprcs.)		Total No. Of Containers	Remarks
1. 06-5 1116289 1116350 1116351	10/4/06	1030	X			X					1	2	1	1	1						1	1	1								9	Table 1
2. 06-4 1116290 1116352 1116353	10/4/06	~~1210~~	X			X					1	2	1	1	1						1	1	1								9	↓
3. M-1 1116291 1116354 1116355	10/4/06		X			X					1	2	1	1	1						1	1	1								9	
4.																															
5.																															
6.																															
7.																															
8.																															
9.																															
10.																															
11.																															
12.																															

Common Parameter/Container - Preservation Key

*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
Leah M. Graham	(Y) N	10/4/06		[illegible]	10-4-06	13:50
Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
[signature]	(Y) N	10/4/06	1350			

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other

Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

On ice 4.7°C

H:\RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

From Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

[redacted]

no samples collected Fri, Sat. Keely not in office on Tues.

Coc#72433
pg 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Laboratory Results

MDH Certification: 027-137-157

NTS COC: 72541
Received: 10/5/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Approved by: Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

NTS Sample: 116430
Description: OB-1
Sample Date: 10/5/2006 1:40:00 PM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	10/26/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 116431
Description: MW-05-09
Sample Date: 10/5/2006 2:00:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	0.130	ng/L	0.056	EPA 1630	10/26/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 116432
Description: FB-1
Sample Date: 10/5/2006 7:45:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	10/26/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 116433
Description: Pour Blank
Sample Date: 10/5/2006 7:45:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Mercury, Low Level	0.4	ng/L	0.2	EPA 1631E	10/25/2006	RH	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	10/26/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 116535
Description: OB-1
Sample Date: 10/5/2006 1:40:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	111	µg/L	25	EPA 200.7	10/17/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	10/13/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	10/11/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	10/17/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	10/17/2006	KJD	
Boron	<50	µg/L	50	EPA 200.7	10/17/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/17/2006	KJD	
Calcium	29.7	mg/L	1	EPA 200.7	10/17/2006	CSD	
Chromium	1.7	µg/L	1	EPA 218.2	10/20/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	10/13/2006	KJD	
Copper	<2	µg/L	2	EPA 220.2	10/11/2006	KJD	
Iron	87.9	µg/L	50	EPA 200.7	10/17/2006	CSD	
Lead	<2	µg/L	1	EPA 239.2	10/14/2006	KJD	c
Magnesium	7.72	mg/L	1	EPA 200.7	10/17/2006	CSD	
Manganese	<10	µg/L	10	EPA 200.7	10/17/2006	CSD	
Mercury, Low Level	<0.5	ng/L	0.5	EPA 1631E	10/25/2006	RH	
Molybdenum	<5	µg/L	5	EPA 246.2	10/12/2006	KJD	
Nickel	<2	µg/L	2	EPA 249.2	10/12/2006	KJD	
Potassium	1.81	mg/L	0.25	EPA 200.7	10/17/2006	CSD	
Selenium	<2	µg/L	2	EPA 270.2	10/11/2006	KJD	
Silver	<1	µg/L	1	EPA 272.2	10/17/2006	KJD	
Sodium	7.38	mg/L	2	EPA 200.7	10/17/2006	CSD	
Strontium	112	µg/L	5	EPA 200.7	10/17/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	10/11/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	10/19/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	10/17/2006	CSD	
TOC	1.5	mg/L	1	EPA 415.1	10/11/2006	CSD	
Alkalinity, Total	47.4	mg/L as CaCO3	10	EPA 310.1	10/17/2006	JLC	
Chloride	15.7	mg/L	0.5	EPA 300.0 ATP	10/15/2006	DB	
COD	<10	mg/L	10	SM 18th Ed 5220D	10/16/2006	JLC	
Fluoride	0.11	mg/L	0.1	EPA 300.0	10/15/2006	DB	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	10/12/2006	LL	
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/17/2006	DB	
pH	9.0	Std Units	0.1	SM 4500-H+	10/9/2006	JLC	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	10/12/2006	LL	
Sulfate	37.2	mg/L	1	EPA 300.0 ATP	10/15/2006	DB	
Hardness, Total (calc)	106	mg/L	3	EPA 200.7	11/16/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116535
Description: OB-1
Sample Date: 10/5/2006 1:40:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.2	10/16/2006	SUB	S2
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4
Platinum	<0.02	µg/L	0.02	EPA 200.8	10/23/2006	SUB	S4

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116536
Description: MW-05-09
Sample Date: 10/5/2006 2:00:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	27100	µg/L	250	EPA 200.7	10/17/2006	CSD
Antimony	<3	µg/L	3	EPA 204.2	10/13/2006	KJD
Arsenic	4.8	µg/L	2	EPA 206.2	10/11/2006	KJD
Barium	214	µg/L	10	EPA 200.7	10/17/2006	CSD
Beryllium	0.7	µg/L	0.2	EPA 210.2	10/17/2006	KJD
Boron	<50	µg/L	50	EPA 200.7	10/17/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/17/2006	KJD
Calcium	7.08	mg/L	1	EPA 200.7	10/17/2006	CSD
Chromium	55	µg/L	2	EPA 218.2	10/20/2006	KJD
Cobalt	8.8	µg/L	1	EPA 219.2	10/13/2006	KJD
Copper	99.6	µg/L	10	EPA 220.2	10/12/2006	KJD
Iron	29800	µg/L	500	EPA 200.7	10/17/2006	CSD
Lead	6.1	µg/L	2	EPA 239.2	10/14/2006	KJD
Magnesium	6.83	mg/L	1	EPA 200.7	10/17/2006	CSD
Manganese	584	µg/L	10	EPA 200.7	10/17/2006	CSD
Mercury, Low Level	28.8	ng/L	0.5	EPA 1631E	10/25/2006	RH
Molybdenum	12.1	µg/L	5	EPA 246.2	10/12/2006	KJD
Nickel	40.2	µg/L	2	EPA 249.2	10/12/2006	KJD
Potassium	6.87	mg/L	2.5	EPA 200.7	10/17/2006	CSD
Selenium	<2	µg/L	2	EPA 270.2	10/11/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	10/17/2006	KJD
Sodium	12	mg/L	2	EPA 200.7	10/17/2006	CSD
Strontium	65.1	µg/L	5	EPA 200.7	10/17/2006	CSD
Thallium	<2	µg/L	2	EPA 279.2	10/11/2006	KJD
Titanium	1040	µg/L	200	EPA 283.2	10/19/2006	KJD
Zinc	46.3	µg/L	25	EPA 200.7	10/17/2006	CSD
TOC	5.2	mg/L	1	EPA 415.1	10/11/2006	CSD
Alkalinity, Total	26.4	mg/L as CaCO3	10	EPA 310.1	10/17/2006	JLC
Chloride	0.69	mg/L	0.5	EPA 300.0 ATP	10/15/2006	DB
COD	<10	mg/L	10	SM 18th Ed 5220D	10/16/2006	DB
Fluoride	<0.1	mg/L	0.1	EPA 300.0	10/15/2006	DB
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	10/12/2006	LL
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/17/2006	DB
pH	7.5	Std Units	0.1	SM 4500-H+	10/9/2006	JLC
Phosphorous, Total	0.25	mg/L as P	0.1	EPA 365.4	10/12/2006	LL
Sulfate	10.4	mg/L	1	EPA 300.0 ATP	10/15/2006	DB
Hardness, Total (calc)	45.8	mg/L	3	EPA 200.7	11/16/2006	RMS

Qualifier	Description	Note
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116536
Description: MW-05-09
Sample Date: 10/5/2006 2:00:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.2	10/16/2006	SUB	S2
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4
Platinum	<0.02	µg/L	0.02	EPA 200.8	10/23/2006	SUB	S4

Qualifier	Description	Note
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116537
Description: FB-1
Sample Date: 10/5/2006 7:45:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	<25	µg/L	25	EPA 200.7	10/17/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	10/13/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	10/11/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	10/17/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	10/17/2006	KJD	
Boron	<50	µg/L	50	EPA 200.7	10/17/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/17/2006	KJD	
Calcium	<1	mg/L	1	EPA 200.7	10/17/2006	CSD	
Chromium	<1	µg/L	1	EPA 218.2	10/20/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	10/13/2006	KJD	
Copper	<2	µg/L	2	EPA 220.2	10/12/2006	KJD	
Iron	<50	µg/L	50	EPA 200.7	10/17/2006	CSD	
Lead	<2	µg/L	1	EPA 239.2	10/14/2006	KJD	c
Magnesium	<1	mg/L	1	EPA 200.7	10/17/2006	CSD	
Manganese	<10	µg/L	10	EPA 200.7	10/17/2006	CSD	
Mercury, Low Level	0.9	ng/L	0.5	EPA 1631E	10/25/2006	RH	
Molybdenum	<5	µg/L	5	EPA 246.2	10/12/2006	KJD	
Nickel	<2	µg/L	2	EPA 249.2	10/12/2006	KJD	
Potassium	<0.25	mg/L	0.25	EPA 200.7	10/17/2006	CSD	
Selenium	<2	µg/L	2	EPA 270.2	10/11/2006	KJD	
Silver	<1	µg/L	1	EPA 272.2	10/17/2006	KJD	
Sodium	<2	mg/L	2	EPA 200.7	10/17/2006	CSD	
Strontium	<5	µg/L	5	EPA 200.7	10/17/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	10/11/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	10/19/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	10/17/2006	CSD	
TOC	<1	mg/L	1	EPA 415.1	10/11/2006	CSD	
Alkalinity, Total	<10	mg/L as CaCO3	10	EPA 310.1	10/17/2006	JLC	
Chloride	<0.5	mg/L	0.5	EPA 300.0 ATP	10/15/2006	DB	
COD	<10	mg/L	10	SM 18th Ed 5220D	10/16/2006	JLC	
Fluoride	<0.1	mg/L	0.1	EPA 300.0	10/15/2006	DB	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	10/12/2006	LL	
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/17/2006	DB	
pH	8.9	Std Units	0.1	SM 4500-H+	10/9/2006	JLC	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	10/12/2006	LL	
Sulfate	<1	mg/L	1	EPA 300.0 ATP	10/15/2006	DB	
Hardness, Total (calc)	<10	mg/L	10	EPA 200.7	11/16/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116537
Description: FB-1
Sample Date: 10/5/2006 7:45:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.2	10/16/2006	SUB	S2
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/23/2006	SUB	S4
Platinum	<0.02	µg/L	0.02	EPA 200.8	10/23/2006	SUB	S4

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 116538
Description: OB-1
Sample Date: 10/5/2006 1:40:00 PM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	55.2	µg/L	25	EPA 200.7	10/9/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/21/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	10/10/2006	KJD
Copper	2.2	µg/L	2	EPA 220.2	10/10/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	10/21/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	10/10/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	10/11/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	10/10/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	10/9/2006	CSD

NTS Sample: 116539
Description: MW-05-09
Sample Date: 10/5/2006 2:00:00 PM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	430	µg/L	25	EPA 200.7	10/9/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/21/2006	KJD
Chromium	1.2	µg/L	1	EPA 218.2	10/10/2006	KJD
Copper	7.9	µg/L	2	EPA 220.2	10/10/2006	KJD
Molybdenum	8.8	µg/L	5	EPA 246.2	10/21/2006	KJD
Nickel	3	µg/L	2	EPA 249.2	10/10/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	10/11/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	10/10/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	10/9/2006	CSD

NTS Sample: 116540
Description: FB-1
Sample Date: 10/5/2006 7:45:00 AM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 72541
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	10/9/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/21/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	10/10/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	10/10/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	10/21/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	10/10/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	10/11/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	10/10/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	10/9/2006	CSD

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

07 November 2006

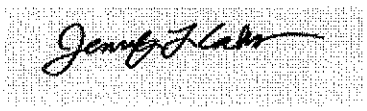
Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Cahn For Kristina Spadafora
Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc. **SDG:**

Client: Northeast Technical Services Inc. **Project:** Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
116430	0610024-01	Water	05-Oct-06 00:00	06-Oct-06 10:24
116431	0610024-02	Water	05-Oct-06 00:00	06-Oct-06 10:24
116432	0610024-03	Water	05-Oct-06 00:00	06-Oct-06 10:24
116433	0610024-04	Water	05-Oct-06 00:00	06-Oct-06 10:24

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

Work Order Number: 0610024:

SAMPLE RECEIPT
Four (4) water samples were received on October 6, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 3.0 degrees Celsius.

Upon receipt, the water samples for methyl mercury were preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottles for methyl mercury analysis were stored in a refrigerator until distillation and analysis.

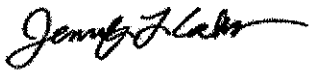
SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits.

Frontier GeoSciences, Inc.



Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

NORTHEAST TECHNICAL SERVICES
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
(218)741-4290 Fax (218)742-1010

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CHAIN OF CUSTODY RECORD
PAGE____OF____
COC#_____

CLIENT NAME	INVOICE TO:	REPORT TO:
NORTHEAST TECHNICAL SERVICES 315 Chestnut Street PO Box 1142 Virginia, MN 55792 (218)741-4290 Fax (218)742-1010	Renee Stone @ NTS	Renee Stone @ NTS

PO NUMBER: 72641/3933

DESCRIPTION:	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	MATRIX LIQ.	MATRIX SOL.	filter	CONTAINERS	ANALYSIS:
116430	10/5/2006			x	X			1	Methyl Mercury
116431	10/5/2006			x	X			1	Methyl Mercury
116432	10/5/2006			x	X			1	Methyl Mercury
116433	10/5/2006			x	X			1	Methyl Mercury

SPECIAL INSTRUCTIONS:

SAMPLED BY:	DATE:	RELINQUISHED BY:	DATE:	RELINQUISHED TO NTS SAMPLE LOCK-UP:	DATE:
	TIME:		TIME:		TIME:
RELINQUISHED BY:	DATE: 10/5/06	RECEIVED BY:	DATE:	RECEIVED FROM NTS SAMPLE LOCK-UP:	DATE:
	TIME: 16:15		TIME:		TIME:
RECEIVED BY:	DATE: 10/6/06	RELINQUISHED BY:	DATE:	RECEIVED FOR LAB BY: DATE:	SAMPLE TEMP:
	TIME: 1030		TIME:	TIME:	°C

CUSTODY SEALS INTACT: YES____ NO____ COMMENTS: SAMPLES RECEIVED ON ICE: YES____ NO____

Frontier GeoSciences, Inc.

