

Appendix F2

Aquatic Effects Monitoring Program – Core Receiving Environment Monitoring Program, 2009 Meadowbank Gold Project, March 2010

Final

**Aquatic Effects Monitoring Program –
Core Receiving Environment Monitoring Program 2009**

Meadowbank Gold Project

Prepared for:

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- Gary Mann (Azimuth) – Gary was responsible for overall management of this project. He also provided oversight and logistical support for the field crew, and reviewed the CREMP report.
- Maggie McConnell (Azimuth) – Maggie was responsible for implementing the CREMP field monitoring program in 2009. In addition to participating in summer sampling trips, Maggie conducted most of the data analysis, interpretation, and report writing.
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PROFESSIONAL LIABILITY STATEMENT

This report has been prepared by Azimuth Consulting Group Inc. (Azimuth), for the use of Agnico-Eagle Mines Ltd. (AEM), who has been party to the development of the scope of work for this project and understands its limitations. The extent to which previous investigations were relied on is detailed in the report.

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ACRONYMS

AEMP – Aquatic Effects Monitoring Program¹
ANOVA – Analysis of Variance
AWPAR – All Weather Private Access Road
BBD – Baker Lake – barge dock
BPJ – Baker Lake – proposed jetty
BAP – Baker Lake – Akilahaarjuk Point
CREMP – Core Receiving Environment Monitoring Program
DFO – Department of Fisheries and Oceans
DLs – Detection limits
DQO – Data Quality Objective
EAS – Effects Assessment Strategy
EEM – Environmental Effects Monitoring
EIA – Environmental Impact Assessment
GPS – Global Positioning System
INUG – Inuggugayualik Lake
ISQG – Interim Sediment Quality Guidelines
MDL – Method detection limit
MMER – Metal Mining Effluent Regulations
PAHs – Polycyclic Aromatic Hydrocarbons
PDL – Pipedream Lake
PEL – Probable Effect Level
QA/QC – Quality Assurance / Quality Control
RPD – Relative percent difference
SOP – Standard Operating Procedure
SQG – Sediment Quality Guidelines
SP – Second Portage Lake
TE – Tehek Lake
TEFF – Tehek Lake – Farfield
TPE, TPN, TPS – Third Portage Lake – East, North, and South Basins
UTM – Universal Transverse Mercator
WAL – Wally Lake

¹ See text box in **Section 1.1**.



EXECUTIVE SUMMARY

Overview

This Core Receiving Environment Monitoring Program (CREMP²) for the Meadowbank Gold Project describes the strategy, methodology and results of receiving environment aquatic monitoring during the 2009 open-water and through-ice seasons of the Meadowbank study lakes and, for the second time, at Baker Lake.

Monitoring Strategy and General Study Design

At its core, the CREMP was designed to address key issues identified in the Meadowbank EIA (i.e., mining-related activities with the potential to affect water quality, fish habitat and fish populations). The core program is tailored based on our understanding of mine construction, operation and infrastructure (e.g., dikes, effluents, stream crossings, roads, etc.) and has been developed to detect mine-related impacts at temporal and spatial scales that are ecologically relevant. The core program initially focused solely on the project lakes, but was expanded to Baker Lake in 2008 to ensure that monitoring was also in place to track project-related activities in that area. The 2009 program consisted of 12 stations, each categorized into one of the three main types of stations described below:

- *Near-field (NF) areas* – Stations are situated in close proximity to the development, in particular near dikes and effluent sources. They are the first line of early-warning for introductions of stressors into the receiving environment. NF stations for the Meadowbank study lakes are Third Portage Lake North (TPN), Third Portage Lake East (TPE), Second Portage Lake (SP), Wally Lake (WAL), and Tehek Lake (TE). The TE location was affected by sediment released during construction of the East Dike in Second Portage Lake, just upstream, and so in 2009 has become an NF station. NF stations for Baker Lake are Baker Barge Dock (BBD) and the Baker Proposed Jetty (BPJ).
- *Far-field (FF) area* – The intent of this station is to monitor downstream of project infrastructure to provide insights into the spatial extent of any effects observed at the near-field stations. One far-field reference was added in 2009 well downstream of the maximum extent of observed water quality effects within Tehek Lake (Tehek Farfield: TEFF). Given the natural drainage of the entire Meadowbank project area, this Tehek Lake station is a key location to assess

² AEM has a number of monitoring programs relevant to tracking potential changes to the aquatic receiving environment surrounding the Meadowbank Gold Project



whether or not contaminants are detectable downstream of the entire mine development.

- *Reference (Ref) areas* – Reference stations are sufficiently removed from the mine that they are presumed to be unaffected by any infrastructure (roads, dikes, runways) and point sources (aerial and aquatic) associated with mine development. Internal (Third Portage Lake South [TPS]) and external (Inuggugayualik Lake [INUG]) reference areas were chosen for the purposes of making comparisons with the Meadowbank study lakes (BAER, 2005). An external reference was added in 2009 in another remote lake, Pipedream Lake (PDL). For Baker Lake, the internal reference area is at Akilahaarjuk Point (BAP).

In addition to the core CREMP program, the following targeted monitoring studies were conducted in 2009:

- *Dike construction monitoring* – A detailed monitoring and management program for dike construction was developed as part of the Nunavut Water Board (NWB) A License process. The program was implemented for the construction of the Bay-Goose Dike during open water 2009. Monitoring program results are documented in a separate report (Azimuth, 2010a).
- *Total suspended solids (TSS) effects assessment strategy (EAS)* – In response to elevated TSS concentrations related to construction of the Bay-Goose Dike, the TSS EAS was implemented to determine the physical and ecological extent and magnitude of this event. A number of components were also monitored as follow-up from effects associated with construction of the East Dike in 2008 (Azimuth, 2010b).

Other programs conducted in 2009 within the same aquatic receiving environment:

- *East Dike Habitat Monitoring* – The East Dike permanently separated Second Portage Pit (which becomes part of Third Portage Lake post-closure) and Second Portage Lake. As such, this is the first feature installed within the project lakes that is intended to function as productive fish habitat in partial compensation for habitat losses within the project lakes as a result of mine development (Azimuth, 2010c). This targeted program is designed to monitor the capability of this structure in providing productive habitat.
- *Habitat Mapping of the NW Arm of Second Portage Lake* – The NW of Second Portage Lake, designated as a Tailings Impoundment Facility, was mapped primarily using aerial photographs through water in 2005 to quantify the spatial distribution and abundance of habitat types important to fish (Azimuth, 2010d). With partial de-watering of the impoundment, mapping techniques were repeated,

both from the air and from ground surveys to compare results to the 2005 mapping effort. Ultimately, this information will be used to correlate abundance of habitat with abundance and biomass of fish from the fishout program.



Meadowbank Gold Project – Development Status

The construction phase of the Meadowbank Gold Project officially started in June 2008, upon receipt of the NWB A Water License (2AM-MEA0815) for the project. The Fisheries and Oceans Canada (DFO) *Fisheries Act* Authorization (NU-03-0191) for the project was issued on July 30, 2008; in-water construction activities started that same day. For 2008, these activities included: the East Dike construction (located in Second Portage Lake) and the Western Channel Dike construction (located between Third Portage Lake and Second Portage Lake). For 2009, these activities included: Phase 1 of Bay-Goose Dike construction which was undertaken in Third Portage Lake East, with Phase 2 and completion of the dike scheduled for summer of 2010. The closest CREMP station to these activities was the Second Portage Lake (SP) and Tehek Lake stations in 2008 and the Third Portage Lake East station in 2009.

Meadowbank Study Lakes

- Limnology results show that the lakes are generally cold, clear, isothermal, well mixed, and well oxygenated. These results are consistent among stations and seasons for 2009 and similar to historical data. During through-ice sampling in winter months, observed differences were colder lake water temperatures and higher dissolved oxygen concentrations, as would be expected.
- Water chemistry results show that the lakes are circum-neutral with low conductivity, hardness and ions. Total and dissolved solids concentrations are very low and typically below detection limits (see exceptions below). Carbon was also low, close to laboratory detection limits and did not differ appreciably within or among lakes and seasons. Some stations detected nitrogen above DLs and never exceeded guidelines. On a few occasions phosphorus concentrations exceeded the guideline for ultra-oligotrophic lakes in Third Portage Lake East (see next bullet) and Tehek Lake. Total metals in water were consistently low among study lakes and seasons, with only six of 29 metals occasionally above detection limits and none exceeding CCME guidelines (except for TPE, see next bullet). These results are generally consistent with previous years and confirm their status as ultra-oligotrophic lakes.
- Construction of the Bay-Goose Dike introduced suspended sediments into Third Portage Lake East in August and September 2009. This resulted in elevated concentrations of total suspended solids (TSS), certain nutrients (e.g., total phosphorus) and some metals (aluminum, chromium copper and iron exceeded CCME guidelines) in Third Portage Lake East. The extent and ecological significance of the sediment introductions is assessed in greater detail in the dike construction monitoring and EAS reports, respectively (Azimuth, 2010a, b).

-
- Sediment chemistry results showed naturally elevated metals (primarily arsenic, copper, chromium which typically exceeded CCME guidelines) at many locations. Lead and zinc marginally exceeded guidelines once or twice in no apparent pattern. Total organic carbon concentrations were consistent with those measured in previous years. Also in 2009, concentrations of all PAHs, oil & grease, and LEPHs & HEPHs were below detection limits in sediment for all stations.
 - Primary productivity was generally low, as indicated by low phytoplankton biomass and low chlorophyll- α , as expected for these ultra-oligotrophic lakes. Phytoplankton biomass and abundance showed the largest seasonal decline in Third Portage Lake East from July through to September, likely due to increased TSS from Bay-Goose Dike construction. We also observed higher than desired variability between field duplicates; the implications of this natural variability will be explored further in the CREMP design review process. Results from EAS data analyses with the CREMP data set show that phytoplankton biomass was reduced in TPE in September 2009 compared to open-water seasonal data since July 2006, but this effect did not extend to November 2009 (Azimuth, 2010b).
 - Benthic community samples were dominated by chironomid larvae in 2009, consistent with previous years. Most stations had consistent results to last year. Natural inter-annual variability was explored at Third Portage East, where fairly large changes have occurred over the years that are unrelated to mine development. Potential changes related to dike construction activities were explored in a targeted study: TSS Effects Assessment Study (Azimuth, 2010b).

Baker Lake

- Limnology results suggest some influence of marine water at the Baker Lake stations, with fairly widespread elevated conductivity, hardness and ions relative to the Meadowbank study lakes. However, inputs from the Thelon River, which is more similar to water from the Meadowbank study lakes, seem to prevail under certain conditions (e.g., strong southerly winds). Despite some vertical differences in salinity, oxygen and temperature profiles show un-stratified conditions.
- Water chemistry results showed 24 of 29 metals below detection limits and all were below applicable CCME guidelines.
- Sediment chemistry showed lower metals concentrations than the Meadowbank study lakes, with only arsenic exceeding CCME guidelines (at the barge dock and the proposed jetty stations). Concentrations of all PAHs, oil & grease, and LEPHs & HEPHs were below detection limits in sediment for the three stations. Oil and grease slightly exceeded detection limits at the reference station, but this was

likely due to organic matter and not hydrocarbons, given the absence of industrial activity and lack of LEPH and HEPH chemicals in the sediment.

- Primary productivity was slightly higher at the Baker Lake stations relative to the Meadowbank study lakes, with chlorophyll- α concentrations being quite consistent among stations but slightly higher at the reference station and the highest phytoplankton biomass found at the barge dock station.
- Benthic community samples in Baker Lake were dominated by chironomid larvae. Total abundance and diversity at the Baker Lake reference station was generally higher than the Meadowbank study lakes, despite having a somewhat sandier substrate.
- In a number of ways, the reference station BAP appears to be quite different from the exposure stations; thus, consideration for locating a new reference for Baker Lake will be given during 2010 sample planning.

1. INTRODUCTION

1.1. Background

Agnico-Eagle Mines (AEM) Ltd.'s Meadowbank Gold Project is situated approximately 75 km north of the hamlet of Baker Lake, Nunavut. The Aquatic Effects Management Program (AEMP, 2005) was developed to address issues identified during the environmental impact assessment (EIA) process that could potentially impact the aquatic receiving environments surrounding the development. Building from earlier baseline monitoring (BAER, 2005), the 2005 AEMP describes the general monitoring strategy designed to detect impacts to the aquatic environment. This strategy relies on two primary components (discussed further in **Section 1.3**): the core monitoring program and targeted studies. Monitoring following the 2005 AEMP strategy has been implemented as follows:

- 2006 and 2007 – The core monitoring program is implemented over two complete cycles (Azimuth, 2008a, b) prior to construction of the mine (i.e., baseline conditions).
- 2008 and 2009 – Mine construction starts in 2008, with dike construction activities occurring directly in the receiving environment. Core receiving environment monitoring (Azimuth, 2009a; this report) was complemented by targeted studies on dike construction monitoring (Azimuth,

“AEMP” Terminology

The term “AEMP” was first used in the 2005 report *Aquatic Effects Management Program*, which described the rationale, framework, strategy, methods, and scope of receiving environment monitoring for the Meadowbank Gold Project. Receiving environment monitoring conducted in 2006 and 2007 use this term in the annual report titles.

The Nunavut Water Board A Licence, issued in 2008, defines “AEMP” as the Aquatic Effects Monitoring Program. Annual report titles for 2008 and 2009 (this report) reflect this change.

AEM has a number of monitoring programs (e.g., effluent monitoring, ground water monitoring, air quality monitoring) relevant to tracking potential changes to the aquatic receiving environment surrounding the Meadowbank Gold Project. One of the requirements of the NWB A Licence is to revise the Aquatic Effects Monitoring Program (AEMP) to consider the results of all these programs; these revisions are currently underway. Previously, the term “AEMP” was essentially synonymous with receiving environment monitoring. However, given the AEMP’s broadened scope, more specific terminology is needed to minimize confusion. To that end, we use the following terms in this report:

CREMP – refers to the “core receiving environment monitoring program”; this is synonymous with “core monitoring program”.

2005 AEMP – refers to the original AEMP, which is essentially the plan for the CREMP; this plan will be revised over the next year.

AEMP – is used generically when not referring to either of the first two definitions.



2009b; 2010a) and effects assessment studies for total suspended solids (TSS) (Azimuth, 2009c; 2010b).

This CREMP monitoring report documents the strategy, methods and results of aquatic receiving environment monitoring activities undertaken during 2009.

1.2. Environmental Setting

Understanding the environmental setting of the project lakes is integral to understanding the design of the CREMP. The Meadowbank project lakes are situated in the barren-ground central Arctic region of Nunavut within an area of continuous permafrost. These are headwater ultra-oligotrophic/oligotrophic (nutrient poor and unproductive) lakes, situated on the watershed boundary that separates two main drainages – the Arctic and Hudson Bay drainages. Only a few hundred meters to the north of Second and Third Portage lakes is the divide between water that flows north to the Arctic Ocean (via the Meadowbank and Back River system) or to Chesterfield Inlet and Hudson Bay (via the Quoich River system).

The landscape consists of rolling hills and relief with low-growing vegetative cover and poor soil development. Numerous lakes are interspersed among boulder fields, eskers and bedrock outcrops, with indistinct and complex drainages. The main lakes in the Meadowbank project area include: Third Portage Lake (TP), Second Portage Lake (SP), Tehek Lake (TE), and the Vault Lake system – Vault, Wally (WAL) and Drilltrail lakes. As is common of headwater lakes, all of the project lakes have small drainage areas relative to the surface area of the lakes themselves. Local inflow from surrounding terrain is the predominant influence on water movement within the system. Small channels connect the project area lakes, although there is little flow between lakes during most of the year. The ice-free season on these lakes is very short, with ice break-up in late-June to mid-July and ice-up beginning in late September or early October. Maximum ice thickness is at least 2 m by March/April.

Overall, the Meadowbank project lakes support healthy communities of plankton, benthos and fish that are typical of oligotrophic Arctic lakes (BAER, 2005). Biological productivity of the lakes is limited by nutrient availability, cold water and a short growing season.

1.3. Objectives and Approach

The 2005 AEMP takes an integrated, ecosystem-based approach that links mitigation and monitoring of physical/chemical effects on key ecological receptors in the receiving environment. At its core, the 2005 AEMP was designed to address key issues identified in the Meadowbank EIA (i.e., mining-related activities with the potential to affect water



quality, fish habitat and fish populations). Monitoring results are intended to inform the adaptive management process, supporting the early identification of potential problems and development of mitigation options to address them. Consistent with the principles of adaptive management, the 2005 AEMP will be reviewed over the next year to refine and optimize the program. The Meadowbank 2005 AEMP has two primary components, which are described below.

1.3.1. Core Monitoring Program (CREMP)

Under the 2005 AEMP framework, the core monitoring program (CREMP; the focus of this annual monitoring report) consists of a general strategy to monitor water and sediment quality, phytoplankton, periphyton and benthic invertebrates. The core program is tailored based on our understanding of mine construction, operation and infrastructure (e.g., dikes, effluents, stream crossings, roads, etc.) and has been developed to detect mine-related impacts at temporal and spatial scales that are ecologically relevant. The core program initially focused solely on the project lakes, but was expanded to Baker Lake in 2008 to ensure that monitoring was also in place to track project-related activities in that area related primarily to barge traffic and shipping. In 2009, as dike construction and mineral exploration continued to expand, two additional reference areas were added; one far-field reference well downstream of the maximum extent of observed water quality effects within Tehek Lake (Tehek Farfield: TEFF) and another remote external reference in Pipedream Lake (PDL). Also in 2009, sampling was conducted on a monthly basis throughout the year where ice conditions permitted and thus was expanded to include May, November, and December in addition to the routine July, August and September sampling (requirements of license). Following from the recommendation in the 2008 CREMP (Azimuth, 2009a) to conclude periphyton sampling, these organisms were not collected in 2009 and are no longer part of the CREMP. This decision was based on having collected several years of baseline periphyton data; enough data with which to compare periphyton growth on habitat compensation features, satisfying the purpose of this sampling component.

The study design is based on a control-impact approach but has also incorporated the concept of gradients in exposure. To this end, the 2009 program consisted of 12 stations (see **Figures 1-1 to 1-3**), each categorized into one of the three main types of stations described below:

Near-field (NF) areas – Stations are situated in close proximity to the development, in particular near dikes and effluent sources (**Figures 1-2 and 1-3**). These stations provide the first line of early-warning for introductions of stressors into the receiving environment. For the project lakes area, these stations include: Third Portage Lake North (TPN), Third Portage Lake East (TPE), Second Portage (SP) and Wally Lake (WAL) and



Tehek Lake (TE). The TE location was affected by sediment released during construction of the East Dike in Second Portage Lake, just upstream. Effect of sediment release was the subject of a targeted monitoring study (Azimuth, 2009c). For Baker Lake, there are two NF stations, one targeting the hamlet's barge landing area (Baker Barge Dock [BBD]) and the other AEM's fuel storage facility (Baker Proposed Jetty [BPJ]).

Far-field (FF) area – The intent of this station is to monitor downstream of project infrastructure to provide insights into the spatial extent of any effects observed at the near-field stations. The Tehek Farfield (TEFF) station is a key location that will ultimately determine whether or not contaminants are detectable downstream of the entire mine development. Lake waters from Second and Third Portage Lakes and the Vault Lakes (Vault, Wally, Drilltrail) meet at the southern end of Second Portage Lake and discharge via a single channel into Tehek Lake (**Figure 1-1**). Monitoring the water and sediment quality and the health of the benthic invertebrate community in the basin adjoining the discharge point from Second Portage Lake will help determine if any effects identified at NF stations are extending into Tehek Lake beyond the first basin located just downstream of the outlet from Second Portage Lake.

Reference (Ref) areas – By definition, reference stations are sufficiently removed from the mine that they are presumed to be unaffected by any infrastructure (roads, dikes, runways) and point sources (aerial and aquatic) associated with mine development. Internal (Third Portage Lake South [TPS]) and external (Inuggugayualik Lake [INUG], Pipedream Lake [PDL]) reference areas were chosen for the purposes of making comparisons with the project lakes (BAER, 2005). Monitoring of reference areas is important in order to distinguish between possible mine-related changes in water quality or ecological parameters and natural changes, unrelated to the mine. The internal reference area (at the extreme headwaters of Third Portage Lake) is far removed from the mine, upstream of the development area and is removed from the prevailing wind direction. The external reference area (Inuggugayualik Lake) is situated about 16 km west of the mine site (**Figures 1-1 and 1-2**). Inuggugayualik Lake is a headwater lake of the Meadowbank River system that flows north to the Arctic Ocean. Despite the different drainage basin, Inuggugayualik Lake satisfies the requirements of an external reference lake from a physical/chemical perspective because it is at the same latitude, has similar geology, relief and climate, does not have any significant inflows and has similar limnological parameters, water chemistry and aquatic biological community structure to the project lakes (BAER, 2005). Pipedream Lake was investigated as a candidate reference area in 1998 (EVS, 1999) from a fisheries perspective. The fish community of this lake differs from the other lakes in that there was a preponderance of lake trout, very few Arctic char and no round whitefish captured from the 113 fish caught. Further examination of the fish community may be required. For Baker Lake, an internal

reference area was added several kilometers to the east of the hamlet along the north shore of the lake (Baker Akilahaarjuk Point [BAP]).

Thus, the core monitoring program design allows for the detection of changes, as well as the extent (both spatially and temporally) of any adverse effects.

1.3.2. Targeted Monitoring Studies

Under the 2005 AEMP, Targeted studies are specific studies that typically have narrower temporal or spatial bounds and are designed to address specific questions related to particular components of mine development during construction or operation (AEMP, 2005). These are integrated with, and complementary to, the core monitoring program. The following target monitoring studies were conducted in 2009:

- *Dike construction monitoring* – A detailed monitoring and management program for dike construction was developed as part of the Nunavut Water Board (NWB) A License process. This program was updated in 2009 by AEM (2009). The program was implemented for the construction of the Bay-Goose Dike during open water 2009. Monitoring program results are documented in a separate report (Azimuth, 2010a).
- *Total suspended solids (TSS) effects assessment strategy (EAS)* – In response to elevated TSS concentrations related to construction of the Bay-Goose Dike, the TSS EAS was implemented to determine the physical and ecological extent and magnitude of this event. A number of components were also monitored as follow-up from effects associated with construction of the East Dike in 2008 (Azimuth, 2010b).

Other programs conducted in 2009 within the same aquatic receiving environment:

- *East Dike Habitat Monitoring* – The East Dike permanently separated Second Portage Pit (which becomes part of Third Portage Lake post-closure) and Second Portage Lake. As such, this is the first feature installed within the project lakes that is intended to function as productive fish habitat in partial compensation for habitat losses within the project lakes as a result of mine development (Azimuth, 2010c). This targeted program is designed to monitor the capability of this structure in providing productive habitat.
- *Habitat Mapping of the NW Arm of Second Portage Lake* – The northwest arm of Second Portage Lake, designated as a Tailings Impoundment Facility, was mapped primarily using aerial photographs through water in 2005 to quantify the spatial distribution and abundance of habitat types important to fish (Azimuth, 2010d). With partial de-watering of the impoundment, mapping techniques were

repeated, both from the air and from ground surveys to compare results to the 2005 mapping effort. Ultimately, this information will be used to correlate abundance of habitat with abundance and biomass of fish from the fishout program.

1.4. Meadowbank Gold Project Development

The construction phase of the Meadowbank Gold Project officially started in June 2008, upon receipt of the NWB A Water License (2AM-MEA0815) for the project. The Fisheries and Oceans Canada (DFO) *Fisheries Act* Authorization (NU-03-0191) for the project was issued on July 30, 2008, thus allowing the start of in-water construction activities, which started that same day. Major in-water construction activities for 2008 included the East Dike (located in Second Portage Lake) and the Western Channel Dike (located between Third Portage Lake and Second Portage Lake); the closest CREMP station to these activities was the Second Portage Lake station (SP).

While a number of construction activities were conducted across the site, those conducted adjacent to, or particularly within, aquatic receiving environments were of greatest interest due to their higher potential to introduce sediments or other contaminants. Notably, these were dike construction activities in Second Portage Lake (East Dike, 2008) and Third Portage Lake East (Bay-Goose Dike phase 1, 2009) and to a lesser extent, dust from road construction and utilization and blasting. As discussed previously, targeted studies were developed to closely monitor dike construction activities as well as potential nutrient additions as a result of blasting. Notwithstanding, the CREMP program was also designed to provide insights into the potential adverse effects of these activities. Consequently, the studies should be viewed as complementary, rather than independent.

The onset of construction activities signaled the end of the baseline (i.e., pre-development) phase for certain CREMP stations:

- SP – construction activities on the East Dike started on July 30, 2008.
- TE – this station was also exposed to elevated TSS from East Dike construction activities.
- TPN – dewatering activities started in March, 2009.
- TPE – construction activities on phase 1 of the Bay-Goose Dike started on July 27, 2009.

The end of the baseline phase is specific to each station. For example, TPE would have still been in the baseline phase in August 2008 (it is up gradient of Second Portage Lake), but not in August 2009.



In 2009, Phase 1 of Bay-Goose Dike construction was undertaken in the east basin of Third Portage Lake, with Phase 2 and completion of the dike scheduled for summer of 2010. Despite the use of double silt curtains, more judicious selection of rock, re-alignment of the dike to travel over shallower water with less potential for sediment disturbance, sediment was released from the impoundment into the east basin. This prompted an Effects Assessment Study (EAS) within the east basin during the fall of 2009 involving water turbidity/TSS monitoring, water chemistry, primary & secondary productivity, and sedimentation traps (Azimuth, 2010b). This targeted study will continue in 2010 as construction of the dike is completed.



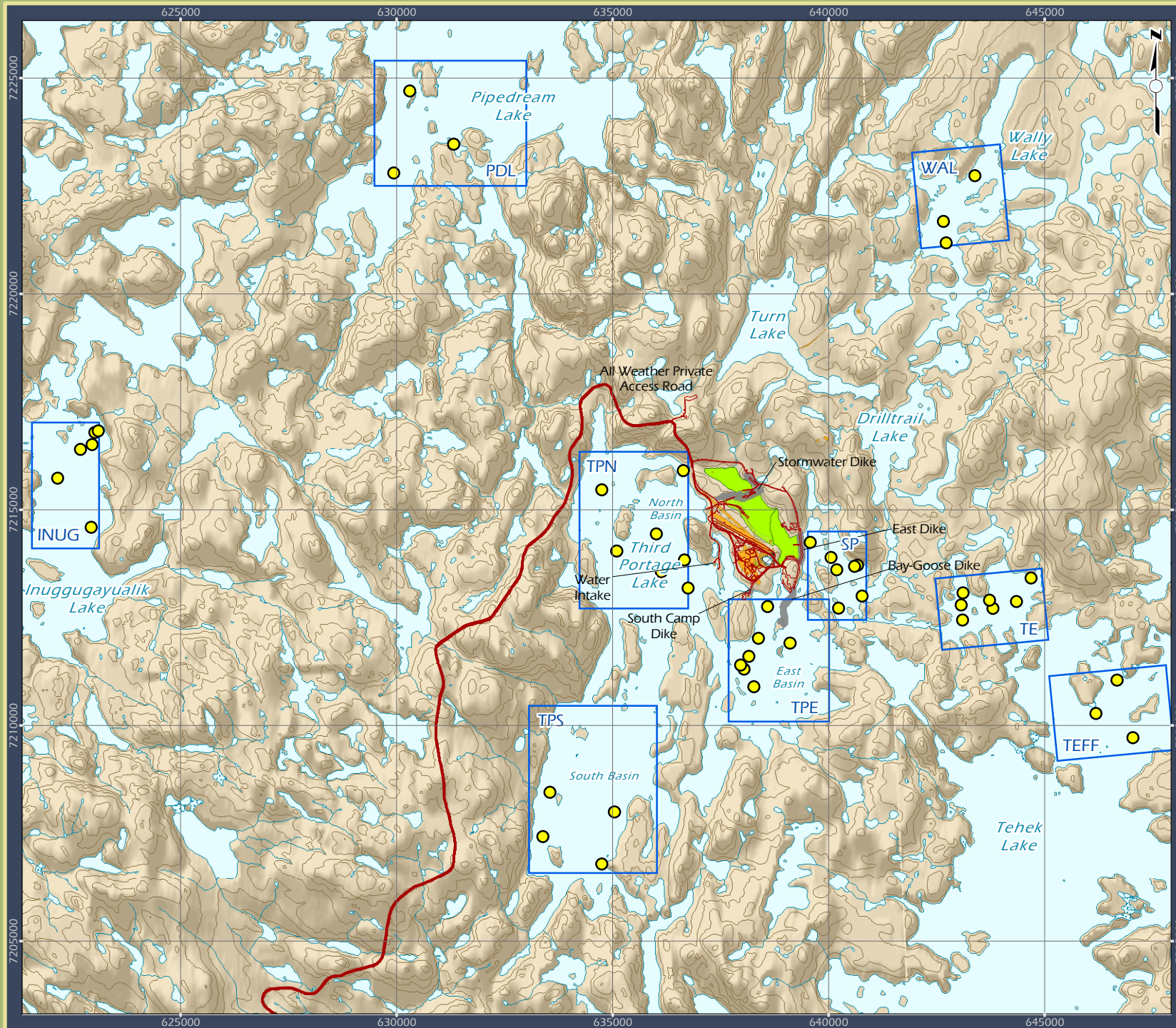
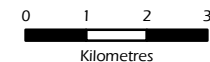
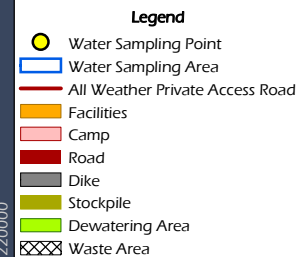


Figure 1-1: Water Quality Monitoring Areas and Sampling Stations - 2009



Projection: UTM Zone 14 NAD83

Data Sources:
 Natural Resources Canada, GeoBase®
 National Topographic Database
 Agnico-Eagle Mines Limited.
 Azimuth Consulting Group Inc.

Meadowbank Gold Project

Prepared for:



By:

Caslys Consulting Ltd.