Jennifer Cahn

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Methyl Mercury Analytical Results

Matrix: Water

Extraction: Methyl Hg Distillation for Water

Total Metals

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method:	Notes
116430	ND	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	U
116431	**0.130**	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	
116432	ND	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	U
116433	ND	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0610034-01

Matrix: Water
Sequence: 6J30004
Batch: F610163
Lab Number: F610163-DUP1
Preparation: Methyl Hg Distillation for Water

Total Metals

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.021	ND	0.056	ND	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0610034-01

Matrix: Water
Batch: F610163
Preparation: Methyl Hg Distillation for Water
Sequence: 6J30004
Lab Number: F610163-MS/MSD1

Total Metals

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.021	2.008	1.808	89.0	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	2.033	100	11.7	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Sequence: 6J30004
Batch: F610163
Lab Number: F610163-BS/BSD1
Preparation: Methyl Hg Distillation for Water

Total Metals

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.892	94.2	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.920	95.6	1.47	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Sequence: 6J30004
Instrument: MeHg-15
Preparation: Methyl Hg Distillation for Water

Total Metals

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F610163-BLK1	Methyl Mercury	0.002	0.056	ng/L	F610163	FGS-070	U
F610163-BLK2	Methyl Mercury	-0.002	0.056	ng/L	F610163	FGS-070	U
F610163-BLK3	Methyl Mercury	0.008	0.056	ng/L	F610163	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

Chain of Custody

72541

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

COC 1 of 1

Project Number: 23/69-862 004 009

Project Name: PolyMet

№ 22059

Project Manager: CDP

Project Contact: KDP

Sampled by: LMG, KSJ

Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Prcs.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl)	TOC	LL Hg	Methyl Hg	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) - 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unpres.) *2	% Moisture (plastic vial, unpres.)		Total No. Of Containers	Remarks
1. 06-1	10/5/06	1340	X		X					1	2	1	1	1						1	1	1								9	Table 1
2. MW-05-09	10/5/06	1400	X		X					1	1	1		1						1	1	1								7	Table 1 excluding ~~Pt, Pd~~, Cyanide
3. FB-1	10/5/06	0745	X		X					1	2	1	1	1						1	1	1								9	Table 1
4. Pour Blank	10/5/06	0745	X		X																1	1								2	LL Hg, Methyl Hg
5. 116430 | 116535 | 116538																															
6. 116431 | 116536 | 116539																															
7. 116432 | 116537 | 116540																															
8. 116433																															
9.																															
10.																															
11.																															
12.																															

Common Parameter/Container - Preservation Key

*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time
[signature]	Y	10-5-06	1600	[signature]	10-5-06	16:05
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other

Air Bill Number:

5.9°C on ice

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

From Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

[redacted]

No samples collected Fri, Sat.

Kelly not in office on Tues.

Coc#72433
pg 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

MDH Certification: 027-137-157

Laboratory Results

NTS COC: 72829
Received: 10/16/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Approved by: Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

NTS Sample: 119232
Description: OB-3
Sample Date: 10/16/2006 12:15:00 PM

Matrix: Aqueous
Sample Type: Grab

Notes: A Field Blank did not accompany this sample. All samples analyzed for Mercury by EPA Method 1631 require Field Blanks.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Mercury, Low Level	0.8	ng/L	0.5	EPA 1631E	11/1/2006	SUB	
TOC	3.2	mg/L	1	EPA 415.1	10/18/2006	CSD	
Alkalinity, Total	66.2	mg/L as CaCO3	10	EPA 310.1	10/17/2006	JLC	
Chloride	93.1	mg/L	0.5	EPA 300.0 ATP	10/17/2006	DB	
COD	<10	mg/L	10	SM 18th Ed 5220D	10/31/2006	JLC	
Fluoride	0.97	mg/L	0.1	EPA 300.0	10/17/2006	DB	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	10/19/2006	DB	
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/17/2006	DB	
pH	6.6	Std Units	0.1	SM 4500-H+	10/17/2006	LXP	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	10/19/2006	DB	
Sulfate	66.4	mg/L	1	EPA 300.0 ATP	10/17/2006	DB	
Cyanide	<0.02	mg/L	0.02	EPA 335.2	10/20/2006	SUB	S2
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	10/26/2006	SUB	S7

Qualifier	Description	Note
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 119233
Description: OB-3
Sample Date: 10/16/2006 12:15:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 72829
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	368	µg/L	25	EPA 200.7	10/25/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	10/28/2006	KJD	
Arsenic	4.1	µg/L	2	EPA 206.2	11/3/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	10/25/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	10/28/2006	KJD	
Boron	<50	µg/L	50	EPA 200.7	10/25/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 7131A	10/31/2006	KJD	
Calcium	21	mg/L	1	EPA 200.7	10/25/2006	CSD	
Chromium	<2.5	µg/L	2.5	EPA 200.7	10/25/2006	CSD	
Cobalt	4.1	µg/L	1	EPA 219.2	10/21/2006	KJD	
Copper	2.1	µg/L	2	EPA 220.2	10/27/2006	KJD	
Iron	7040	µg/L	50	EPA 200.7	10/25/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	10/20/2006	KJD	
Magnesium	21.4	mg/L	1	EPA 200.7	10/25/2006	CSD	
Manganese	383	µg/L	10	EPA 200.7	10/25/2006	CSD	
Molybdenum	<5	µg/L	5	EPA 246.2	10/27/2006	KJD	
Nickel	128	µg/L	5	EPA 200.7	10/25/2006	CSD	
Potassium	2.33	mg/L	0.25	EPA 200.7	10/25/2006	CSD	
Selenium	<2	µg/L	2	EPA 7740	11/2/2006	KJD	
Silver	<1	µg/L	1	EPA 272.2	10/21/2006	KJD	n
Sodium	6.33	mg/L	2	EPA 200.7	10/25/2006	CSD	
Strontium	74.8	µg/L	5	EPA 200.7	10/25/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	10/28/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	10/28/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	10/25/2006	CSD	
Hardness, Total (calc)	140	mg/L	3	EPA 200.7	10/25/2006	CSD	
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/27/2006	SUB	S4
Platinum	<0.02	µg/L	0.02	EPA 200.8	10/27/2006	SUB	S4

Qualifier	Description		Note
n	Matrix Spike recovery not within control limits.		=84%
S4	Analysis performed by Pace: MDH# 027-053-137	1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 119234
Description: OB-3
Sample Date: 10/16/2006 12:15:00 PM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 72829
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 11/16/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	10/24/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	10/21/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	11/4/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	11/4/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	10/21/2006	KJD
Nickel	100	µg/L	10	EPA 249.2	11/4/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	10/24/2006	KJD
Silver	<1	µg/L	1	EPA 7761	11/4/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	10/24/2006	CSD

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

07 November 2006

Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Cahn For Matthew Gomes

Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc. **SDG:**

Client: Northeast Technical Services Inc. **Project:** Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
119232	0610074-01	Water	16-Oct-06 12:15	17-Oct-06 14:20

Frontier GeoSciences, Inc.

Jennifer Cahn For Matthew Gomes, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

Work Order Number: 0610074:

SAMPLE RECEIPT
One (1) water samples were received on October 17, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 2.2 degrees Celsius.

Upon receipt, the water sample for methyl mercury was preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottle for methyl mercury analysis was stored in a refrigerator until distillation and analysis.

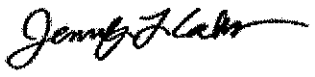
SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits.

Frontier GeoSciences, Inc.



Jennifer Cahn For Matthew Gomes, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

NORTHEAST TECHNICAL SERVICES
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
(218)741-4290 Fax (218)742-1010

0810074

CHAIN OF CUSTODY RECORD
PAGE____OF____
COC#_____

CLIENT NAME	INVOICE TO:	REPORT TO:	SPECIAL INSTRUCTIONS:
NORTHEAST TECHNICAL SERVICES 315 Chestnut Street PO Box 1142 Virginia, MN 55792 (218)741-4290 Fax (218)742-1010	Renee Stone @ NTS	Renee Stone @ NTS	

PO NUMBER: 72829/3933

DESCRIPTION	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	MATRIX LIQ.	MATRIX SOIL	SIZE	CONTAINERS	ANALYSIS
119232	10/16/2008	12:15		x				1	Methyl Mercury

GENERAL - NO PRES. | NUTRIENTS - H2SO4 | METALS - HNO3 | 40 VOAS - HCL | 1LT AMBER - HCL | 500R - H2SO4

SAMPLED BY:	DATE: TIME:	RELINQUISHED BY:	DATE: TIME:	RELINQUISHED TO NTS SAMPLE LOCKUP:	DATE: TIME:
RELINQUISHED BY:	DATE: 10/17 TIME: 11:55	RECEIVED BY: D. Bucek	DATE: 10/17 TIME: 1400	RECEIVED FROM NTS SAMPLE LOCKUP:	DATE: TIME:
RECEIVED BY:	DATE: TIME:	RELINQUISHED BY:	DATE: TIME:	RECEIVED FOR LAB BY:	DATE: TIME: SAMPLE TEMP: 2.2 c
CUSTODY SEALS INTACT: YES____ NO____		COMMENTS:		SAMPLES RECEIVED ON ICE:	YES____ NO____

Frontier GeoSciences, Inc.

Jennifer Cahn

Jennifer Cahn For Matthew Gomes, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL RESULTS

119232

Matrix: Water **Laboratory ID:** 0610074-01

Total Metals

Analyte	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method	Notes
Methyl Mercury	ND	0.056	ng/L	1.25	F610163	25-Oct-06	6J30004	26-Oct-06	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Matthew Gomes, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0610034-01

Matrix: Water
Sequence: 6J30004
Batch: F610163
Lab Number: F610163-DUP1
Preparation: Methyl Hg Distillation for Water

Total Metals

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.021	ND	0.056	ND	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Matthew Gomes, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0610034-01

Matrix: Water
Batch: F610163
Preparation: Methyl Hg Distillation for Water
Sequence: 6J30004
Lab Number: F610163-MS/MSD1

Total Metals

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.021	2.008	1.808	89.0	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	2.033	100	11.7	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

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Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Sequence: 6J30004
Batch: F610163
Lab Number: F610163-BS/BSD1
Preparation: Methyl Hg Distillation for Water

Total Metals

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.892	94.2	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.920	95.6	1.47	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Matthew Gomes, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Sequence: 6J30004
Instrument: MeHg-15
Preparation: Methyl Hg Distillation for Water

Total Metals

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F610163-BLK1	Methyl Mercury	0.002	0.056	ng/L	F610163	FGS-070	U
F610163-BLK2	Methyl Mercury	-0.002	0.056	ng/L	F610163	FGS-070	U
F610163-BLK3	Methyl Mercury	0.008	0.056	ng/L	F610163	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Matthew Gomes, Project Manager

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Chain of Custody

72829

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

COC 1 of 1

Project Number: 23/69-862004.009

Project Name: PolyMet

№ 21468

Project Manager: CDP

Project Contact: KDP

Sampled by: LMG

Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Pres.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl)	TOC	Lt Hg	Methyl Hg	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) - 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unpres.) *2	% Moisture (plastic vial, unpres.)		Total No. Of Containers	Remarks
1. 06-3	10/16	1215	X		X					1	2	1	1	1					1	1	1									9	Table 1
2. 119232																															
3. 119233																															
4. 119234																															
5.																															
6.																															
7.																															
8.																															
9.																															
10.																															
11.																															
12.																															

Common Parameter/Container - Preservation Key

*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By	On Ice? Y N	Date	Time	Received by	Date	Time
Leah M. Graham	(Y) N	10/16/06	1330	[illegible] Kosle	10-16-06	13:30
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other

Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

5.2°C

H:\RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

From Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

[redacted]

No samples collected Fri, Sat. Kathy not in office on Tues.

Coc#72433

pg 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Jennifer Cahn For Matthew Gomes, Project Manager

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Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

MDH Certification: 027-137-157

Laboratory Results

NTS COC: 73067
Received: 10/24/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/5/2006

Approved by: Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

NTS Sample: 121862
Description: P-2
Sample Date: 10/24/2006 9:00:00 AM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	11/17/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 121863
Description: P-2
Sample Date: 10/24/2006 9:00:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73067
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/5/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Palladium	<0.1	µg/L	0.1	EPA 200.8	10/27/2006	SUB	S4
Platinum	<0.02	µg/L	0.02	EPA 200.8	10/27/2006	SUB	S4

Qualifier	Description	Note
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 121871
Description: P-2
Sample Date: 10/24/2006 9:00:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73067
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/5/2006

Notes: A Field Blank was not received with this sample. A Field Blank is required for all samples analyzed for mercury by EPA Metho

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	<25	µg/L	25	EPA 200.7	11/2/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	10/28/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	11/3/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	11/2/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	10/28/2006	KJD	
Boron	194	µg/L	50	EPA 200.7	11/2/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 7131A	10/31/2006	KJD	
Calcium	12.8	mg/L	1	EPA 200.7	11/2/2006	CSD	
Chromium	<1	µg/L	1	EPA 218.2	11/1/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	11/1/2006	KJD	
Copper	<2	µg/L	2	EPA 220.2	10/28/2006	KJD	
Iron	253	µg/L	50	EPA 200.7	11/2/2006	CSD	
Lead	<5	µg/L	5	EPA 239.2	10/31/2006	KJD	c
Magnesium	7.67	mg/L	1	EPA 200.7	11/2/2006	CSD	
Manganese	21.7	µg/L	10	EPA 200.7	11/2/2006	CSD	
Mercury, Low Level	<0.5	ng/L	0.5	EPA 1631E	11/7/2006	SUB	
Molybdenum	<5	µg/L	5	EPA 7481	11/1/2006	KJD	
Nickel	<2	µg/L	2	EPA 249.2	10/27/2006	KJD	
Potassium	1.03	mg/L	0.25	EPA 200.7	11/2/2006	CSD	
Selenium	<2	µg/L	2	EPA 7740	11/2/2006	KJD	
Silver	<1	µg/L	1	EPA 272.2	10/31/2006	KJD	
Sodium	24.4	mg/L	2	EPA 200.7	11/2/2006	CSD	
Strontium	56.5	µg/L	5	EPA 200.7	11/2/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	10/27/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	10/28/2006	KJD	
Zinc	65.4	µg/L	25	EPA 200.7	11/2/2006	CSD	
TOC	3.3	mg/L	1	EPA 415.1	11/9/2006	CSD	i
Alkalinity, Total	101	mg/L as CaCO3	10	EPA 310.1	10/26/2006	DB	i
Chloride	1.29	mg/L	0.5	EPA 300.0 ATP	10/30/2006	LXP	i
COD	<10	mg/L	10	SM 18th Ed 5220D	10/31/2006	JLC	i
Fluoride	0.31	mg/L	0.1	EPA 300.0	10/30/2006	LXP	i
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	11/21/2006	LXP	i
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	10/26/2006	LXP	i
pH	7.7	Std Units	0.1	EPA 150.1	10/26/2006	DB	i
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	10/27/2006	DB	i
Sulfate	9.06	mg/L	1	EPA 300.0 ATP	10/30/2006	LXP	i
Hardness, Total (calc)	63.5	mg/L	3	SM 2340B	12/5/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
i	Improper sample preservation noted, analysis performed.	Sample received at 6.2 °C
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	

NTS Sample: 121871
Description: P-2
Sample Date: 10/24/2006 9:00:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73067
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/5/2006

Notes: A Field Blank was not received with this sample. A Field Blank is required for all samples analyzed for mercury by EPA Metho

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.3	10/31/2006	SUB	i,S2

Qualifier	Description	Note
c	Elevated Reporting Limit.	
i	Improper sample preservation noted, analysis performed.	Sample received at 6.2 °C
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	

NTS Sample: 121872
Description: P-2
Sample Date: 10/24/2006 9:00:00 AM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 73067
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/5/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	10/26/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 7131A	11/8/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	11/4/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	11/4/2006	KJD
Molybdenum	<5	µg/L	5	EPA 7481	11/8/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	11/4/2006	KJD
Selenium	<2	µg/L	2	EPA 7740	11/2/2006	KJD
Silver	<1	µg/L	1	EPA 7761	11/4/2006	KJD
Zinc	59.1	µg/L	25	EPA 200.7	10/26/2006	CSD

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

November 01, 2006

Ms. Renee Stone
Northeast Technical Services
315 Chestnut Street
Virginia, MN 55792

RE: Project: 3933
Pace Project No.: 1040740

Dear Ms. Stone:
Enclosed are the analytical results for sample(s) received by the laboratory on October 25, 2006. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Schuft

Colin Schuft

colin.schuft@pacelabs.com
Project Coordinator

Illinois Certification #: 200011
Iowa Certification #: 368
Minnesota Certification #: 027-053-137
Wisconsin Certification #: 999407970

Enclosures

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE SUMMARY

Project: 3933
Pace Project No.: 1040740

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1040740001	121863	Water	10/24/06 09:00	10/25/06 09:05

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Minneapolis, MN 55414
Phone: (612)607-1700
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SAMPLE ANALYTE COUNT

Project: 3933
Pace Project No.: 1040740

Lab ID	Sample ID	Method	Analytes Reported
1040740001	121863	EPA 200.8	2

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Minneapolis, MN 55414
Phone: (612)607-1700
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ANALYTICAL RESULTS

Project: 3933
Pace Project No.: 1040740

Sample: 121863 **Lab ID: 1040740001** Collected: 10/24/06 09:00 Received: 10/25/06 09:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Palladium	ND	ug/L	0.10	0.050	1	10/26/06 00:00	10/27/06 20:59	7440-05-3	
Platinum	ND	ug/L	0.020	0.010	1	10/26/06 00:00	10/27/06 20:59	7440-06-4	

11/2/06 Land entered results, pcd

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALITY CONTROL DATA

Project: 3933
Pace Project No.: 1040740

QC Batch: MPRP/7609
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Associated Lab Samples: 1040740001

METHOD BLANK: 276300
Associated Lab Samples: 1040740001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Palladium	ug/L	ND	0.10	
Platinum	ug/L	ND	0.020	

LABORATORY CONTROL SAMPLE: 276301

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Palladium	ug/L	80	81.0	101	85-115	
Platinum	ug/L	80	79.6	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 276303 276304

Parameter	Units	1040738006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Palladium	ug/L	ND	80	80	76.6	75.7	96	95	70-130	1	20	
Platinum	ug/L	ND	80	80	75.8	75.4	95	94	70-130	.5	20	

SAMPLE DUPLICATE: 276302

Parameter	Units	1040658001 Result	Dup Result	RPD	Max RPD	Qualifiers
Palladium	ug/L	ND	ND	72	20	D7
Platinum	ug/L	ND	ND	200	20	D7

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Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALIFIERS

Project: 3933
Pace Project No.: 1040740

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

ANALYTE QUALIFIERS

D7	The sample and/or duplicate results for this parameter are less than the reporting limit, calculations are based on estimated values and may be statistically unreliable.

Northeast Technical Services
315 Chestnut Street
P.O. Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

1040740

DATE 10/24/2006

PO Number 73067/3933

PROJECT MGR Renee Stone

COC # 73067

NTS Job # 3933

Vendor: **Pace Analytical Svcs., Inc.**
Address: **1700 Elm Street SE**
Suite #200
Minneapolis, MN 55414

Qty	Description
1	Pd,Pt

TOTAL TESTS **1**

SHIPPER UPS

SHIPPING CHARGE

Sample Condition Upon Receipt

Pace Analytical

Client Name: WTS

Project # 1040740 ~~1040740~~ 10-2506

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Optional: Proj. Due Date: Proj. Name:

Tracking #: 125971103570044 48

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other _____

Thermometer Used 230194010 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 1.4 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and initials of person examining contents: 10-25-06 JF

Comments:

				Comments
Chain of Custody Present:	☒Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☒Yes	☐No	☐N/A	2.
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☐Yes	☒No	☐N/A	4.
Samples Arrived within Hold Time:	☒Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes	☒No	☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A	7.
Sufficient Volume:	☒Yes	☐No	☐N/A	8.
Correct Containers Used:	☒Yes	☐No	☐N/A	9.
-Pace Containers Used:	☐Yes	☒No	☐N/A	
Containers Intact:	☒Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A	11.
Sample Labels match COC:	☒Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT				
All containers needing preservation have been checked.	☒Yes	☐No	☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes	☐No	☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes	☐No		Initial when completed: JF Lot # of added preservative:
Samples checked for dechlorination:	☐Yes	☐No	☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A	15.
Trip Blank Present:	☐Yes	☐No	☒N/A	16.
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased):				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 10/25/06

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

1040740

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Chain of Custody Record

Analysis to be performed by: Pace

COC:	NTS COC: 73067 NTS Project: #3933 NTS Project Desc: Barr Engineering, 23/69-862004009 Poly Met						
Sample	**Collected**	**Type**	**Fil**	**Matrix**	**Location**	**Containers**	**Analyses**
121863	10/24/2006 9:00:00 AM	Grab		Aqueous	P-2		Pd,Pt 1040740001

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Remarks:
[signature]	10-24-06	15:15		
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	
	10-25-06	09:05	[signature] Pace	
Received for Lab By: (Signature)	Date	Time	Temp at Arrival:	
			1.4 °C	

1040740 10/26/06 CLS

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

01 December 2006

Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kristina Spadafora

Kristina Spadafora
Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc. **SDG:**

Client: Northeast Technical Services Inc. **Project:** Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
121862	0610097-01	Water	24-Oct-06 09:00	25-Oct-06 09:36

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

Work Order Number: 0610097:

SAMPLE RECEIPT
One (1) water sample was received on October 25, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 1.8 degrees Celsius.

Upon receipt, the water sample for methyl mercury was preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottle for methyl mercury analysis was stored in a refrigerator until distillation and analysis.

SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits, except the duplicate for F611088-Dup1, which is reported as none detected since one value is below the minimum reporting limit and qualified with QR-04.

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

0610097

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Chain of Custody Record

Analysis to be performed by: Frontier Geosciences

COC:	NTS COC: 73007 NTS Project: #8933 NTS Project Desc: Barr Engineering, 23/69-U52004009 Poly Met							
Sample	Collected		Type	Fil	Matrix	Location	Containers	Analyses
121662	10/24/2006	9:00:00 AM	Grab		Aqueous	P-2		Methyl Hg

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Remarks:
[signature]	10-24-06	15:24		
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	
	10/25/06	0834	[signature]	
Received for Lab By: (Signature)	Date	Time	Temp at Arrival: 1.8 °C	

Frontier GeoSciences, Inc.

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

[signature]

Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Methyl Mercury Analytical Results

Matrix: Water **Extraction:** Methyl Hg Distillation for Water

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method:	Notes
121862	ND	0.056	ng/L	1.25	F611088	16-Nov-06	6K22002	17-Nov-06	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0611034-02

Matrix: Water
Sequence: 6K22002
Batch: F611088
Lab Number: F611088-DUP1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.124	ND	0.056	ND	25	FGS-070	QR-04, U

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0611034-02

Matrix: Water
Sequence: 6K22002
Batch: F611088
Lab Number: F611088-MS/MSD1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.124	2.008	1.865	86.7	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.636	75.3	13.1	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Batch: F611088
Preparation: Methyl Hg Distillation for Water
Sequence: 6K22002
Lab Number: F611088-BS/BSD1
LCS Source: LCS

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.894	94.3	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.865	92.9	1.54	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Instrument: MeHg-15
Sequence: 6K22002
Preparation: Methyl Hg Distillation for Water

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F611088-BLK1	Methyl Mercury	0.013	0.056	ng/L	F611088	FGS-070	
F611088-BLK2	Methyl Mercury	0.008	0.056	ng/L	F611088	FGS-070	U
F611088-BLK3	Methyl Mercury	0.014	0.056	ng/L	F611088	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
QR-04	RPD and/or RSD value exceeded control limit. Sample concentrations less than 10 times the reporting limit and the difference between the QC values were less than 2 times the reporting limit.
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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

Chain of Custody

73067

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/69-862 004009

Project Name: № 21473

COC 1 of 1

Project Manager: CDP

Project Contact: KDP

Sampled by: MTH

Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Pres.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl)	TOC / Lt. Hg / Met. Hg	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) - 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unpres.) *2	% Moisture (plastic vial, unpres.)			Total No. Of Containers	Remarks
1. P-2	10-24-06	9:00	X		X					1	2	1	1	1					1	1										Table 1
2. 121862																														
3. 121863																														
4.																														
5.																														
6.																														
7.																														
8.																														
9.																														
10.																														
11.																														
12.																														

Common Parameter/Container - Preservation Key

*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice? (Y) N	Date	Time	Received by:	Date	Time
		10-24-06	2:15			
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time
					10-24-06	14:15

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other

Air Bill Number:

6.2° C on ice

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

From Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

~~XXXXXX~~

no samples collected Fri, Sat.

Keely not in office on Tues.

Coc#72433
pg. 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

MDH Certification: 027-137-157

Laboratory Results

NTS COC: 73258
Received: 10/31/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Approved by: Renee Stone

RECEIVED
JAN 03 2007
Barr Engineering Co.

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

NTS Sample: 124045
Description: P-2
Sample Date: 10/31/2006 10:25:00 AM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	0.070	ng/L	0.056	EPA 1630	11/17/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 124046
Description: P-2
Sample Date: 10/31/2006 10:25:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73258
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Palladium	<0.1	µg/L	0.1	EPA 200.8	11/6/2006	SUB	S4
Platinum	<0.02	µg/L	0.02	EPA 200.8	11/6/2006	SUB	S4

Qualifier	Description		Note
S4	Analysis performed by Pace: MDH# 027-053-137	1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 124047
Description: P-2
Sample Date: 10/31/2006 10:25:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73258
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Notes: A Field Blank was not received with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	<25	µg/L	25	EPA 200.7	11/8/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	11/15/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	11/3/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	11/8/2006	CSD	
Beryllium	0.2	µg/L	0.2	EPA 210.2	11/16/2006	KJD	
Boron	168	µg/L	50	EPA 200.7	11/8/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	11/16/2006	KJD	
Calcium	13.5	mg/L	1	EPA 200.7	11/8/2006	CSD	
Chromium	<1	µg/L	1	EPA 218.2	11/16/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	11/15/2006	KJD	
Copper	<2	µg/L	2	EPA 220.2	11/14/2006	KJD	
Iron	271	µg/L	50	EPA 200.7	11/8/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	11/15/2006	KJD	
Magnesium	8.48	mg/L	1	EPA 200.7	11/8/2006	CSD	
Manganese	23.6	µg/L	10	EPA 200.7	11/8/2006	CSD	
Mercury, Low Level	<0.5	ng/L	0.5	EPA 1631E	11/13/2006	SUB	
Molybdenum	<5	µg/L	5	EPA 246.2	11/17/2006	KJD	
Nickel	<2	µg/L	2	EPA 249.2	11/14/2006	KJD	
Potassium	1.04	mg/L	0.25	EPA 200.7	11/8/2006	CSD	
Selenium	4	µg/L	2	EPA 270.2	11/2/2006	KJD	c
Silver	<1	µg/L	1	EPA 272.2	11/15/2006	KJD	
Sodium	23.2	mg/L	2	EPA 200.7	11/8/2006	CSD	
Strontium	60.7	µg/L	5	EPA 200.7	11/8/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	11/14/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	11/17/2006	KJD	
Zinc	67.7	µg/L	25	EPA 200.7	11/8/2006	CSD	
DRO	<0.1	mg/L	0.1	WI(95) DRO	11/6/2006	CSD	n
TOC	3.9	mg/L	1	EPA 415.1	11/9/2006	CSD	
Alkalinity, Total	105	mg/L as CaCO3	10	EPA 310.1	11/8/2006	DB	
Chloride	1.4	mg/L	0.5	EPA 300.0 ATP	11/4/2006	LXP	
COD	<10	mg/L	10	SM 18th Ed 5220D	11/8/2006	LXP	
Fluoride	0.15	mg/L	0.1	EPA 340.2	11/8/2006	JLC	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	11/1/2006	DB	
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	11/1/2006	DB	
pH	7.1	Std Units	0.1	EPA 150.1	11/1/2006	LXP	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	11/3/2006	DB	
Sulfate	7.88	mg/L	1	EPA 300.0 ATP	11/4/2006	LXP	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
n	Matrix Spike recovery not within control limits.	= 118%
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	See Attached Report.