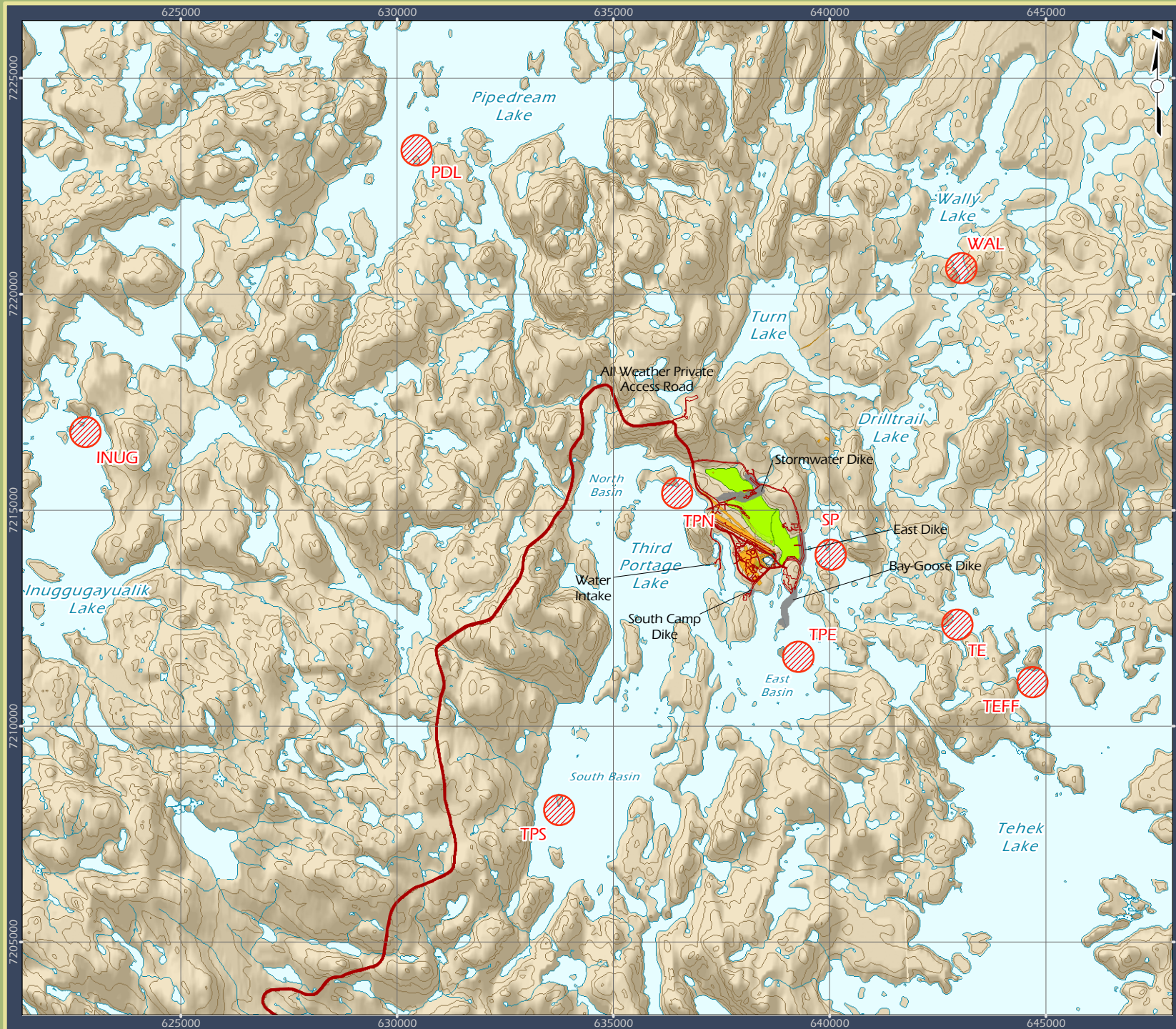
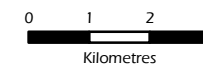


Figure 1-2: Sediment Quality and Benthic Invertebrate Sampling Stations - 2009

Legend

- All Weather Private Access Road
- ▨ Benthos Invertebrate / Sediment Quality Sampling Station
- Facilities
- Camp
- Road
- Dike
- Stockpile
- Dewatering Area
- ▨ Waste Area

Area of Detail



Projection: UTM Zone 14 NAD83

Data Sources:

Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

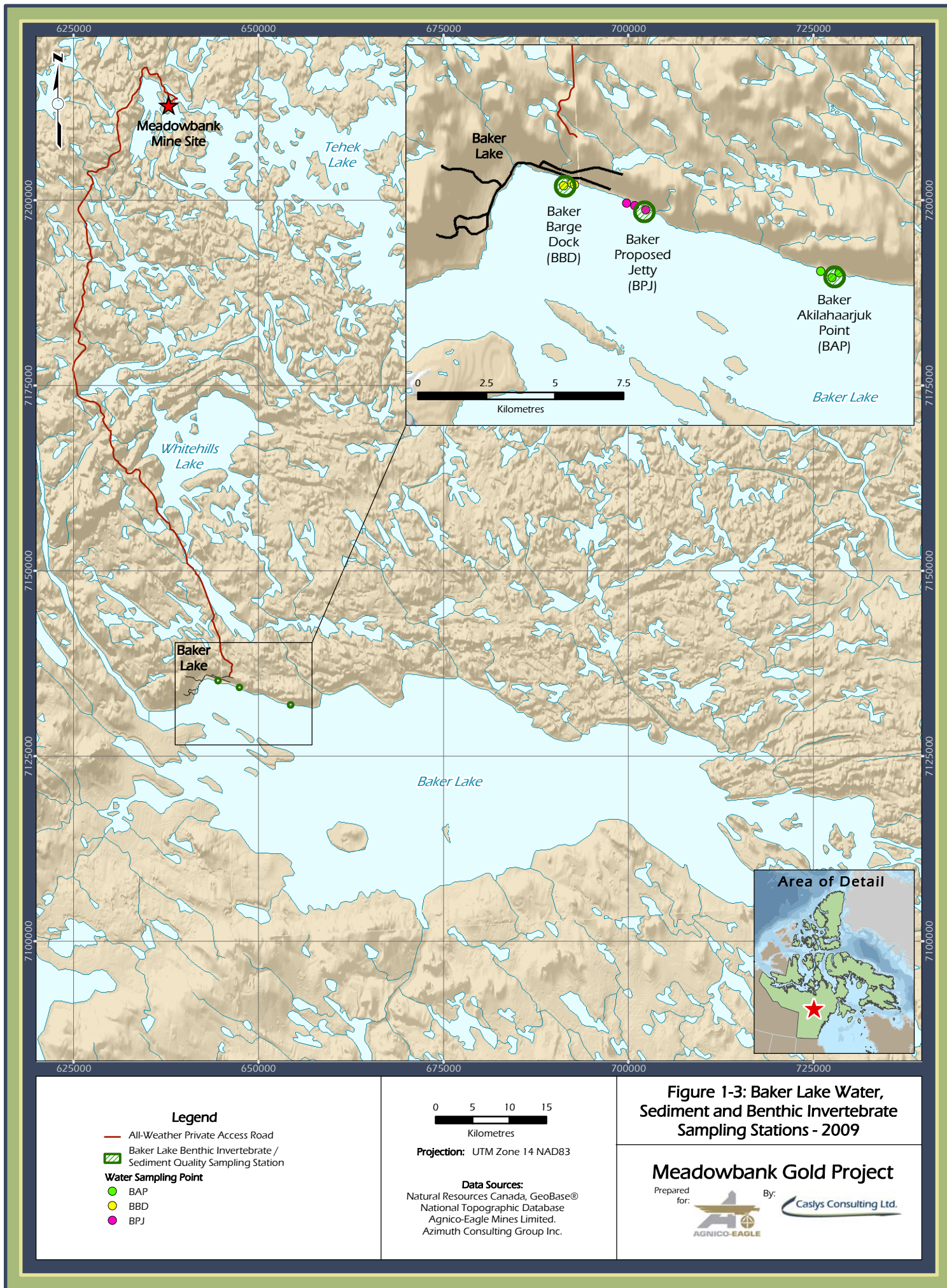
Meadowbank Gold Project

Prepared for:



By:

Caslys Consulting Ltd.



2. METHODS

2.1. 2009 CREMP Program Overview

Open-water field sampling in 2009 was conducted during three time periods; spring (July 16–28), summer (August 12–24) and fall (September 11–19). The water monitoring program was expanded this year, as part of the requirements of the water license, to include through-ice sampling during winter months, thus samples were collected in May (3–6, 28–30), November (25–29), and December (18–22). Sampling was not conducted in June or October because of dangerous ice conditions. In order to better characterize the study lakes, the spatial magnitude of sampling areas was increased to include the entire basin from each of the study lakes (**Figure 1-1**). Individual sampling stations were selected at random each month from within their respective lake basin.

General limnology, water and phytoplankton samples were collected in all four seasons, while sediment and benthos sampling was conducted in summer only (August).

Additional water and phytoplankton samples (some stratified by depth) were collected at all stations, sediment replicate samples at all stations, and single-grab benthos replicate samples at TPE and INUG were taken but are not presented here. The additional data will be used to support the CREMP design review.

Global Positioning System (GPS) Universal Transverse Mercator (UTM) coordinates (in NAD 83) for all monitoring components at the sampling stations are shown in **Table 2-1**.

2.2. General Limnology

Vertical temperature (°C), dissolved oxygen (mg/L) and conductivity (µS/cm) depth profiles were acquired using the YSI Model 85 temperature – oxygen meter. Profiles were acquired from each station at each sampling event to track changes in oxygen and temperature profiles. Secchi depth (m) and pH was measured prior to collection of water and sediment samples.

2.3. Water Chemistry

Water samples were collected from all sampling stations in spring, summer and fall and at a selection of stations during May, November and December through-ice. Water was collected from approximately 3 m depth by pumping lake water using weighted flexible (food-grade silicone) tubing, and a diaphragm pump connected to a 12 volt battery. An inline filter was connected to the end of the outflow tube when filling bottles for



dissolved metals and dissolved organic carbon analyses. The procedures for collecting the water samples are outlined in detail in the Standard Operating Procedure (SOP) for Water and Phytoplankton Sampling (AEM, 2009). Water quality sampling locations are illustrated in **Figures 1-1 and 1-3**.

ALS Environmental (Vancouver, BC) provided all of the sampling containers and appropriate preservatives. All samples were stored in the dark and kept on ice immediately following collection and during transport to the laboratory. A completed chain-of-custody form accompanied the samples during transport.

Water samples were analyzed by ALS Environmental for conventional parameters (hardness, conductivity, pH, turbidity, and total dissolved and suspended solids), anions (alkalinity, bromide, chloride, fluoride, silicate and sulfate), nutrients (ammonia, nitrate, nitrite, total Kjeldahl nitrogen, orthophosphate and total phosphate), organic parameters (chlorophyll- α , dissolved and total organic carbon) and total and dissolved metals.

Water chemistry concentrations were tabulated and compared against each other, and, when available, the federal Canadian Council of Ministers of the Environment (CCME, 2007) water quality guidelines for the protection of aquatic life. These guidelines are intended to provide a conservative level of protection to freshwater aquatic life from anthropogenic contaminants or other physical changes (suspended solids, temperature).

2.4. Sediment Chemistry

Sediment was collected in the summer (August) using proven sample collection and handling techniques (Environment Canada, 1984). The procedures for collecting the sediment samples are outlined in detail in the SOP for Benthos and Sediment Sampling (AEM, 2009). Sediment (top 3–5 cm) was collected from all stations using a Petite Ponar grab (sampling area of 0.023 m²). Three grab samples were composited from each station to reduce the influence of within-station spatial heterogeneity³. Sediment chemistry grabs were collected after benthic invertebrate sampling to avoid possible disturbance of biota. Sediment chemistry sampling locations are shown in **Figures 1-2 and 1-3**.

Only those grab samples that met the following acceptability criteria were retained for analysis: did not contain large foreign objects; adequate penetration depth (i.e., 10–15 cm); not overfilled (sediment surface not touching the top of sampler); did not leak (there was overlying water present and no visible leaks); and was undisturbed (sediment surface was relatively flat). Grabs that did not satisfy these conditions were discarded.

³ Within-station spatial variability was directly assessed in the targeted sediment coring study which is reported in the EAS (Azimuth, 2010b).

Sampling jars were placed in a cooler with ice packs and transported to ALS Environmental (Vancouver, BC) for analysis. A completed chain-of-custody form accompanied the samples during transport. Sediment samples were analyzed for pH, total organic carbon, moisture content, particle size (% gravel, sand, silt and clay), oil and grease, light & heavy extractable petroleum hydrocarbons (LEPHs and HEPHs), PAHs (polycyclic aromatic hydrocarbons) and total metals concentrations.

Sediment metals concentrations were compared to sediment quality guideline (SQG) concentrations developed by the CCME (2002) for the protection of aquatic life. There are two levels of SQGs: Interim Sediment Quality Guidelines (ISQG) and Probable Effects Level (PEL) concentrations. ISQGs are conservative values that represent the concentration below which adverse effects are unexpected. The PEL is less conservative and represents a concentration above which adverse effects may be observed, based on laboratory studies. It is important to realize that background concentrations of some metals in sediments routinely exceed both ISQG and PEL concentrations. This is common in many in mineralized areas and this does not mean that adverse effects should be expected. All of the measured sediment chemistry concentrations from the study lakes were tabulated and compared against each other and, when available, the SQGs.

2.5. Phytoplankton

Phytoplankton are microscopic, unicellular plant species that are suspended in the water column and, as primary producers, comprise the base of the food web. There are six major groups of phytoplankton present in lakes: cyanophytes (blue green algae), chlorophytes (green algae), chrysophytes (golden-brown algae), diatoms, cryptophytes and dinoflagellates. Seasonal production of phytoplankton can vary widely depending upon water temperature, nutrient concentration, time of year, water clarity and amount of sunlight and predation by zooplankton. Estimates of phytoplankton biomass (mg/m^3) are useful as gross indicators of lake productivity to determine if there have been potential changes due to nutrient additions as a result of blasting (i.e., addition of nitrogen and ammonia from ammonium nitrate).

Unfiltered water was collected at 3 m depth from each sampling station during the spring, summer, fall and winter of 2009 and a small aliquot was transferred to a 50 mL vial and preserved with Lugol's solution. The procedures for collecting the phytoplankton samples are outlined in detail in the SOP for Water and Phytoplankton Sampling (AEM, 2009).

Preserved samples were transported to Winnipeg, MB for taxonomic identification and analysis by Plankton R Us Inc. For the analysis, 10-mL aliquots of preserved sample were gravity settled for 24 hours. Counts were performed on an inverted microscope at magnifications of 125X, 400X, and 1200X with phase contrast illumination. Cell counts



were performed using the Ütermohl technique as modified by Nauwerck (1963). Cell counts were converted to wet weight biomass (mg/m³) by estimating cell volume. Estimates of cell volume for each species were obtained by measurements of up to 50 cells of an individual species and applying the geometric formula best fitted to the shape of the cell (Vollenweider, 1968; Rott, 1981). A specific gravity of 1 was assumed for cellular mass. All biomass (mg/m³) and density (cells/L) estimates are summed by major taxa, per station.

Simpson's diversity index was calculated for each station to quantify phytoplankton species diversity among stations and sampling events (Washington, 1984). Simpson's diversity (D) is calculated as follows:

$$D = \sum \frac{n_i(n_i - 1)}{N(N - 1)}$$

where: N is the total number of organisms/station; n_i is the total number of organisms of the i th taxa/station. The number of species occurring per sample was calculated to measure the species richness among stations and sampling events.

2.6. Benthic Invertebrates

Benthic invertebrates are small animals that live in or on bottom sediments. The most commonly encountered organisms include the aquatic larval stages (i.e., resembling worms) of insects, especially chironomids (i.e., midge larvae). Other common organisms are oligochaete worms, small bivalve clams and amphipods (i.e., crustaceans). Benthic invertebrates form a very important food source for juvenile fish of all species (i.e., lake trout, Arctic char and round whitefish) and adult whitefish and char.

Benthic invertebrates were collected from each sampling station in the summer (August) of 2009, using a Petite Ponar grab (0.023 m²) and a 500-µm sieve. Sampling locations are illustrated in **Figures 1-2 and 1-3**; UTM coordinates for each sample are presented in **Table 2-1**. Five replicate samples were collected per station. Two independent grabs per replicate were composited to form a single sample to reduce sampling variation within stations and to increase the surface area sampled. Depths ranged from 6.5 to 9.7 m (with the exception of one replicate in Wally Lake which was taken at 4.8 m depth because this lake is naturally shallow).

Only those grab samples that met the following acceptability criteria were retained for analysis: did not contain large foreign objects; adequate penetration depth (i.e., 10–15 cm); not overfilled (sediment surface not touching the top of sampler); did not leak (there was overlying water present and no visible leaks); and was undisturbed (sediment surface was relatively flat). Grabs that did not satisfy these conditions were discarded.



The procedures for collecting the benthic invertebrate samples are outlined in detail in the SOP for Benthos and Sediment Sampling (AEM, 2009).

Benthos samples were preserved in the field with a 10% buffered formalin solution and sent to Zaranko Environmental Assessment Services (ZEAS) (Nobleton, ON) for taxonomic identification and analysis.

Upon arrival at ZEAS, samples were immediately logged and inspected to ensure adequate preservation to a minimum level of 10% buffered formalin and checked for correct labeling. Benthos samples were sorted at a magnification of between 7 and 10 times with the use of a stereomicroscope. To expedite sorting prior to processing, all samples were stained with a protein dye that is absorbed by aquatic organisms but not by organic material, such as detritus and algae.

Prior to sorting, samples were washed free of formalin in a 500- μ m sieve. Benthos were enumerated and sorted into major taxonomic groups, (i.e., order and family), placed in glass bottles and re-preserved in 80% ethanol for more detailed taxonomic analysis by senior staff. Each bottle was labeled internally with the survey name, date, station and replicate number.

Abundance of organisms/ m^2 was determined from the total number of organisms enumerated (see **Section 3.5**). Nematodes and ostracods were not reported, nor were they included in abundance and richness calculations because they are too small to be reliably retained on a 500- μ m sieve.

The following endpoints were used for assessing benthic community structure, based on sensitivity, objectivity, ease of interpretation and cost-effectiveness:

Taxa richness (i.e., corresponds to the number of species or taxa per sample and provides a measure of diversity).

Total abundance (i.e., number of organisms per m^2).

Abundance and richness of all major taxa (e.g., insects, molluscs, worms).

Statistical analyses were used to explore spatial differences (i.e., to test for “lake effect,” which looks for differences among lakes and/or basins) in total abundance and richness, and in abundance and richness of all major taxa groups. Differences among lake stations are investigated independently using ANOVA ($\alpha = 0.05$). Where significant differences exist, post-hoc testing (Tukey’s HSD [honestly significant difference] multiple comparisons) was used to determine where differences existed.

2.7. Quality Assurance / Quality Control

The objective of quality assurance and quality control (QA/QC) is to assure that the chemical and biological data collected are representative of the material or populations being sampled, are of known quality, are properly documented, and are scientifically defensible. Data quality was assured throughout the collection and analysis of samples using specified standardized procedures, by the employment of laboratories that have been certified for all applicable methods, and by staffing the program with experienced technicians.

Laboratory QA/QC – Data Quality Objectives (DQOs) are numerically definable measures of analytical precision and completeness. Analytical precision is a measurement of the variability associated with duplicate analyses of the same sample in the laboratory. The laboratory duplicate is a new aliquot from the sample bottle/jar and is analyzed from the start in the same manner as the original aliquot taken from the bottle/jar. Completeness for this study is defined as the percentage of valid analytical results. Results that were made uncertain due to missed hold times, improper calibration, contamination of analytical blanks, or poor calibration verification results were deemed invalid. Duplicate results were assessed using the relative percent difference (RPD) between measurements. The equation used to calculate a RPD is:

$$RPD = \frac{(A - B)}{((A + B)/2)} \times 100$$

where: A = analytical result; B = duplicate result.

The laboratory DQOs for this project were:

- Analytical Precision = 25% RPD for concentrations that exceed 10x the method detection limit (MDL).
- Completeness = 95% valid data obtained.

RPD values may be either positive or negative, and ideally should provide a mix of the two, clustered around zero. Consistently positive or negative values may indicate a bias. Large variations in RPD values are often observed between duplicate samples when the concentrations of analytes are very low and approaching the detection limit. The reason for this is apparent if one considers duplicate samples with concentrations of an analyte of 0.0005 and 0.0007 mg/L. In absolute terms, the concentration difference between the two is only 0.0002 mg/L, a very tiny amount; however, the RPD value is 33.3%. This may sometimes lead to a belief that the level of precision is less than it actually is. RPDs are not calculated for cases where one of the samples (i.e., either A or B above) is below detection and the other is not.

Field QA/QC: Water Sampling – Field QA/QC standards during water sampling were maintained for every sample. The standard QA/QC procedures included thoroughly flushing the flexible tubing and pump to prevent cross-contamination between stations and thoroughly rinsing the sample containers with site water prior to sample collection.

One or two field duplicate samples per sampling event were collected to assess sampling variability and sample homogeneity; a RPD of 50% for concentrations that exceed 10x the MDL is considered acceptable. One equipment blank was also collected during each sampling event by pumping de-ionized water through the water sampling equipment (pump, tubing and inline filter) and filling the specified sample containers at the site; these samples are used to assess the potential introduction of any contamination accountable to sample handling and sampling techniques. One travel blank was also included with the sampling containers sent from the laboratory which is never opened by the field crew; these samples are used to assess the potential tampering with samples on route to or from the laboratory. Results from both the equipment and travel blanks are examined for detectable concentrations of any of the parameters measured; no parameter in either blank should exceed detection.

Field QA/QC: Sediment Sampling – Field QA/QC standards during sediment sampling was careful to avoid cross-contamination between sampling areas by rinsing and cleaning the Petite Ponar grab, stainless steel compositing bowls and spoons between stations. This entailed rinsing the equipment with site water to remove sediment and organic material, scrubbing with phosphate-free cleaning detergent, and again rinsing with site water. An ashless filter (QA/QC Filter) was swiped over the pre-cleaned bowl at one station to assess the cleaning procedures. The significance of any metal detected on this filter was evaluated by comparing this amount to the measured concentrations in the sediment samples. Where comparison were required, the concentration of metals originating from any equipment was estimated by dividing the amount detected on the filter (weight) by: the surface area of 3 Petite Ponar grabs (assuming a thickness of 3 cm was collected from each), which was multiplied by the density of sediment (assumed to be 2 g/cm³).

Two field duplicates were collected to assess sampling variability and sample homogeneity; a RPD of 50% for concentrations that exceed 10x the MDL is considered acceptable.

Field and Laboratory QA/QC: Biota Sampling – Standard procedures were used to collect biota samples. All sampling gear was thoroughly rinsed between sampling stations to ensure that there was no inadvertent introduction of biota from one station to another.

Field duplicates were collected for phytoplankton during each sampling event in coordination with water sample duplicates and were taken in order to assess sampling variability and sample homogeneity. A RPD of 50% for density and biomass



concentrations is considered acceptable. As a measure of QA/QC on the enumeration method replicate counts were performed on ~10% of the samples. Replicate samples were chosen at random and processed at different times from the original analysis to reduce biases. The laboratory replicate is a new aliquot (10 ml) from the sample jar and is counted from the start in the same manner as the original aliquot (10 ml) taken from the jar.

Field replicates were collected for benthos to determine natural variability and heterogeneity. Data quality objectives (DQO) for replicates should be within $\pm 25\%$ of the first count (i.e., the RPD).

ZEAS incorporates the following set of QA/QC procedures in all benthic projects undertaken by the company to ensure the generation of high quality and reliable data:

- Samples were logged upon arrival, inspected, and enumerated;
- Samples were checked for proper preservation;
- Samples were stained to facilitate sorting;
- Taxonomic identifications were based on the most updated and widely used keys;
- 10% of the samples were re-sorted, documenting 90% recovery;
- Precision and accuracy estimates were calculated;
- A voucher was compiled;
- Sorted sediments and debris are re-preserved in 10% formalin and are retained for up to three months. For samples subject to subsampling, sorted and unsorted fractions were re-preserved separately.



Table 2-1. CREMP sampling location coordinates (GPS, UTM, NAD83), Meadowbank study lakes & Baker Lake, 2009.

Station ID ¹	Station Type ²	Water & Phytoplankton (monthly)			Sediment (August)				Benthos (August)			
		Date	Easting	Northing	Grab ID	Depth (m)	Easting	Northing	Replicate ID	Depth (m)	Easting	Northing
TPE-1	NF	Early May	14 W 0638044	7211302	TPE	6.9	14 W 0639012	7211529	TPE-1	6.9	14 W 0639012	7211529
TPE-1		Late May	14 W 0638154	7211594	TPE-2	7.7	14 W 0639111	7211561	TPE-2	7.7	14 W 0639111	7211561
TPE-4		July	14 W 0639107	7211901	TPE-3	7.8	14 W 0639508	7211575	TPE-3	7.8	14 W 0639508	7211575
TPE-7		August	14 W 0638380	7212016					TPE-4	6.5	14 W 0638957	7211563
TPE-8		September	14 W 0638272	7210892					TPE-5	6.5	14 W 0639080	7211569
TPE-11		November	14 W 0637968	7211393								
TPE-14		December	14 W 0638588	7212750								
TPN-1	NF	Early May	14 W 0634753	7215459	TPN	8.7	14 W 0636379	7215537	TPN-1	8.7	14 W 0636379	7215537
TPN-1		Late May	14 W 0636014	7214430	TPN-2	7.1	14 W 0636402	7215543	TPN-2	7.1	14 W 0636402	7215543
TPN-4		July	14 W 0636662	7213828	TPN-3	8.5	14 W 0636417	7215521	TPN-3	8.5	14 W 0636417	7215521
TPN-7		August	14 W 636132	7213552					TPN-4	7.8	14 W 0636548	7215434
TPN-8		September	14 W 0636746	7213177					TPN-5	8.8	14 W 0636401	7215517
TPN-11		November	14 W 0635097	7214034								
TPN-14		December	14 W 0636640	7215905								
TPS-1	Int. Ref	July	14 W 0633552	7208447	TPS	8.0	14 W 0633804	7208050	TPS-1	8.0	14 W 0633804	7208050
TPS-4		August	14 W 0634754	7206786	TPS-2	6.8	14 W 0633723	7208059	TPS-2	6.8	14 W 0633723	7208059
TPS-5		September	14 W 0635046	7207990	TPS-3	7.3	14 W 0633711	7208015	TPS-3	7.3	14 W 0633711	7208015
TPS-8		December	14 W 0633391	7207422					TPS-4	7.3	14 W 0633759	7208064
									TPS-5	9.7	14 W 0633838	7208227
SP-1	NF	Early May	14 W 0640057	7213886	SP	7.5	14 W 0640087	7213984	SP-1	7.5	14 W 0640087	7213984
SP-1		Late May	14 W 0640670	7213708	SP-2	7.7	14 W 0640139	7213899	SP-2	7.7	14 W 0640139	7213899
SP-4		July	14 W 0640773	7212993	SP-3	6.8	14 W 0639984	7214075	SP-3	6.8	14 W 0639984	7214075
SP-7		August	14 W 0640187	7213600					SP-4	7.1	14 W 0640021	7214101
SP-8		September	14 W 0640601	7213679					SP-5	8.1	14 W 0639909	7214039
SP-11		November	14 W 0640228	7212711								
SP-14		December	14 W 0639575	7214237								
TE-1	NF	Early May	15 W 0360295	7212625	TE	7.0	15 W 0360105	7212252	TE-1	7.0	15 W 0360105	7212252
TE-1		Late May	15 W 0361022	7212478	TE-2	7.4	15 W 0360000	7212181	TE-2	7.4	15 W 0360000	7212181
TE-4		July	15 W 0361966	7213093	TE-3	6.9	15 W 0360122	7212144	TE-3	6.9	15 W 0360122	7212144
TE-7		August	15 W 0361576	7212586					TE-4	8.2	15 W 0360001	7212194
TE-8		September	15 W 0360366	7212902					TE-5	7.9	15 W 0360058	7212235
TE-11		November	15 W 0360957	7212678								
TE-14		December	15 W 0360295	7212277								
TEFF-1	FF	July	15 W 0363166	7209829	TEFF	6.9	15 W 0361851	7210820	TEFF-1	6.9	15 W 0361851	7210820
TEFF-4		August	15 W 0363961	7209191	TEFF-2	6.6	15 W 0361846	7210823	TEFF-2	6.6	15 W 0361846	7210823
TEFF-5		September	15 W 0363721	7210551	TEFF-3	7.8	15 W 0361824	7210717	TEFF-3	7.8	15 W 0361824	7210717
									TEFF-4	7.2	15 W 0361706	7210649
									TEFF-5	6.9	15 W 0361638	7210624
INUG-1	Ext. Ref	Early May	14 W 0622691	7216394	INUG	7.6	14 W 0622770	7216810	INUG-1	7.6	14 W 0622770	7216810
INUG-1		Late May	14 W 0622939	7214586	INUG-2	7.9	14 W 0622740	7216831	INUG-2	7.9	14 W 0622740	7216831
INUG-4		July	14 W 0622162	7215731	INUG-3	7.0	14 W 0622627	7216826	INUG-3	7.0	14 W 0622627	7216826
INUG-7		August	14 W 0622956	7216504					INUG-4	6.9	14 W 0622796	7216849
INUG-8		September	14 W 0623022	7216789					INUG-5	6.9	14 W 0622591	7216836
INUG-11		November	14 W 0623104	7216822								
WAL-1	NF	July	15 W 0360747	7221012	WAL	4.8	15 W 0360734	7221517	WAL-1	4.8	15 W 0360734	7221517
WAL-4		August	15 W 0360730	7221513	WAL-2	7.4	15 W 0360885	7220481	WAL-2	7.4	15 W 0360885	7220481
WAL-5		September	15 W 0361555	7222500	WAL-3	7.3	15 W 0360902	7220451	WAL-3	7.3	15 W 0360902	7220451
									WAL-4	7.3	15 W 0360949	7220391
									WAL-5	7.5	15 W 0360977	7220343
PDL-1	Ext. Ref	July	14 W 0629936	7222801	PDL	7.2	14 W 0630544	7223349	PDL-1	7.2	14 W 0630544	7223349
PDL-4		August	14 W 0630310	7224700	PDL-2	8.0	14 W 0630448	7223318	PDL-2	8.0	14 W 0630448	7223318
PDL-5		September	14 W 0631322	7223464	PDL-3	7.3	14 W 0630720	7222752	PDL-3	8.3	14 W 0630421	7223319
									PDL-4	7.3	14 W 0630720	7222752
									PDL-5	7.5	14 W 0630689	7222803

Table 2-1. CREMP sampling location coordinates (GPS, UTM, NAD83), Meadowbank study lakes & Baker Lake, 2009.

Station ID ¹	Station Type ²	Water & Phytoplankton (monthly)			Sediment (August)				Benthos (August)			
		Date	Easting	Northing	Grab ID	Depth (m)	Easting	Northing	Replicate ID	Depth (m)	Easting	Northing
BBD	NF	July	14 W 0644488	7135192	BBD	6.5	14 W 0644592	7135321	BBD-1	6.5	14 W 0644592	7135321
		August	14 W 0644784	7135279	BBD-2	7.5	14 W 0644541	7135324	BBD-2	7.5	14 W 0644541	7135324
		September	14 W 0644880	7135234	BBD-3	7.6	14 W 0644510	7135351	BBD-3	7.6	14 W 0644510	7135351
									BBD-4	7.6	14 W 0644470	7135349
									BBD-5	8.0	14 W 0644430	7135351
BPJ	NF	July	15 W 0356598	7134408	BPJ	7.6	15 W 0357299	7134106	BPJ-1	7.6	15 W 0357299	7134106
		August	15 W 0356883	7134287	BPJ-2	6.6	15 W 0357274	7134138	BPJ-2	6.6	15 W 0357274	7134138
		September	15 W 0357267	7134098	BPJ-3	6.9	15 W 0357196	7134179	BPJ-3	6.9	15 W 0357196	7134179
									BPJ-4	7.3	15 W 0357113	7134204
									BPJ-5	6.7	15 W 0357074	7134224
BAP	Int. Ref	July	15 W 0363391	7131273	BAP	8.3	15 W 0364134	7131140	BAP-1	8.3	15 W 0364134	7131140
		August	15 W 0364048	7131161	BAP-2	7.9	15 W 0364101	7131164	BAP-2	7.9	15 W 0364101	7131164
		September	15 W 0363783	7131010	BAP-3	6.8	15 W 0364046	7131196	BAP-3	6.8	15 W 0364046	7131196
									BAP-4	7.5	15 W 0363980	7131221
									BAP-5	8.0	15 W 0363890	7131256

Notes:

¹ Station IDs are as follows: TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Farfield; INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake; BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilahaarjuk Point.

² Station types are as follows: NF = near-field; FF = far-field; Int. Ref.= internal reference; Ext. Ref. = external reference.

3. RESULTS AND DISCUSSION

3.1. QA/QC

QA/QC procedures consisted of a combination of careful field collection and sample handling, the collection of field duplicate samples and the analysis of laboratory replicates and standard reference materials. Results of the QA/QC analyses are presented in **Tables 3-1 to 3-4** for water and sediment chemistry, phytoplankton and benthos, respectively.

ALS Environmental is an analytical laboratory accredited by the Canadian Association of Environmental Analytical Laboratories. This accreditation ensures that laboratories achieve and demonstrate the highest levels of technical and management excellence for their services. Laboratory QA/QC procedures performed on the water and sediment samples met all of the laboratory's internal data quality objectives for accuracy, precision and completeness

Water Chemistry

As part of every sampling component, a level of at least 30% QA was achieved. For water samples during each event (which consisted of 5–12 sample stations), one or two field duplicates, one laboratory duplicate, one travel blank and one equipment blank were each analyzed for all water parameters. As a result, a total of 9 field duplicates, and 7 laboratory duplicates, travel blanks, and equipment blanks were each analyzed for 24 conventional parameters as well as 29 total and 29 dissolved metals. Although the results below show some exceedances of the established DQOs, it is important to note that these exceedances represent less than 1% of the total for QA samples and parameters measured. When comparing results for a large number of parameters, many of which are near detection limits, simple odds dictate that a few parameters will exceed DQOs when in fact they do not (i.e., a false positive). The results of the RPD analysis for all these parameters are presented in **Table 3-1** and discussed below:

- **Field Duplicates** – Overall, these samples showed a high level of consistency with the original samples. While there were some cases where the RPD exceeded 50% (e.g., TKN), measured concentrations in each case were less than 10 times the MDL. Consequently, all samples met the DQO for this project.
- **Laboratory Duplicates** – These samples, conducted randomly as part of the laboratory's internal QA/QC program, also showed a high degree of consistency. Again, there were a few cases in which the RPD exceeded 25% (e.g., TKN, ammonia, copper, and total phosphate), but measured concentrations in all these cases were within 10 times the MDL. Consequently, DQOs were met in all samples.