NTS Sample: 124047
Description: P-2
Sample Date: 10/31/2006 10:25:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73258
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Notes: A Field Blank was not received with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Hardness, Total (calc)	68.6	mg/L	3	SM 2340B	12/29/2006	RMS	
Cyanide	<0.02	mg/L	0.02	EPA 335.3	11/3/2006	SUB	S2

Qualifier	Description	Note
c	Elevated Reporting Limit.	
n	Matrix Spike recovery not within control limits.	= 118%
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	See Attached Report.

NTS Sample: 124048
Description: P-2
Sample Date: 10/31/2006 10:25:00 AM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 73258
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	11/18/2006	BAM
Cadmium	0.2	µg/L	0.2	EPA 7131A	11/8/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	11/4/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	11/4/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	11/8/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	11/4/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	11/2/2006	KJD
Silver	<1	µg/L	1	EPA 7761	11/4/2006	KJD
Zinc	68.2	µg/L	25	EPA 200.7	11/29/2006	CSD

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
1411 S. 12th St. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

Report Date: 5 Nov 06
Lab Number: 06-A49045
Work Order #:12-12425
Account #: 022015
Sample Matrix: WASTEWATER
Date Sampled: 31 Oct 06 10:25
Date Received: 1 Nov 06 9:35
PO #: 73258/3933
Chain of Custody Number: 73258
Temp at Receipt: 1.0C

RENEE STONE
NORTHEAST TECHNICAL SERVICES
PO BOX 1142
VIRGINIA MN 55792-1142

Project Number: 3933
Sample Description: 124047

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cyanide, Total	< 0.02	mg/L	0.02	SM 4500E	3 Nov 06 11:50	JD

Approved by: Jason G. Smith, Inorganic
Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

01 December 2006

Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kristina Spadafora

Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc. **SDG:**

Client: Northeast Technical Services Inc. **Project:** Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
124045	0611002-01	Water	31-Oct-06 10:25	01-Nov-06 10:19

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

Work Order Number: 0611002:

SAMPLE RECEIPT
One (1) water samples were received on November 1, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 4.0 degrees Celsius.

Upon receipt, the water sample for methyl mercury was preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottle for methyl mercury analysis was stored in a refrigerator until distillation and analysis.

SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits, except the duplicate for F611088-Dup1, which is reported as none detected since one value is below the minimum reporting limit and qualified with QR-04.

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Chain of Custody Record

Analysis to be performed by: Frontier Geosciences

COC:

NTS COC: 73298
NTS Project: #3933
NTS Project Desc: Barr Engineering, 23/69-862004009 Poly Met

Sample	Collected		Type	Fil	Matrix	Location	Containers	Analyses
124045	10/31/2006	10:25:00 AM	Grab		Aqueous	P-2		Methyl Hg

Relinquished By: (Signature)	Date	Time	Received By: (Signature)
[signature]	10-31-06	14:20	
Relinquished By: (Signature)	Date	Time	Received By: (Signature)
Received for Lab By: (Signature)	Date	Time	Temp at Arrival:
[signature] FGS	11-1-06	1015	Temp blank 4.0 °C

Jennifer Cahn

VTSR-1000

Remarks: Sample arrived in client specific jar. JC 11-1-06

WO# 0611002

Frontier GeoSciences, Inc.

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

[signature]

Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Methyl Mercury Analytical Results

Matrix: Water **Extraction:** Methyl Hg Distillation for Water

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method:	Notes
124045	**0.070**	0.056	ng/L	1.25	F611088	16-Nov-06	6K22002	17-Nov-06	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0611034-02

Matrix: Water
Sequence: 6K22002
Batch: F611088
Lab Number: F611088-DUP1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.124	ND	0.056	ND	25	FGS-070	QR-04, U

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0611034-02

Matrix: Water
Batch: F611088
Preparation: Methyl Hg Distillation for Water

Sequence: 6K22002
Lab Number: F611088-MS/MSD1

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.124	2.008	1.865	86.7	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.636	75.3	13.1	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Sequence: 6K22002
Batch: F611088
Lab Number: F611088-BS/BSD1
Preparation: Methyl Hg Distillation for Water
LCS Source: LCS

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.894	94.3	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.865	92.9	1.54	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Instrument: MeHg-15
Sequence: 6K22002
Preparation: Methyl Hg Distillation for Water

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F611088-BLK1	Methyl Mercury	0.013	0.056	ng/L	F611088	FGS-070	
F611088-BLK2	Methyl Mercury	0.008	0.056	ng/L	F611088	FGS-070	U
F611088-BLK3	Methyl Mercury	0.014	0.056	ng/L	F611088	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
QR-04	RPD and/or RSD value exceeded control limit. Sample concentrations less than 10 times the reporting limit and the difference between the QC values were less than 2 times the reporting limit.
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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

Chain of Custody

73258

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 23/69-862 00 4009

Project Name: **№ 21475**

COC 1 of 1

Project Manager: CDP

Project Contact: KDP, WDS

Sampled by: LMG

Laboratory: LMG

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Pres.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl) – extended	TOC	LLHg	Methyl Hg	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) – 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unpres.) *2	% Moisture (plastic vial, unpres.)			Total No. Of Containers
1. P-2	10/31/06	1025	X		X					1	2	1	1	1					1	1	1	1								10
2. 124045																														
3. 124046																														
4. 124047																														
5. 124048																														
6.																														
7.																														
8.																														
9.																														
10.																														
11.																														
12.																														

Remarks:

Table 1 and extended DRO.

Contact Ward Swanson with questions.

800-632-2277

Common Parameter/Container - Preservation Key

*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice? Y / N	Date	Time	Received by:	Date	Time
Leah M. Gruby	Y	10/31/06	1402			
Relinquished By:	On Ice? Y / N	Date	Time	Received by:	Date	Time
					10-31-06	14:02

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☒ Sampler ☐ Other

Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

4.7°C on ice

H:RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

From Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

[redacted]

No samples collected Fri, Sat.

Kelly not in office on Tues.

Coc #72433

pg 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Laboratory Results

MDH Certification: 027-137-157

NTS COC: 73431
Received: 11/7/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/7/2006

Approved by: RMS
Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

NTS Sample: 126375
Description: P-2
Sample Date: 11/7/2006 10:35:00 AM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	11/7/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 126376
Description: P-2
Sample Date: 11/7/2006 10:35:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73431
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/7/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Palladium	<0.1	µg/L	0.1	EPA 200.8	11/17/2006	SUB
Platinum	<0.02	µg/L	0.02	EPA 200.8	11/17/2006	SUB

NTS Sample: 126377
Description: P-2
Sample Date: 11/7/2006 10:35:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73431
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/7/2006

Notes: A Field Blank was not received with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	11/21/2006	CSD
Antimony	<3	µg/L	3	EPA 204.2	11/15/2006	KJD
Arsenic	<2	µg/L	2	EPA 7060A	11/9/2006	KJD
Barium	<10	µg/L	10	EPA 200.7	11/21/2006	CSD
Beryllium	0.2	µg/L	0.2	EPA 210.2	11/16/2006	KJD
Boron	153	µg/L	50	EPA 200.7	11/21/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	11/16/2006	KJD
Calcium	15.5	mg/L	1	EPA 200.7	11/21/2006	CSD
Chromium	1.1	µg/L	1	EPA 218.2	11/16/2006	KJD
Cobalt	<1	µg/L	1	EPA 219.2	11/16/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	11/14/2006	KJD
Iron	325	µg/L	50	EPA 200.7	11/21/2006	CSD
Lead	<1	µg/L	1	EPA 239.2	11/15/2006	KJD
Magnesium	9.41	mg/L	1	EPA 200.7	11/21/2006	CSD
Manganese	26.2	µg/L	10	EPA 200.7	11/21/2006	CSD
Mercury, Low Level	0.5	ng/L	0.5	EPA 1631E	11/15/2006	SUB
Molybdenum	<5	µg/L	5	EPA 246.2	11/17/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	11/14/2006	KJD
Potassium	1.04	mg/L	0.25	EPA 200.7	11/21/2006	CSD
Selenium	<2	µg/L	2	EPA 270.2	11/9/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	11/15/2006	KJD
Sodium	23.3	mg/L	2	EPA 200.7	11/21/2006	CSD
Strontium	69.7	µg/L	5	EPA 200.7	11/21/2006	CSD
Thallium	<2	µg/L	2	EPA 279.2	11/14/2006	KJD
Titanium	<20	µg/L	20	EPA 283.2	11/17/2006	KJD
Zinc	125	µg/L	25	EPA 200.7	11/21/2006	CSD
TOC	4.5	mg/L	1	EPA 415.1	11/10/2006	CSD
Alkalinity, Total	74	mg/L as CaCO3	10	EPA 310.1	11/10/2006	JLC
Chloride	1.35	mg/L	0.5	EPA 300.0 ATP	11/9/2006	DB
COD	<10	mg/L	10	SM 18th Ed 5220D	11/8/2006	LXP
Fluoride	0.13	mg/L	0.1	EPA 300.0	11/9/2006	DB
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	11/8/2006	LXP
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	11/9/2006	LXP
pH	8.4	Std Units	0.1	EPA 150.1	11/8/2006	JLC
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	11/9/2006	LXP
Sulfate	6.53	mg/L	1	EPA 300.0 ATP	11/9/2006	DB
Hardness, Total (calc)	77.4	mg/L	3	SM 2340B	12/7/2006	RMS

NTS Sample: 126377
Description: P-2
Sample Date: 11/7/2006 10:35:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73431
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/7/2006

Notes: A Field Blank was not received with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Cyanide	<0.02	mg/L	0.02	SM 4500E	11/15/2006	SUB

NTS Sample: 126378
Description: P-2
Sample Date: 11/7/2006 10:35:00 AM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 73431
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/7/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	11/29/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	11/22/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	11/24/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	11/25/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	11/11/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	11/25/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	11/18/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	11/24/2006	KJD
Zinc	134	µg/L	25	EPA 200.7	11/13/2006	BAM

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

01 December 2006

Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kristina Spadafora

Kristina Spadafora
Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc.
SDG:
Client: Northeast Technical Services Inc.
Project: Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
126375	0611036-01	Water	07-Nov-06 10:35	08-Nov-06 10:03

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

Work Order Number: 0611036:

SAMPLE RECEIPT
One (1) water sample was received on November 8, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 1.0 degrees Celsius.

Upon receipt, the water sample for methyl mercury was preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottle for methyl mercury analysis was stored in a refrigerator until distillation and analysis.

SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits, except the duplicate for F611088-Dup1, which is reported as none detected since one value is below the minimum reporting limit and qualified with QR-04.

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Chain of Custody Record

Analysis to be performed by: Frontier Geosciences

0611036

PM = KJ

COC:			NTS COC: 73131 NTS Project: 65003 NTS Project Desc: Barr Engineering, 23/69-862504009 Poly Mat					
Sample	Collected		Type	Fil	Matrix	Location	Containers	Analyses
126/F5	11/7/2006	10:25:00 AM	Grab		Aqueous	P-2		Methyl Hg

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Remarks:
	11/7/06	1500		Chris Barnett, FGS
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	
	11/8/06	9:45		
Received for Lab By: (Signature)	Date	Time	Temp at Arrival: LD °C	

COC: Enthet
USTR: 9 a.m. 11/8/06
Courier UPS

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Methyl Mercury Analytical Results

Matrix: Water **Extraction:** Methyl Hg Distillation for Water

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method:	Notes
126375	ND	0.056	ng/L	1.25	F611088	16-Nov-06	6K22002	17-Nov-06	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0611034-02

Matrix: Water
Sequence: 6K22002
Batch: F611088
Lab Number: F611088-DUP1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.124	ND	0.056	ND	25	FGS-070	QR-04, U

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0611034-02

Matrix: Water
Sequence: 6K22002
Batch: F611088
Lab Number: F611088-MS/MSD1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.124	2.008	1.865	86.7	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.636	75.3	13.1	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Sequence: 6K22002
Batch: F611088
Lab Number: F611088-BS/BSD1
Preparation: Methyl Hg Distillation for Water
LCS Source: LCS

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.894	94.3	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.865	92.9	1.54	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Instrument: MeHg-15
Sequence: 6K22002
Preparation: Methyl Hg Distillation for Water

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F611088-BLK1	Methyl Mercury	0.013	0.056	ng/L	F611088	FGS-070	
F611088-BLK2	Methyl Mercury	0.008	0.056	ng/L	F611088	FGS-070	U
F611088-BLK3	Methyl Mercury	0.014	0.056	ng/L	F611088	FGS-070	

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
QR-04	RPD and/or RSD value exceeded control limit. Sample concentrations less than 10 times the reporting limit and the difference between the QC values were less than 2 times the reporting limit.
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Kristina Spadafora

Kristina Spadafora, Project Manager

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Pace Analytical®
www.pacelabs.com

73431
Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

November 20, 2006

Ms. Renee Stone
Northeast Technical Services
315 Chestnut St.
Virginia, MN 55792

RE: Project: 3933
Pace Project No.: 1041800

Dear Ms. Stone:
Enclosed are the analytical results for sample(s) received by the laboratory on November 10, 2006. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Schuft

colin.schuft@pacelabs.com
Project Coordinator

Illinois Certification #: 200011
Iowa Certification #: 368
Minnesota Certification #: 027-053-137
Wisconsin Certification #: 999407970

Enclosures

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE SUMMARY

Project: 3933
Pace Project No.: 1041800

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1041800001	**126376**	Water	11/07/06 10:35	11/10/06 08:50

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE ANALYTE COUNT

Project: 3933
Pace Project No.: 1041800

Lab ID	Sample ID	Method	Analytes Reported
1041800001	**126376**	EPA 200.8	2

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

ANALYTICAL RESULTS

Project: 3933
Pace Project No.: 1041800

Sample: 126376 **Lab ID: 1041800001** Collected: 11/07/06 10:35 Received: 11/10/06 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Palladium	ND	ug/L	0.10	0.050	1	11/14/06 14:29	11/17/06 16:57	7440-05-3	
Platinum	ND	ug/L	0.020	0.010	1	11/14/06 14:29	11/17/06 16:57	7440-06-4	

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALITY CONTROL DATA

Project: 3933
Pace Project No.: 1041800

QC Batch: MPRP/7768
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Associated Lab Samples: 1041800001

METHOD BLANK: 283307
Associated Lab Samples: 1041800001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Palladium	ug/L	ND	0.10	
Platinum	ug/L	ND	0.020	

LABORATORY CONTROL SAMPLE: 283308

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Palladium	ug/L	80	81.1	101	85-115	
Platinum	ug/L	80	79.8	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 284649 284650

Parameter	Units	1041800001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Palladium	ug/L	ND	80	80	68.6	72.0	86	90	70-130	5	20	
Platinum	ug/L	ND	80	80	72.8	76.8	91	96	70-130	5	20	

SAMPLE DUPLICATE: 284651

Parameter	Units	1041802001 Result	Dup Result	RPD	Max RPD	Qualifiers
Palladium	ug/L	ND	ND	25	20	D7
Platinum	ug/L	ND	ND	0	20	

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALIFIERS

Project: 3933
Pace Project No.: 1041800

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

ANALYTE QUALIFIERS

D7	The sample and/or duplicate results for this parameter are less than the reporting limit, calculations are based on estimated values and may be statistically unreliable.