-
- Travel Blanks – No parameters were measured above the MDL; DQOs were met.
 - Equipment Blanks – Most parameters were less than the MDL, with the exception of the following individual cases: turbidity, DOC, cadmium, calcium, iron, and lead. Each of the exceedances in equipment blanks were re-analyzed by the laboratory and confirmed as real values. It is important to note that the method used for collecting equipment blanks did not allow for sufficient flushing of the equipment (i.e., field methodology allowed for 2 minutes of flushing of lake water before collection of samples) because of a limited amount of de-ionized water available. As a result, any measured data affected by these exceedances are indicated in the results (**Table 3-5**) and are interpreted with caution herein.
 - Overall – The frequency of DQO exceedances represent a small fraction of the total number of samples and parameters that were measured for QA/QC purposes (i.e., <1%). In addition, there were no apparent patterns in exceedances of parameters or sampling stations suggesting that there was no trend towards higher or lower results in replicate samples. As such, the measured concentrations are considered usable but some are flagged to be interpreted with caution as a result of detectable concentrations in field blanks.

Sediment Chemistry

Sediment QA/QC results are presented in **Table 3-2** and discussed below:

- Field Duplicates – None of the RPD values exceeded the DQO for field duplicate samples.
- Laboratory Duplicates – DQOs were met in all cases. The only RPD exceeding 25% was for oil & grease, but measured concentrations were less than 10 times the MDL.
- Filter Swipes – filter swipes were analyzed for total metals in units of µg/filter. While the majority of parameters tested were below the MDL, a few were detected (aluminum, barium, calcium, iron, magnesium). However, the incremental influence of the measured amounts was estimated to be less than 0.001% of actual measured sediment concentrations in all cases. Consequently, the potential for meaningful cross-contamination is considered negligible and DQOs were considered to be fully met.

Phytoplankton

For phytoplankton, during each event 1–2 field duplicates and 1–2 laboratory duplicates were analyzed for density and biomass (total and for each major phytoplankton group). Similar to water chemistry, the results for phytoplankton QA/QC below show a number of exceedances of the established DQOs. However, where density or biomass of a



particular phytoplankton group is very small (i.e., about 1% of total), small differences in that metric between the original and the duplicate can cause very large differences in the RPD. Thus, we evaluate the quality of these data based on *total* density and *total* biomass both for field and laboratory duplicates. The results of the RPD analysis for all these parameters are presented in **Table 3-3** and is discussed below:

- **Field Duplicates** – The phytoplankton field duplicates from Wally, Third Portage, Tehek and Baker lakes displayed greater than desired variability in both density (cells/L) and biomass (mg/m³). Within-taxa variability was quite high, which has been commonly observed in similar data sets over the years. For example, rare groups may be present in one field sample but not another. For example, Cyanophytes were present in Wally Lake in the duplicate sample in July but were not present in the original sample. In such cases, where abundance or biomass is less than 1% of totals, RPD values are not calculated. Nevertheless, RPDs for *total* density and *total* biomass for most field duplicate samples were lower and met the DQO (i.e., 10/14 RPDs), although some were still greater than 50% (i.e., 4/14 RPDs). This highlights an inherently high degree of natural variability for this component of the CREMP, as these samples were collected from the same location at about the same time (likely <10 minutes apart). RPD values were always much less than 50% for number of species and Simpson's diversity.
- **Laboratory Duplicates** – Duplicate re-counts were conducted on 10% of the samples analyzed. RPDs for *total* density and *total* biomass consistently met the DQOs (i.e., <25%), with two (of 16 RPDs) small exceptions (both 29%). Similar to field duplicates, laboratory duplicates showed high within-taxa variability.
- **Overall** – These results illustrate the inherently large difference in phytoplankton taxa composition because of the relatively small number of plankters enumerated relative to the very large number of plankters present in the sample. However, notwithstanding within replicate differences in taxonomic composition, total biomass did not differ in one direction or another for laboratory duplicates. The implications of this for monitoring effects is discussed further in **Section 3.4** and will be evaluated in detail as part of the CREMP design review, in progress.

Benthic Invertebrates

For benthos, laboratory replicate counts were performed on 10% of all samples. Replicate samples were chosen at random and processed at different times from the original analysis to reduce bias. Of the re-sorted samples, 5/63 (7.9%), 4/81 (4.9%), 2/58 (3.4%), 2/50 (4.0%), 0/69 (0%) and 0/56 (0%) of organisms were missed (**Table 3-4**), with an overall omission rate of less than 3.5%. These results suggest that the vast majority of animals observed in benthic samples by the taxonomist were recovered. A reference collection of benthic taxa has been compiled.



Table 3-1. QA/QC data for water parameters, Meadowbank study lakes Baker Lake, 2009.

	MDLs	Third Portage East			Second Portage Lake			Wally Lake			Baker Lake - Barge Dock			Third Portage North			Third Portage East			Baker Lake - Proposed Jetty			Tehuk Lake			Third Portage North			Various Lakes		
		TPE-1 05-May-09	Field Dup-1 05-May-09	RPD (%)	SP-2 28-May-09	Field Dup-1 28-May-09	RPD (%)	WAL-2-S 21-Jul-09	July Dup-2 21-Jul-09	RPD (%)	BBD-2-S 28-Jul-09	July Dup-4 28-Jul-09	RPD (%)	TPN-7-S 21-Aug-09	Aug Dup-2 21-Aug-09	RPD (%)	TPE-8-S 11-Sep-09	Sept. Dup-1 11-Sep-09	RPD (%)	BPJ-5-S 19-Sep-09	Sept. Dup-4 19-Sep-09	RPD (%)	TE-13-S 26-Nov-09	Nov. Dup-1 26-Nov-09	RPD (%)	TPE-14-S 19-Dec-09	Dec. Dup-1 19-Dec-09	RPD (%)	Original Early May	Laboratory Duplicate	RPD (%)
CONVENTIONAL PARAMETERS																															
Physical Tests																															
Conductivity (µS/cm)	2.0	18.1	17.6	2.80	31.0	30.7	0.97	26.2	26.4	-0.76	30.1	30.3	-0.66	13.7	14.2	-3.58	16.9	16.4	3.00	204	200	1.98	20.8	21.0	-0.96	18.9	19.3	-2.09	20.1	20.1	0
Hardness (mg/L)	1.1	6.6	6.7	-1.50	11.6	11.5	0.87	11.7	9.30	22.9	10	9.9	1.0	5.2	5.2	0	5.9	5.9	0	27.8	27.9	-0.36	7.9	7.7	2.6	7.9	8.0	-1.3	-	-	-
pH	0.10	6.34	6.38	-0.63	7.64	6.98	9.03	7.02	6.97	0.71	7.0	7.02	-0.29	6.68	6.64	0.60	7.06	6.92	2.00	7.11	7.14	-0.42	6.70	6.68	0.30	6.77	6.70	1.04	6.34	6.41	-1.10
Total Suspended Solids (mg/L)	1.0	<1.0	-	-	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	2.3	1.3	56	5.7	7.7	-30	1.3	1.7	-27	<1.0	1.1	NA	1.6	1.0	46	-	-	-
Total Dissolved Solids (mg/L)	10	14	-	-	18	19	-5.4	23	19	19	19	21	-10	<10	<10	0	11	<10	NA	106	103	2.87	17	17	0	<10	13	NA	-	-	-
Turbidity (NTU)	0.10	0.46	-	-	0.97	0.93	4.2	0.27	0.28	-3.6	0.58	0.63	-8.3	0.31	0.29	6.7	12.2	12.7	-4.02	1.38	1.35	2.20	0.41	0.43	-4.8	3.26	3.22	1.23	<0.10	<0.10	0
Anions & Nutrients (mg/L)																															
Alkalinity - Bicarbonate (as CaCO3)	2.0	-	-	-	-	-	-	9.1	9.5	-4.3	7.6	7.8	-2.6	3.5	3.8	-8.2	4.9	4.3	13	8.8	9.3	-5.5	6.3	5.9	6.6	6.1	6.1	0	-	-	-
Alkalinity - Carbonate (as CaCO3)	2.0	-	-	-	-	-	-	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	-	-	-
Alkalinity - Hydroxide (as CaCO3)	2.0	-	-	-	-	-	-	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	-	-	-
Alkalinity - Total (as CaCO3)	2.0	-	-	-	-	-	-	9.1	9.5	-4.3	7.6	7.8	-2.6	3.5	3.8	-8.2	4.9	4.3	13	8.8	9.3	-5.5	6.3	5.9	6.6	6.1	6.1	0	-	-	-
Ammonia (as N)	0.020	<0.020	0.027	NA	<0.020	<0.020	0	<0.020	0.027	30	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	0.022	0.022	0
Bromide	0.050	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	0.186	0.174	6.67	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0
Chloride	0.50	0.6	0.6	0	0.67	0.69	-2.9	<0.50	<0.50	0	3.18	3.34	-4.91	<0.50	<0.50	0	<0.50	<0.50	0	48.7	48.4	0.62	0.58	0.58	0	0.58	0.57	1.7	0.93	0.93	0
Fluoride	0.020	0.075	0.075	0	0.078	0.08	-2.5	0.036	0.036	0	0.054	0.059	-8.8	0.041	0.040	2.5	0.067	0.068	-1.5	0.04	0.04	0	0.055	0.056	-1.8	0.067	0.065	3.0	0.09	0.09	0
Nitrate (as N)	0.0050	<0.0050	<0.0050	0	0.0371	0.0358	3.6	<0.0050	<0.0050	0	0.0066	0.0053	22	<0.0050	<0.0050	0	0.0096	<0.0050	NA	0.0108	0.0106	1.87	<0.0050	<0.0050	0	0.0166	0.0122	30.6	0.006	0.0059	1.68
Nitrite (as N)	0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0
Total Kjeldahl Nitrogen	0.050	0.06	0.175	97.9	0.129	0.062	70.2	0.121	0.135	-10.9	0.103	0.170	-49.1	0.081	0.081	0	0.062	0.066	-6.3	0.175	0.137	24.4	0.0800	0.124	-43.1	0.131	0.134	-2.26	-	-	-
Ortho Phosphate (as P)	0.0010	-	-	-	-	-	-	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	0.0010	<0.0010	NA	-	-	-
Total Phosphate (as P)	0.0020	-	-	-	-	-	-	<0.0020	0.0020	0	0.004	0.0035	13	<0.0020	<0.0020	0	0.0043	0.0068	-45	0.0038	0.0034	11	0.0021	<0.0020	NA	0.0034	0.0035	-2.9	-	-	-
Silicate (as SiO2)	1.0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
Sulfate (SO4)	0.50	1.83	1.82	0.55	2.92	2.96	-1.4	2.34	2.33	0.43	0.84	0.87	-3.5	1.23	1.28	-3.98	1.46	1.47	-0.68	6.75	6.69	0.89	2.20	2.17	1.37	1.79	1.77	1.12	3.43	3.43	0
ORGANIC / INORGANIC CARBON																															
Dissolved Organic Carbon (mg/L)	0.50	1.40	1.45	-3.51	1.67	1.53	8.7	1.74	1.76	-1.14	2.86	3.09	-7.73	1.19	1.18	0.84	1.19	1.16	2.55	2.99	2.97	0.67	1.59	1.79	-11.8	1.23	1.49	-19.1	1.58	1.56	1.27
Total Organic Carbon (mg/L)	0.50	1.49	1.52	-1.99	1.65	1.63	1.2	1.65	1.90	-14.1	2.98	3.09	-3.62	1.21	1.19	1.67	1.22	1.26	-3.23	3.15	2.99	5.21	1.69	1.83	-7.95	1.20	1.60	-28.6	1.61	1.53	5.10
PLANT PIGMENTS																															
Chlorophyll a (µg/L)	0.010	0.127	-	-	-	0.478	-	0.624	0.390	46.2	1.04	1.03	0.97	0.369	0.385	-4.24	-	-	-	1.13	1.26	-10.9	0.647	0.696	-7.30	0.279	0.310	-10.5	-	-	-
TOTAL METALS (mg/L)																															
Aluminum	0.0050	<0.0050	<0.0050	0	0.0481	0.051	-5.9	<0.0050	<0.0050	0	0.0083	0.0088	-5.8	0.0066	0.0070	-5.9	0.565	0.525	7.34	0.0274	0.0304	-10.4	0.0133	0.0135	-1.49	0.181	0.177	2.23	<0.010	<0.010	0
Antimony	0.00050	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0
Arsenic	0.00050	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	0.00056	0.00053	5.5	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0
Barium	0.020	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	0.021	<0.020	NA	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0
Beryllium	0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0
Boron	0.10	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0
Cadmium	0.000017	<0.000017	<0.000017	0	<0.000017	<0.000017	0	<0.000017	<0.000017	0	<0.000017	<0.000017	0	<0.000017	<0.000017	0	<0.000017	<0.000017	0	<0.000017	<0.000017	0	<0.000017	<0.000017	0	<0.000017	<0.000017	0	<0.000017	0.000013	NA
Calcium	0.10	1.48	1.5	-1.3	3.01	3.03	-0.66	3.09	3.18	-2.87	2.16	2.12	1.87	1.09	1.10	-0.91	1.40	1.74	-21.7	3.60	3.59	0.28	2.07	2.13	-2.86	1.83	1.78	2.77	1.6	1.62	-1.24
Chromium	0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	0.0024	0.0021	13	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0
Cobalt	0.00030	<0.00030	<0.00030	0	<0.00030	<0.00030	0	<0.00030	<0.00030	0	<0.00030	<0.00030	0	<0.00030	<0.00030	0	0.00031	0.00030	3.3	<0.00030	<0.00030	0	<0.00030	<0.00030	0						

Table 3-1. QA/QC data for water parameters, Meadowbank study lakes Baker Lake, 2009.

	Various Lakes			Various Lakes			Various Lakes			Various Lakes			Various Lakes			Various Lakes			Travel Blanks								Equipment Blanks							
	Original Late May	Laboratory Duplicate	RPD (%)	Original July	Laboratory Duplicate	RPD (%)	Original August	Laboratory Duplicate	RPD (%)	Original September	Laboratory Duplicate	RPD (%)	Original November	Laboratory Duplicate	RPD (%)	Original December	Laboratory Duplicate	RPD (%)	1 Early May	1 Late May	1 July	1 August	1 September	1 November	1 December	EB-1 04-May-09	EB-1 29-May-09	EB-1 20-Jul-09	EB-3 15-Aug-09	EB-1 11-Sep-09	EB-1 25-Nov-09	EB-1 22-Dec-09		
CONVENTIONAL PARAMETERS																																		
Physical Tests																																		
Conductivity (µS/cm)	2.0	17.9	18.2	-1.66	-	-	-	-	-	-	14.4	14.4	0	27.1	26.7	1.49	18.9	18.8	0.53	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Hardness (mg/L)	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.53	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	
pH	0.10	6.6	6.66	-0.90	6.70	6.83	-1.92	-	-	-	6.95	6.98	-0.43	6.91	6.91	0	6.69	6.71	-0.30	5.83	5.68	5.60	5.63	5.63	5.65	5.65	5.81	5.55	5.69	5.83	6.07	5.61	5.58	
Total Suspended Solids (mg/L)	1.0	-	-	-	<1.0	<1.0	0	-	-	-	<1.0	<1.0	0	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Dissolved Solids (mg/L)	10	-	-	-	<10	<10	0	14	14	0	<10	<10	0	-	-	-	-	-	-	<10	<10	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	
Turbidity (NTU)	0.10	0.19	0.2	-5.1	0.39	0.41	-5.0	-	-	-	0.52	0.52	0	0.73	0.74	-1.4	0.41	0.41	0	<0.10	<0.10	-	-	<0.10	<0.10	<0.10	-	0.19	-	-	<0.10	<0.10	<0.10	
Anions & Nutrients (mg/L)																																		
Alkalinity - Bicarbonate (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Alkalinity - Carbonate (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Alkalinity - Hydroxide (as CaCO ₃)	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Alkalinity - Total (as CaCO ₃)	2.0	-	-	-	4.3	4.3	0	-	-	-	3.9	4.0	-2.53	6.3	6.6	-4.7	7.9	7.9	0	-	-	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Ammonia (as N)	0.020	<0.020	<0.020	0	0.024	0.022	8.7	-	-	-	<0.020	<0.020	0	0.035	0.026	30	-	-	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Bromide	0.050	<0.050	<0.050	0	<0.050	<0.050	0	-	-	-	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	0	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Chloride	0.50	0.81	0.81	0.0	0.5	0.5	0	-	-	-	<0.50	<0.50	0	0.52	0.52	0	0.58	0.58	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Fluoride	0.020	0.084	0.084	0.0	0.048	0.049	-2.1	-	-	-	0.059	0.059	0.00	0.055	0.055	0	0.067	0.068	-1.5	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Nitrate (as N)	0.0050	0.0199	0.02	-0.50	<0.0050	<0.0050	0	-	-	-	<0.0050	<0.0050	0	<0.0050	<0.0050	0	0.0166	0.0164	1.21	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Nitrite (as N)	0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	0	-	-	-	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Total Kjeldahl Nitrogen	0.050	0.113	0.105	7.34	0.196	0.109	57.0	-	-	-	0.061	0.056	8.55	0.087	0.094	-7.7	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Ortho Phosphate (as P)	0.0010	-	-	-	<0.0010	<0.0010	0	-	-	-	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Total Phosphate (as P)	0.0020	-	-	-	<0.0020	<0.0020	0	-	-	-	0.0043	0.0048	-10.99	0.0032	0.0032	0	0.0031	0.0021	38	-	-	<0.0020	<0.0020	<0.0020	<0.0020	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	
Silicate (as SiO ₂)	1.0	<1.0	<1.0	0	<1.0	<1.0	0	-	-	-	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Sulfate (SO ₄)	0.50	3.29	3.3	-0.30	1.89	1.88	0.53	-	-	-	1.42	1.43	-0.70	2.12	2.12	0	1.79	1.79	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
ORGANIC / INORGANIC CARBON																																		
Dissolved Organic Carbon (mg/L)	0.50	1.18	1.15	2.58	1.40	1.34	4.38	<0.50	<0.50	0	1.89	1.85	2.14	1.88	1.88	0	1.23	1.20	2.47	-	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	
Total Organic Carbon (mg/L)	0.50	1.22	1.22	0	1.33	1.41	-5.84	<0.50	<0.50	0	1.93	1.95	-1.03	1.91	1.89	1.05	<0.50	<0.50	0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
PLANT PIGMENTS																																		
Chlorophyll a (µg/L)	0.010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL METALS (mg/L)																																		
Aluminum	0.0050	<0.0050	<0.0050	0	0.0341	0.0342	-0.29	0.0134	0.0131	2.26	0.565	0.582	-2.96	0.204	0.214	-4.78	0.0428	0.0393	8.53	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Antimony	0.00050	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Arsenic	0.00050	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	0.00056	0.00056	0	<0.00050	<0.00050	0	<0.00050	<0.00050	0	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Barium	0.020	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Beryllium	0.0010	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	0	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	0.10	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Cadmium	0.000017	<0.000017	<0.000010	0	<0.000017	<0.000010	0	<0.000017	<0.000010	0	<0.000017	<0.000010	0	<0.000017	0.000013	NA	<0.000017	<0.000010	0	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	
Calcium	0.10	1.22	1.21	0	2.31	2.30	0.43	1.76	1.75	0.57	1.40	1.37	2.17	1.65	1.63	1.22	2.49	2.50	-0.40	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	&			

Table 3-2. QA/QC data for sediment parameters, Meadowbank study lakes & Baker Lake, August 2009.

Analytes	MDLs	Pipedream Lake			Third Portage Lake - South Basin			Various Lakes			Various Lakes			BAP	Recovery of Surrogate Standards for PAHs											
		PDL-2	Field Dup-1	RPD	TPS-2	Field Dup-2	RPD	Original	Laboratory Duplicate	RPD	Original	Laboratory Duplicate	RPD	QA/QC FILTER	TPE	TPN	TPS	SP	TE	TEFF	INUG	WAL	PDL	BBD	BPJ	BAP
		17-Aug-09	17-Aug-09	(%)	21-Aug-09	21-Aug-09	(%)	August		(%)	August		(%)	25-Aug-09												
CONVENTIONAL PARAMETERS																										
Physical & Organic Parameters																										
Moisture (%)	0.1	73.9	79.6	-7.43	82.8	82.0	0.97	80.7	80.5	0.25	-	-	-													
pH	0.1	6.39	6.31	1.26	5.91	5.92	-0.17	6.31	6.35	-0.63	5.96	5.95	0.17													
Total Organic Carbon (% dw)	0.1	1.84	2.64	-35.7	4.40	4.11	6.82	3.31	3.34	-0.90	0.54	0.51	5.7													
Particle Size																										
% Gravel (>2mm)	1	<1.0	<1.0	0	<1.0	<1.0	0	2	2	0	<1.0	<1.0	0													
% Sand (2.00mm - 0.063mm)	1	11	16	-37	36	25	36	25	22	13	25	24	4.1													
% Silt (0.063mm - 4µm)	1	66	67	-1.5	49	55	-12	54	58	-7.1	54	55	-1.8													
% Clay (<4µm)	1	23	17	30	15	20	-29	19	18	5.4	21	21	0													
AGGREGATE ORGANICS (mg/kg)																										
Oil and Grease	500-1082	<900	<1200	0	<1400	<1400	0	<1525	<1440	0	770	530	36.9													
HYDROCARBONS (mg/kg)																										
EPH10-19	200-480	<240	<350	-	<390	<380	-	<460	<480	-	<200	<200	0													
EPH19-32	200-480	<240	<350	-	<390	<380	-	<460	<480	-	<200	<200	0													
LEPH	200-480	<240	<350	-	<390	<380	-	-	-	-	-	-	-													
HEPH	200-480	<240	<350	-	<390	<380	-	-	-	-	-	-	-													
POLYCYCLIC AROMATIC HYDROCARBONS																										
Acenaphthene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.0050	<0.0050	0													
Acenaphthylene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.0050	<0.0050	0													
Anthracene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.0040	<0.0040	0													
Benz(a)anthracene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Benzo(a)pyrene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Benzo(b)fluoranthene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Benzo(g,h,i)perylene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Benzo(k)fluoranthene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Chrysene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Dibenz(a,h)anthracene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.0050	<0.0050	0													
Fluoranthene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Fluorene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Indeno(1,2,3-c,d)pyrene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
2-Methylnaphthalene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Naphthalene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Phenanthrene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
Pyrene (mg/kg)	0.005-0.10	<0.050	<0.050	0	<0.050	<0.050	0	<0.10	<0.10	0	<0.010	<0.010	0													
d10-Acenaphthene (%)															108	86	80	109	105	103	90	86	92	94	99	88
d12-Chrysene (%)															98	73	71	101	93	90	82	78	82	90	103	86
d8-Naphthalene (%)															107	84	80	105	101	102	89	85	92	95	78	89
d10-Phenanthrene (%)															112	87	85	114	107	106	99	90	95	104	108	99

Table 3-2. QA/QC data for sediment parameters, Meadowbank study lakes & Baker Lake, August 2009.

Analytes	MDLs	Pipedream Lake			Third Portage Lake - South Basin			Various Lakes			Various Lakes			BAP	Recovery of Surrogate Standards for PAHs											
		PDL-2	Field Dup-1	RPD	TPS-2	Field Dup-2	RPD	Original	Laboratory Duplicate	RPD	Original	Laboratory Duplicate	RPD	QA/QC FILTER												
		17-Aug-09	17-Aug-09	(%)	21-Aug-09	21-Aug-09	(%)	August		(%)	August		(%)	25-Aug-09	TPE	TPN	TPS	SP	TE	TEFF	INUG	WAL	PDL	BBD	BPJ	BAP
TOTAL METALS (mg/kg dw)															TOTAL METALS (µg)											
Aluminum	50	23300	22500	3.49	18000	18500	-2.74	27100	27400	-1.10	20600	21200	-2.87	11												
Antimony	10	<10	<10	0	<10	<10	0	<10	<10	0	<10	<10	0	<10												
Arsenic	5	47.6	38.7	20.6	10.3	12.3	-17.7	26.3	26.7	-1.51	18.5	19.5	-5.26	<10												
Barium	1	97.9	95.9	2.06	86.4	83.3	3.65	155	156	-0.64	83.1	85.8	-3.20	1.29												
Beryllium	0.5	1.11	1.01	9.43	1.20	1.24	-3.28	2.04	2.10	-2.90	1.23	1.26	-2.41	<0.30												
Bismuth	20	<20	<20	0	<20	<20	0	<20	<20	0	<20	<20	0	<10												
Cadmium	0.5	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	0	<0.50	<0.50	0	<0.50												
Calcium	50	1860	2090	-11.65	2380	2070	13.93	2130	2100	1.4	1430	1490	-4.11	22.1												
Chromium	2	142	143	-0.70	80.6	85.2	-5.55	88.0	89.7	-1.91	118	120	-1.68	<1.0												
Cobalt	2	18.7	16.7	11.3	10.0	10.6	-5.83	22.8	22.3	2.22	12.2	12.0	1.65	<0.50												
Copper	1	59.0	54.8	7.38	45.7	46.1	-0.87	64.9	64.6	0.46	58.5	58.9	-0.68	<0.50												
Iron	50	47000	44900	4.57	23500	26900	-13.49	85800	86000	-0.23	34400	34700	-0.87	9.7												
Lead	30	<30	<30	0	<30	<30	0	<30	<30	0	<30	<30	0	<3.0												
Lithium	2	35.6	34.5	3.14	34.1	34.6	-1.46	51.8	51.9	-0.19	36.4	37.0	-1.63	<0.50												
Magnesium	50	12500	11900	4.92	8480	8780	-3.48	10100	10100	0	9480	9610	-1.36	8.2												
Manganese	1	1440	1240	14.93	343	442	-25.2	5200	5060	2.73	441	442	-0.23	<0.30												
Mercury	0.005	0.00930	0.0145	-43.7	0.0188	0.0185	1.61	0.0415	0.0383	8.02	0.0149	0.0148	0.67	-												
Molybdenum	4	4.7	<4.0	NA	<4.0	<4.0	0	8.1	8.5	-4.8	<4.0	<4.0	0	<2.0												
Nickel	5	93.0	90.5	2.72	56.7	56.4	0.53	118	116	1.71	61.8	62.7	-1.45	<3.0												
Phosphorus	50	516	493	4.56	400	412	-2.96	524	528	-0.76	567	579	-2.09	<20												
Potassium	200	3190	3190	0	3030	3040	-0.33	5050	5130	-1.57	3110	3260	-4.71	<100												
Selenium	2	<2.0	<2.0	0	<2.0	<0.50	-	<2.0	<2.0	0	<2.0	<2.0	0	<10												
Silver	2	<2.0	<2.0	0	<2.0	<2.0	0	<3.0	<3.0	0	<2.0	<2.0	0	<0.50												
Sodium	200	<200	<200	0	<200	<200	0	240	240	0	<200	<200	0	<100												
Strontium	0.5	20.0	21.6	-7.69	16.0	15.0	6.45	18.7	19.1	-2.12	14.0	14.5	-3.51	<0.30												
Thallium	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<10												
Tin	5	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<2.0												
Titanium	1	538	524	2.64	654	664	-1.52	844	864	-2.34	524	550	-4.84	<0.50												
Vanadium	2	40.3	37.4	7.46	30.1	31.2	-3.59	42.5	42.9	-0.94	35.1	35.4	-0.85	<2.0												
Zinc	1	84.4	78.3	7.50	81.8	80.4	1.73	114	113	0.88	83.5	84.4	-1.07	<2.0												

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate))/2) x 100.

Shaded RPDs exceed 25% (lab duplicates) or 50% (field duplicates).

Bolded RPDs exceed 50% (field duplicates) or 25% (laboratory duplicates), but < 10 x MDL.

Bolded filter swipes exceed laboratory method detection limits.

NA = RPDs have not been calculated for cases where one of the samples is below detection and the other is not.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2009.

	Wally Lake			Baker Lake			Third Portage Lake			Third Portage Lake		
	WAL-2-S 21-Jul-09	July Field Duplicate-2	RPD (%)	BBD-2-S 28-Jul-09	July Field Duplicate-4	RPD (%)	TPN-7-S 21-Aug-09	Aug. Field Duplicate-2	RPD (%)	TPE-8-S 11-Sep-09	Sept. Field Duplicate-1	RPD (%)
Phytoplankton Density (cells/L)												
Cyanophyte	0	21552	NA	28736	7184	120	600	800	-29	4200	1600	90
Chlorophyte	65856	86808	-27	129312	122328	6	188384	138896	30	590088	172816	109
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	2326648	1655936	34	1942280	3802136	-65	1002176	1086384	-8	575920	317496	58
Diatom	58688	123744	-71	113576	101624	11	73640	81224	-10	59872	65656	-9
Cryptophyte	96192	22152	125	198968	221720	-11	21952	15768	33	74640	29136	88
Dinoflagellate	800	1000	-22	9184	16568	-57	14968	29736	-66	1000	7384	-152
Total	2548184	1911192	29	2422056	4271560	-55	1301720	1352808	-3.8	1305720	594088	75
Phytoplankton Biomass (mg/m3)												
Cyanophyte	0	1.93	NA	0.57	0.78	-31	0.05	0.08	-45	4.93	0.46	166
Chlorophyte	4.89	4.61	6.0	4.35	5.95	-31	7.68	7.45	3.0	12.61	6.16	69
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	280.74	185.29	41	191.23	323.11	-51	137.61	85.70	46	64.45	32.76	65
Diatom	6.16	9.00	-37	12.45	18.46	-39	8.59	8.12	6	5.17	4.21	21
Cryptophyte	7.71	2.06	116	18.22	34.35	-61	1.64	1.83	-11	5.83	2.39	84
Dinoflagellate	10.81	8.19	28	14.29	24.87	-54	12.02	29.35	-84	14.31	7.19	66
Total	310	211	38	241	408	-51	168	133	23	107	53	67
# Species												
	45	36	22	38	44	-15	36	40	-11	32	31	3.2
Simpsons Diversity												
	0.83	0.83	-0.1	0.84	0.81	2.9	0.89	0.85	5.23	0.84	0.90	-7.5

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2009.

	Baker Lake			Tehek Lake			Third Portage Lake			Third Portage Lake		
	BPJ-5-S 19-Sep-09	Sept. Field Duplicate-4	RPD (%)	TE-13-S 26-Nov-09	Nov. Field Duplicate-1	RPD (%)	TPE-14-S 19-Dec-09	Dec. Field Duplicate-1	RPD (%)	TPE-6-S 16-Jul-09	Lab Duplicate	RPD (%)
Phytoplankton Density (cells/L)												
Cyanophyte	10384	400	185	600	1200	-67	7092	0	NA	14368	86208	-143
Chlorophyte	448208	524832	-16	201952	137696	38	326232	259458	23	79624	137296	-53
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	1761680	1768264	0	1151040	848112	30	546484	401798	31	2081576	1951264	6.5
Diatom	292968	385160	-27	159248	203552	-24	10638	3546	100	109560	145880	-28
Cryptophyte	23352	245256	-165	131512	130912	0	107880	76766	34	65256	36520	56
Dinoflagellate	7784	14768	-62	7984	7984	0	0	0	0	10384	11784	-13
Total	2544376	2938680	-14	1652336	1329456	22	998326	741568	30	2360768	2368952	-0.3
Phytoplankton Biomass (mg/m3)												
Cyanophyte	1.11	0.08	173	0.12	0.29	-80	0.11	0	NA	0.50	2.069	-122
Chlorophyte	15.96	8.65	59	3.08	4.00	-26	3.83	3.74	3	5.477	10.16	-60
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	164.72	150.20	9	90.94	61.69	38	24.55	33.55	-31	170	172	-1
Diatom	59.25	54.28	9	7.92	11.94	-40	0.28	0.09	100	6.75	8.09	-18
Cryptophyte	3.60	14.37	-120	9.94	8.66	14	7.62	7.07	8	5.38	2.95	58
Dinoflagellate	6.29	11.07	-55	12.99	16.68	-25	0	0	0	23.3	32.40	-33
Total	251	239	5	125	103	19	36	44	-20	211	227	-7
# Species												
	45	46	-2	33	34	-3	22	20	10	40	41	-2.5
Simpsons Diversity												
	0.89	0.91	-2.7	0.9	0.9	-0.2	0.8	0.8	-0.2	0.83	0.85	-1.9

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2009.

	Baker Lake			Tehek Lake			Third Portage Lake			Baker Lake		
	BPJ-1-S	Lab	RPD	TEFF-4-S	Lab	RPD	TPN-8-S	Lab	RPD	BBD-5-S	Lab	RPD
	28-Jul-09	Duplicate	(%)	14-Aug-09	Duplicate	(%)	11-Sep-09	Duplicate	(%)	19-Sep-09	Duplicate	(%)
Phytoplankton Density (cells/L)												
Cyanophyte	0	0	0	30336	600	192	600	200	100	600	1800	-100
Chlorophyte	122128	122128	0	124128	94592	27	504680	684080	-30	295544	481928	-48
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	1867256	1772664	5.2	1722576	1507656	13	1078400	1157824	-7	1280552	999776	25
Diatom	93024	156680	-51	240472	167432	36	74240	60472	20	250600	238216	5
Cryptophyte	256040	233488	9.2	51488	58872	-13	66256	59672	10	72040	86208	-18
Dinoflagellate	22952	37920	-49	23152	15968	37	21952	14568	40	1000	1000	0
Total	2361400	2322880	1.6	2192152	1845120	17	1746128	1976816	-12	1900336	1808928	4.9
Phytoplankton Biomass (mg/m3)												
Cyanophyte	0	0	0	1.202	0.11	167	0.148	0.04	108	0.102	0.33	-105
Chlorophyte	4.2	3.92	6	5.0	3.02	49	18.2	31.46	-53	11.1	11.42	-3
Euglenophyte	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyte	180.0	152.7	16	138.5	122.0	13	96.7	87.0	11	123.6	107.1	14
Diatom	13.0	16.7	-25	18.6	14.0	28	8.2	9.9	-18	36.0	26.6	30
Cryptophyte	24.3	20.4	17	3.2	3.6	-15	3.6	4.3	-17	8.0	10.8	-30
Dinoflagellate	27.66	42.41	-42	29.93	27.67	8	9.91	8.84	11	14.14	10.77	27
Total	249	236	5.4	196	170	14	137	142	-3.4	193	167	14
# Species												
	46	45	2.2	44	42	4.7	37	41	-10.3	34	33	3.0
Simpsons Diversity												
	0.85	0.87	-2.7	0.87	0.85	2.9	0.90	0.85	5.7	0.89	0.88	1.8

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-3. QA/QC data for phytoplankton, Meadowbank study lakes and Baker Lake, 2009.

	Inuggugayualik Lake			Tehek Lake			Third Portage Lake		
	INUG-11-D 28-Nov-09	Lab Duplicate	RPD (%)	TE-13-S 26-Nov-09	Lab Duplicate	RPD (%)	TPE-14-S 19-Dec-09	Lab Duplicate	RPD (%)
Phytoplankton Density (cells/L)									
Cyanophyte	21552	7184	100	600	0	NA	7092	0	NA
Chlorophyte	202752	123528	49	201952	187784	7	326232	429166	-27
Euglenophyte	0	0	0	0	0	0	0	0	0
Chrysophyte	1279768	1170608	9	1151040	920752	22	546484	521662	5
Diatom	208352	182416	13	159248	102176	44	10638	3546	100
Cryptophyte	66456	80624	-19	131512	133312	-1	107880	84058	25
Dinoflagellate	7384	600	170	7984	14768	-60	0	100	-200
Total	1786264	1564960	13.2	1652336	1358792	19.5	998326	1038532	-3.9
Phytoplankton Biomass (mg/m3)									
Cyanophyte	0.65	0.22	100	0.12	0	NA	0.11	0	NA
Chlorophyte	8.62	4.58	61	3.08	5.41	-55	3.83	4.91	-25
Euglenophyte	0	0	0	0	0	0	0	0	0
Chrysophyte	128.29	119.04	7	90.94	56.91	46	24.55	32.90	-29
Diatom	17.62	15.06	16	7.92	8.03	-1	0.28	0.09	100
Cryptophyte	10.18	8.23	21	9.94	11.45	-14	7.62	8.69	-13
Dinoflagellate	9.72	5.16	61	12.99	11.75	10	0.00	2.36	-200
Total	175	152	14	125	94	29	36	49	-29
# Species									
	34	35	-2.9	33	32	3.1	22	24	-8.7
Simpsons Diversity									
	0.88	0.89	-1.3	0.87	0.85	1.9	0.80	0.80	0.5

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 50% (field duplicates) or 25% (lab duplicates).

NA = Not Applicable for rare species.

Table 3-4. Percent recovery of benthic invertebrate samples, Meadowbank study lakes & Baker Lake, August 2009.

Station	Number of Organisms Recovered	Number of Organisms in Re-sort	Percent Recovery
INUG-1	58	63	92.1%
INUG-2	77	81	95.1%
PDL-2	56	58	96.6%
SP-3	48	50	96.0%
TPN-3	69	69	100%
TPS-5	56	56	100%
<i>Average % Recovery</i>			96.6%

Notes:

All sixty samples were sorted in their entirety.



3.2. Limnology and Water Chemistry

3.2.1. Meadowbank Study Lakes

Vertical temperature and dissolved oxygen profiles of all lakes and seasons were isothermal with little evidence of stratification (**Figures 3-1 to 3-9**). Generally, water temperatures at Meadowbank increased through the spring and summer open water season, followed by cooling in the fall. Given the frequency of wind events at Meadowbank, none of the lakes typically become stratified by more than two or three degrees for more than a few days (BAER, 2005). During the open water season, dissolved oxygen concentrations were typically high, related to temperature changes, and were nearly always saturated. During winter months, lake water temperatures were clearly much colder and consequently dissolved oxygen concentrations were even higher (see **Figures 3-1, 3-2, 3-4, 3-5, and 3-7**).

Maximum water temperature varied among lakes and was related to water depth and volume of water in the basin being measured. For example, water temperatures during open water at Meadowbank tended to be lower in the large, deep, south basin of Third Portage Lake (**Figure 3-3**) in the spring (4.1–5.1°C) and barely exceeded 8°C as a maximum in this basin. Water temperatures were warmest in Wally Lake, reaching 10°C in this lake in spring (July 21) but only reached 11°C in summer (August 16) because of a relatively cold summer (**Figure 3-8**). Summer maxima have been typically higher in previous years in Wally Lake (e.g., 10°C on July 13, 2006; 15°C on August 7, 2006; 12°C on July 28, 2007; 15°C on July 22, 2008).

Conventional water quality parameters were generally similar among the Meadowbank study lakes (**Table 3-5**) and typical of ultra-oligotrophic/oligotrophic lakes (Welch et al., 1989) in this region of the Arctic.

The pH of open surface waters was circum-neutral: 6.7–7.7 (except for one sample in September at PDL of pH 8.6, which is likely a false measurement considering PDL in July was 7.7 and August was 6.9). Conductivity was lowest in Third Portage (13.5–20.1 µS/cm) and Inuggugayualik lakes (13.7–21.7 µS/cm) and somewhat higher in Second Portage (21.8–31.4 µS/cm), Tehek (17.0–32.1 µS/cm) and Wally (26.3–29.1 µS/cm) lakes.

Total suspended solids (TSS) in surface waters were consistently near or below detection (<1.0 mg/L) in all far-field and reference lake stations, which is consistent with work previous to 2005 (BAER, 2005). TSS in Third Portage Lake East was detected at 2.3 mg/L in mid-August, increased to 5.7 mg/L by September 11, then decreased again in November (1.9 mg/L) and December (1.6 mg/L) through-ice. The elevated suspended concentrations of solids in the east basin are a result of introductions of suspended

sediment due to construction of the Bay-Goose Dike that began on 27 July, and despite installation of silt curtains, released sediments to the lake. These suspended solids became dispersed by wind and were eventually transported throughout much of the east basin of Third Portage Lake and into discrete locations in Second Portage Lake (Azimuth 2010a). TSS concentrations in the east basin were much higher closer to the Bay-Goose dike. More details on the extent and magnitude of elevated TSS in Third Portage Lake, as well as the ecological significance of the sediment inputs, are discussed within the dike construction monitoring and EAS reports, respectively (Azimuth, 2010a, b).

Total dissolved solids (TDS) concentration was higher than suspended solids in Second Portage Lake (up to 24 mg/L in November), Tehek Lake (up to 33 mg/L in May), Wally Lake (up to 20 mg/L in July) and Pipedream Lake (up to 19 mg/L in July). In Third Portage Lake East and North, total dissolved solids increased with suspended solids, but did not exceed 15–16 mg/L. TDS was near or below detection (<10 mg/L) for Tehek Lake Farfield, Inuggugayualik Lake and Third Portage Lake South.

Nutrient concentrations (nitrogen, phosphorus) in the Meadowbank study lakes were low, generally close to laboratory detection limits and did not appear to differ appreciably within or among lakes and seasons. Some stations showed elevated levels of nitrogen, although did not exceed guidelines: Third Portage Lake East later in the year (nitrate up to 0.02 mg/L; ammonia up to 0.04 mg/L), and Second Portage Lake (nitrate up to 0.04 mg/L; ammonia up to 0.09 mg/L) and Tehek Lake (nitrate up to 0.02 mg/L; ammonia up to 0.05 mg/L) during winter months. Total phosphorus concentrations exceeded guidelines in Third Portage Lake East (concentrations above detection ranged from 0.0034–0.0043 mg/L) and Tehek Lake (0.0031–0.0048 mg/L). Total and dissolved organic carbon ranged from 1.15–2.85 mg/L and 1.03–2.74 mg/L in the Meadowbank lakes, respectively.

Chlorophyll- α concentrations during through-ice events typically ranged from 0.11–0.55 $\mu\text{g/L}$. However, very low levels were measured in Third Portage Lake East in late May (0.034 $\mu\text{g/L}$) and higher levels were detected in Second Portage Lake (0.56 $\mu\text{g/L}$ in early May, 0.71 $\mu\text{g/L}$ in late May, and 0.62 $\mu\text{g/L}$ in late November), Third Portage Lake East (0.65 $\mu\text{g/L}$ in late November) and Wally Lake (0.83 $\mu\text{g/L}$ in late November). As for open-water sampling, chlorophyll- α typically ranged from 0.21–0.59 $\mu\text{g/L}$. Outside of this range, lower concentrations were measured in mid September in TPN (0.15 $\mu\text{g/L}$) and Tehek Lake Farfield (0.14 $\mu\text{g/L}$) and higher levels in mid July in SP (0.77 $\mu\text{g/L}$). Typically, oligotrophic lakes have chlorophyll- α concentrations of less than 1 $\mu\text{g/L}$ (Wetzel, 1983), so these data are consistent with very nutrient poor, low productivity lakes.

Generally, most lake stations saw an initial increase in chlorophyll- α concentrations in July just after ice-off of the lakes followed by a decrease each event for the rest of the

year (**Figure 3-13**). Exceptions were Third Portage Lake East and Inuggugayualik Lake, which initially peaked in July, had slight decreases in August, then followed with a continued increase through to November. Third Portage Lake North was quite variable and shows no meaningful trend. The low chlorophyll- α concentrations and general lack of seasonal pattern is indicative of low productivity and possibly seasonal grazing by zooplankton in this nutrient poor system.

Inter-annual differences in chlorophyll- α are also apparent. For example, looking at mid-July data for Second Portage and Tehek lakes between 2006 and 2009, chlorophyll- α concentrations in Second Portage Lake ranged from 0.19 $\mu\text{g/L}$ (2006) to 0.60 $\mu\text{g/L}$ (2007) to 0.34 $\mu\text{g/L}$ (2008) to 0.77 $\mu\text{g/L}$ (2009) and in Tehek Lake from 0.13 $\mu\text{g/L}$ (2006) to 0.46 $\mu\text{g/L}$ (2007) to 0.31 $\mu\text{g/L}$ (2008) to 0.59 $\mu\text{g/L}$ (2009). Potential changes in chlorophyll- α and nutrient concentrations will be examined in greater detail in the CREMP design review.

Total metals concentrations measured in 2009 from surface waters were consistently low among the project lakes (**Table 3-5**). Of the 29 metals for which concentration data were measured, 23 were consistently below detection limits (DLs) and 6 were occasionally above guidelines and are discussed below. The concentrations of common salts (calcium, magnesium, manganese and potassium) exceeded DLs, but were always low in concentration with no trend or pattern over time or between lakes. Results from 2009 were consistent to monitoring results from previous years (Azimuth, 2009a, 2008a, b; BAER, 2005). Dissolved metals concentrations were much lower than total metals concentrations, which indicates that the metals are found in particulate form.

Total (i.e., unfiltered) concentrations of aluminum, cadmium, chromium, copper, iron and zinc each exceeded their DLs and in a few cases also exceeded the CCME (2007) guideline for protection of aquatic life (**Table 3-5**). In Third Portage Lake East in September, aluminum (0.57 mg/L), chromium, copper and iron were all in exceedance of guidelines. This result is related to the elevated TSS concentrations (5.7 mg/L) that were also measured in Third Portage Lake East in September, originating from sediment released into the east basin during the construction of the Bay-Goose dike. To a lesser degree, aluminum was also in exceedance of guidelines (0.16–0.18 mg/L) in Third Portage Lake East in November and December, accordingly TSS was lower during these months but still above DLs (1.9 and 1.6 mg/L, respectively). The significance of this situation is discussed further in Azimuth (2010a, b).

Cadmium and zinc only exceed guidelines on one occasion (different stations & seasons); there does not appear to be any meaningful pattern with regards to these 2 exceedances.

Limnological data, conventional water quality parameters, chlorophyll- α and nutrient concentrations indicate that typically the Meadowbank study lakes are ultra-oligotrophic (i.e., clear, nutrient poor) with very low productivity. However, recent development and

dike construction at the mine have had some effects on the water quality of the lakes in close proximity to these developments (see Azimuth 2010a, b for more details). Lake waters are mainly neutral pH, soft (i.e., low hardness), and well mixed throughout the open water season with high oxygen concentration, and low turbidity which is consistent with previous work and with the remote, pristine nature of these headwater lakes. Because the study lakes are situated in the uppermost reaches of the Quioch River system, they do not receive inputs from upstream lakes or streams that might carry suspended and dissolved solids and/or nutrients into the study lakes.

3.2.2. Baker Lake

Vertical temperature and dissolved oxygen profiles of all stations and seasons were isothermal with little evidence of stratification (**Figures 3-10 to 3-12**). Water temperatures were cooler in the spring than in the fall in Baker Lake, but still warmest in summer.

Water samples from Baker Lake were analyzed for the same parameters as samples from the Meadowbank lakes (**Table 3-5**). Conventional water chemistry parameters from Baker Lake were clearly different from the Meadowbank study lakes. These differences are explored below.

Conductivity in Baker Lake ranged from 30.5–283 $\mu\text{S}/\text{cm}$ near surface, with some vertical stratification in conductivity. While total suspended solids in surface waters were consistently low (<3.0 mg/L) at all stations, total dissolved solids (23–146 mg/L), chloride (3.44–57.4 mg/L) and sulfate (0.890–9.82 mg/L) varied substantially and were very closely related to conductivity patterns in these surface waters. The varying conductivity values are likely related to wind speed and direction (both due to their influence on wind-driven vertical mixing) and inflow from the Thelon River, just east of Baker Lake.

Nutrient concentrations (nitrogen, phosphorus) were low, generally close to laboratory detection limits and did not differ appreciably within the lake and among seasons. As discussed above, anions, chloride, and sulfate concentrations varied among stations and seasons, and were related to hardness and conductivity. Dissolved and total organic carbon did not vary much among stations or seasons, ranging from 2.64–3.07 mg/L and 2.91–3.15 mg/L, respectively.

Chlorophyll- α concentrations in Baker Lake ranged from 1.01–1.19 $\mu\text{g}/\text{L}$ and were about 2–3 times higher than levels found in the Meadowbank project lakes, which is consistent with results from 2008. Chlorophyll- α concentrations increased over the season and peaked in spring at BBD and BPJ and in summer at BAP.

Of the 29 metals analyzed in water 24 were consistently below detection limits at all stations and over seasons and were well below CCME (2007) guidelines for the protection of aquatic life. Only the common salts calcium, magnesium, manganese, potassium and sodium (**Table 3-5**) exceeded DLs and again, were related to conductivity/hardness in surface waters, which could be described as slightly brackish.

Table 3-5. Conventional water chemistry and total and dissolved metals (mg/L), Meadowbank study lakes Baker Lake, 2009

Lake & Basin		Third Portage Lake																Second Portage Lake								Tehuk Lake											
		East (TPE)								North (TPN)								South (TPS)																			
Station ID	Depth (m)	TPE-1	TPE-3	TPE-4	TPE-7	TPE-8	TPE-11	TPE-14	TPN-1	TPN-3	TPN-4	TPN-7	TPN-8	TPN-11	TPN-14	TPS-1	TPS-4	TPS-5	TPS-8	SP-1	SP-3	SP-4	SP-7	SP-8	SP-11	SP-14	TE-1	TE-3	TE-4	TE-7	TE-8	TE-11	TE-14				
Date	CCME (2007) Guideline ¹	05-May-09	28-May-09	16-Jul-09	16-Aug-09	11-Sep-09	27-Nov-09	19-Dec-09	03-May-09	29-May-09	23-Jul-09	21-Aug-09	11-Sep-09	29-Nov-09	19-Dec-09	23-Jul-09	21-Aug-09	11-Sep-09	22-Dec-09	05-May-09	28-May-09	18-Jul-09	12-Aug-09	15-Sep-09	25-Nov-09	18-Dec-09	04-May-09	30-May-09	19-Jul-09	15-Aug-09	12-Sep-09	26-Nov-09	21-Dec-09				
CONVENTIONAL PARAMETERS																																					
Physical Tests																																					
Conductivity (µS/cm)	NG	18.1	17.4	17.0	14.6	16.9	16.8	18.9	20.1	16.4	13.8	13.7	14.3	15.4	17.7	14.3	13.5	14.4	14.7	29.6	31.4	23.3	21.8	22.9	27.1	23.0	27.7	32.1	18.8	17.0	18.8	22.6	29.6				
Hardness (mg/L)	NG	6.6	5.7	5.4	5.6	5.9	6.4	7.9	7.3	5.6	4.9	5.2	5.1	5.4	6.1	5.0	5.3	5.0	5.7	12	11	9.6	9.5	9.3	10.6	10.0	10	12	7.1	6.9	7.0	9.2	8.8				
pH	6.5 - 9.0	6.34	6.60	6.73	6.89	7.06	7.18	6.77	6.81	6.76	6.76	6.68	6.95	6.86	6.76	6.77	6.78	6.92	6.72	6.95	8.01	6.89	6.82	6.86	6.91	7.89	7.01	7.12	6.91	6.97	6.96	6.73	6.94				
Total Suspended Solids (mg/L)	NG	<1.0	<1.0	<1.0	2.3	5.7	1.9	1.6	<1.0	<1.0	<1.0	2.3	1.7	<1.0	<1.0	<1.0	2.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1.3	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	3.0				
Total Dissolved Solids (mg/L)	NG	14	<10	<10	<10	11	15	<10	12	<10	<10	<10	16	14	<10	14	<10	<10	<10	12	16	14	15	17	24	11	15	33	12	14	<10	14	16				
Turbidity (NTU)	NG	0.46	0.39	0.39	0.98	1.2	3.8	3.3	0.37	0.26	0.32	0.31	0.70	0.27	0.26	0.21	0.27	0.40	0.23	0.50	0.87	0.68	0.52	2.2	0.73	0.74	0.24	0.51	0.56	0.43	0.69	0.63	0.59				
Anions & Nutrients (mg/L)																																					
Alkalinity - Bicarbonate (as CaCO ₃)	NG	-	-	4.5	4.7	4.9	4.9	6.1	-	-	4.2	3.5	4.3	4.6	5.1	4.7	4.1	4.8	4.6	-	-	7.3	6.8	6.7	7.9	7.9	-	-	5.9	7.4	6.0	6.5	7.2				
Alkalinity - Carbonate (as CaCO ₃)	NG	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0					
Alkalinity - Hydroxide (as CaCO ₃)	NG	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0					
Alkalinity - Total (as CaCO ₃)	NG	-	-	4.5	4.7	4.9	4.9	6.1	-	-	4.2	3.5	4.3	4.6	5.1	4.7	4.1	4.8	4.6	-	-	7.3	6.8	6.7	7.9	7.9	-	-	5.9	7.4	6.0	6.5	7.2				
Ammonia (as N) ²	0.274 - 81.6	<0.020	<0.020	<0.020	<0.020	<0.020	0.039	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.029	<0.020	0.024	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.093	<0.020	<0.020	<0.0	<0.020	0.024	<0.020	0.051	<0.020					
Bromide	NG	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050					
Chloride	NG	0.60	0.59	<0.50	<0.50	0.58	0.59	0.58	0.54	<0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.66	0.71	<0.50	<0.50	0.60	<0.50	0.91	0.79	<0.50	<0.50	0.54	0.54	0.54					
Fluoride	NG	0.075	0.070	0.054	0.045	0.067	0.059	0.067	0.082	0.066	0.052	0.041	0.059	0.054	0.054	0.056	0.041	0.060	0.051	0.079	0.081	0.047	0.045	0.055	0.056	0.053	0.068	0.084	0.049	0.043	0.062	0.055	0.056				
Nitrate (as N)	2.9	<0.0050	<0.0050	<0.0050	<0.0050	0.0096	0.012	0.017	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.035	0.025	0.0066	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.024	<0.0050	<0.0050	<0.0050	<0.0050					
Nitrite (as N)	0.06	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010					
Total Kjeldahl Nitrogen	NG	0.060	0.066	0.10	0.077	0.062	0.081	0.13	0.20	0.12	0.087	0.061	0.061	0.091	0.11	0.092	0.073	0.066	0.13	0.12	0.17	0.12	0.094	0.12	0.13	0.12	0.11	0.14	0.16	<0.050	0.077	0.097	0.080				
Ortho Phosphate (as P)	NG	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	<0.010	<0.010	<0.010	<0.010					
Total Phosphate (as P)	0.004	-	-	<0.020	<0.020	0.0043	0.0030	0.0034	-	-	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-	-	<0.020	<0.020	<0.020	0.0021	0.0023	-	-	<0.020	0.0048	<0.020	0.0020	0.0031				
Silicate (as SiO ₂)	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0					
Sulfate (SO ₄)	NG	1.83	1.74	1.39	1.22	1.46	1.52	1.79	2.07	1.65	1.33	1.23	1.41	1.51	1.56	1.42	1.26	1.43	1.41	2.89	2.88	2.31	1.96	2.12	2.48	2.22	3.30	3.27	1.88	1.68	1.90	2.24	2.29				
ORGANIC / INORGANIC CARBON																																					
Dissolved Organic Carbon (mg/L)	NG	1.40	1.28	1.47	1.19	1.19	1.29	1.23	2.33	1.19	1.16	1.19	1.43	1.66	1.73	1.14	1.03	1.41	1.16	1.78	1.65	1.57	1.61	1.51	1.93	2.00	1.81	1.79	1.66	1.35	1.44	2.26	1.73				
Total Organic Carbon (mg/L)	NG	1.49	1.30	1.43	1.25	1.22	1.16	1.20	2.53	1.21	1.15	1.21	1.38	1.71	1.72	1.36	1.19	1.32	1.22	1.71	1.77	1.81	1.40	1.60	1.80	1.79	1.92	1.80	1.68	1.48	1.50	1.91	1.77				
PLANT PIGMENTS																																					
Chlorophyll a - standardized (µg/L)	NG	0.127	0.034	0.382	0.340	0.495	0.651	0.279	0.330	0.394	0.208	0.369	0.147	0.555	0.323	0.347	0.340	0.264	0.228	0.564	0.708	0.771	0.485	0.523	0.618	0.389	0.340	0.299	0.587	0.451	0.320	0.108	0.372				
TOTAL METALS (mg/L)																																					
Aluminum ³	0.005 - 0.100	<0.0050	<0.0050	0.0061	0.025	0.57	0.16	0.18	<0.010	<0.0050	0.0085	0.0066	0.018	0.010	0.0094	<0.0050	0.0070	0.0069	<0.0050	0.023	0.020	0.025	<0.030	0.065	0.032	0.043	<0.010	0.016	0.014	0.011	0.029	0.028	0.034				
Antimony	NG	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050					
Arsenic	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.00056	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050					
Barium	NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020					
Beryllium	NG	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010					
Boron	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0					
Cadmium ⁴	0.0000024 - 0.000014	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	0.000021	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017					
Calcium	NG	1.48	1.32	1.26	1.32	1.40	1.49	1.83	1.60	1.22	1.16	1.09	1.20	1.28	1.17	1.08	1.18	1.24	1.31	2.83	2.48	2.28	2.31	2.69	2.47	2.52	3.03	1.80	1.70	1.82	2.33	2.34					
Chromium ⁵	0.0010	<0.010	<0.010	<0.010	<0.010	0.0024	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010					
Cobalt	NG	<0.0030	<0.0030	<0.0030	<0.0030	0.00031	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.003																									

NG = no guideline

NG = no guideline

¹CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated December 2007.

²Ammonia guidelines are for 10°C and are pH dependent

³Aluminum guideline is pH dependent

⁵Guidelines have not yet been made for "Dissolved Metals," thus were screened against CCME guidelines for "Total Metals."

⁵Guidelines have not yet been made for "Dissolved Metals," thus were screened against CCME guidelines for "Total Metals."

*Cadmium, copper, lead and nickel guidelines are hardness dependent.

Shaded concentrations exceed the CCME guideline.

Boxed concentrations indicate data with potential field contamination: result of detectable concentration in the equipment blank collected post-sample collection

Table 3-5. Conventional water chemistry and total and dissolved metals (mg/L), Meadowbank study lakes Baker Lake, 2009.

Lake & Basin				Tehek Farfield			Inuggugayualik Lake							Wally Lake			Pipedream Lake			Barge Dock			Proposed Jetty			Akilaharjuk Point		
Station ID	Depth (m)	CCME (2007)		TEFF-1	TEFF-4	TEFF-5	INUG-1	INUG-3	INUG-4	INUG-7	INUG-8	INUG-11	WAL-1	WAL-4	WAL-5	PDL-1	PDL-4	PDL-5	BBD-1	BBD-4	BBD-5	BPJ-1	BPJ-4	BPJ-5	BAP-1	BAP-4	BAP-5	
Date		Guideline ¹		20-Jul-09	14-Aug-09	12-Sep-09	03-May-09	28-May-09	24-Jul-09	19-Aug-09	16-Sep-09	28-Nov-09	21-Jul-09	16-Aug-09	13-Sep-09	26-Jul-09	17-Aug-09	14-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09	26-Jul-09	24-Aug-09	19-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09	
CONVENTIONAL PARAMETERS																												
Physical Tests																												
Conductivity (µS/cm)			NG	15.3	15.1	14.3	21.7	17.9	13.9	13.7	14.3	15.0	26.3	27.3	29.1	23.8	19.5	20.9	30.5	42.7	69.0	72.2	222	204	92.8	179	283	
Hardness (mg/L)			NG	5.3	5.7	4.9	8.2	6.3	5.0	5.3	5.2	5.6	12	13	12	7.3	8.2	8.2	9.9	12	15	14	23	28	16	11	36	
pH	6.5 - 9.0		NG	6.84	6.89	6.83	6.94	6.68	6.78	6.81	6.84	6.75	6.99	6.93	7.14	7.67	6.90	8.66	7.00	7.13	6.94	6.98	6.89	7.11	6.99	6.96	7.53	
Total Suspended Solids (mg/L)			NG	<1.0	<1.0	<3.0	<1.0	<1.0	<1.0	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	<1.0	1.3	<1.0	<1.0	<1.0	<1.0	
Total Dissolved Solids (mg/L)			NG	11	10	<10	<10	<10	<10	<10	11	<10	14	20	16	15	19	12	19	23	26	43	44	124	106	48	100	146
Turbidity (NTU)			NG	0.24	0.32	0.33	0.16	0.18	0.29	0.41	0.46	0.29	0.28	0.27	0.32	0.31	0.22	0.26	0.55	0.39	0.62	0.60	0.67	1.4	0.61	0.49	0.39	
Anions & Nutrients (mg/L)																												
Alkalinity - Bicarbonate (as CaCO ₃)			NG	4.1	3.8	4.0	-	-	4.6	4.9	4.1	4.7	9.4	9.2	9.9	6.9	7.3	14	7.6	8.8	8.8	7.4	9.1	8.8	7.8	8.9	9.4	
Alkalinity - Carbonate (as CaCO ₃)			NG	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Alkalinity - Hydroxide (as CaCO ₃)			NG	<2.0	<2.0	<2.0	-	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Alkalinity - Total (as CaCO ₃)			NG	4.1	3.8	4.0	4.0	4.0	4.1	4.1	4.7	9.4	9.2	9.9	6.9	7.3	14	7.6	8.8	8.8	7.4	9.1	8.8	7.8	8.9	9.4	9.4	
Ammonia (as N) ²	0.274 - 81.6		NG	0.021	<0.020	<0.020	0.027	<0.020	0.024	<0.020	<0.020	0.021	0.028	<0.020	<0.020	<0.020	<0.020	0.026	<0.020	0.023	<0.020	<0.020	<0.020	<0.020	<0.020	0.025	<0.020	0.031
Bromide			NG	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.062	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.0510	<0.050	0.157	0.186	0.0620	0.121	0.255	
Chloride			NG	<0.50	<0.50	0.51	1.07	0.89	0.63	0.56	0.69	0.70	<0.50	<0.50	<0.50	0.53	<0.50	0.57	3.44	5.22	13.1	14.5	57.4	48.7	19.6	44.7	71.3	
Fluoride			NG	0.045	0.040	0.053	0.084	0.069	0.051	0.039	0.052	0.052	0.038	0.027	0.044	0.046	0.023	0.032	0.059	0.053	0.037	0.060	0.056	0.040	0.060	0.055	0.041	
Nitrate (as N)	2.9		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0058	<0.0050	<0.0050	0.011	0.014	0.011	0.014	0.0093	0.013	
Nitrite (as N)	0.06		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Total Kjeldahl Nitrogen			NG	0.15	0.069	0.073	0.24	0.17	0.11	<0.10	0.11	0.097	0.11	0.14	0.092	0.077	0.10	0.098	0.11	0.19	0.15	0.12	0.18	0.18	0.14	0.17	0.18	
Ortho Phosphate (as P)			NG	<0.0010	<0.0010	<0.0010	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Total Phosphate (as P)	0.004		<0.0020	<0.0020	<0.0020	-	-	0.0021	<0.0020	<0.0020	0.0023	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0030	<0.0020	0.0035	0.0084	0.0026	0.0035	0.0021	0.0038	0.0031	0.0032	0.0024	
Silicate (as SiO ₂)			NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Sulfate (SO ₄)			NG	1.71	1.64	1.67	1.39	1.16	0.800	0.720	0.860	0.86	2.42	2.23	2.56	1.43	1.35	1.48	0.890	1.18	1.99	2.40	8.49	6.75	3.10	6.73	9.82	
ORGANIC / INORGANIC CARBON																												
Dissolved Organic Carbon (mg/L)			NG	1.35	1.34	1.33	2.53	1.80	1.61	1.64	1.85	2.74	1.87	1.29	1.91	1.65	1.43	1.63	2.64	2.96	2.99	3.07	2.84	2.99	2.90	2.86	2.99	
Total Organic Carbon (mg/L)			NG	1.20	1.17	1.32	2.56	1.92	1.76	1.64	1.96	2.85	1.85	1.75	1.91	1.70	1.41	1.54	2.99	3.07	2.96	3.15	2.91	3.15	3.10	2.98	3.02	
PLANT PIGMENTS																												
Chlorophyll a - standardized (µg/L)			NG	0.288	0.442	0.144	0.168	0.107	0.362	0.336	0.521	0.834	0.414	0.320	0.325	0.517	0.233	0.463	1.11	1.03	1.05	1.15	1.01	1.13	1.03	1.19	1.09	
TOTAL METALS (mg/L)																												
Aluminum ³	0.005 - 0.100		<0.0050	<0.010	0.0070	<0.010	0.0055	0.0062	0.0061	0.010	0.0087	<0.0050	<0.0050	<0.0050	0.0057	<0.0050	<0.0050	0.0066	0.0082	<0.0050	0.019	0.0083	0.0057	0.027	0.0098	<0.0050	0.0076	
Antimony			NG	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Arsenic	0.0050		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Bariem			NG	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Beryllium			NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron			NG	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Cadmium ⁴	0.000024 - 0.000014		<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	
Calcium			NG	1.29	1.30	1.41	1.60	1.24	0.99	1.03	1.02	1.09	3.19	3.40	4.02	1.98	2.08	2.04	2.13	1.15	2.83	2.40	3.48	2.60	2.55	2.14	4.14	
Chromium ⁴	0.0010		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Cobalt			NG	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0							

Notes

NG = no guideline.

¹CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated December 2007.

²Ammonia guidelines are for 10°C and are pH dependent

³Aluminum guideline is pH dependent

⁴Chromium guideline is for Cr VI.

⁵Guidelines have not yet been made for "Dissolved Metals," thus were screened against CCME guidelines for "Total Metals."