Chain of Custody 43431

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

COC 1 of 1

Project Number: 23/69-862004.009

Project Name: PolyMet

№ 21476

Project Manager: CDP

Project Contact: KDP

Sampled by: JAM2/HAW

Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Pres.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl)	Toc	LL Hg	Methyl Hg	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) - 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unpres.) *2	% Moisture (plastic vial, unpres.)		Total No. Of Containers	Remarks
1. P-3 *	11/7/06	10:35	X		X					1	2	1	1	1						1	1	1								9	Table 1
2. 126375																															
3. 126377																															
4. 126378																															
5.																															
6.																															
7.																															
8.																															
9.																															
10.																															
11. * Bottles had P-2 written on them.																															
12. Client called & the correct site name is P-2	11-7-06	OK 14:55 AM																													

Common Parameter/Container - Preservation Key

*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time
[signature]	Y	11/7/06	13:55			
Relinquished By:	On Ice? Y N	Date	Time	Received by: [signature] Kosi	Date 11-7-06	Time 13:55

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☒ Sampler ☐ Other

Air Bill Number: 5.7°C ice

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

From Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

~~XXXXXX~~

No samples collected Fri, Sat.

Leahy not in office on Tues.

Coc #73433

pg 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

MDH Certification: 027-137-157

Laboratory Results

NTS COC: 73604
Received: 11/14/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Approved by: Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

NTS Sample: 128119
Description: P-2
Sample Date: 11/14/2006 10:00:00 AM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	11/22/2006	SUB

NTS Sample: 128120
Description: P-2
Sample Date: 11/14/2006 10:00:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73604
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Palladium	<0.1	µg/L	0.1	EPA 200.8	11/29/2006	SUB
Platinum	<0.02	µg/L	0.02	EPA 200.8	11/29/2006	SUB

NTS Sample: 128121
Description: P-2
Sample Date: 11/14/2006 10:00:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73604
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Notes: A Field Blank was not collected with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	<25	µg/L	25	EPA 200.7	11/28/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	12/2/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	11/22/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	11/28/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	12/5/2006	KJD	
Boron	148	µg/L	50	EPA 200.7	11/28/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	12/5/2006	KJD	
Calcium	16.7	mg/L	1	EPA 200.7	11/28/2006	CSD	
Chromium	<1	µg/L	1	EPA 218.2	11/28/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	11/28/2006	KJD	
Copper	<2	µg/L	2	EPA 220.2	12/2/2006	KJD	
Iron	351	µg/L	50	EPA 200.7	11/28/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	11/30/2006	KJD	
Magnesium	10	mg/L	1	EPA 200.7	11/28/2006	CSD	
Manganese	27.3	µg/L	10	EPA 200.7	11/28/2006	CSD	
Mercury, Low Level	<0.5	ng/L	0.5	EPA 1631E	11/21/2006	SUB	
Molybdenum	<5	µg/L	5	EPA 246.2	12/1/2006	KJD	
Nickel	<2	µg/L	2	EPA 249.2	12/2/2006	KJD	
Potassium	1.1	mg/L	0.25	EPA 200.7	11/28/2006	CSD	
Selenium	<4	µg/L	4	EPA 270.2	11/21/2006	KJD	c
Silver	<1	µg/L	1	EPA 272.2	11/28/2006	KJD	
Sodium	23.9	mg/L	2	EPA 200.7	11/28/2006	CSD	
Strontium	74.9	µg/L	5	EPA 200.7	11/28/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	12/2/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	12/7/2006	KJD	
Zinc	122	µg/L	25	EPA 200.7	11/28/2006	CSD	
TOC	5.3	mg/L	1	EPA 415.1	11/21/2006	CSD	i
Alkalinity, Total	108	mg/L as CaCO3	10	EPA 310.1	11/17/2006	JLC	i
Chloride	1.3	mg/L	0.5	EPA 300.0 ATP	11/17/2006	LXP	i
COD	<10	mg/L	10	SM 18th Ed 5220D	11/15/2006	LXP	i
Fluoride	0.37	mg/L	0.1	EPA 300.0	11/17/2006	LXP	i
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	11/21/2006	LXP	i
Nitrogen, Nitrate+Nitrite	<0.1	mg/L as N	0.1	EPA 353.2	11/15/2006	DB	i
pH	7.5	Std Units	0.1	EPA 150.1	11/16/2006	LXP	i
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	11/16/2006	DB	i
Sulfate	5.76	mg/L	1	EPA 300.0 ATP	11/17/2006	LXP	i
Hardness, Total (calc)	82.9	mg/L	3	SM 2340B	12/29/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
i	Improper sample preservation noted, analysis performed.	Sample received at 6.8 °C

NTS Sample: 128121
Description: P-2
Sample Date: 11/14/2006 10:00:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73604
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Notes: A Field Blank was not collected with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	SM 4500E	11/21/2006	SUB	i

Qualifier	Description	Note
c	Elevated Reporting Limit.	
i	Improper sample preservation noted, analysis performed.	Sample received at 6.8 °C

NTS Sample: 128122
Description: P-2
Sample Date: 11/14/2006 10:00:00 AM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 73604
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	11/24/2006	BAM
Cadmium	<0.2	µg/L	0.2	EPA 213.2	11/22/2006	KJD
Chromium	<1	µg/L	1	EPA 218.2	11/24/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	11/25/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	11/24/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	11/25/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	11/18/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	11/24/2006	KJD
Zinc	122	µg/L	25	EPA 200.7	11/24/2006	BAM

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

December 06, 2006

Ms. Renee Stone
Northeast Technical Services
315 Chestnut St.
Virginia, MN 55792

RE: Project: 3933
Pace Project No.: 1042582

Dear Ms. Stone:
Enclosed are the analytical results for sample(s) received by the laboratory on November 28, 2006. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Schuft

Colin Schuft

colin.schuft@pacelabs.com
Project Coordinator

Illinois Certification #: 200011
Iowa Certification #: 368
Minnesota Certification #: 027-053-137
Wisconsin Certification #: 999407970

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE SUMMARY

Project: 3933
Pace Project No.: 1042582

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1042582001	128120	Water	11/14/06 10:00	11/28/06 08:55

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www.pacelabs.com

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1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE ANALYTE COUNT

Project: 3933
Pace Project No.: 1042582

Lab ID	Sample ID	Method	Analytes Reported
1042582001	**128120**	EPA 200.8	2

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

ANALYTICAL RESULTS

Project: 3933
Pace Project No.: 1042582

Sample: 128120 **Lab ID: 1042582001** Collected: 11/14/06 10:00 Received: 11/28/06 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Palladium	ND	ug/L	0.10	0.050	1	11/29/06 00:00	12/04/06 17:24	7440-05-3	
Platinum	ND	ug/L	0.020	0.010	1	11/29/06 00:00	12/04/06 17:24	7440-06-4	

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Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALITY CONTROL DATA

Project: 3933
Pace Project No.: 1042582

QC Batch: MPRP/7905
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Associated Lab Samples: 1042582001

METHOD BLANK: 288842
Associated Lab Samples: 1042582001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Palladium	ug/L	ND	0.10	
Platinum	ug/L	ND	0.020	

LABORATORY CONTROL SAMPLE: 288843

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Palladium	ug/L	80	83.3	104	85-115	
Platinum	ug/L	80	83.4	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 288844 288845

Parameter	Units	878772001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Palladium	ug/L	ND	80	80	76.5	77.6	96	97	70-130	1	20	
Platinum	ug/L	ND	80	80	78.4	78.2	98	98	70-130	.2	20	

SAMPLE DUPLICATE: 288846

Parameter	Units	1042582001 Result	Dup Result	RPD	Max RPD	Qualifiers
Palladium	ug/L	ND	ND	30	20	
Platinum	ug/L	ND	ND	0	20	

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1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALIFIERS

Project: 3933
Pace Project No.: 1042582

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

1042582

Northeast Technical Services
315 Chestnut Street
P.O. Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

DATE 11/14/2006

PO Number 73604/3933

PROJECT MGR Renee Stone

Vendor: **Pace Analytical Svcs., Inc.**
Address: **1700 Elm Street SE**
Suite #200
Minneapolis, MN 55414

COC # 73604
NTS Job # 3933

Qty	Description
1	Pd,Pt

TOTAL TESTS 1

SHIPPER UPS

SHIPPING CHARGE

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Chain of Custody Record

Analysis to be performed by: Pace

1042582

COC:	NTS COC: 73604 NTS Project: #3933 NTS Project Desc: Barr Engineering, 23/69-862004009 Poly Met

Sample	Collected		Type	Fil	Matrix	Location	Containers	Analyses
128120	11/14/2006	10:00:00 AM	Grab		Aqueous	P-2		Pd,Pt

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Remarks:
[signature]	11-21-06	11:20		
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	
	11.28.06	08:55	[signature] Pace	
Received for Lab By: (Signature)	Date	Time	Temp at Arrival: °C	

Sample Condition Upon Receipt

Pace Analytical

Client Name: NTS Project # 10425B2

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 12 559 711 03 5207 1565

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other _____

Thermometer Used 230194010 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 0.6 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Comments:

Date and initials of person examining contents: 11.28.06 JL

Chain of Custody Present:	☒Yes	☐No	☐N/A 1.
Chain of Custody Filled Out:	☒Yes	☐No	☐N/A 2.
Chain of Custody Relinquished:	☒Yes	☐No	☐N/A 3.
Sampler Name & Signature on COC:	☐Yes	☒No	☐N/A 4.
Samples Arrived within Hold Time:	☒Yes	☐No	☐N/A 5.
Short Hold Time Analysis (<72hr):	☐Yes	☒No	☐N/A 6.
Rush Turn Around Time Requested:	☐Yes	☒No	☐N/A 7.
Sufficient Volume:	☒Yes	☐No	☐N/A 8.
Correct Containers Used:	☒Yes	☐No	☐N/A 9.
-Pace Containers Used:	☐Yes	☒No	☐N/A
Containers Intact:	☒Yes	☐No	☐N/A 10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☒N/A 11.
Sample Labels match COC:	☒Yes	☒No	☐N/A 12. COC-128120, Sample-128120-318
-Includes date/time/ID/Analysis Matrix: WT			
All containers needing preservation have been checked.	☒Yes	☐No	☐N/A 13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes	☐No	☐N/A
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes	☐No	Initial when completed JL / Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No	☒N/A 14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☒N/A 15.
Trip Blank Present:	☐Yes	☐No	☒N/A 16.
Trip Blank Custody Seals Present	☐Yes	☐No	☒N/A
Pace Trip Blank Lot # (if purchased):			

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: 11/28/06

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
1411 S. 12th St. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

Report Date: 21 Nov 06
Lab Number: 06-A51634
Work Order #:12-13093
Account #: 022015
Sample Matrix: WASTEWATER
Date Sampled: 14 Nov 06 10:00
Date Received: 17 Nov 06 9:30
PO #: 73604/3933
Chain of Custody Number: 73604
Temp at Receipt: -1.0C

RENEE STONE
NORTHEAST TECHNICAL SERVICES
PO BOX 1142
VIRGINIA MN 55792-1142

Project Number: 3933
Sample Description: 128121

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cyanide, Total	< 0.02	mg/L	0.02	SM 4500E	21 Nov 06 10:42	JD

Approved by: Jason G. Smith, Inorganic
Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

06 December 2006

Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jennifer Cahn For Kristina Spadafora
Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc.
SDG:
Client: Northeast Technical Services Inc.
Project: Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
128119	0611072-01	Water	14-Nov-06 10:00	15-Nov-06 08:37

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

Work Order Number: 0611072:

SAMPLE RECEIPT
One (1) water sample was received on November 15, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 0.9 degrees Celsius.

Upon receipt, the water sample for methyl mercury was preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottle for methyl mercury analysis was stored in a refrigerator until distillation and analysis.

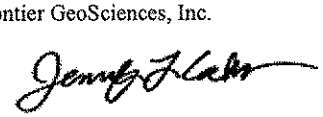
SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits.

Frontier GeoSciences, Inc.



Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

#-061072 PM=KS

Chain of Custody Record

Analysis to be performed by: Frontier Geosciences

COC:			NTS COC: 73004 NTS Project: #3603 NTS Project Desc: Barr Engineering, 23/63-462004009 Poly Mat						
Sample	Collected		Type	Fil	Matrix	Location		Containers	Analyses
126119	11/14/2006	12:00:00 AM	Grab		Aqueous	P-2			Methyl Hg
Relinquished By: (Signature)			Date	Time	Received By: (Signature)		Remarks:		
Relinquished By: (Signature)			Date	Time	Received By: (Signature)				
Received for Lab By: (Signature)			Date	Time	Temp at Arrival: 0.9 °C		VTSR: 830 UPS COC: NA		

Kaitlin Kruger
FGS 11/15/06 835

Frontier GeoSciences, Inc.