*Cadmium, copper, lead and nickel guidelines are hardness dependent

Shaded concentrations exceed the CCME guideline

Boxed concentrations indicate data with potential field contamination: result of detectable concentration in the equipment blank collected post-sample collection

Figure 3-1. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– East Basin, 2009.

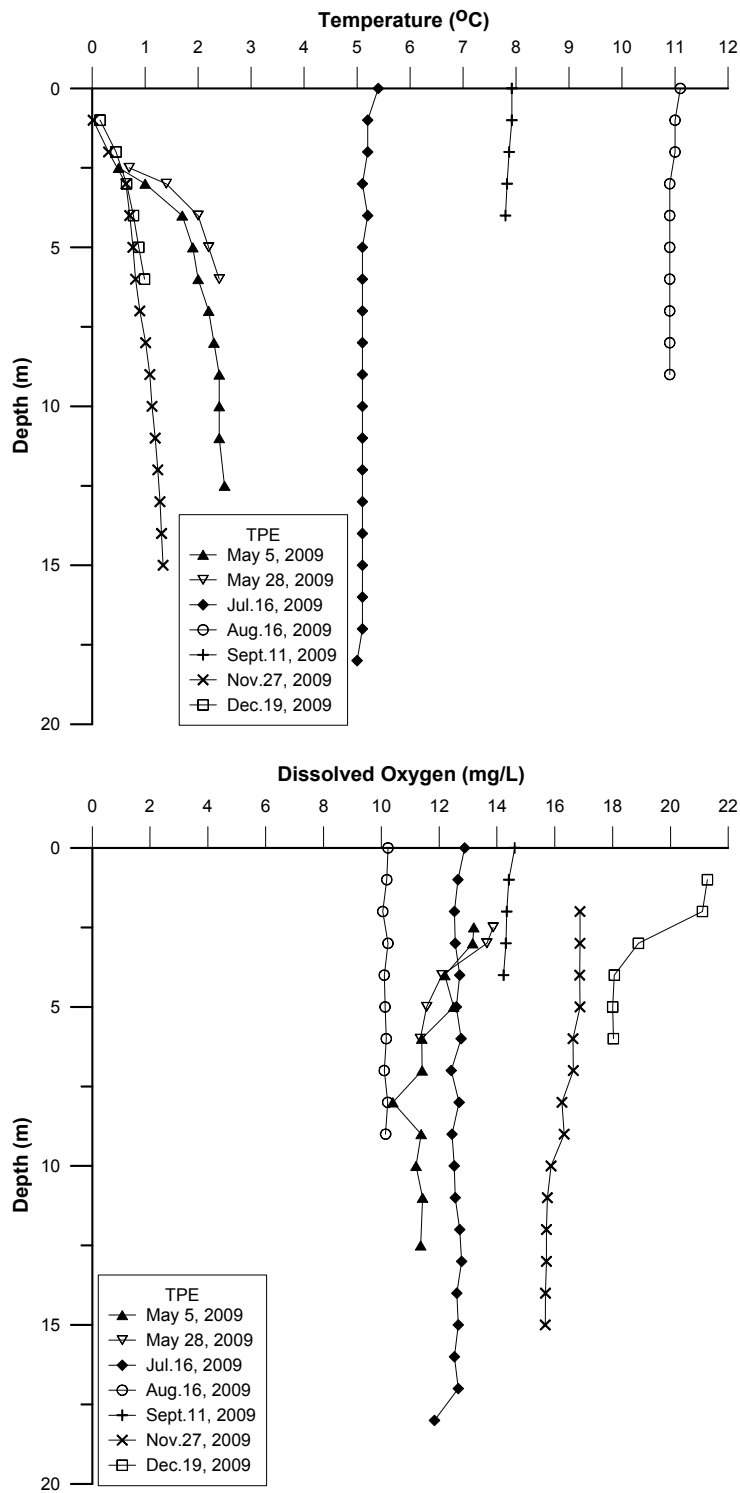


Figure 3-2. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– North Basin, 2009.

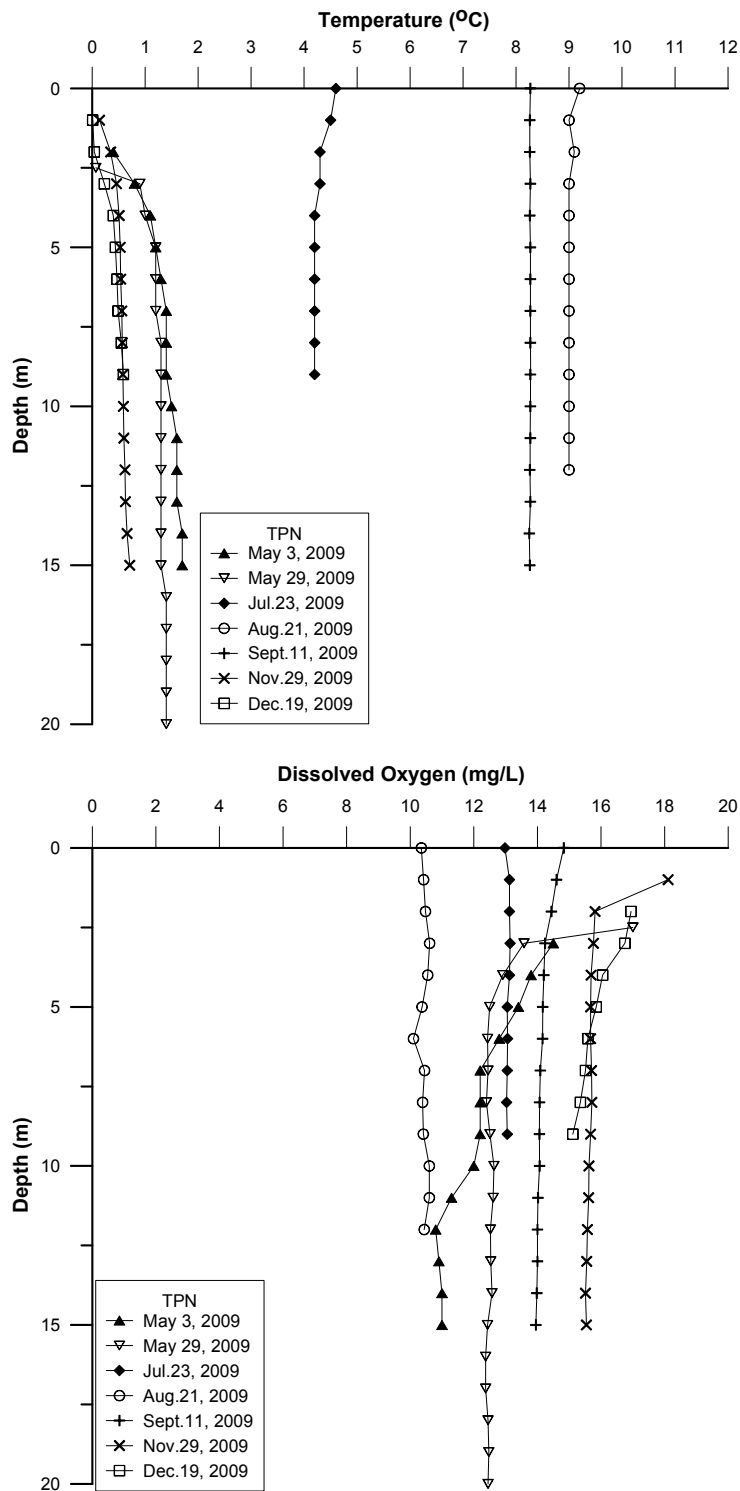


Figure 3-3. Temperature (°C) and dissolved oxygen (mg/L) profiles for Third Portage Lake– South Basin, 2009.

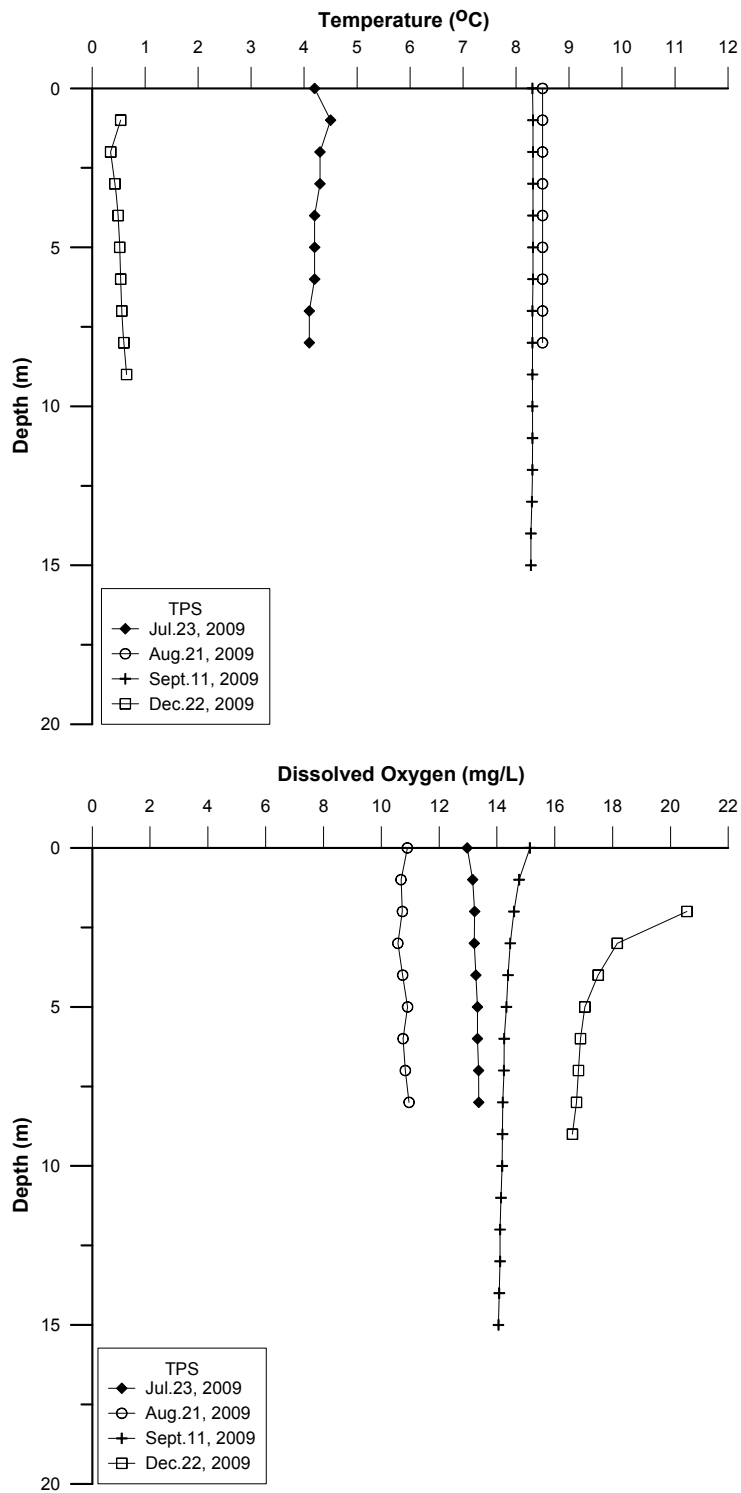


Figure 3-4. Temperature (°C) and dissolved oxygen (mg/L) profiles for Second Portage Lake, 2009.

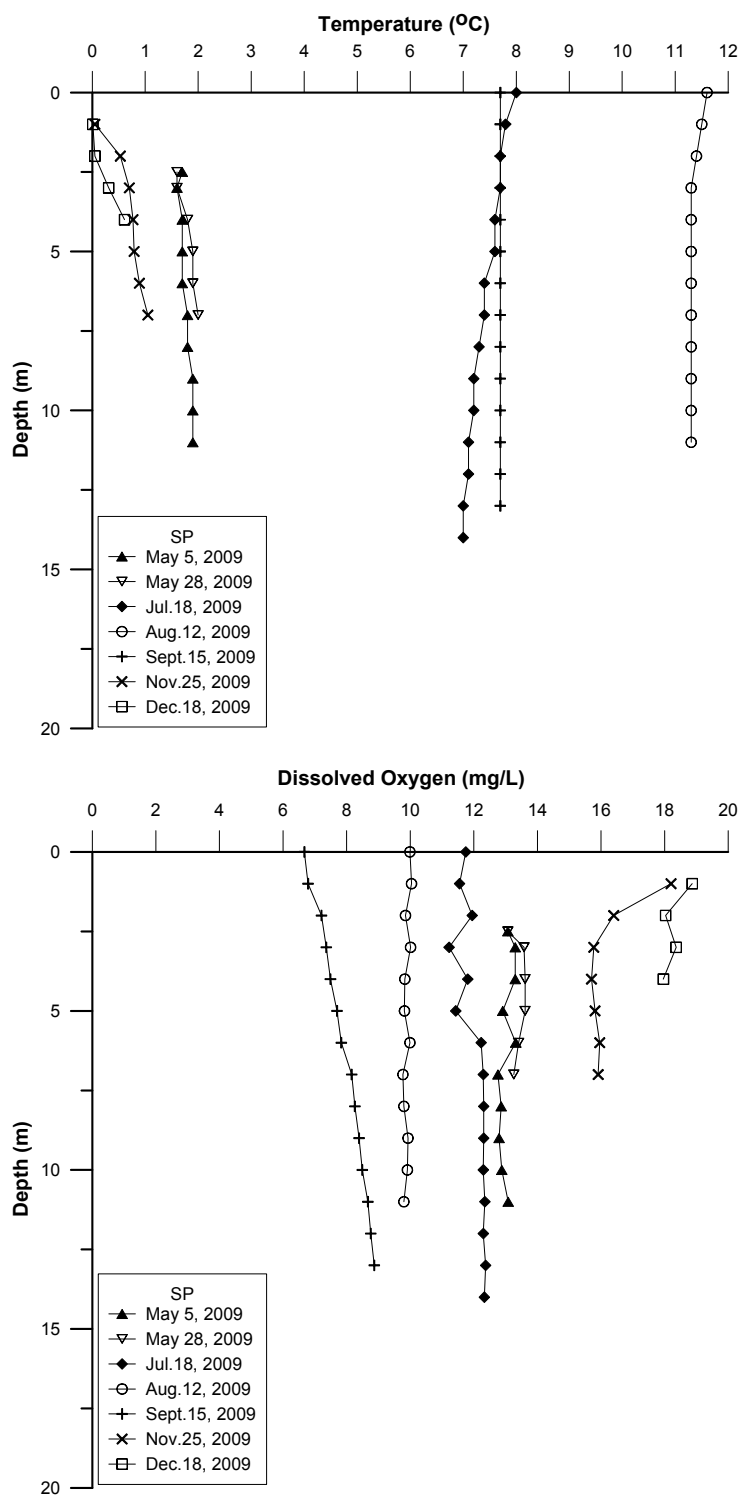


Figure 3-5. Temperature (°C) and dissolved oxygen (mg/L) profiles for Tehek Lake, 2009.

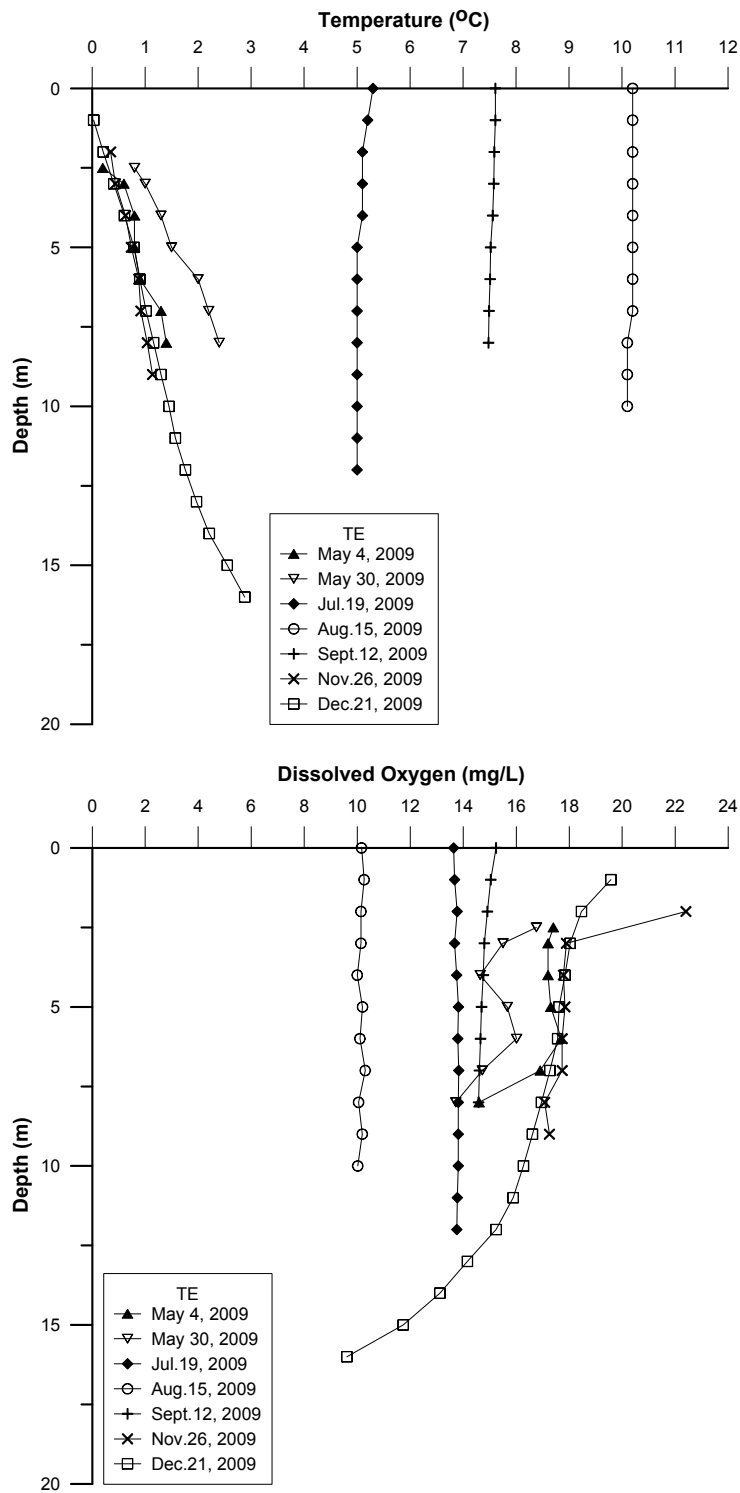


Figure 3-6. Temperature (°C) and dissolved oxygen (mg/L) profiles for Tehek Lake Farfield, 2009.

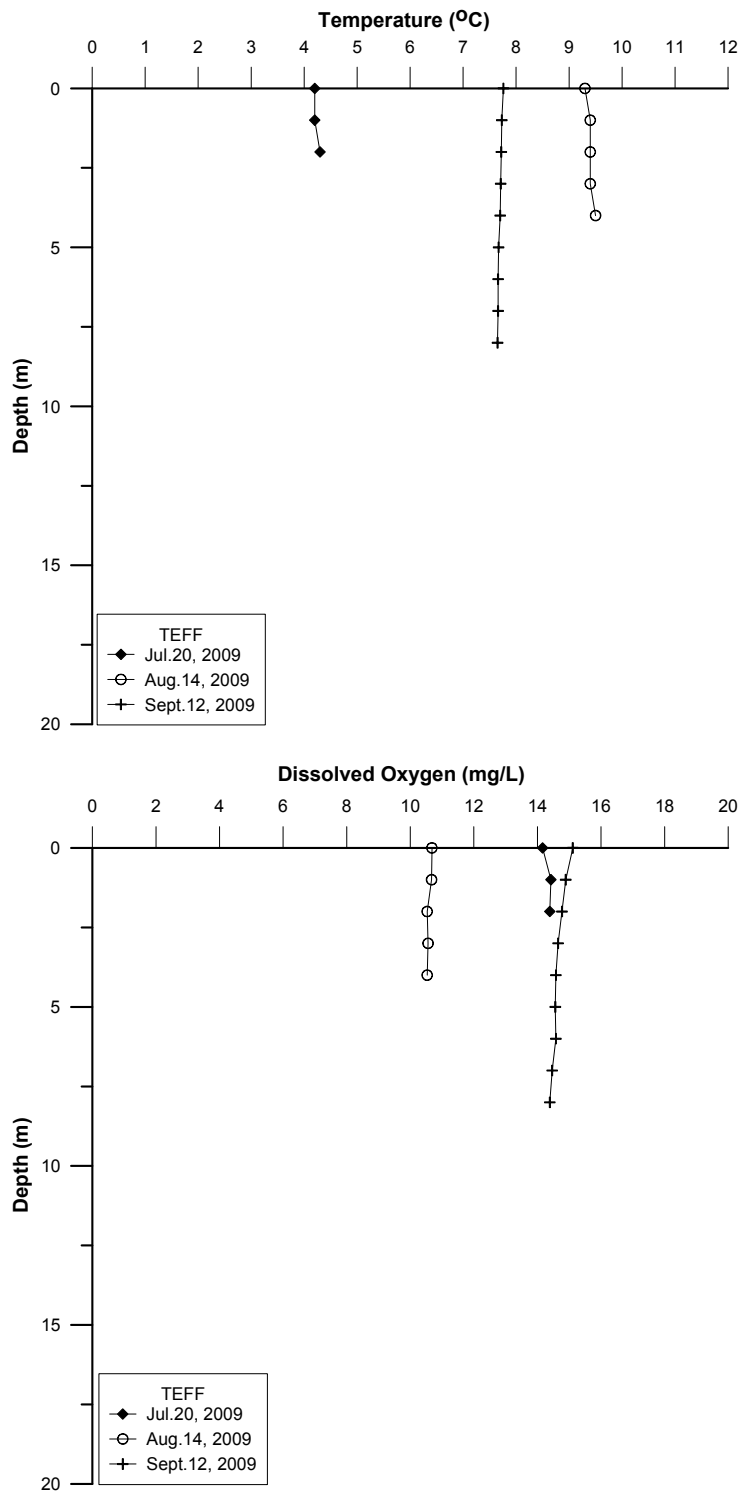


Figure 3-7. Temperature (°C) and dissolved oxygen (mg/L) profiles for Inuggugayualik Lake, 2009.

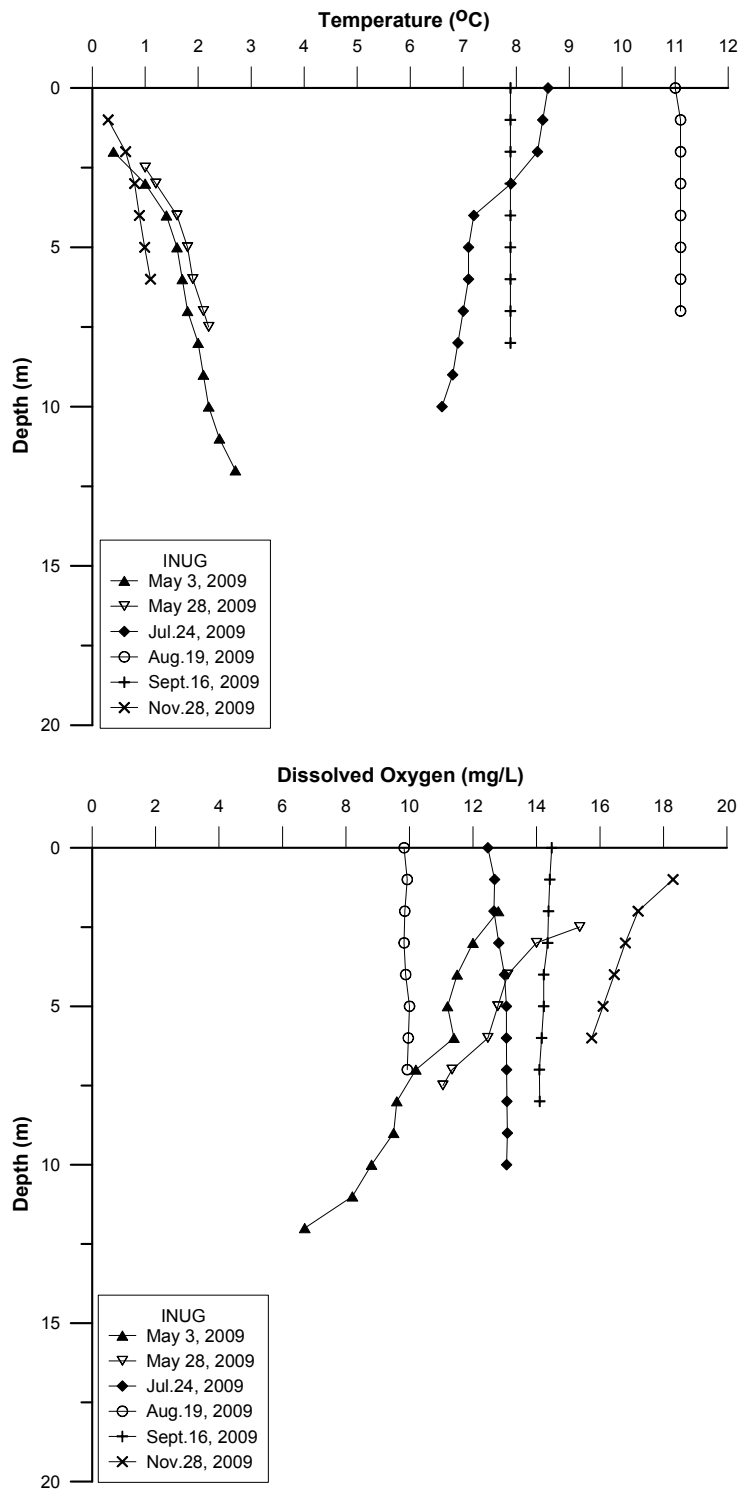


Figure 3-8. Temperature (°C) and dissolved oxygen (mg/L) profiles for Wally Lake, 2009.

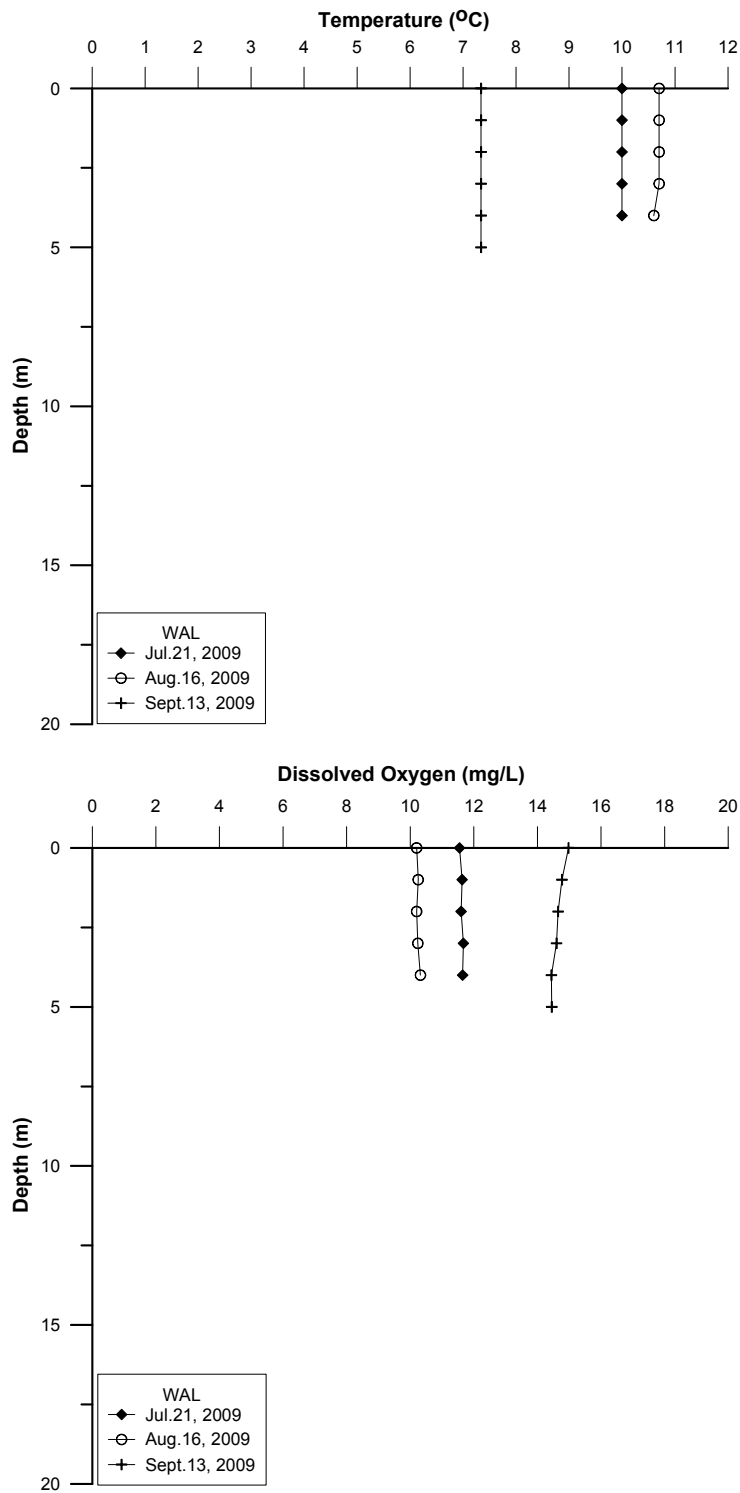


Figure 3-9. Temperature (°C) and dissolved oxygen (mg/L) profiles for Pipedream Lake, 2009.

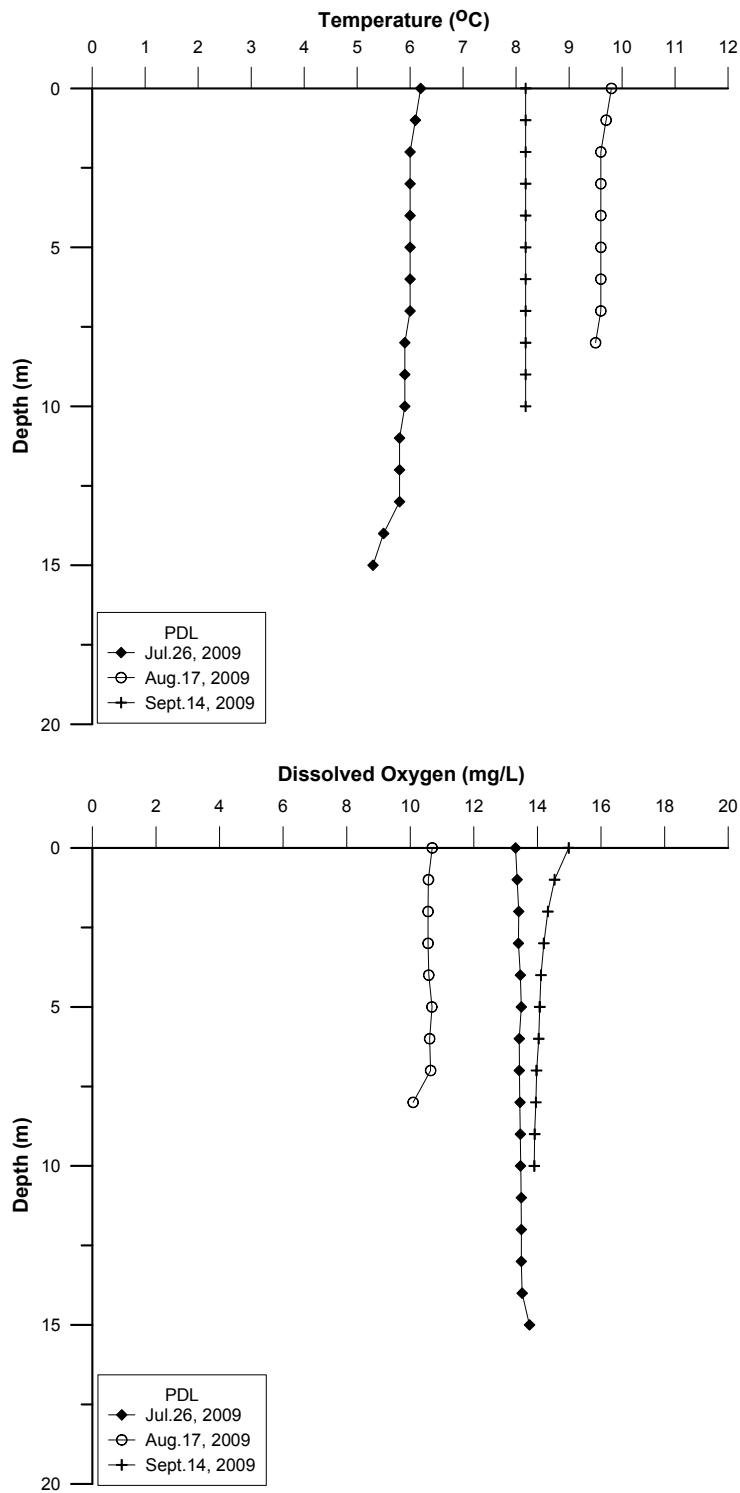


Figure 3-10. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake – Barge Dock, 2009.

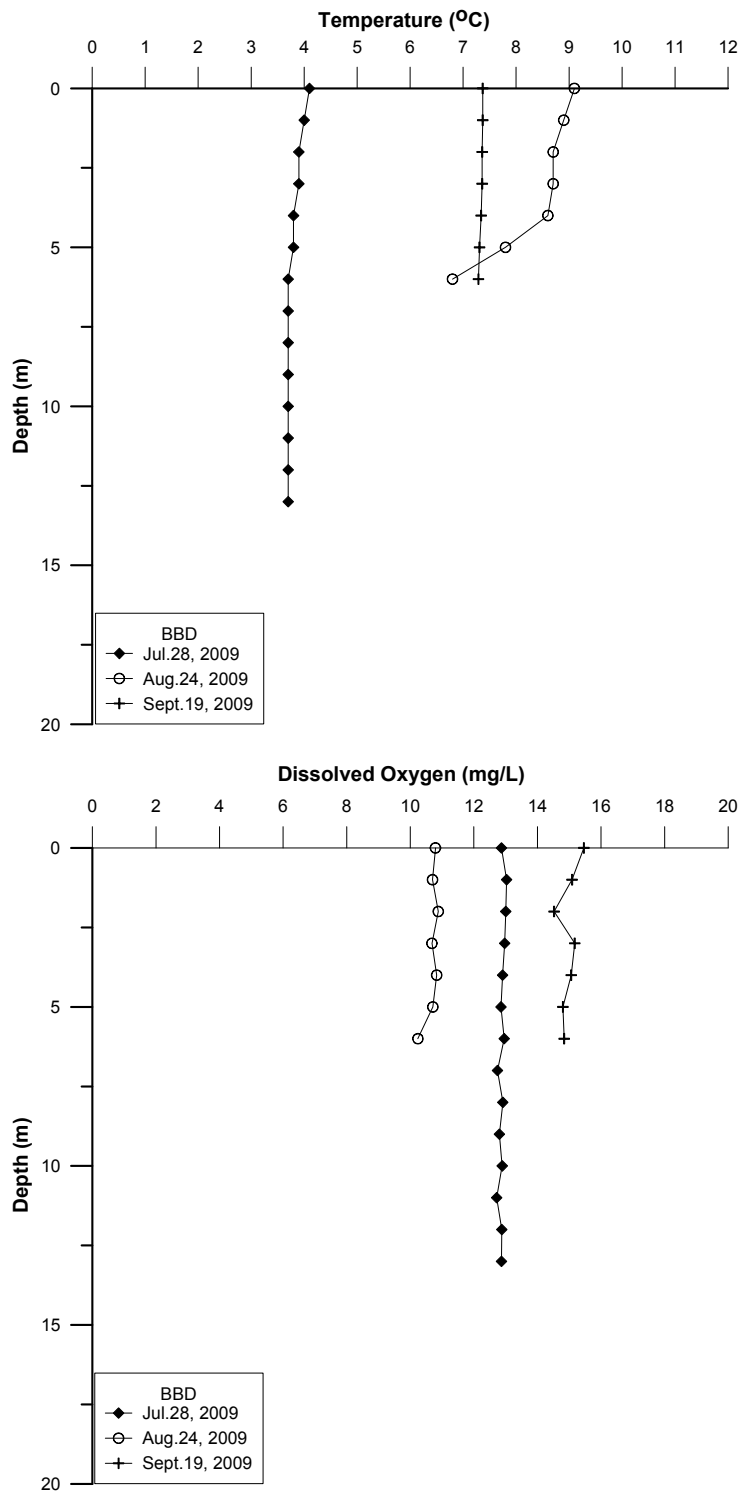


Figure 3-11. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake – Proposed Jetty, 2009.

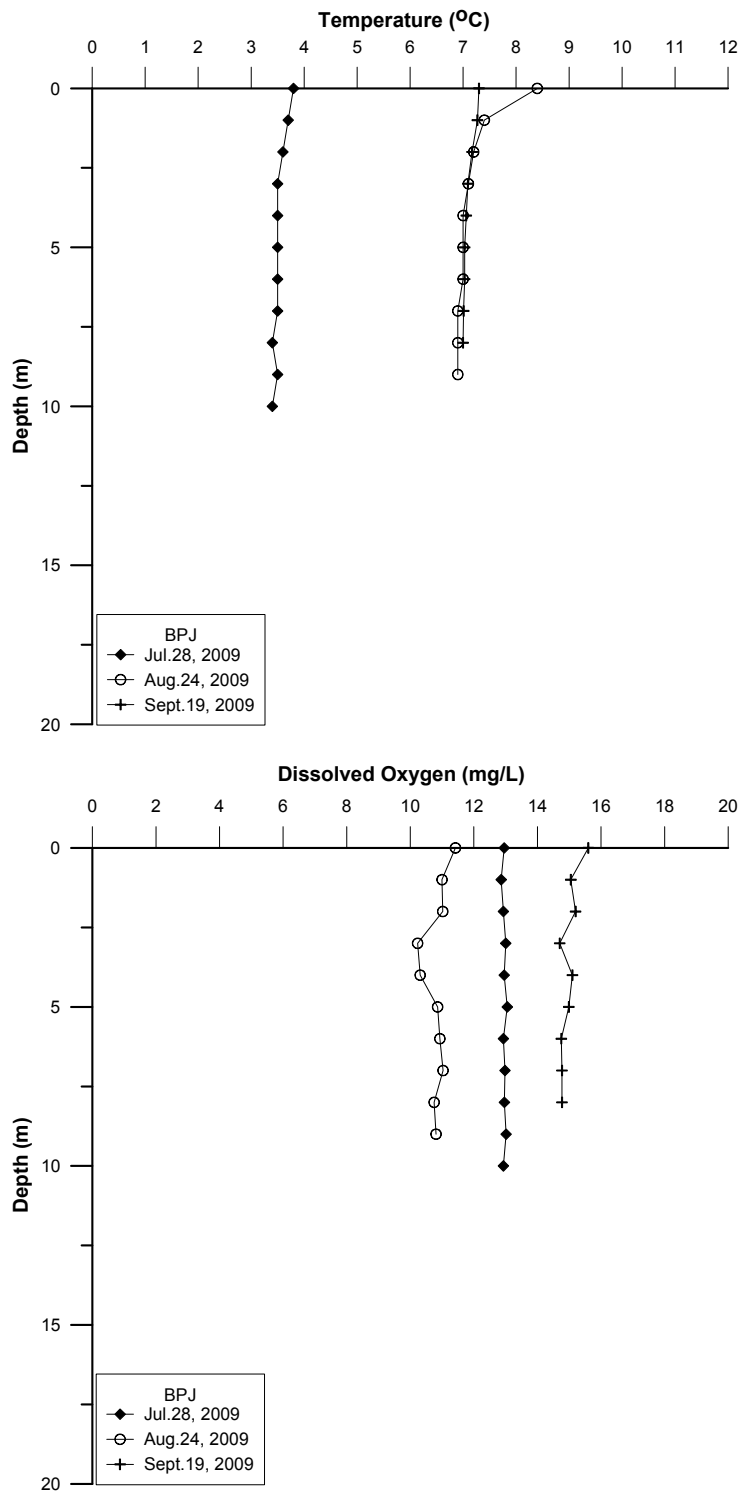


Figure 3-12. Temperature (°C) and dissolved oxygen (mg/L) profiles for Baker Lake– Akilahaarjuk Point, 2009.

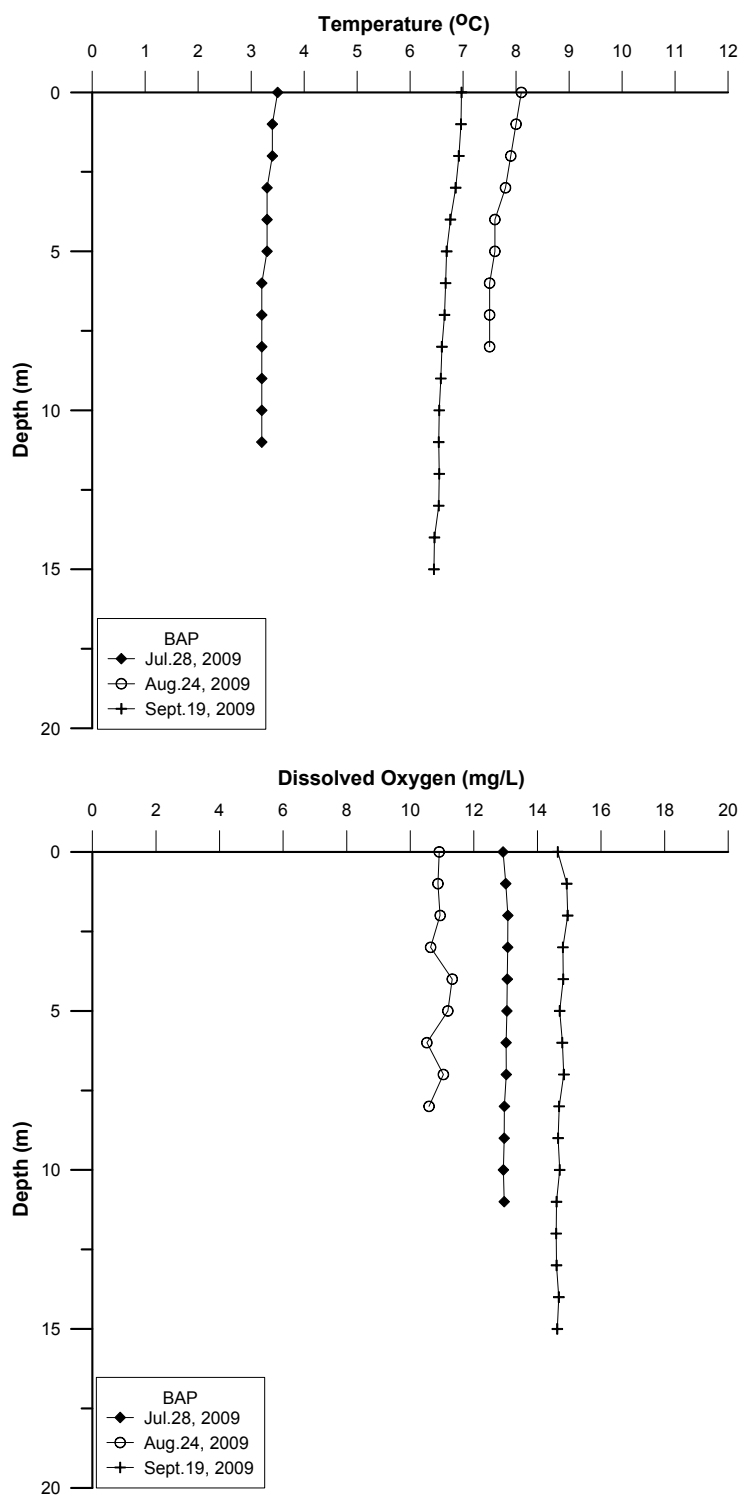
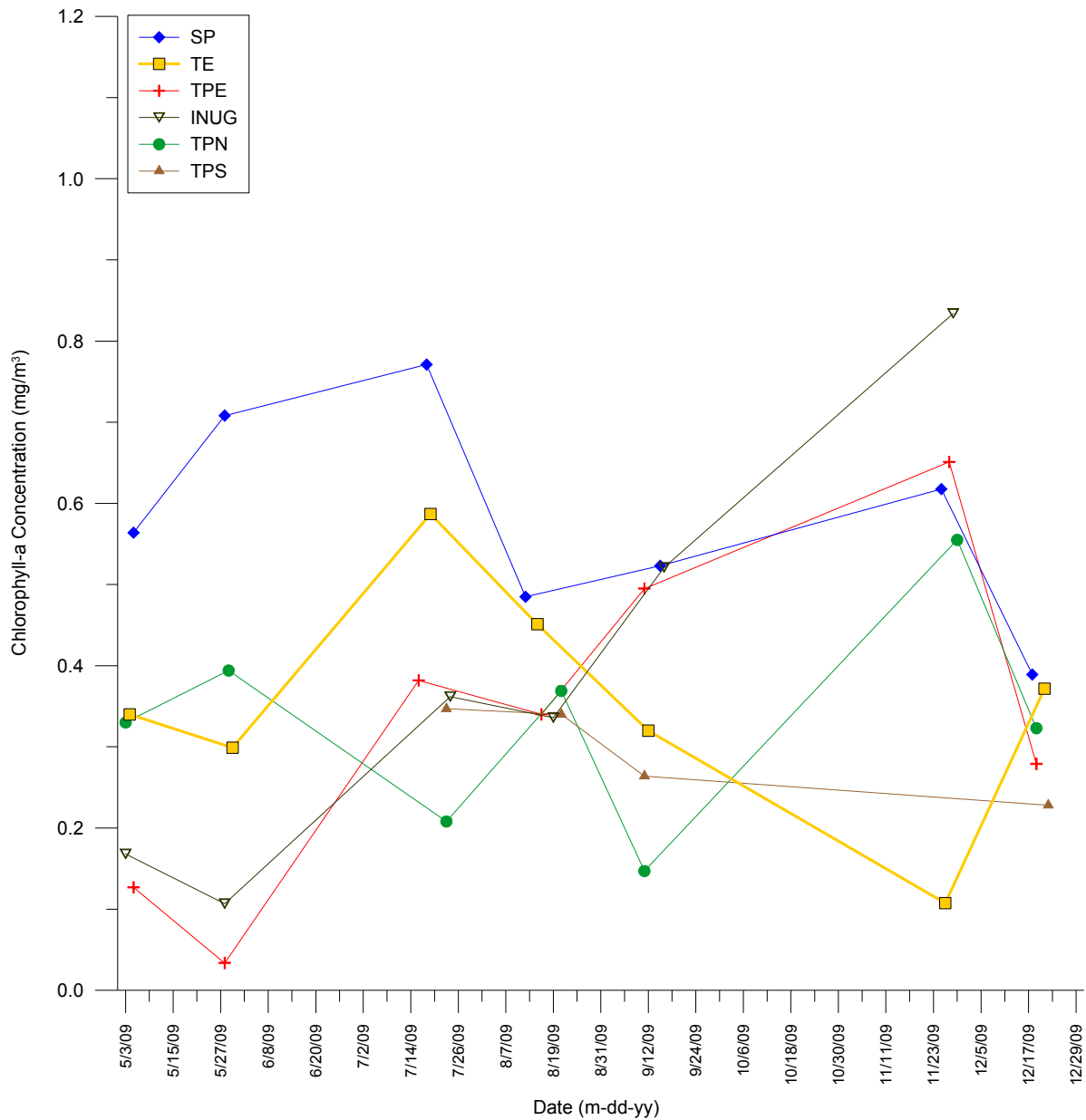


Figure 3-13. Seasonal chlorophyll- α concentrations for Second & Third Portage, Tehek, and Inuggugayualik Lakes, 2009.



3.3. Sediment Chemistry

3.3.1. Meadowbank Study Lakes

Total metals concentrations (mg/kg dry weight), PAHs, oil and grease, hydrocarbons, pH, moisture content, total organic carbon and particle size were measured in sediment from each sampling station during summer sampling only (**Table 3-6**). Because the study lakes are headwater lakes, there are no significant fluvial sources of sediments; therefore sedimentation rates in the lakes are likely extremely low. Consequently, changes to sediment chemistry would be expected to occur only very slowly under natural conditions. Local geology and hydrology, therefore, would also be expected to strongly influence sediment chemistry within these lakes.

Sediment was acquired from all stations at depths ranging from 4.8–8.7 m. To ensure consistency and provide relevant information for benthic communities, the sediment was sampled from the same depths/locations as the benthos samples. For this reason, sediment grain size was consistent among lakes and was dominated by fine sediments (75–98% silt/clay).

Total organic carbon concentrations ranged from 2.5–8.7% dry weight over the study lakes (except for Pipedream Lake, which had a TOC of 0.7%), which is reasonably high for an oligotrophic system and illustrates the likely small amount of inorganic input into the lakes and low sedimentation rate. These values are consistent with total organic carbon concentrations measured in previous years (Azimuth, 2009a, 2008a, b; BAER, 2005).

Sediment metals concentrations measured in each of the study lakes were compared against federal (CCME, 2002) ISQG and PEL sediment quality guidelines (**Table 3-6**) for those metals for which there are SQG guidelines. Note that exceedences of these guideline values does not necessarily imply that adverse effects have occurred or are expect to occur. These values are relatively conservative and do not reflect site-specific conditions, regional geochemistry or adaptations by benthic organisms to regional characteristics.

Arsenic, chromium and copper exceeded ISQGs in all Meadowbank study lakes in 2009, which was consistent with results from all previous years at all locations (Azimuth, 2009a, 2008a, b; BAER, 2005). Arsenic exceeded the PEL in most lakes, while chromium exceeded the PEL in Third Portage Lake North, and South, Inuggugayualik Lake and Pipedream Lake. Lead (37 mg/kg) and zinc (127 mg/kg) marginally exceeded the ISQGs in Wally Lake. The similarity and magnitude of concentrations in these metals is indicative of background. Zinc also exceeded in SP (124 mg/kg) in 2009, but was within the typical range for this metal from previous years (Azimuth, 2009a, 2008a, b;

BAER, 2005). Baseline concentrations of zinc hovered around the ISQG and occasionally exceeded the conservative guideline concentration at some locations, but not in any consistent pattern.

Elevated metals, primarily chromium and zinc, were identified in sediment trap samples collected from Second Portage Lake in 2008 (Azimuth, 2009c). The sediment coring investigation conducted last year at all CREMP stations was repeated at four locations (INUG, SP, TE, and TPE [prior to the onset of Bay-Goose Dike construction]) in 2009 to determine whether TSS releases during East Dike construction may have affected sediment chemistry; details of this study are reported in the TSS EAS (Azimuth, 2010b).

Polycyclic aromatic hydrocarbons (PAHs) and oil & grease were measured in sediment for the first time in 2008. These parameters were measured in order to establish a baseline prior to mine development and have been repeated this year as follow-up monitoring. Light & heavy extractable petroleum hydrocarbons (LEPHs & HEPHs) were measured in sediment in 2009 for the first time as part of the CREMP. These parameters were included this year in response to elevated oil & grease concentrations detected in sediments in 2008. The laboratory had suggested that other organics, such as plant material, may have confounded the results. Since then, the laboratory has discovered a calculation error and is adjusting the results from the previous year; the elevated concentrations that were flagged are actually below detection. In 2009, concentrations of all PAHs, oil & grease, and LEPHs & HEPHs were below detection limits in sediment for all stations (**Table 3-6**).

3.3.2. Baker Lake

Baker Lake sediments were analyzed for the same parameters as were Meadowbank study sediments (**Table 3-6**). Sediment was acquired from the three stations at depths ranging from 6.5–8.3 m. Sediment grain size was consistent among Baker Lake stations and was generally dominated by sand. Total organic carbon concentrations were low and ranged from 0.2–0.9% dry weight.

Sediment metals concentrations measured in each of the study lakes were compared against federal (CCME, 2002) ISQG and PEL sediment quality guidelines (**Table 3-6**) for those metals for which there are SQG guidelines. Arsenic was the only metal that exceeded CCME guideline concentrations at the barge dock (BBD) and the proposed jetty (BPJ) locations. None of the other metals that exceeded guidelines from the study lakes were exceeded in Baker Lake; this may be in part due to larger grain size material (e.g., sand rather than clay). The range in metals concentration among stations was relatively small, usually less than 2 times the average concentration.

Concentrations of all PAHs, oil & grease, and LEPHs & HEPHs were below detection limits in sediment for the three stations. Oil and grease slightly exceeded detection limits



at BAP, the reference station (**Table 3-6**), but this was likely due to organic matter and not hydrocarbons, given the absence of LEPH and HEPH chemicals in the sediment at this reference site.



Table 3-6. Conventional sediment chemistry, hydrocarbons, PAHs and total metals (mg/kg), Meadowbank study lakes & Baker Lake, August 2009.

Lake & Basin			Third Portage Lake			Second Portage Lake	Tehek Lake	Tehek Farfield	Inuggugayualik Lake	Wally Lake	Pipedream Lake	Baker Lake		
	Sediment Quality Guidelines (CCME 2002) ¹		East	North	South							Barge Dock	Proposed Jetty	Akilahaarjuk Point
Station ID			TPE	TPN	TPS	SP	TE	TEFF	INUG	WAL	PDL	BBD	BPJ	BAP
Date	ISQG	PEL	13-Aug-09	21-Aug-09	21-Aug-09	12-Aug-09	14-Aug-09	14-Aug-09	20-Aug-09	16-Aug-09	17-Aug-09	25-Aug-09	26-Aug-09	25-Aug-09
CONVENTIONAL PARAMETERS														
Physical & Organic Parameters														
Moisture (%)	NG	NG	86.7	81.4	85.6	84.5	80.7	84.5	80.8	88.4	57.8	33.1	42.3	46.6
pH	NG	NG	6.26	6.00	6.05	6.28	6.11	6.27	5.95	6.40	6.50	6.73	7.24	6.20
Total Organic Carbon (% dw)	NG	NG	3.41	2.86	4.22	3.74	2.49	2.87	3.52	8.72	0.72	0.20	0.38	0.93
Particle Size														
% Gravel (>2mm)	NG	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0
% Sand (2.00mm - 0.063mm)	NG	NG	6	25	5	2	5	5	7	6	20	61.0	55.0	68.0
% Silt (0.063mm - 4µm)	NG	NG	58	54	62	68	66	61	69	60	46	35.0	38.0	28.0
% Clay (<4µm)	NG	NG	36	21	33	30	29	34	24	34	33	3.0	6.0	4.0
AGGREGATE ORGANICS (mg/kg)														
Oil and Grease	NG	NG	<3055	<1300	<1700	<1525	<500	<275	<1300	<2100	<500	<500	<500	770
HYDROCARBONS (mg/kg)														
EPH10-19	NG	NG	<500	<370	<440	<440	<360	<420	<360	<570	<200	<200	<200	<200
EPH19-32	NG	NG	<500	<370	<440	<440	<360	<420	<360	<570	<200	<200	<200	<200
LEPH	NG	NG	<500	<370	<440	<440	<360	<420	<360	<570	<200	<200	<200	<200
HEPH	NG	NG	<500	<370	<440	<440	<360	<420	<360	<570	<200	<200	<200	<200
POLYCYCLIC AROMATIC HYDROCARBONS														
Acenaphthene (mg/kg)	0.00671	0.0889	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.0050	<0.0050	<0.0050
Acenaphthylene (mg/kg)	0.00587	-0.128	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.0050	<0.0050	<0.0050
Anthracene (mg/kg)	0.0469	0.245	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.0040	<0.0040	<0.0040
Benz(a)anthracene (mg/kg)	0.0317	0.385	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Benzo(a)pyrene (mg/kg)	0.0319	0.782	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Benzo(b)fluoranthene (mg/kg)	NG	NG	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Benzo(g,h,i)perylene (mg/kg)	NG	NG	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Benzo(k)fluoranthene (mg/kg)	NG	NG	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Chrysene (mg/kg)	0.0571	0.862	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Dibenz(a,h)anthracene (mg/kg)	0.00622	0.135	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.0050	<0.0050	<0.0050
Fluoranthene (mg/kg)	0.111	2.355	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Fluorene (mg/kg)	0.0212	0.144	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Indeno(1,2,3-c,d)pyrene (mg/kg)	NG	NG	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
2-Methylnaphthalene (mg/kg)	0.0202	0.201	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Naphthalene (mg/kg)	0.0346	0.391	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Phenanthrene (mg/kg)	0.0419	0.515	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010
Pyrene (mg/kg)	0.0530	0.8750	<0.13	<0.050	<0.050	<0.10	<0.10	<0.10	<0.10	<0.050	<0.050	<0.010	<0.010	<0.010

Table 3-6. Conventional sediment chemistry, hydrocarbons, PAHs and total metals (mg/kg), Meadowbank study lakes & Baker Lake, August 2009.

Lake & Basin			Third Portage Lake			Second Portage Lake	Tehek Lake	Tehek Farfield	Inuggugayualik Lake	Wally Lake	Pipedream Lake	Baker Lake		
			East	North	South	Lake						Barge Dock	Proposed Jetty	Akilahaarjuk Point
Station ID	Sediment Quality Guidelines (CCME 2002) ¹		TPE	TPN	TPS	SP	TE	TEFF	INUG	WAL	PDL	BBD	BPJ	BAP
Date	ISQG	PEL	13-Aug-09	21-Aug-09	21-Aug-09	12-Aug-09	14-Aug-09	14-Aug-09	20-Aug-09	16-Aug-09	17-Aug-09	25-Aug-09	26-Aug-09	25-Aug-09
TOTAL METALS (mg/kg dw)														
Aluminum	NG	NG	23800	16700	25100	28300	27700	25400	25800	22500	27400	6060	7020	6410
Antimony	NG	NG	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic	5.9	17.0	18.1	9.80	18.0	42.5	23.5	12.7	16.3	41.5	23.1	8.60	7.60	<5.0
Barium	NG	NG	124	66.5	108	143	136	124	139	108	133	83.4	80.1	343
Beryllium	NG	NG	1.88	0.970	1.50	2.40	2.52	2.15	1.59	1.53	1.18	<0.50	<0.50	<0.50
Bismuth	NG	NG	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	-	-
Cadmium	0.6	3.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Calcium	NG	NG	1930	1390	1880	2360	2230	2060	2110	4250	2220	-	-	-
Chromium	37.3	90.0	80.7	101	112	76.9	60.5	55.2	115	60.5	125	11.0	16.1	16.4
Cobalt	NG	NG	16.1	8.80	13.4	17.6	13.2	12.3	12.1	9.20	22.0	4.60	5.40	4.20
Copper	35.7	197	53.8	46.7	70.6	89.5	74.4	57.2	55.2	119	47.5	4.80	6.90	7.40
Iron	NG	NG	50300	24600	33300	76800	55800	48000	46500	32000	41300	-	-	-
Lead	35.0	91.3	<30	<30	<30	<30	<30	<30	<30	37.0	<30	<30	<30	<30
Lithium	NG	NG	48.5	29.0	43.4	51.5	58.3	58.3	34.7	42.5	49.3	-	-	-
Magnesium	NG	NG	9320	7960	10500	10300	9930	8940	11100	9370	13400	-	-	-
Manganese	NG	NG	2900	300	578	2150	1580	2740	768	287	1730	-	-	-
Mercury	0.17	0.486	0.0679	0.0116	0.0208	0.0861	0.0275	0.0555	0.0236	0.0506	0.00700	<0.0050	0.00680	0.00510
Molybdenum	NG	NG	5.4	<4.0	<4.0	8.1	6.9	5.1	<4.0	7.8	4.7	<4.0	<4.0	<4.0
Nickel	NG	NG	65.0	49.7	71.9	72.4	48.7	38.7	79.8	51.1	103	7.90	9.80	9.90
Phosphorus	NG	NG	400	507	551	681	792	438	1070	611	364	544	807	708
Potassium	NG	NG	4350	2500	4160	5170	5400	5090	4070	3870	4620	-	-	-
Selenium	NG	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.0	<2.0	<2.0	<2.0	<2.0
Silver	NG	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Sodium	NG	NG	<200	<200	<200	260	260	240	220	220	250	-	-	-
Strontium	NG	NG	17.0	12.7	16.9	21.4	19.9	19.8	25.8	29.1	24.6	-	-	-
Thallium	NG	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Tin	NG	NG	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Titanium	NG	NG	781	450	684	795	953	862	632	654	938	-	-	-
Vanadium	NG	NG	38.0	29.2	39.3	42.6	42.7	39.2	39.6	30.5	45.9	14.8	19.6	20.7
Zinc	123	315	101	62.8	95.3	124	116	104	90.0	127	92.6	21.7	29.1	24.8

Notes:

NG = no guideline.

¹CCME (Canadian Council of Ministers of the Environment) Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, 1999, updated in 2002.

ISQG = Interim freshwater Sediment Quality Guideline, PEL = Probable Effect Level.

Shaded concentrations = or > ISQG.

Boxed concentrations also > PEL.

3.4. Phytoplankton

3.4.1. Meadowbank Study Lakes

Over 110 phytoplankton species were identified from the Meadowbank study lakes, represented by six major taxa: 9 Cyanophyte (blue green algae), 30 Chlorophyte (green algae), 38 Chrysophyte (golden-brown algae), 23 diatoms, 6 Cryptophyte and 8 Dinoflagellate taxa (**Appendix A**).

Density (**Table 3-7**) and biomass (**Table 3-8**) based results for major taxa groups show fairly similar results among stations during the open water season. Biomass-based community assemblage results across stations are shown in **Figure 3-14**. The phytoplankton assemblages were dominated by Chrysophytes (72% of abundance, 74% of biomass), with smaller proportions (<10%) of the other five major groups.

The dominant Chrysophyte taxa for the Meadowbank lakes were: *Chrysococcus*, *Chrysochromulina laurentiana* Kling, *Dinobryon sociale* Ehrenberg, *Chrysolkos skuja* (Nauwerck) Willen and *Kephyrion*. Dominating species for the other groups were: *Oocystis lacustris* Chodat and *Staurodesmus extensus* (Andersson) Teiling for chlorophytes, *Planktolyngbya limnetica* for cyanophytes, *Cyclotella michiganiana* Skvortzow for diatoms, *Cryptomonas erosa* Ehrenberg for cryptophytes, and *Gymnodinium* for dinoflagellates.

Chrysophytes are small, usually unicellular, and are very numerous in lake water; by virtue of their very large numbers, they frequently comprise the greatest biomass as a group. Density of Chrysophytes was high, comprising 72% of the total phytoplankton density (cells/L) with Chlorophytes having the next highest density at only 14% (**Table 3-7**). Compositionally, the study lakes in 2009 had comparable assemblages to those documented from the same stations in 2007 and 2008 (Azimuth, 2008a, 2009a). A chart of the phytoplankton species presence/absence at each sampling station in 2009, by season, is presented in **Appendix A**.

Phytoplankton biomass (mg/m^3) is generally a more important metric ecologically than density, as this represents the amount (by weight) of food available to fish. Trends in biomass were similar to density however, with Chrysophytes dominating biomass at 74% (**Table 3-8**). Diatoms and Dinoflagellates were the next most important groups (see also **Figure 3-14**). Among the nine sampling areas, total biomass per sample ranged from 23 mg/m^3 (TPS in mid-December) to 328 mg/m^3 (INUG in late July). Mean biomass (**Figure 3-15**) was also quite comparable among Meadowbank study lakes, and ranged from 107 mg/m^3 to 219 mg/m^3 .



Biomass of phytoplankton was typically highest during the open water months in most lake basins (**Table 3-8**). The range in biomass within lake basins between July and September tended to be smaller than differences in biomass between basins, which may be due to nutrient availability and water temperature. Third Portage Lake South is deep and cold and in the past has tended to have lower biomass than other basins. In 2009, water temperatures in all basins were somewhat colder than in previous years and this was reflected in relatively smaller differences in biomass between TPS and other stations. The largest seasonal decline in biomass and abundance among all stations was in Third Portage Lake East between July – August (272 mg/m³) and September (107 mg/m³). This was due to sediment inputs from Bay-Goose Dike construction that resulted in elevated TSS and turbidity, reducing light penetration and causing a small decline in production. Although the biomass in September in TPE was the lowest during open water months, September biomass was only slightly higher in Third Portage Lake North, Tehek Lake and Inuggugayualik Lake.

Over 110 plankton taxa were identified among the nine study sites in 2009, averaging 36 taxa per station (**Table 3-8 and Appendix A**). Taxa richness was similar among most stations during open-water sampling (32–46) and also for through-ice sampling (22–38). Taxa diversity was relatively stable among the nine study sites, with a Simpson's diversity index averaging 0.87 (**Table 3-8**). Third Portage Lake East had the lowest number of taxa in September (32) samples relative to the other stations, which again may have been due to lower biomass because of elevated turbidity.

Phytoplankton results are quite variable and as such it is often difficult to distinguish an apparent trend in any particular season or year from natural variability. The lack of consistency of this metric will be examined in greater detail. In 2009, a large number of extra samples were collected (targeting better characterization of temporal and spatial [horizontal and vertical] variability); these will be discussed in detail in the CREMP design review.