Jennifer Cahn

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Methyl Mercury Analytical Results

Matrix: Water **Extraction:** Methyl Hg Distillation for Water

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method:	Notes
128119	ND	0.056	ng/L	1.25	F611148	20-Nov-06	6K29008	22-Nov-06	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0611027-01

Matrix: Water
Sequence: 6K29008
Batch: F611148
Lab Number: F611148-DUP1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.671	0.553	0.056	19.3	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0611027-05

Matrix: Water
Sequence: 6K29008
Batch: F611148
Lab Number: F611148-MS/MSD1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.461	2.008	2.457	99.4	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	2.601	107	5.69	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Sequence: 6K29008
Batch: F611148
Lab Number: F611148-BS/BSD1
Preparation: Methyl Hg Distillation for Water
LCS Source: LCS

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.996	99.4	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.910	95.1	4.40	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Instrument: MeHg-15
Sequence: 6K29008
Preparation: Methyl Hg Distillation for Water

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F611148-BLK1	Methyl Mercury	0.009	0.056	ng/L	F611148	FGS-070	U
F611148-BLK2	Methyl Mercury	0.003	0.056	ng/L	F611148	FGS-070	U
F611148-BLK3	Methyl Mercury	-0.004	0.056	ng/L	F611148	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

Chain of Custody 73604

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

COC 1 of 1

Project Number: 23/69-862004.009
Project Name: PolyMet PhIII Hydro № 21477

Project Manager: CDP
Project Contact: KDP
Sampled by: JAM2
Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Water: Volatile Organics (Pres.) *1	Water: Semivolatile Organics *2	Water: Dissolved Metals (HNO_3)	Water: Total Metals (HNO_3)	Water: General (Unpreserved) *3	Water: Cyanide (NaOH)	Water: Nutrients (H_2SO_4) *4	Water: Oil and Grease (H_2SO_4)	Water: Sulfide (Zn Acetate)	Water: Methane	Water: Bacteria ($Na_2S_2O_3$)	Water: DRO (HCl)	Water: TOC	Water: LL Hg	Water: Methyl Hg	Soil: VOCs (2-oz tared MeOH) *1	Soil: GRO, BTEX (2-oz tared MeOH) *1	Soil: DRO (2-oz tared) - 25 grams	Soil: Metals (2-oz unpreserved)	Soil: SVOCs (2 or 4-oz unpres.) *2	Soil: % Moisture (plastic vial, unpres.)	Total No. Of Containers	Remarks
1. P-2	11/14/06	10:00	X		X					1	2	1	1	1						1	1	1							9	Table 1
2. 128119																														
3. 128120																														
4. 128121																														
5. 128122																														
6.																														
7.																														
8.																														
9.																														
10.																														
11.																														
12.																														

Common Parameter/Container - Preservation Key
*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time
[signature]	Y	11/14/06	13:35			
Relinquished By:	On Ice? Y N	Date	Time	Received by: [signature]	Date 11-14-06	Time 13:35

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☒ Sampler ☐ Other

Air Bill Number: 6.8°C on ice

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

from Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

~~~~~~

No samples collected Fri, Sat.

Kelly not in office on Tues.
~~~~~~

Coc#72433

pg 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

MDH Certification: 027-137-157

Laboratory Results

NTS COC: 73742
Received: 11/20/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Approved by: Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

NTS Sample: 129030
Description: MW-05-02
Sample Date: 11/20/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	0.146	ng/L	0.056	EPA 1630	12/1/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 129031
Description: MW-05-02
Sample Date: 11/20/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73742
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Palladium	<0.1	µg/L	0.1	EPA 200.8	11/29/2006	SUB
Platinum	<0.01	µg/L	0.01	EPA 200.8	11/29/2006	SUB

NTS Sample: 129032
Description: MW-05-02
Sample Date: 11/20/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73742
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Notes: A Field Blank was not received with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	31.6	µg/L	25	EPA 200.7	12/5/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	12/5/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	12/6/2006	KJD	
Barium	<10	µg/L	10	EPA 200.7	12/5/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	12/5/2006	KJD	
Boron	<50	µg/L	50	EPA 200.7	12/5/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	12/5/2006	KJD	
Calcium	18.6	mg/L	1	EPA 200.7	12/5/2006	CSD	
Chromium	<1	µg/L	1	EPA 218.2	12/9/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	12/9/2006	KJD	
Copper	2.4	µg/L	2	EPA 220.2	12/2/2006	KJD	
Iron	54.3	µg/L	50	EPA 200.7	12/5/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	12/8/2006	KJD	
Magnesium	5.65	mg/L	1	EPA 200.7	12/5/2006	CSD	
Manganese	61.9	µg/L	10	EPA 200.7	12/5/2006	CSD	
Mercury, Low Level	0.5	ng/L	0.5	EPA 1631E	11/29/2006	SUB	
Molybdenum	<5	µg/L	5	EPA 246.2	12/1/2006	KJD	
Nickel	<2	µg/L	2	EPA 249.2	12/2/2006	KJD	
Potassium	1.93	mg/L	0.25	EPA 200.7	12/5/2006	CSD	
Selenium	<2	µg/L	2	EPA 270.2	12/6/2006	KJD	
Silver	<2	µg/L	2	EPA 272.2	12/9/2006	KJD	c
Sodium	5.38	mg/L	2	EPA 200.7	12/5/2006	CSD	
Strontium	88.6	µg/L	5	EPA 200.7	12/5/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	12/2/2006	KJD	
Titanium	<20	µg/L	20	EPA 283.2	12/7/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	12/5/2006	CSD	
TOC	2.6	mg/L	1	EPA 415.1	11/21/2006	CSD	
Alkalinity, Total	68.3	mg/L as CaCO3	10	EPA 310.1	11/21/2006	LXP	
Chloride	1.11	mg/L	0.5	EPA 300.0 ATP	11/21/2006	LXP	
COD	<10	mg/L	10	SM 18th Ed 5220D	11/28/2006	DB	
Fluoride	<0.1	mg/L	0.1	EPA 300.0	11/21/2006	LXP	
Nitrogen, Ammonia	<0.1	mg/L as N	0.1	EPA 350.1	11/28/2006	DB	
Nitrogen, Nitrate+Nitrite	1.42	mg/L as N	0.1	EPA 353.2	11/22/2006	DB	
pH	6.5	Std Units	0.1	EPA 150.1	11/21/2006	JLC	
Phosphorous, Total	<0.1	mg/L as P	0.1	EPA 365.4	11/24/2006	DB	
Sulfate	16.4	mg/L	1	EPA 300.0 ATP	11/21/2006	LXP	
Hardness, Total (calc)	69.7	mg/L	10	SM 2340B	12/29/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	

NTS Sample: 129032
Description: MW-05-02
Sample Date: 11/20/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73742
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Notes: A Field Blank was not received with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	EPA 335.3	11/30/2006	SUB	S2

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	

NTS Sample: 129033
Description: MW-05-02
Sample Date: 11/20/2006 12:00:00 PM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 73742
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 12/29/2006

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	<25	µg/L	25	EPA 200.7	11/24/2006	BAM
Cadmium	<0.2	µg/L	0.2	EPA 213.2	11/28/2006	KJD
Chromium	1.1	µg/L	1	EPA 218.2	11/30/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	11/25/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	12/6/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	11/25/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	11/25/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	11/30/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	11/24/2006	BAM

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
1411 S. 12th St. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

Report Date: 4 Dec 06
Lab Number: 06-A52189
Work Order #:12-13226
Account #: 022015
Sample Matrix: WASTEWATER
Date Sampled: 21 Nov 06 11:15
Date Received: 22 Nov 06 9:50
PO #: 73742/3933
Chain of Custody Number: 73742
Temp at Receipt: 3.0C

RENEE STONE
NORTHEAST TECHNICAL SERVICES
PO BOX 1142
VIRGINIA MN 55792-1142

Project Number: 3933
Sample Description: 129032

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cyanide, Total	< 0.02	mg/L	0.02	SM 4500E	30 Nov 06 8:38	JD

Approved by: Jason G. Smith, Inorganic
Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

December 06, 2006

Ms. Renee Stone
Northeast Technical Services
315 Chestnut St.
Virginia, MN 55792

RE: Project: 3933
Pace Project No.: 1042584

Dear Ms. Stone:
Enclosed are the analytical results for sample(s) received by the laboratory on November 28, 2006. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Schuft

Colin Schuft

colin.schuft@pacelabs.com
Project Coordinator

Illinois Certification #: 200011
Iowa Certification #: 368
Minnesota Certification #: 027-053-137
Wisconsin Certification #: 999407970

Enclosures

REPORT OF LABORATORY ANALYSIS

ACCREDITED IN ACCORDANCE WITH nelac

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE SUMMARY

Project: 3933
Pace Project No.: 1042584

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1042584001	129031	Water	11/21/06 11:20	11/28/06 08:55

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE ANALYTE COUNT

Project: 3933
Pace Project No.: 1042584

Lab ID	Sample ID	Method	Analytes Reported
1042584001	129031	EPA 200.8	2

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

ANALYTICAL RESULTS

Project: 3933
Pace Project No.: 1042584

Sample: 129031 **Lab ID: 1042584001** Collected: 11/21/06 11:20 Received: 11/28/06 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Palladium	ND	ug/L	0.10	0.050	1	11/29/06 00:00	12/04/06 18:02	7440-05-3	
Platinum	ND	ug/L	0.020	0.010	1	11/29/06 00:00	12/04/06 18:02	7440-06-4	

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALITY CONTROL DATA

Project: 3933
Pace Project No.: 1042584

QC Batch: MPRP/7905
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Associated Lab Samples: 1042584001

METHOD BLANK: 288842
Associated Lab Samples: 1042584001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Palladium	ug/L	ND	0.10	
Platinum	ug/L	ND	0.020	

LABORATORY CONTROL SAMPLE: 288843

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Palladium	ug/L	80	83.3	104	85-115	
Platinum	ug/L	80	83.4	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 288844 288845

Parameter	Units	878772001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Palladium	ug/L	ND	80	80	76.5	77.6	96	97	70-130	1	20	
Platinum	ug/L	ND	80	80	78.4	78.2	98	98	70-130	.2	20	

SAMPLE DUPLICATE: 288846

Parameter	Units	1042582001 Result	Dup Result	RPD	Max RPD	Qualifiers
Palladium	ug/L	ND	ND	30	20	
Platinum	ug/L	ND	ND	0	20	

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Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALIFIERS

Project: 3933
Pace Project No.: 1042584

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

1042584

Northeast Technical Services
315 Chestnut Street
P.O. Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

DATE 11/20/2006

PO Number 73742/3933

PROJECT MGR Renee Stone

Vendor: **Pace Analytical Svcs., Inc.**
Address: **1700 Elm Street SE**
Suite #200
Minneapolis, MN 55414

COC # 73742
NTS Job # 3933

Qty	Description
1	Pd,Pt

TOTAL TESTS 1

SHIPPER UPS

SHIPPING CHARGE

Northeast Technical Services
315 Chestnut Sfreet
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Chain of Custody Record

Analysis to be performed by: Pace

1042584

COC:	NTS COC: 73742 NTS Project: #3933 NTS Project Desc: Barr Engineering, 23/69-862004009 Poly Met						
Sample	**Collected**	**Type**	**Fil**	**Matrix**	**Location**	**Containers**	**Analyses**
129031	11/20/2006 12:00:00 PM	Grab		Aqueous	MW-05-02		Pb,Pt

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Remarks:
[signature]	11-21-06	11:20		
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	
	11.28.06	08:55	[signature] Pace	
Received for Lab By: (Signature)	Date	Time	Temp at Arrival: °C	

Sample Condition Upon Receipt

Pace Analytical

Client Name: NTS

Project # 1042584

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 12 559 711 03 5607 1565

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other _____

Thermometer Used 230194010 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 0.6 Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Comments:

Date and Initials of person examining contents: 11.28.06 JF

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12. COC - 129031, Sample 129031-329
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	Initial when completed JF Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 11/28/06

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

07 December 2006

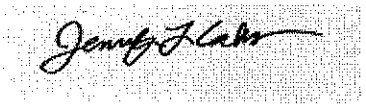
Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Cahn For Kristina Spadafora
Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc. **SDG:**

Client: Northeast Technical Services Inc. **Project:** Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
129030	0611120-01	Water	20-Nov-06 12:00	21-Nov-06 09:13

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CASE NARRATIVE

Work Order Number: 0611120:

SAMPLE RECEIPT
One (1) water sample was received on November 21, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 1.1 degrees Celsius.

Upon receipt, the water sample for methyl mercury was preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottle for methyl mercury analysis was stored in a refrigerator until distillation and analysis.

SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits except for the following;

The trap containing the blank spike (LCS) was not initially burned due to analyst error yielding a non-detectible result. Due to the oversight, the trap used for CCV1 contained both the LCS and CCV yielding a high percent recovery at 167%. The CCV was reanalyzed and in control at 99.6%. As all other QC points were within the control limits, no further corrective action was taken.

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

Pg. 1 of 1

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

WO# 0611120

Chain of Custody Record

Analysis to be performed by: Frontier Geosciences

COC:	NTS COC: 73742 NTS Project: 03333 NTS Project Desc: Barr Engineering, 23/69-082004039 PolyMet							
Sample	**Collected**		**Type**	**Fil**	**Matrix**	**Location**	**Containers**	**Analyses**
129033	11/20/2006	12:00:00 PM	Grab		Aqueous	MW-05-02		Methyl Hg

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Remarks:
[signature]	11-20-06	14:30	[signature] FGS	VSR: 8:15 Cs Seal: N/A UPS tracking #: 1Z 559 711 15 5474 1278
Relinquished By: (Signature)	**Date** 11/21/06	**Time** 9:07	**Received By: (Signature)**	
Received for Lab By: (Signature)	**Date**	**Time**	**Temp at Arrival:** 1.1 °C	

FGS Notes: (2 50 mL client specific container)

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

Frontier GeoSciences, Inc.

[signature]

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Methyl Mercury Analytical Results

Matrix: Water **Extraction:** Methyl Hg Distillation for Water

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method:	Notes
129030	ND	0.056	ng/L	1.25	F611199	30-Nov-06	6L06004	01-Dec-06	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0611110-01

Matrix: Water
Sequence: 6L06004
Batch: F611199
Lab Number: F611199-DUP1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.146	0.146	0.056	0.00	25	FGS-070	

Frontier GeoSciences, Inc.