3.4.2. Baker Lake

At least 80 phytoplankton species were identified in Baker Lake, represented by six major taxa: 3 Cyanophyte (blue green algae), 23 Chlorophyte (green algae), 28 Chrysophyte (golden-brown algae), 16 diatom, 5 Cryptophyte and 6 Dinoflagellate taxa (**Appendix A**).

Density (**Table 3-7**) and biomass-(**Table 3-8**) based results for major taxa groups showed fairly similar results among stations during the open water season. Biomass-based community assemblage results across stations are shown in **Figure 3-14**. The phytoplankton assemblages were dominated by Chrysophytes, with smaller populations of the other five major groups.



The dominant Chrysophyte taxa at Baker Lake were: *Chrysococcus*, *Kephyrion*, *Dinobryon sertularia* Ehrenberg, *Chrysolkos skuja* (Nauwerck) Willen, *Uroglena volvox* Ehrenberg and *Chrysochromulina laurentiana* Kling.

Dominant taxa within the other groups were: *Chlamydomonas* (Chlorophyte), *Planktolyngbya limnetica* (Cyanophyte), *Cyclotella stelligera* Cleve and Grunow, *Synedra acus* Kutzing, *Asterionella formosa* Hassall and *Aulacoseira italica v subarctica* (O.Muller) Simonsen (Diatom), *Rhodomonas minuta* Skuja, *Cryptomonas erosa* Ehrenberg and *Katablepharis ovalis* Skuja (Cryptophyte), and *Gymnodinium* and *Peridinium pusillum* (Penard) Lemmermann (Dinoflagellate).

Chrysophytes comprised 66% of the total phytoplankton density (cells/L) with Chlorophytes having the next highest density at only 18% (**Table 3-7**). A chart of the phytoplankton taxa presence/absence at each of the three sampling station in 2009, by season, is presented in **Appendix A**.

Trends in biomass were similar to density, with Chrysophytes dominating biomass at 68% (**Table 3-8**). Diatoms and Dinoflagellates were the next most important groups (see also **Figure 3-14**). The three sampling stations had total phytoplankton biomass ranging from 184 mg/m³ to 468 mg/m³.

Eighty-one taxa were identified for the three study sites in July, August and September 2009, averaging 41 taxa per station (**Table 3-8 and Appendix A**). Taxa richness was similar among stations and seasons, and ranged from 34 - 46. Taxa diversity was relatively stable among the three stations, with a Simpson's diversity index averaging 0.89 (**Table 3-8**). Taxa diversity was usually highest in August for Baker Lake stations.

Table 3-7. Seasonal density (cells/L) of major phytoplankton groups, Meadowbank study lakes & Baker Lake, 2009.

Station	Date	Phytoplankton Density (cells/L)						Total
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	
Third Portage Lake								
TPE-4-S	16-Jul-09	14368	230688	2139848	144280	45104	23552	2597840
TPE-7-S	16-Aug-09	1000	59272	1928712	302928	23552	11184	2326648
TPE-8-S	11-Sep-09	4200	590088	575920	59872	74640	1000	1305720
TPE-11-S	27-Nov-09	22752	308912	869664	151464	69056	7384	1429232
TPE-14-S	19-Dec-09	7092	326232	546484	10638	107880	0	998326
TPN-4-S	23-Jul-09	0	165632	1107336	87408	14568	10584	1385528
TPN-7-S	21-Aug-09	600	188384	1002176	73640	21952	14968	1301720
TPN-8-S	11-Sep-09	600	504680	1078400	74240	66256	21952	1746128
TPN-11-S	29-Nov-09	3546	436858	348408	32168	84412	100	905492
TPN-14-S	19-Dec-09	3646	106480	576252	8692	136148	300	831518
TPS-1-S	23-Jul-09	0	129912	1150840	194768	30336	1400	1507256
TPS-4-S	21-Aug-09	7784	539200	1044680	81024	30536	9584	1712808
TPS-5-S	11-Sep-09	1000	511864	1100152	81624	30136	400	1725176
TPS-8-S	22-Dec-09	0	71520	145586	17084	26722	100	261012
Second Portage Lake								
SP-4-S	18-Jul-09	0	93992	2216672	342664	31736	1600	2686664
SP-7-S	12-Aug-09	215520	309912	1402880	398920	215536	16368	2559136
SP-8-S	15-Sep-09	0	398520	1250416	526848	143896	8384	2328064
SP-11-S	25-Nov-09	22952	238272	1179576	242072	134912	7784	1825568
SP-14-S	18-Dec-09	100	280134	457434	89850	105488	500	933506
Tehek Lake								
TE-4-S	19-Jul-09	0	72440	1664704	359016	7784	1800	2105744
TE-7-S	15-Aug-09	400	181800	937320	138096	44304	15568	1317488
TE-8-S	12-Sep-09	22152	194968	1331440	150480	38320	800	1738160
TE-11-S	26-Nov-09	7184	432040	977424	141896	112360	1000	1671904
TE-14-S	21-Dec-09	0	312348	933198	113926	125618	6146	1491236
TEFF-1-S	20-Jul-09	0	173016	1707008	163448	1200	1800	2046472
TEFF-4-S	14-Aug-09	30336	124128	1722576	240472	51488	23152	2192152
TEFF-5-S	12-Sep-09	1000	224904	1743928	239672	36720	22752	2268976
Inuggugayualik Lake								
INUG-4-S	24-Jul-09	0	22152	2291544	299544	54488	9984	2677712
INUG-7-S	19-Aug-09	200	224904	2193520	183200	24152	600	2626576
INUG-8-S	16-Sep-09	43104	88208	1138472	124328	36520	7584	1438216
INUG-11-S	28-Nov-09	0	180600	894448	262024	131312	1200	1469584
Wally Lake								
WAL-1-S	21-Jul-09	35920	65856	2149232	86024	14768	1000	2352800
WAL-4-S	16-Aug-09	43104	347032	1403080	125528	31336	400	1950480
WAL-5-S	13-Sep-09	28736	296344	1641952	175232	88608	1000	2231872
Pipedream Lake								
PDL-1-S	26-Jul-09	7184	123728	1586896	132912	94592	12184	1957496
PDL-4-S	17-Aug-09	7184	130312	866480	102976	36920	400	1144272
PDL-5-S	14-Sep-09	0	374968	1665904	189784	22552	7984	2261192
MEADOWBANK LAKES								
Relative Abundance (%)		0.8	14	72	9.4	3.6	0.4	

Table 3-7. Seasonal density (cells/L) of major phytoplankton groups, Meadowbank study lakes & Baker Lake, 2009.

Station	Date	Phytoplankton Density (cells/L)						Total
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	
Baker Lake								
BBD-1-S	28-Jul-09	200	222904	2239424	120776	61872	2400	2647576
BBD-4-S	24-Aug-09	0	561152	2054456	547224	114160	17368	3294360
BBD-5-S	19-Sep-09	600	295544	1280552	250600	72040	1000	1900336
BPJ-1-S	28-Jul-09	0	122128	1867256	93024	256040	22952	2361400
BPJ-4-S	24-Aug-09	2400	1056448	1060048	227768	97192	8384	2452240
BPJ-5-S	19-Sep-09	10384	448208	1761680	292968	23352	7784	2544376
BAP-1-S	28-Jul-09	0	165232	1389112	134360	198568	15568	1902840
BAP-4-S	24-Aug-09	0	468360	1366176	274088	160448	7984	2277056
BAP-5-S	19-Sep-09	9584	539200	1214696	295400	14568	7584	2081032
BAKER LAKE								
Relative Abundance (%)		0.1	18	66	10	4.7	0.4	

Table 3-8. Seasonal biomass (mg/m³) and diversity of major phytoplankton groups, Meadowbank study lakes & Baker Lake, 2009.

Station	Date	Phytoplankton Biomass (mg/m ³)						# Species	Simpsons Diversity	
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate			Total
Third Portage Lake										
TPE-4-S	16-Jul-09	0.2	5.8	231.5	8.3	5.2	21.2	272.2	38	0.85
TPE-7-S	16-Aug-09	0.2	5.0	210.6	11.6	4.1	30.7	262.2	34	0.83
TPE-8-S	11-Sep-09	4.9	12.6	64.4	5.2	5.8	14.3	107.3	32	0.84
TPE-11-S	27-Nov-09	0.8	12.0	59.0	9.2	7.8	8.5	97.3	31	0.91
TPE-14-S	19-Dec-09	0.1	3.8	24.5	0.3	7.6	0.0	36.4	22	0.80
TPN-4-S	23-Jul-09	0	5.2	86.0	7.3	1.4	24.7	124.5	34	0.85
TPN-7-S	21-Aug-09	0.1	7.7	137.6	8.6	1.6	12.0	167.6	36	0.89
TPN-8-S	11-Sep-09	0.1	18.2	96.7	8.2	3.6	9.9	136.9	37	0.90
TPN-11-S	29-Nov-09	0.1	3.9	30.3	8.0	17.2	0.1	59.7	29	0.75
TPN-14-S	19-Dec-09	0.3	1.4	30.3	2.9	12.3	0.6	47.9	23	0.85
TPS-1-S	23-Jul-09	0	5.6	101.0	14.6	4.1	20.0	145.4	34	0.85
TPS-4-S	21-Aug-09	0.3	7.7	170.0	12.0	2.8	30.8	223.6	36	0.90
TPS-5-S	11-Sep-09	0.3	6.3	123.9	9.4	4.1	6.2	150.2	33	0.89
TPS-8-S	22-Dec-09	0	1.7	10.9	5.0	4.0	1.6	23.1	26	0.87
Second Portage Lake										
SP-4-S	18-Jul-09	0	1.9	222.9	34.1	5.3	13.2	277.4	38	0.80
SP-7-S	12-Aug-09	0.7	7.5	174.7	25.6	23.1	16.4	248.0	46	0.92
SP-8-S	15-Sep-09	0	9.7	163.9	96.2	17.7	18.7	306.2	45	0.90
SP-11-S	25-Nov-09	2.4	5.0	72.5	12.0	16.8	10.4	119.1	38	0.84
SP-14-S	18-Dec-09	0	4.3	28.8	6.6	15.4	5.1	60.2	26	0.86
Tehek Lake										
TE-4-S	19-Jul-09	0	3.7	172.8	36.0	0.8	16.3	229.7	34	0.87
TE-7-S	15-Aug-09	0.1	15.2	98.8	8.3	4.1	17.6	144.1	41	0.90
TE-8-S	12-Sep-09	0.6	6.7	94.7	11.9	4.7	3.7	122.2	40	0.89
TE-11-S	26-Nov-09	0.4	8.1	81.7	11.4	15.9	4.8	122.3	31	0.88
TE-14-S	21-Dec-09	0	6.9	51.8	6.0	17.2	22.9	104.8	30	0.85
TEFF-1-S	20-Jul-09	0	6.3	185.4	10.7	1.1	20.8	224.3	34	0.82
TEFF-4-S	14-Aug-09	1.2	5.0	138.5	18.6	3.2	29.9	196.4	44	0.87
TEFF-5-S	12-Sep-09	0.2	12.5	170.9	23.2	1.9	26.8	235.5	41	0.89
Inuggugayualik Lake										
INUG-4-S	24-Jul-09	0	1.9	271.5	23.5	7.2	24.9	329.0	40	0.85
INUG-7-S	19-Aug-09	0	8.3	156.2	13.4	2.8	9.4	190.2	44	0.85
INUG-8-S	16-Sep-09	0.8	3.7	96.3	9.4	2.9	11.8	124.9	40	0.90
INUG-11-S	28-Nov-09	0	6.5	103.4	21.1	13.9	16.2	161.2	33	0.92
Wally Lake										
WAL-1-S	21-Jul-09	0.6	3.8	216.2	4.3	1.0	5.9	231.8	34	0.82
WAL-4-S	16-Aug-09	0.8	14.9	104.0	14.7	3.6	3.4	141.4	40	0.88
WAL-5-S	13-Sep-09	1.4	15.2	138.5	21.0	6.8	13.0	196.0	45	0.88
Pipedream Lake										
PDL-1-S	26-Jul-09	0.1	5.1	210.3	12.9	7.5	50.8	286.6	39	0.89
PDL-4-S	17-Aug-09	0.2	5.0	94.6	10.8	2.2	8.8	121.6	32	0.88
PDL-5-S	14-Sep-09	0	5.1	151.5	17.1	1.7	15.3	190.6	35	0.88
MEADOWBANK LAKES										
Relative Biomass (%)		0.3	4.2	74	9.0	4.2	8.8			

Table 3-8. Seasonal biomass (mg/m³) and diversity of major phytoplankton groups, Meadowbank study lakes & Baker Lake, 2009.

Station	Date	Phytoplankton Biomass (mg/m ³)							# Species	Simpsons Diversity
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	Total		
Baker Lake										
BBD-1-S	28-Jul-09	0.1	6.5	248.9	19.7	10.3	18.6	304.1	43	0.85
BBD-4-S	24-Aug-09	0	12.6	290.7	114.4	19.0	31.7	468.4	44	0.93
BBD-5-S	19-Sep-09	0.1	11.1	123.6	36.0	8.0	14.1	192.9	34	0.89
BPJ-1-S	28-Jul-09	0	4.2	180.0	13.0	24.3	27.7	249.1	46	0.85
BPJ-4-S	24-Aug-09	0.4	17.9	110.1	30.2	14.9	9.9	183.5	38	0.89
BPJ-5-S	19-Sep-09	1.1	16.0	164.7	59.3	3.6	6.3	250.9	45	0.89
BAP-1-S	28-Jul-09	0	3.8	158.3	27.4	12.9	11.4	213.7	34	0.85
BAP-4-S	24-Aug-09	0	26.5	227.1	44.8	10.1	7.3	315.7	45	0.92
BAP-5-S	19-Sep-09	1.5	11.2	130.1	86.4	0.9	5.0	235.1	41	0.92
BAKER LAKE										
Relative Biomass (%)		0.1	4.5	68	18	4.3	5.5			

Phytoplankton Biomass (mg/m³)

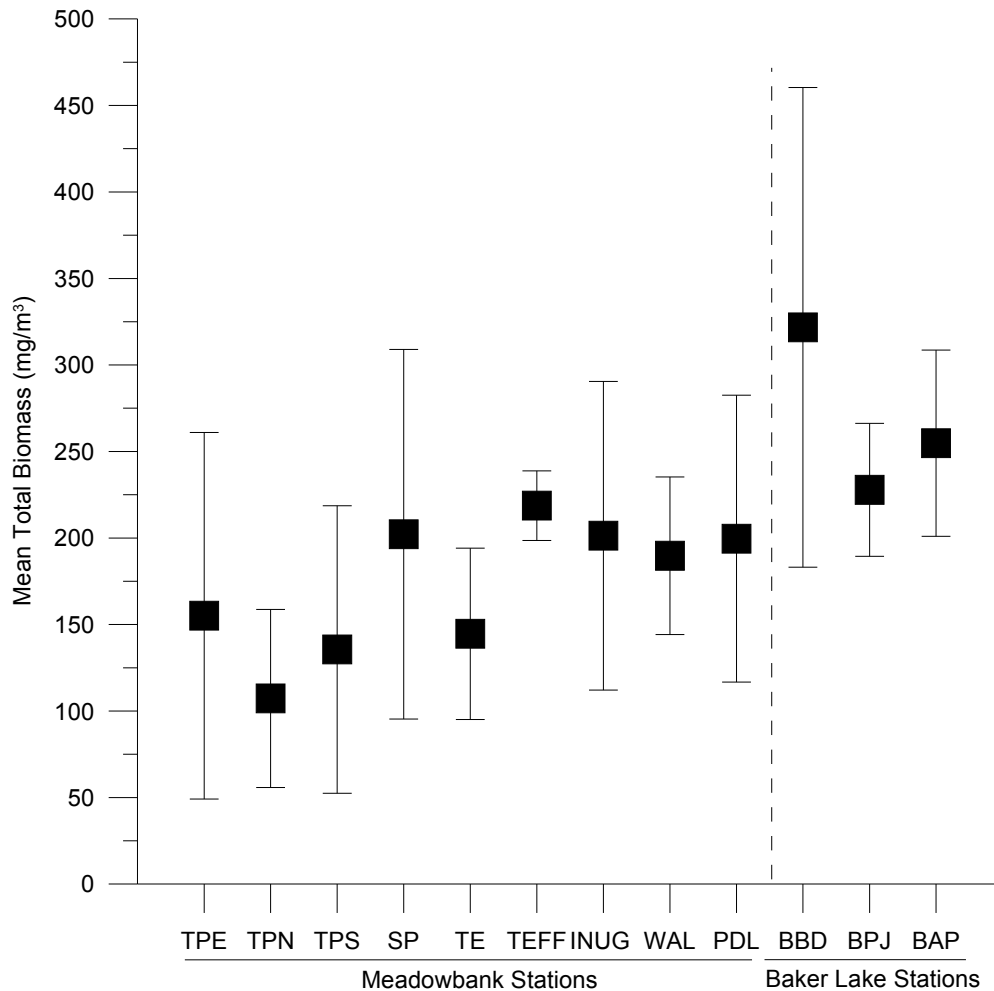
Legend:

- Dinoflagellate
- Cryptophyte
- Diatom
- Chrysophyte
- Chlorophyte
- Cyanophyte

Meadowbank Stations

Baker Lake Stations

Figure 3-15. Phytoplankton mean total biomass (mg/m^3), ± 1 standard deviation, Meadowbank study lakes & Baker Lake, 2009.



3.5. Benthic Invertebrates

Benthic invertebrates (collectively referred to as “benthos”) are small animals that live on or in the bottom sediments and are an important food source for most fish species, especially young-of-the-year and juvenile lake trout, round whitefish, and Arctic char (Machniak, 1975; Scott and Crossman, 1979). This section gives a general description of observations made on abundance and richness of all major taxa (e.g., insects, molluscs, worms). The abundance of roundworms (Nematoda) and seed shrimp (Ostracoda) is reported, but is not included in statistical comparisons of total number of genera, abundance or richness. Because of their small size, they are not consistently retained on a 500- μm sieve, thus their presence would be confounding if they were used to quantitatively compare abundance estimates among stations. Summarized data are in **Tables 3-9 and 3-10** and raw data are in **Appendix B**.

3.5.1. Meadowbank Study Lakes

A total of 35 taxa were identified and enumerated in the benthic invertebrate samples collected from the nine stations (**Appendix B**). Insects, almost exclusively chironomids, dominated number of organisms enumerated and number of taxa identified at all stations (except Tehek Lake) (**Tables 3-9 and 3-10**). Clearly, chironomid larvae (F. Chironomidae) were the dominant taxonomic group over all stations with about 60% of all taxa identified consisting of chironomids within five subfamilies (**Appendix B**). Six genera of chironomids dominated richness.

The most abundant chironomid genus was *Stictochironomus* (SF. Chironominae); however, this chironomid was only found in large numbers at Wally and Pipedream Lakes. *Procladius* (SF. Tanypodinae) was fairly abundant throughout all the study lakes. *Paratanytarsus* (SF. Chironominae) was abundant in Third Portage Lake South, Tehek Lake Farfield and Wally Lake, but rarely in the other lakes.

In addition to chironomid larvae, *Cyclocalyx/Neopisidium*, genera of the family Sphaeriidae (fingernail clams), were also abundant in the study lakes. Oligochaete worms were also relatively abundant in the lake sediments; generally, at least one oligochaete genus was present at all stations (**Appendix B**).

Abundance of organisms ($\#/\text{m}^2$) was relatively similar among most lakes/basins (**Table 3-9**). In most lakes/basins (see exceptions below), total abundance ranged from about $1200/\text{m}^2$ to $1700/\text{m}^2$ with Wally Lake having a higher abundance ($2265/\text{m}^2$). This was also consistent with 2008 results for these areas (Azimuth, 2009a). Benthic invertebrate abundance in Wally Lake has sometimes been 2–3 times higher than the rest of the project lakes (2006 & 2007), possibly because of its shallower depth, warmer water and higher total organic content in sediment (8% relative to 3% in the other lakes).



Inter-annual variability in benthos abundance and diversity can be naturally high. For example, mean abundance at Third Portage Lake East changed substantially between 2006 (3261/m²), 2007 (1578/m²), 2008 (5,626/m²), and 2009 (1713/m²). It should be noted that the sample collection in 2009 occurred prior to any significant increases in TSS related to Bay-Goose Dike construction. This variability is not uncommon, can complicate the detection of actual effects, and will be explored in more detail in the CREMP design review.

Changes in benthic community metrics can also occur as a result of exposure to mine-related stressors. In 2008, the CREMP benthos data set was used in the TSS EAS (Azimuth, 2009c) to determine whether elevated TSS from East Dike construction may have affected the benthic community. A marginal effect trend (i.e., not statistically significant, but a fairly large effect size) was identified for benthos abundance in Second Portage Lake, but not in Tehek Lake. In addition to another year of CREMP monitoring, the TSS EAS followed-up with a more spatially intensive investigation of the possible effects of increased TSS to benthic communities; both the CREMP and EAS benthos data sets are evaluated in more detail in this year's TSS EAS report (Azimuth, 2010b).

Benthic invertebrate abundance can be patchy, depending on the specific location of sampling that can differ from year to year within the sampling area, water depth, organic carbon, water temperature and development time of larvae and time of year. All of these factors contribute to variability both within and between stations and years. Several years of data are required to refine the range in abundance that might be considered to be 'typical' for a particular station.

This section explores the spatial difference (i.e., it looks for differences among lakes and/or basins) on total abundance and richness, and abundance and richness of all major taxa groups. Differences among lake stations that were normally distributed (or normal after transformation) were investigated independently using ANOVA. Where significant differences exist, pairwise comparisons (using t tests with pooled standard deviations) or Tukey's HSD [honestly significant difference] multiple comparisons were used to determine which lake stations were different from one another.

The statistical results from these tests for all variables (total abundance, abundance of each of four major taxa groups, total richness, and richness of each of four major taxa groups) are presented and plotted in **Table 3-11** and **Figures 3-16 and 3-17**.

Abundance and richness of organisms were similar for the most part among Meadowbank lake stations, with a few exceptions (**Figures 3-16 and 3-17**). Total abundance of organisms at Third Portage Lake East was significantly greater than at Tehek Lake. And a number of lake stations had significantly greater insect richness than both Second Portage Lake and Tehek Lake (**Table 3-11**).



3.5.2. Baker Lake

A total of 37 taxa were identified and enumerated in the benthic invertebrate samples collected from the three stations (**Appendix B**). Similar to Meadowbank lake stations, insects were dominant in terms of numbers of organisms enumerated and taxa identified at all three lake stations (**Tables 3-9 and 3-10**). Again, chironomid larvae (F. Chironomidae) were the dominant taxonomic group with about 65% of all taxa identified consisting of chironomids within five subfamilies (**Appendix B**).

Some differences were found among the Baker Lake stations. The most abundant chironomid genera were *Paratanytarsus* and *Stictochironomus* (SF. Chironominae) which were both found in high numbers at the Akilahaarjuk point station (BAP) but rarely at the barge dock (BBD) and the proposed jetty (BPJ). Similar to Meadowbank, *Procladius* (SF. Tanypodinae) was quite abundant in all Baker Lake stations.

In addition to chironomid larvae, *Cyclocalyx/Neopisidium*, genera of the family Sphaeriidae (fingernail clams), were also abundant in Baker Lake. Oligochaete worms were also reasonably abundant in the lake sediments; generally, at least one oligochaete genus was present at all stations (**Appendix B**).

As for Meadowbank lakes, this next section explores the spatial difference on total abundance and richness, and abundance and richness of all major taxa groups. Differences among lake stations that were normally distributed (or normal after transformation) were investigated independently using ANOVA. Where significant differences exist, pairwise comparisons (using t tests with pooled standard deviations) or Tukey's HSD [honestly significant difference] multiple comparisons were used to determine which lake stations were different from one another. The statistical results from these tests for all variables are presented and plotted in **Table 3-11** and **Figures 3-18 and 3-19**.

Abundance and richness of organisms were visually similar among the 2 Baker Lake exposure stations, with a general increase from BBD to BPJ to BAP (**Figures 3-18 and 3-19**). Total abundance of oligochaetes at BAP was significantly greater than at both BBD and BPJ. And BAP also had significantly greater total and oligochaete richness than both BBD and BPJ (**Table 3-11**). The reference station BAP appears to be quite different from the 2 exposure stations and thus may not prove to be ideal. Consideration of locating a new reference for Baker Lake will be given for 2010 sample planning.

Total abundance of organisms ranged from 930 organisms/m² (mean for BBD) to 4983 organisms/m² (mean for BAP). These abundances are similar or higher than mean abundances in Meadowbank project lakes, despite larger grain size and lower total organic carbon content of the sediment in Baker Lake. Mean total richness ranged from 7–19 taxa at Baker Lake stations.

Table 3-9. Benthic invertebrate total abundance ($\#/m^2$), Meadowbank study lakes & Baker Lake, August 2009.

Station	Date	Depth (m)	Total Abundance (#/m ²)				Total
			Oligochaetes	Insects	Molluscs	Other Taxa	
Third Portage Lake							
TPE-1	13-Aug-09	6.9	109	1130	217	87	1543
TPE-2	13-Aug-09	7.7	0	1196	696	0	1891
TPE-3	14-Aug-09	7.8	0	587	457	22	1065
TPE-4	14-Aug-09	6.5	174	870	587	196	1826
TPE-5	14-Aug-09	6.5	109	1326	717	87	2239
Station Mean			78	1022	535	78	1713
TPN-1	21-Aug-09	8.7	22	1022	522	0	1565
TPN-2	21-Aug-09	7.1	0	674	457	43	1174
TPN-3	21-Aug-09	8.5	0	826	609	43	1478
TPN-4	21-Aug-09	7.8	0	652	413	22	1087
TPN-5	21-Aug-09	8.8	0	478	391	22	891
Station Mean			4	730	478	26	1239
TPS-1	21-Aug-09	8.0	87	957	174	0	1217
TPS-2	21-Aug-09	6.8	22	2000	500	0	2522
TPS-3	21-Aug-09	7.3	283	2130	913	0	3326
TPS-4	21-Aug-09	7.3	0	1717	304	0	2022
TPS-5	21-Aug-09	9.7	43	304	370	0	717
Station Mean			87	1422	452	0	1961
Second Portage Lake							
SP-1	12-Aug-09	7.5	65	348	261	130	804
SP-2	12-Aug-09	7.7	22	391	261	22	696
SP-3	12-Aug-09	6.8	65	413	326	109	913
SP-4	12-Aug-09	7.1	43	435	326	43	848
SP-5	12-Aug-09	8.1	22	370	239	0	630
Station Mean			43	391	283	61	778
Tehok Lake							
TE-1	14-Aug-09	7.0	22	152	587	87	848
TE-2	14-Aug-09	7.4	109	391	196	65	761
TE-3	14-Aug-09	6.9	0	130	391	0	522
TE-4	14-Aug-09	8.2	0	391	348	130	870
TE-5	14-Aug-09	7.9	0	413	304	130	848
Station Mean			26	296	365	83	770
TEFF-1	14-Aug-09	6.9	0	587	239	196	1022
TEFF-2	14-Aug-09	6.6	22	1348	130	43	1543
TEFF-3	14-Aug-09	7.8	0	1109	326	0	1435
TEFF-4	14-Aug-09	7.2	0	609	326	43	978
TEFF-5	14-Aug-09	6.9	0	935	217	43	1196
Station Mean			4	917	248	65	1235
Inuggugayualik Lake							
INUG-1	20-Aug-09	7.6	109	522	435	65	1130
INUG-2	20-Aug-09	7.9	65	935	457	87	1543
INUG-3	20-Aug-09	7.0	0	1087	457	87	1630
INUG-4	20-Aug-09	6.9	0	304	326	0	630
INUG-5	20-Aug-09	6.9	43	522	370	87	1022
Station Mean			43	674	409	65	1191
Wally Lake							
WAL-1	16-Aug-09	4.8	348	4152	1109	130	5739
WAL-2	16-Aug-09	7.4	0	848	674	130	1652
WAL-3	16-Aug-09	7.3	22	761	522	87	1391
WAL-4	16-Aug-09	7.3	0	674	370	22	1065
WAL-5	16-Aug-09	7.5	87	826	500	65	1478
Station Mean			91	1452	635	87	2265
Pipedream Lake							
PDL-1	17-Aug-09	7.2	0	1348	630	22	2000
PDL-2	17-Aug-09	8.0	22	696	457	22	1196
PDL-3	17-Aug-09	8.3	22	500	196	43	761
PDL-4	17-Aug-09	7.3	196	2478	543	109	3326
PDL-5	17-Aug-09	7.5	326	848	152	22	1348
Station Mean			113	1174	396	43	1726

Table 3-9. Benthic invertebrate total abundance ($\#/m^2$), Meadowbank study lakes & Baker Lake, August 2009.

Station	Date	Depth (m)	Total Abundance (#/m ²)				Total
			Oligochaetes	Insects	Molluscs	Other Taxa	
<i>Baker Lake</i>							
BBD-1	25-Aug-09	6.5	65	326	0	0	391
BBD-2	25-Aug-09	7.5	22	130	0	22	174
BBD-3	25-Aug-09	7.6	0	22	0	0	22
BBD-4	25-Aug-09	7.6	43	87	0	0	130
BBD-5	25-Aug-09	8.0	239	3522	22	152	3935
		<i>Station Mean</i>	<i>74</i>	<i>817</i>	<i>4</i>	<i>35</i>	<i>930</i>
BPJ-1	26-Aug-09	7.6	109	4391	174	109	4783
BPJ-2	26-Aug-09	6.6	109	630	0	22	761
BPJ-3	26-Aug-09	6.9	0	43	0	0	43
BPJ-4	26-Aug-09	7.3	0	304	22	0	326
BPJ-5	26-Aug-09	6.7	22	217	43	0	283
		<i>Station Mean</i>	<i>48</i>	<i>1117</i>	<i>48</i>	<i>26</i>	<i>1239</i>
BAP-1	25-Aug-09	8.3	957	3826	0	22	4804
BAP-2	25-Aug-09	7.9	3348	3413	304	65	7130
BAP-3	25-Aug-09	6.8	2000	2283	348	130	4761
BAP-4	25-Aug-09	7.5	674	2804	609	500	4587
BAP-5	25-Aug-09	8.0	804	2174	457	196	3630
		<i>Station Mean</i>	<i>1557</i>	<i>2900</i>	<i>343</i>	<i>183</i>	<i>4983</i>

Table 3-10. Benthic invertebrate total richness (#taxa), Meadowbank study lakes & Baker Lake, August 2009.

Station	Date	Total Richness (#taxa)				Total
		Oligochaetes	Insects	Molluscs	Other Taxa	
Third Portage Lake						
TPE-1	13-Aug-09	2	8	1	1	12
TPE-2	13-Aug-09	0	10	1	0	11
TPE-3	14-Aug-09	0	7	1	1	9
TPE-4	14-Aug-09	0	10	1	1	12
TPE-5	14-Aug-09	2	8	1	1	12
Station Mean		1	9	1	1	11
TPN-1	21-Aug-09	1	9	1	0	11
TPN-2	21-Aug-09	0	7	1	1	9
TPN-3	21-Aug-09	0	6	1	1	8
TPN-4	21-Aug-09	0	5	1	1	7
TPN-5	21-Aug-09	0	9	1	1	11
Station Mean		0	7	1	1	9
TPS-1	21-Aug-09	1	9	1	0	11
TPS-2	21-Aug-09	1	9	1	0	11
TPS-3	21-Aug-09	1	9	1	0	11
TPS-4	21-Aug-09	0	10	1	0	11
TPS-5	21-Aug-09	1	6	1	0	8
Station Mean		1	9	1	0	10
Second Portage Lake						
SP-1	12-Aug-09	1	2	1	1	5
SP-2	12-Aug-09	1	4	1	1	7
SP-3	12-Aug-09	0	5	2	1	8
SP-4	12-Aug-09	0	6	1	1	8
SP-5	12-Aug-09	0	5	1	0	6
Station Mean		0	4	1	1	7
Tehok Lake						
TE-1	14-Aug-09	1	4	1	1	7
TE-2	14-Aug-09	0	5	1	1	7
TE-3	14-Aug-09	0	3	2	0	5
TE-4	14-Aug-09	0	5	1	2	8
TE-5	14-Aug-09	0	6	1	1	8
Station Mean		0	5	1	1	7
TEFF-1	14-Aug-09	0	9	1	1	11
TEFF-2	14-Aug-09	1	9	1	1	12
TEFF-3	14-Aug-09	0	7	1	0	8
TEFF-4	14-Aug-09	0	10	1	1	12
TEFF-5	14-Aug-09	0	7	1	1	9
Station Mean		0	8	1	1	10
Inuggugayualik Lake						
INUG-1	20-Aug-09	2	7	3	3	15
INUG-2	20-Aug-09	1	9	3	2	15
INUG-3	20-Aug-09	0	10	3	2	15
INUG-4	20-Aug-09	0	6	2	0	8
INUG-5	20-Aug-09	2	8	3	2	15
Station Mean		1	8	3	2	14
Wally Lake						
WAL-1	16-Aug-09	2	9	2	2	15
WAL-2	16-Aug-09	0	7	2	2	11
WAL-3	16-Aug-09	1	4	2	2	9
WAL-4	16-Aug-09	0	6	2	1	9
WAL-5	16-Aug-09	1	5	2	2	10
Station Mean		1	6	2	2	11
Pipedream Lake						
PDL-1	17-Aug-09	0	8	1	1	10
PDL-2	17-Aug-09	1	9	1	1	12
PDL-3	17-Aug-09	1	7	1	2	11
PDL-4	17-Aug-09	0	8	1	1	10
PDL-5	17-Aug-09	2	7	1	1	11
Station Mean		1	8	1	1	11

Table 3-10. Benthic invertebrate total richness (#taxa), Meadowbank study lakes & Baker Lake, August 2009.

Station	Date	Total Richness (#taxa)				Total
		Oligochaetes	Insects	Molluscs	Other Taxa	
<i>Baker Lake</i>						
BBD-1	25-Aug-09	2	5	0	0	7
BBD-2	25-Aug-09	1	4	0	1	6
BBD-3	25-Aug-09	0	0	0	0	0
BBD-4	25-Aug-09	2	2	0	0	4
BBD-5	25-Aug-09	1	15	1	1	18
<i>Station Mean</i>		<i>1</i>	<i>5</i>	<i>0</i>	<i>0</i>	<i>7</i>
BPJ-1	26-Aug-09	1	14	1	1	17
BPJ-2	26-Aug-09	1	4	0	1	6
BPJ-3	26-Aug-09	0	2	0	0	2
BPJ-4	26-Aug-09	0	8	1	0	9
BPJ-5	26-Aug-09	1	5	1	0	7
<i>Station Mean</i>		<i>1</i>	<i>7</i>	<i>1</i>	<i>0</i>	<i>8</i>
BAP-1	25-Aug-09	3	10	0	1	14
BAP-2	25-Aug-09	3	16	1	1	21
BAP-3	25-Aug-09	3	16	1	1	21
BAP-4	25-Aug-09	3	14	1	2	20
BAP-5	25-Aug-09	2	15	1	1	19
<i>Station Mean</i>		<i>3</i>	<i>14</i>	<i>1</i>	<i>1</i>	<i>19</i>

Table 3-11. ANOVA (or non-parametric equivalent) results testing differences among lake stations, Meadowbank study lakes & Baker Lake, August 2009.

		Data Transformation ¹	Normal?	Homogeneity of Variance?	ANOVA / Kruskal-Wallis?	Significant Differences?	p-value	Pairwise Comparison Results ²
MEADOWBANK LAKES								
Benthos Abundance (# / m ²)	Oligochaetes	sqrt	Yes	No	ANOVA	No	0.240	TPE >TE
	Insects	log10	Yes	No	ANOVA	Yes	<0.001	
	Molluscs	sqrt	Yes	No	ANOVA	Yes	0.036	
	Other	Rank	No	No	K-W	No	0.072	
	Total	log10	Yes	No	ANOVA	Yes	0.007	
Benthos Richness (# taxa)	Oligochaetes	Rank	No	No	K-W	No	0.466	INUG, PDL, TPE, TEFF, TPS> SP, TE
	Insects	sqrt	Yes	Yes	ANOVA	Yes	3.25E-05	
	Molluscs	Rank	No	No	K-W	Yes	1.05E-05	
	Other	Rank	No	No	K-W	Yes	0.003	
	Total	Rank	No	No	K-W	Yes	0.001	
BAKER LAKE								
Benthos Abundance (# / m ²)	Oligochaetes	sqrt	Yes	No	ANOVA	Yes	<0.001	BAP > BBD, BPJ
	Insects	log10	Yes	No	ANOVA	Yes	0.035	
	Molluscs	sqrt	Yes	No	ANOVA	Yes	0.007	
	Other	Rank	No	No	K-W	No	0.054	
	Total	log10	Yes	No	ANOVA	Yes	0.017	
Benthos Richness (# taxa)	Oligochaetes	NA	Yes	Yes	ANOVA	Yes	<0.001	BAP > BBD, BPJ
	Insects	sqrt	Yes	Yes	ANOVA	Yes	0.030	
	Molluscs	NA	Yes	Yes	ANOVA	No	0.178	
	Other	Rank	No	No	K-W	No	0.064	
	Total	NA	Yes	Yes	ANOVA	Yes	0.007	

Notes:

¹ Normality tested using Shapiro-Wilk test (p>0.05 assumed normal). Homogeneity of variance tested using Bartlett's test (p>0.05 assumed homogenous). Data were ranked for non-parametric Kruskal-Wallis test when both ANOVA assumptions were violated.

² Where ANOVA was used and significant differences were found, pairwise comparisons were used to further determine differences.

TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Farfield;

INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake;

BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilahaarjuk Point.

Figure 3-16. Benthic invertebrate replicates of abundance by major taxa group, Meadowbank study lakes, August 2009.

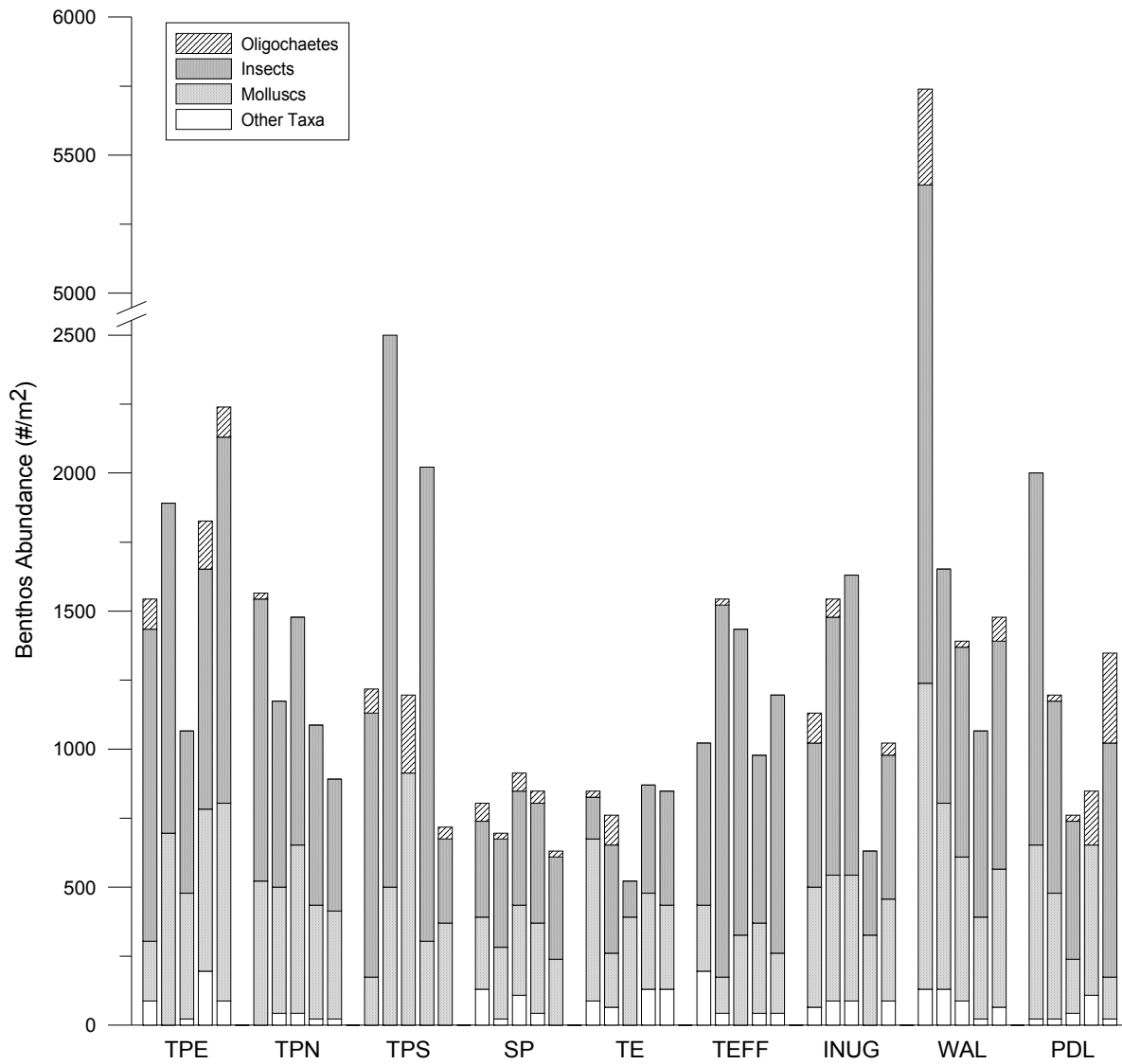


Figure 3-17. Benthic invertebrate replicates of richness by major taxa group, Meadowbank study lakes, August 2009.

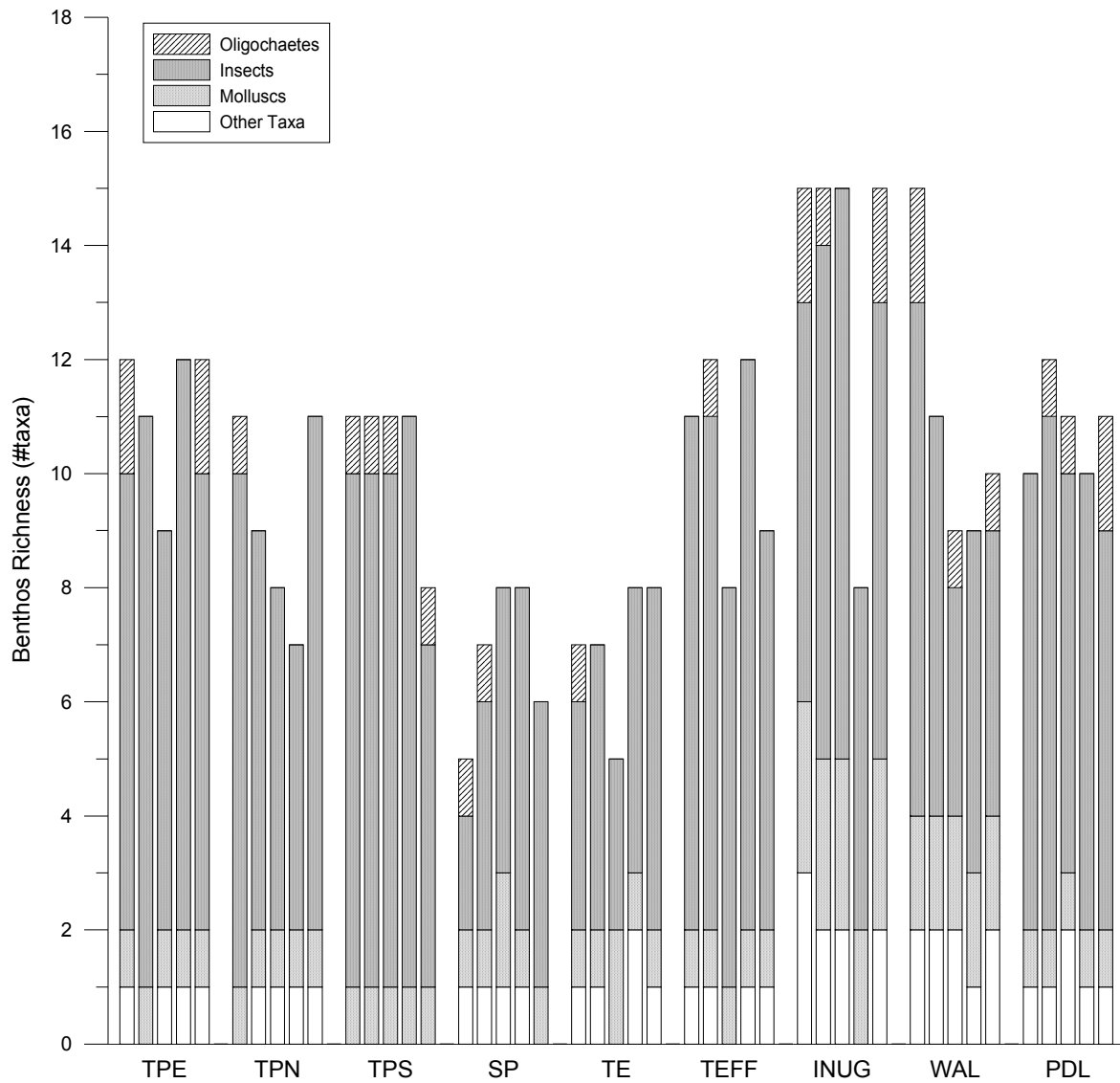


Figure 3-18. Benthic invertebrate replicates of abundance by major taxa group, Baker Lake, August 2009.

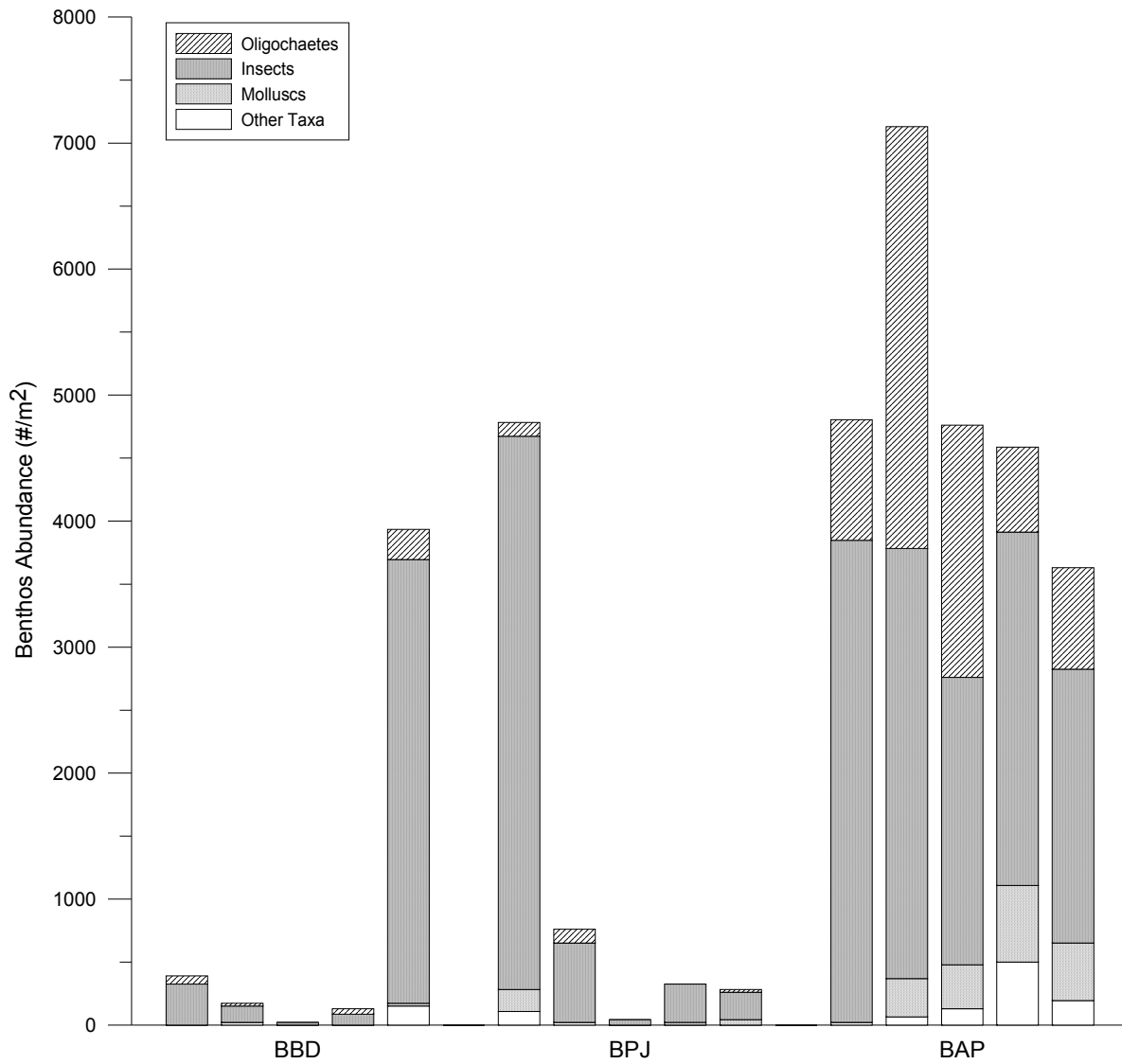
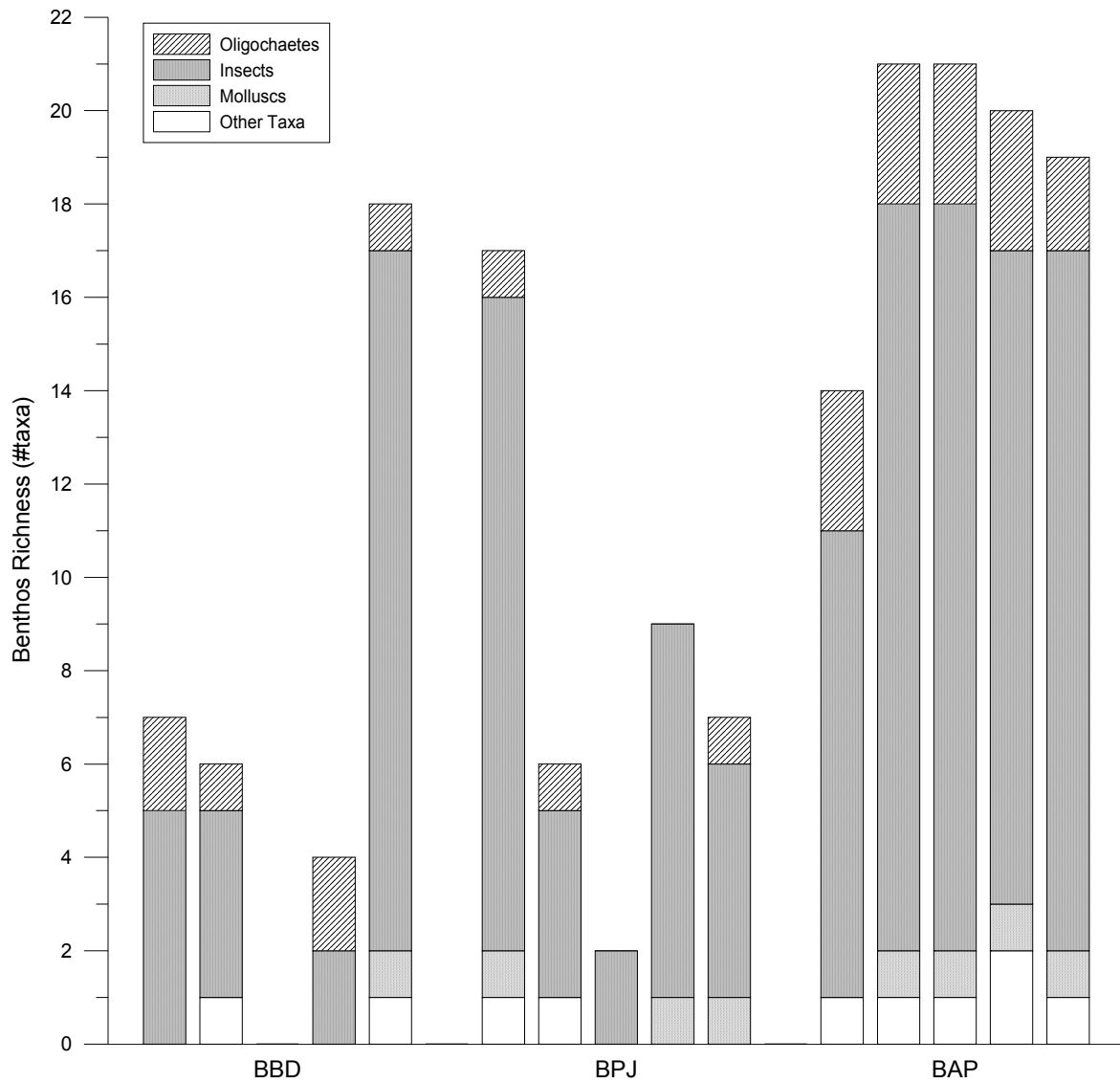


Figure 3-19. Benthic invertebrate replicates of richness by major taxa group, Baker Lake, August 2009.



4. SUMMARY

CREMP receiving environment monitoring focused on two main areas in 2009: Meadowbank study lakes (as in past years) and Baker Lake (new in 2008). As dike construction and mineral exploration continued to expand, two additional reference areas were added; one far-field reference within Tehek Lake (Tehek Farfield: TEFF) and another remote external reference in Pipedream Lake (PDL). Also in 2009, sampling was conducted on a monthly basis throughout the year where ice conditions permitted and thus was expanded to include May, November, and December in addition to the routine July, August and September sampling. In order to better characterize the study lakes, the spatial magnitude of water sampling areas was increased to include the entire basin from each of the study lakes.

With the onset of construction activities related to the Bay-Goose Dike starting in late July, this year marked the second year of construction phase since the last complete baseline year in 2007. Key results for 2009 for each of the two monitoring areas are listed below.

Meadowbank Study Lakes

- Limnology results show that the lakes are generally cold, clear, isothermal, well mixed, and well oxygenated. These results are consistent among stations and seasons for 2009 and similar to historical data. During through-ice sampling in winter months, observed differences were colder lake water temperatures and higher dissolved oxygen concentrations, as would be expected.
- Water chemistry results show that the lakes are circum-neutral with low conductivity, hardness and ions. Total and dissolved solids concentrations are very low and typically below detection limits (see exceptions below). Carbon was also low, close to laboratory detection limits and did not differ appreciably within or among lakes and seasons. Some stations detected nitrogen above DLs and never exceeded guidelines. On a few occasions phosphorus concentrations exceeded the guideline for ultra-oligotrophic lakes in Third Portage Lake East (see next bullet) and Tehek Lake. Total metals in water were consistently low among study lakes and seasons, with only six of 29 metals occasionally above detection limits and none exceeding CCME guidelines (except for TPE, see next bullet). These results are generally consistent with previous years and confirm their status as ultra-oligotrophic lakes.
- Construction of the Bay-Goose Dike introduced suspended sediments into Third Portage Lake East in August and September 2009. This resulted in elevated concentrations of total suspended solids (TSS), certain nutrients (e.g., total phosphorus) and some metals (aluminum, chromium copper and iron exceeded



CCME guidelines) in Third Portage Lake East. The extent and ecological significance of the sediment introductions is assessed in greater detail in the dike construction monitoring and EAS reports, respectively (Azimuth, 2010a, b).

- Sediment chemistry results showed naturally elevated metals (primarily arsenic, copper, chromium which typically exceeded CCME guidelines) at many locations. Lead and zinc marginally exceeded guidelines once or twice in no apparent pattern. Total organic carbon concentrations were consistent with those measured in previous years. Also in 2009, concentrations of all PAHs, oil & grease, and LEPHs & HEPHs were below detection limits in sediment for all stations.
- Primary productivity was generally low, as indicated by low phytoplankton biomass and low chlorophyll- α , as expected for these ultra-oligotrophic lakes. Phytoplankton biomass and abundance showed the largest seasonal decline in Third Portage Lake East from July through to September, likely due to increased TSS from Bay-Goose Dike construction. We also observed higher than desired variability between field duplicates; the implications of this natural variability will be explored further in the CREMP design review process. Results from EAS data analyses with the CREMP data set show that phytoplankton biomass was reduced in TPE in September 2009 compared to open-water seasonal data since July 2006, but this effect did not extend to November 2009 (Azimuth, 2010b).
- Benthic community samples were dominated by chironomid larvae in 2009, consistent with previous years. Most stations had consistent results to last year. Natural inter-annual variability was explored at Third Portage East, where fairly large changes have occurred over the years that are unrelated to mine development. Potential changes related to dike construction activities were explored in a targeted study: TSS Effects Assessment Study (Azimuth, 2010b).

Baker Lake

- Limnology results suggest some influence of marine water at the Baker Lake stations, with fairly widespread elevated conductivity, hardness and ions relative to the Meadowbank study lakes. However, inputs from the Thelon River, which is more similar to water from the Meadowbank study lakes, seem to prevail under certain conditions (e.g., strong southerly winds). Despite some vertical differences in salinity, oxygen and temperature profiles show un-stratified conditions.
- Water chemistry results showed 24 of 29 metals below detection limits and all were below applicable CCME guidelines.
- Sediment chemistry showed lower metals concentrations than the Meadowbank study lakes, with only arsenic exceeding CCME guidelines (at the barge dock and the proposed jetty stations). Concentrations of all PAHs, oil & grease, and LEPHs & HEPHs were below detection limits in sediment for the three stations. Oil and grease slightly exceeded detection limits at the reference station, but this was likely due to organic matter and not hydrocarbons, given the absence of industrial activity and lack of LEPH and HEPH chemicals in the sediment.
- Primary productivity was slightly higher at the Baker Lake stations relative to the Meadowbank study lakes, with chlorophyll- α concentrations being quite consistent among stations but slightly higher at the reference station and the highest phytoplankton biomass found at the barge dock station.
- Benthic community samples in Baker Lake were dominated by chironomid larvae. Total abundance and diversity at the Baker Lake reference station was generally higher than the Meadowbank study lakes, despite having a somewhat sandier substrate.
- In a number of ways, the reference station BAP appears to be quite different from the exposure stations; thus, consideration for locating a new reference for Baker Lake will be given during 2010 sample planning.

5. MONITORING COMPONENTS FOR 2010

As discussed in **Section 1**, the rationale, framework, strategy, methods, and scope of receiving environment (now referred to as *Core Receiving Environment Monitoring Program* or “CREMP”) monitoring for the Meadowbank Gold Project were documented in the 2005 AEMP (AEMP, 2005). The CREMP has been implemented every year since 2006, with some modifications (e.g., station additions, parameter deletions/additions, sampling frequency and intensity) to improve the program or to comply with regulatory requirements (e.g., the NWB A Licence). The CREMP design is being reviewed over the next year as part of AEM’s efforts to develop an integrated adaptive management framework.

In the interim, the 2010 CREMP will be essentially the same as 2009 (unless noted), as follows (**Table 5-1**):

- *Sampling Components* – limnology, water and sediment chemistry, phytoplankton, zooplankton, and benthic invertebrate community.
- *Sampling Areas* – sampling areas have been added over the years as needed, but all the initial stations have remained. Near-field stations include: TPN, TPE, SP, WAL and Baker Lake stations BBD and BPJ; far-field stations include: TE, TEFF; reference stations include: TPS, INUG, PDL and Baker Lake stations BAP. Review of the reference area at Baker Lake will be undertaken in 2010 because of the large differences in benthic community between exposure and reference stations. In 2010, we will samples at the BAP station as well as a new reference station for all parameters.
- *Timing* – water sampling (including limnology and phytoplankton) will be conducted every month (ice conditions permitting) in 2010. The exception to this will be during periods when ice conditions are not deemed safe (e.g., likely June and October, but may vary). Sampling through-ice will take place in January, February, March, April, May, November and December months. Open-water sampling will take place in July, August and September. Sediment chemistry and benthic invertebrate sampling will be conducted in August only, as it has been in previous years.
- *Spatial coverage* – water sampling within each lake basin area will be randomly distributed and possibly replicated to quantify the horizontal and vertical components of spatial variability (high intensity events only). The intensity (number of samples) of the events alternate between high (all areas, full reps) and low (all areas, no reps) during both open-water and through-ice sampling.

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- *Changes from 2009* – The only planned change will be the addition of zooplankton sampling at all stations during August of the open-water season.



Table 5-1. Components planned for 2010 core receiving environment monitoring program (CREMP).

Project Lake	Station ID	TYPE	Through-Ice ¹						Open-Water			Through-Ice		
		MONTH	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Third Portage	TPE		Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto
			Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto
								Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe		
Second Portage	SP		Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto
Tehek	TE		Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto
Tehek	TEFF							Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe		
Inuggugayualik	INUG		Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Limno Water (L) Phyto	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto
Wally	WAL							Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe		
Pipedream	PDL							Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe		

Table 5-1. Components planned for 2010 core receiving environment monitoring program (CREMP).

Project Lake	Station ID	TYPE	Through-Ice ¹						Open-Water			Through-Ice		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Baker Lake	BBD							Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe		
	BPJ							Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe		
	BAP							Ice not safe	Limno Water (H) Phyto	Limno Water (L) Phyto Sed Benthos Zoop	Limno Water (H) Phyto	Ice not safe		

Notes:

Limno: 1 profile; parameters includes vertical temperature (°C), oxygen (mg/L), conductivity (µS/cm), and turbidity (NTU) depth profiles; same sampling location & intensity as water.

Water: sample analysis includes conventional parameters (hardness, conductivity, pH, total dissolved & suspended solids, turbidity), anions (alkalinity, chloride, sulfate), nutrients (ammonia, nitrate, nitrite, total kjeldahl nitrogen, orthophosphate, total phosphate), organics (total & dissolved organic carbon, chlorophyll-a) and total & dissolved metals. intensity (number of samples) for each event alternates between high (H) [spatial and vertical reps], and low (L) [no spatial reps, 1 vertical rep].

Phyto: analysis includes identification of species, biomass (mg/m³) and density (cells/L) for each major taxa from a 50ml sample; same sampling location & intensity as water.

Sed: 3 samples (3 grab composite/sample); analysis includes pH, total organic carbon (TOC), moisture content, particle size, PAHs, oil & grease, LEPHs & HEPHs and total metals concentrations.

Benthos: 5 replicate samples (2 grabs/sample); analysis includes identification of species, abundance (#/m²) and richness (# taxa) (total & for each major taxa group);

Zoop: # of replicate samples yet to be determined; analysis includes identification of species by major taxa and biomass estimates; sample locations yet to be determined.

¹ Through-ice sampling targets the stations shown above; however, samples from INUG may be replaced with TPS if winter tundra travelling conditions are unfavorable.

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APPENDICES



APPENDIX A

PRESENCE (+) / ABSENCE (-) MATRIX OF PHYTOPLANKTON SPECIES IN MEADOWBANK STUDY LAKES AND BAKER LAKE, 2009



Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2009.

Species & Code	Third Portage Lake - East Basin					Third Portage Lake - North Basin					Third Portage Lake - South Basin			
	TPE-4-S 16-Jul-09	TPE-7-S 16-Aug-09	TPE-8-S 11-Sep-09	TPE-11-S 27-Nov-09	TPE-14-S 19-Dec-09	TPN-4-S 23-Jul-09	TPN-7-S 21-Aug-09	TPN-8-S 11-Sep-09	TPN-11-S 29-Nov-09	TPN-14-S 19-Dec-09	TPS-1-S 23-Jul-09	TPS-4-S 21-Aug-09	TPS-5-S 11-Sep-09	TPS-8-S 22-Dec-09
Cyanophyte														
1012 <i>Aphanothece</i>	-	-	-	-	-	-	-	-	-	+	-	-	-	-
1014 <i>Chroococcus limneticus</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1030 <i>Synechococcus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1033 <i>Rhabdogloea lineare</i> Schmidle and Lauterborn	+	-	-	-	+	-	-	-	-	-	-	-	-	-
1054 <i>Planktolyngbya limnetica</i>	-	+	+	+	-	-	+	+	-	+	-	+	+	-
1064 <i>Anabaena lavendrii</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1073 <i>Snowella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1089 <i>Cyanodictyon</i>	-	-	-	+	-	-	-	-	+	-	-	+	-	-
1097 <i>Snowella lacustris</i> (Chodat) Komarek and Hindak	-	-	-	-	-	-	-	-	-	-	-	-	+	-
1122 <i>Phormidium autumnale</i> Agardh	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Chlorophyte														
2100 <i>Pyramidomonas tetrahynchus</i> Schmarda	-	-	-	-	-	-	+	-	-	-	-	-	+	-
2101 <i>Carteria</i>	-	-	-	-	-	+	-	-	-	-	-	-	-	-
2105 <i>Chlamydomonas</i>	+	-	-	+	+	+	-	+	-	+	+	-	+	-
2112 <i>Sphaerocystis Schroeteri</i> Chodat	+	-	-	-	-	+	+	+	-	-	+	+	+	-
2121 <i>Oocystis lacustris</i> Chodat	+	+	-	+	-	+	+	+	+	+	+	+	+	-
2123 <i>Oocystis borgei</i> Snow	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2127 <