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

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0611110-01

Matrix: Water
Sequence: 6L06004
Batch: F611199
Lab Number: F611199-MS/MSD1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.146	2.008	2.248	105	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	2.192	102	2.52	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Batch: F611199
Preparation: Methyl Hg Distillation for Water
Sequence: 6L06004
Lab Number: F611199-BS/BSD1
LCS Source: LCS

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	ND		70 - 130	FGS-070	U

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.942	96.7		70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Instrument: MeHg-7
Sequence: 6L06004
Preparation: Methyl Hg Distillation for Water

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F611199-BLK1	Methyl Mercury	0.002	0.056	ng/L	F611199	FGS-070	U
F611199-BLK2	Methyl Mercury	-0.003	0.056	ng/L	F611199	FGS-070	U
F611199-BLK3	Methyl Mercury	-0.0007	0.056	ng/L	F611199	FGS-070	U

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Notes and Definitions

U	Analyte included in the analysis, but not detected
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

73742

Project Number 23/69-862 004 009

Project Name

№ 21474

COC 1 of 1

Project Manager: CDP

Project Contact: KDP

Sampled by: LMG

Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil		Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Pres.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl)	TOC	LL Hg	Methyl Hg	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) - 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unpres.) *2	% Moisture (plastic vial, unpres.)		Total No. Of Containers	Remarks
1. MW-05-02	11/20/06	1200	X			X					1	2	1	1	1						1	1	1								9	Table 1; call Keely Pearson with questions 800-632-2277
2.																																
3. 129030																																
4. 129031																																
5. 129032																																
6. 129033																																
7.																																
8.																																
9.																																
10.																																
11.																																
12.																																

Common Parameter/Container - Preservation Key

*1 - Volatile Organics = BTEX, GRO, TPH, Full List
*2 - Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs
*3 - General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate
*4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time
Leah M. Grulm	(Y) N	11/20/06	1355			
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time
					11-20-06	13:55

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☒ Sampler ☐ Other

Air Bill Number:

4.2°C

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

from Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

~~XXXXXX~~

No samples collected Fri, Sat.

Keely not in office on Tues.

COC#72433
pg 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

MDH Certification: 027-137-157

Laboratory Results

NTS COC: 73878
Received: 11/28/2006
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 1/5/2007

Approved by: for Renee Stone

Barr Engineering
Attn: Keely Pearson
4700 West 77th Street
Minneapolis, MN 55435

Revised 1/5/07

NTS Sample: 130766
Description: MW-05-08
Sample Date: 11/28/2006 9:20:00 AM

Matrix: Aqueous
Sample Type: Grab

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Methyl Mercury	<0.056	ng/L	0.056	EPA 1630	12/12/2006	SUB	S7

Qualifier	Description	Note
S7	Analysis performed by Frontier Geosciences: MDH# 053-999-381 414 Pontius Ave. N. Seattle, WA	See Attached Report.

NTS Sample: 130767
Description: MW-05-08
Sample Date: 11/28/2006 9:20:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73878
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 1/5/2007

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Palladium	<0.1	µg/L	0.1	EPA 200.8	12/13/2006	SUB	S4
Platinum	<0.02	µg/L	0.02	EPA 200.8	12/13/2006	SUB	S4

Qualifier	Description	Note
S4	Analysis performed by Pace: MDH# 027-053-137 1700 Elm St. S.E. Suite 200 Minneapolis, MN	See Attached Report.

NTS Sample: 130768
Description: MW-05-08
Sample Date: 11/28/2006 9:20:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73878
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 1/5/2007

Notes: A Field Blank was not received with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Aluminum	2620	µg/L	250	EPA 200.7	12/4/2006	CSD	
Antimony	<3	µg/L	3	EPA 204.2	12/5/2006	KJD	
Arsenic	<2	µg/L	2	EPA 206.2	12/6/2006	KJD	
Barium	28.1	µg/L	10	EPA 200.7	12/4/2006	CSD	
Beryllium	<0.2	µg/L	0.2	EPA 210.2	12/5/2006	KJD	
Boron	<50	µg/L	50	EPA 200.7	12/4/2006	CSD	
Cadmium	<0.2	µg/L	0.2	EPA 213.2	12/5/2006	KJD	
Calcium	12.1	mg/L	1	EPA 200.7	12/4/2006	CSD	
Chromium	3.2	µg/L	1	EPA 218.2	12/14/2006	KJD	
Cobalt	<1	µg/L	1	EPA 219.2	12/9/2006	KJD	
Copper	5.7	µg/L	2	EPA 220.2	12/2/2006	KJD	
Iron	1860	µg/L	50	EPA 200.7	12/4/2006	CSD	
Lead	<1	µg/L	1	EPA 239.2	12/8/2006	KJD	
Magnesium	6.47	mg/L	1	EPA 200.7	12/4/2006	CSD	
Manganese	152	µg/L	10	EPA 200.7	12/4/2006	CSD	
Mercury, Low Level	1.6	ng/L	0.5	EPA 1631E	11/30/2006	SUB	
Molybdenum	<5	µg/L	5	EPA 246.2	12/1/2006	KJD	
Nickel	3	µg/L	2	EPA 249.2	12/12/2006	KJD	
Potassium	1.51	mg/L	0.25	EPA 200.7	12/4/2006	CSD	
Selenium	<2	µg/L	2	EPA 270.2	12/6/2006	KJD	
Silver	<2	µg/L	2	EPA 272.2	12/9/2006	KJD	c
Sodium	7.3	mg/L	2	EPA 200.7	12/4/2006	CSD	
Strontium	32.6	µg/L	5	EPA 200.7	12/4/2006	CSD	
Thallium	<2	µg/L	2	EPA 279.2	12/2/2006	KJD	
Titanium	57	µg/L	20	EPA 283.2	12/7/2006	KJD	
Zinc	<25	µg/L	25	EPA 200.7	12/4/2006	CSD	
TOC	1.6	mg/L	1	EPA 415.1	12/8/2006	CSD	
Alkalinity, Total	67.7	mg/L as CaCO3	10	EPA 310.1	11/30/2006	LXP	
Chloride	1.17	mg/L	0.5	EPA 300.0 ATP	11/29/2006	DB	
COD	<10	mg/L	10	SM 18th Ed 5220D	12/6/2006	DB	
Fluoride	0.11	mg/L	0.1	EPA 340.2	12/5/2006	LXP	
Nitrogen, Ammonia	0.42	mg/L as N	0.1	EPA 350.1	11/28/2006	DB	
Nitrogen, Nitrate+Nitrite	0.15	mg/L as N	0.1	EPA 353.2	11/30/2006	LXP	
pH	6.9	Std Units	0.1	EPA 150.1	11/29/2006	DB	
Phosphorous, Total	0.14	mg/L as P	0.1	EPA 365.4	12/1/2006	LXP	
Sulfate	11.2	mg/L	1	EPA 300.0 ATP	11/29/2006	DB	
Hardness, Total (calc)	56.8	mg/L	10	SM 2340B	12/14/2006	RMS	

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	See Attached Report.

NTS Sample: 130768
Description: MW-05-08
Sample Date: 11/28/2006 9:20:00 AM

Matrix: Aqueous
Sample Type: Grab

NTS COC: 73878
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 1/5/2007

Notes: A Field Blank was not received with this sample. All samples analyzed for mercury by EPA Method 1631 require a Field Blank.

Analyte	Result	Units	RL	Method	Analysis Date	Analyst	
Cyanide	<0.02	mg/L	0.02	SM 4500E	12/5/2006	SUB	S2

Qualifier	Description	Note
c	Elevated Reporting Limit.	
S2	Analysis performed by MVTL - New Ulm: MDH# 027-015-125 1126 North Front St. New Ulm, MN	See Attached Report.

NTS Sample: 130769
Description: MW-05-08
Sample Date: 11/28/2006 9:20:00 AM

Matrix: Aqueous
Sample Type: Grab - Filtered

NTS COC: 73878
Client: 0662 - Barr Engineering
Project: 3933 - 23/69-862004009 Poly Met
Sampled By: Client
Report Date: 1/5/2007

Analyte	Result	Units	RL	Method	Analysis Date	Analyst
Aluminum	199	µg/L	25	EPA 200.7	11/29/2006	CSD
Cadmium	<0.2	µg/L	0.2	EPA 213.2	12/11/2006	JK
Chromium	1.2	µg/L	1	EPA 218.2	11/30/2006	KJD
Copper	<2	µg/L	2	EPA 220.2	12/6/2006	KJD
Molybdenum	<5	µg/L	5	EPA 246.2	12/6/2006	KJD
Nickel	<2	µg/L	2	EPA 249.2	12/6/2006	KJD
Selenium	<2	µg/L	2	EPA 270.2	12/6/2006	KJD
Silver	<1	µg/L	1	EPA 272.2	11/30/2006	KJD
Zinc	<25	µg/L	25	EPA 200.7	11/29/2006	CSD

MINNESOTA VALLEY TESTING LABORATORIES, INC.

1126 N. Front St. ~ New Ulm, MN 56073 ~ 800-782-3557 ~ Fax 507-359-2890
1411 S. 12th St. ~ Bismarck, ND 58502 ~ 800-279-6885 ~ Fax 701-258-9724
35 W. Lincoln Way ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885
www.mvtl.com

MEMBER ACIL

TERRI SABETTI
NORTHEAST TECHNICAL SERVICES
PO BOX 1142
VIRGINIA MN 55792-1142

Project Number: 3933
Sample Description: 130768

Report Date: 5 Dec 06
Lab Number: 06-A53162
Work Order #:12-13503
Account #: 022015
Sample Matrix: WASTEWATER
Date Sampled: 28 Nov 06 9:20
Date Received: 1 Dec 06 9:30
PO #: 73878/3933
Chain of Custody Number: 73878
Temp at Receipt: -2.0C

	As Received Result		Method RL	Method Reference	Date Analyzed	Analyst
Cyanide, Total	< 0.02	mg/L	0.02	SM 4500E	5 Dec 06 11:28	JD

Approved by: Jason G. Smith, Inorganic Laboratory Manager New Ulm, MN

RL = Reporting Limit

Elevated "Less Than Result" (<): @ = Due to sample matrix
! = Due to sample quantity
= Due to sample concentration
+ = Due to extract volume

CERTIFICATION: MN LAB # 027-015-125 WI LAB # 999447680 ND MICRO # 1013-M ND WW/DW # R-040 IA LAB #: 132 IA LAB #: 022

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

December 13, 2006

Ms. Renee Stone
Northeast Technical Services
315 Chestnut St.
Virginia, MN 55792

RE: Project: 3933
Pace Project No.: 1043208

Dear Ms. Stone:
Enclosed are the analytical results for sample(s) received by the laboratory on December 08, 2006. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colin Schuft

Colin Schuft

colin.schuft@pacelabs.com
Project Coordinator

Illinois Certification #: 200011
Iowa Certification #: 368
Minnesota Certification #: 027-053-137
Wisconsin Certification #: 999407970

Enclosures

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE SUMMARY

Project: 3933
Pace Project No.: 1043208

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1043208001	130767	Water	11/28/06 09:20	12/08/06 08:55

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

SAMPLE ANALYTE COUNT

Project: 3933
Pace Project No.: 1043208

Lab ID	Sample ID	Method	Analytes Reported
1043208001	130767	EPA 200.8	2

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

ANALYTICAL RESULTS

Project: 3933
Pace Project No.: 1043208

Sample: 130767 **Lab ID: 1043208001** Collected: 11/28/06 09:20 Received: 12/08/06 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Palladium	ND	ug/L	0.10	0.050	1	12/12/06 00:04	12/13/06 01:23	7440-05-3	
Platinum	ND	ug/L	0.020	0.010	1	12/12/06 00:04	12/13/06 01:23	7440-06-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALITY CONTROL DATA

Project: 3933
Pace Project No.: 1043208

QC Batch: MPRP/7983
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Associated Lab Samples: 1043208001

METHOD BLANK: 292588
Associated Lab Samples: 1043208001

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
Palladium	ug/L	ND	0.10	
Platinum	ug/L	ND	0.020	

LABORATORY CONTROL SAMPLE: 292589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Palladium	ug/L	80	86.1	108	85-115	
Platinum	ug/L	80	82.4	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 292590 292591

Parameter	Units	1043208001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Palladium	ug/L	ND	80	80	77.0	78.0	96	97	70-130	1	20	
Platinum	ug/L	ND	80	80	76.5	78.5	96	98	70-130	3	20	

Pace Analytical Services, Inc.
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612)607-1700
Fax: (612)607-6444

QUALIFIERS

Project: 3933
Pace Project No.: 1043208

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

10413208

Northeast Technical Services
315 Chestnut Street
P.O. Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

DATE 11/28/2006

PO Number 73878/3933

PROJECT MGR Renee Stone

Vendor: **Pace Analytical Svcs., Inc.**
Address: **1700 Elm Street SE**
Suite #200
Minneapolis, MN 55414

COC # 73878
NTS Job # 3933

Qty	Description
1	Pd, Pt

TOTAL
TESTS 1

SHIPPER UPS

SHIPPING CHARGE

Northeast Technical Services
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Chain of Custody Record

Analysis to be performed by: Pace

1043208

COC:	NTS COC: 73878 NTS Project: #3933 NTS Project Desc: Barr Engineering, 23/69-862004009 Poly Met						
Sample	**Collected**	**Type**	**Fil**	**Matrix**	**Location**	**Containers**	**Analyses**
130767	11/28/2006 9:20:00 AM	Grab		Aqueous	MW-05-08		Pd,Pt 001

Relinquished By: (Signature)	Date: 12-7-06	Time: 13:50	Received By: (Signature)	Remarks:
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	
Received for Lab By: (Signature)	Date: 12/8	Time: 855	Temp at Arrival: 2.0 °C	

Sample Condition Upon Receipt

Pace Analytical

Client Name: Northeast tech. Project # 1043208

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other _____

Thermometer Used 230194010 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 2.0°C Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: EMA 12/8

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☒Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☒Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☒Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes ☐No ☒N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	15.
Trip Blank Present:	☐Yes ☐No ☒N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 12/8/06

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

27 December 2006

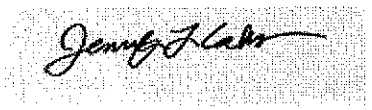
Renee Stone
Northeast Technical Services Inc.
315 Chestnut St
Virginia, MN 55792

RE: Methyl Mercury

Enclosed are the analytical results for samples received by Frontier GeoSciences, Inc. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Cahn For Kristina Spadafora
Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Frontier GeoSciences, Inc. **SDG:**

Client: Northeast Technical Services Inc. **Project:** Methyl Mercury

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
130766	0611147-01	Water	28-Nov-06 13:30	30-Nov-06 09:02

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
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CASE NARRATIVE

Work Order Number: 0611147:

SAMPLE RECEIPT
One (1) water sample was received on November 30, 2006 for methyl mercury analysis. The sample was received within a sealed cooler at a temperature of 1.1 degrees Celsius.

Upon receipt, the water sample for methyl mercury was preserved to 0.4% (v/v) with ultra-pure hydrochloric acid. The bottle for methyl mercury analysis was refrigerated until distillation and analysis.

SAMPLE PREPARATION
Water samples for methyl mercury determination were distilled according to method FGS-013 prior to analysis.

SAMPLE ANALYSIS
Daily analytical runs were begun with a 5-point standard curve, spanning the entire analytical range of interest, with additional continuing calibration verification (CCV) standards run every 10 samples. The daily standard curves were calculated using the instrument blank corrected standards, a linear regression forced through zero. For each analytical set, one matrix duplicate, two matrix spikes, and at least three method blanks were co-processed and analyzed in exactly the same manner as ordinary samples. All results have been corrected for with the mean value of the instrument blanks and the preparation blanks.

METHYL MERCURY
Distilled samples were analyzed using aqueous phase ethylation, purging onto a Carbotrap, isothermal GC separation, and CV-AFS detection according to Frontier SOP# FGS-070. Samples were ethylated by the addition of sodium tetraethyl borate and then the volatile ethyl analogs were purged with nitrogen gas onto a Carbotrap. After a trap-drying step, the mercury ethyl analogs were thermally desorbed into an isothermal GC column held at high heat for separation. Peak heights are assessed by chart recorder and recorded on bench sheets in "chart units" to the nearest 0.2 units.

ANALYTICAL AND QUALITY CONTROL ISSUES
There were no analytical difficulties and all quality control analyses were within acceptable limits.

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

CHAIN OF CUSTODY FORMS

Northeast Technical Services #0611147
315 Chestnut Street
PO Box 1142
Virginia, MN 55792
Phone: 218-741-4290
Fax: 218-742-1010

Chain of Custody Record

Analysis to be performed by: Frontier Geosciences

COC:	NTS COC: 73978 NTS Project: #3333 NTS Project Desc: Barr Engineering, 23/69-862034006 Poly Met							
Sample	Collected		Type	Fil	Matrix	Location	Containers	Analyses
130766	11/28/2006	9:20:00 AM	Grab		Aqueous	MW-06-08		Methyl Hg

Relinquished By: (Signature)	Date	Time	Received By: (Signature)	Remarks:
[signature]	11-28-06	13:30		
Relinquished By: (Signature)	Date	Time	Received By: (Signature)	
Received for Lab By: (Signature)	Date	Time	Temp at Arrival: 1.1 °C	
[signature] FGS 11/30/06 900				

UPS 11/29/06 coc:NA
VTSR: 845
#12559 711155414 0145

Tuesday, November 28, 2006 Page 3 of 4

Frontier GeoSciences, Inc.

[signature]

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

Methyl Mercury Analytical Results

Matrix: Water **Extraction:** Methyl Hg Distillation for Water

Sample Name	Result	MRL	Units	Dilution	Batch	Prepared	Sequence	Analyzed	Method:	Notes
130766	ND	0.056	ng/L	1.25	F612096	11-Dec-06	6L12005	12-Dec-06	FGS-070	U

Frontier GeoSciences, Inc.

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

Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX DUPLICATES/TRIPLICATES

SOURCE: 0611121-18RE1

Matrix: Water
Sequence: 6L12005
Batch: F612096
Lab Number: F612096-DUP1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Methyl Mercury	0.114	0.131	0.056	13.9	25	FGS-070	

Frontier GeoSciences, Inc.

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Jennifer Cahn For Kristina Spadafora, Project Manager

FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 0611121-19RE1

Matrix: Water
Sequence: 6L12005
Batch: F612096
Lab Number: F612096-MS/MSD1
Preparation: Methyl Hg Distillation for Water

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	0.026	2.008	1.908	93.7	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	2.166	107	12.7	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Matrix: Water
Sequence: 6L12005
Batch: F612096
Lab Number: F612096-BS/BSD1
Preparation: Methyl Hg Distillation for Water
LCS Source: LCS

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Revovery Limits	Method	Notes
Methyl Mercury	2.008	1.831	91.2	70 - 130	FGS-070	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Revovery Limits	RPD Limit	Method	Notes
Methyl Mercury	2.008	1.838	91.5	0.382	70 - 130	25	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

414 Pontius Ave North
Seattle, WA 98109
Ph: 206-622-6960
Fx: 206-622-6870

PREPARATION BLANKS

Matrix: Water
Instrument: MeHg-7
Sequence: 6L12005
Preparation: Methyl Hg Distillation for Water

Lab Sample ID	Analyte	Found	MRL	Units	Batch	Method	Notes
F612096-BLK1	Methyl Mercury	0.007	0.056	ng/L	F612096	FGS-070	U
F612096-BLK2	Methyl Mercury	0.007	0.056	ng/L	F612096	FGS-070	U
F612096-BLK3	Methyl Mercury	0.011	0.056	ng/L	F612096	FGS-070	

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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FRONTIER GEOSCIENCES INC.

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Notes and Definitions

U	Analyte included in the analysis, but not detected
DET	Analyte Detected
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

Frontier GeoSciences, Inc.

Jennifer Cahn For Kristina Spadafora, Project Manager

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

Chain of Custody

7878

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

COC 1 of 1

Project Number: 23/69-862004.009

Project Name: № 21481

Project Manager: CDP

Project Contact: KDP

Sampled by: LMG/JAM2

Laboratory: NTS

Sample Identification	Collection Date	Collection Time	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: Volatile Organics (Pres.) *1	Semivolatile Organics *2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (Unpreserved) *3	Cyanide (NaOH)	Nutrients (H_2SO_4) *4	Oil and Grease (H_2SO_4)	Sulfide (Zn Acetate)	Methane	Bacteria ($Na_2S_2O_3$)	DRO (HCl)	TOC	Methyl Hg	LL Hg	Soil: VOCs (2-oz tared MeOH) *1	GRO, BTEX (2-oz tared MeOH) *1	DRO (2-oz tared) - 25 grams	Metals (2-oz unpreserved)	SVOCs (2 or 4-oz unpres.) *2	% Moisture (plastic vial, unpres.)		Total No. Of Containers	Remarks
1. MW-05-08	11/28/06	09:20	X		X					1	2	1	1	1						1	1	1								9	Table 1
2. 130766																															
3. 130767																															
4. 130768																															
5. 130769																															
6.																															
7.																															
8.																															
9.																															
10.																															
11.																															
12.																															

Common Parameter/Container - Preservation Key

*1 - *Volatile Organics = BTEX, GRO, TPH, Full List*
*2 - *Semivolatile Organics = PAHs, PCP, Dioxins, Full List, Herbicide/Pesticide/PCBs*
*3 - *General = pH, Chloride, Flouride, Alkalinity, TSS, TDS, TS, Sulfate*
*4 - *Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN*

Relinquished By:	On Ice? Y / N	Date	Time	Received by:	Date	Time
Leah M Gnelm	Y	11/28/06	12:25			
Relinquished By:	On Ice? Y / N	Date	Time	Received by:	Date	Time
				M Koski	11-28-06	12:25

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other

Air Bill Number: 4.5°C onice

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:RLG\STDFORMS\Chain Of Custody Form RLG Rev. 07\01\05

from Ph. II Work Plan

COC#72433

2 of 3

Table 1. Proposed Parameters for Groundwater Sample Analysis. Detection limits in ug/L unless otherwise noted.

Description	Method	Detection Limit
Alkalinity, Total as CaCO3	EPA 310.1	10 mg/L
Carbon, Total Organic	EPA 415.1	1 mg/L
Chemical Oxygen Demand	STD METH 5220D, 18TH ED	10 mg/L
Chloride	EPA 325.2	0.5 mg/L
Cyanide Total	EPA 335.2	0.02 mg/L
Fluoride	EPA 340.1	0.1 mg/L
Hardness, Total (calculated)	EPA 200.7	1 mg/L
Nitrogen, Ammonia	EPA 350.1	0.1 mg/L
Nitrogen, Nitrate + Nitrite	EPA 353.2	0.1 mg/L
pH	EPA 150.1	0.1 SU
Phosphorus, Total	EPA 365.2	0.1 mg/L
Sulfate	EPA 375.4	1 mg/L
Aluminum, Total	EPA 200.7	25
Aluminum, Dissolved	EPA 200.7	25
Antimony, Total	EPA 204.2	3
Arsenic, Total	EPA 200.8	2
Barium, Total	EPA 200.7	10
Beryllium, Total	EPA 210.2	0.2
Boron, Total	EPA 200.7	35
Cadmium, Total	EPA 213.2	0.2
Cadmium, Dissolved	EPA 213.2	0.2
Calcium, Total	EPA 200.7	0.5 mg/L
Chromium, Total	EPA 218.2	1
Chromium, Dissolved	EPA 218.2	1
Cobalt, Total	EPA 219.2	1
Copper, Total	EPA 220.2	2
Copper, Dissolved	EPA 220.2	2
Iron, Total	EPA 200.7	0.05 mg/L
Lead, Total	EPA 7421	1
Magnesium, Total	EPA 200.7	0.5 mg/L
Manganese, Total	EPA 200.7	0.03 mg/L
Mercury, Low Level Total	EPA 1631E	2 ng/L
Methyl Mercury, Total – 48 hr. holding time	EPA 1631E	0.02 ng/L
Molybdenum, Total	EPA 246.2	5
Molybdenum, Dissolved	EPA 246.2	5
Nickel, Total	EPA 249.2	2

~~XXXXXX~~

No samples collected Fri, Sat.

Keely not in office on Tues.

Coc#72433

pg 3 of 3

Description	Method	Detection Limit
Nickel, Dissolved	EPA 249.2	2
Palladium, Total	EPA 200.7	25
Platinum, Total	EPA 200.7	25
Potassium, Total	EPA 200.7	1 mg/L
Selenium, Total	EPA 270.2	2
Selenium, Dissolved	EPA 270.2	2
Silver, Total	EPA 272.2	1
Silver, Dissolved	EPA 272.2	1
Sodium, Total	EPA 200.7	0.5 mg/L
Strontium, Total	EPA 200.7	4
Thallium, Total	EPA 279.2	2
Titanium, Total	EPA 283.2	10
Zinc, Total	EPA 200.7	10
Zinc, Dissolved	EPA 200.7	10

ISOTECH®
www.isotechlabs.com mail@isotechlabs.com
Isotech Laboratories, Inc. 1308 Parkland Court Champaign, IL 61821-1826 Telephone 217/398-3490 FAX 217/398-3493

January 31, 2007

Revised

Michael Dupay
Barr Engineering Company
4700 West 77th Street
Minneapolis, MN 55435-4803

Dear Michael:

Enclosed are revised analysis report sheets for samples originally reported in December 2006. This is the same revised data that was emailed to you, and if you have any questions, please do not hesitate to contact us.

Thank you for choosing Isotech for your analysis needs, we appreciate your business.

Sincerely,

Steven R. Pelphrey

Steven R. Pelphrey
Laboratory Manager

Enclosure

SRP:cw

ANALYSIS REPORT

Water Analysis Report

REVISED REPORT
See "Remarks" section
for explanation

Lab Number:	106330	Job Number:	7833
Submitter Sample Name:	P-2 10/24/2006		
Submitter Sample ID:			
Submitter Job #:			
Company:	Barr Engineering Company		
Field or Site:	23/69-862004 009 PolyMet Ph III Hydro		
Location:			
Depth/Formation:			
Container Type:	Plastic Bottle		
Sample Collected:	10/24/2006		
Results Reported:	12/18/2006		

Delta D of water ----------	-85.4 per mil relative to VSMOW
Delta O-18 of water ----------	-12.25 per mil relative to VSMOW
Tritium content of water ----------	3.27 ± 0.28 TU
Delta C-13 of DIC ----------	-18.85 per mil relative to VPDB
Carbon-14 content of DIC --------	na

Remarks: Report revised on 1/26/07 to correct hydrogen isotope data.

ANALYSIS REPORT

Water Analysis Report

REVISED REPORT
See "Remarks" section for explanation

Lab Number:	106331	Job Number:	7833
Submitter Sample Name:	P-2 10/31/2006		
Submitter Sample ID:			
Submitter Job #:			
Company:	Barr Engineering Company		
Field or Site:	23/69-862004 009 PolyMet Ph III Hydro		
Location:			
Depth/Formation:			
Container Type:	Plastic Bottle		
Sample Collected:	10/31/2006		
Results Reported:	12/18/2006		

Delta D of water ----------	-85.9 per mil relative to VSMOW
Delta O-18 of water ----------	-12.28 per mil relative to VSMOW
Tritium content of water ----------	2.77 ± 0.28 TU
Delta C-13 of DIC ----------	-17.78 per mil relative to VPDB
Carbon-14 content of DIC --------	na

Remarks:

ANALYSIS REPORT

Water Analysis Report

REVISED REPORT
See "Remarks" section
for explanation

Lab Number:	106332	Job Number:	7833
Submitter Sample Name:	P-2 11/07/2006		
Submitter Sample ID:			
Submitter Job #:			
Company:	Barr Engineering Company		
Field or Site:	23/69-862004 009 PolyMet Ph III Hydro		
Location:			
Depth/Formation:			
Container Type:	Plastic Bottle		
Sample Collected:	11/07/2006		
Results Reported:	12/18/2006		

Delta D of water ----------	-85.9 per mil relative to VSMOW
Delta O-18 of water ----------	-12.29 per mil relative to VSMOW
Tritium content of water ----------	2.99 ± 0.26 TU
Delta C-13 of DIC ----------	-16.86 per mil relative to VPDB
Carbon-14 content of DIC --------	na

Remarks:

ANALYSIS REPORT

Water Analysis Report

REVISED REPORT
See "Remarks" section
for explanation

Lab Number:	106333	Job Number:	7833
Submitter Sample Name:	P-2 11/14/2006		
Submitter Sample ID:			
Submitter Job #:			
Company:	Barr Engineering Company		
Field or Site:	23/69-862004 009 PolyMet Ph III Hydro		
Location:			
Depth/Formation:			
Container Type:	Plastic Bottle		
Sample Collected:	11/14/2006		
Results Reported:	12/18/2006		

Delta D of water ----------	-85.4 per mil relative to VSMOW
Delta O-18 of water ----------	-12.27 per mil relative to VSMOW
Tritium content of water ----------	3.82 ± 0.29 TU
Delta C-13 of DIC ----------	-15.79 per mil relative to VPDB
Carbon-14 content of DIC --------	na

Remarks: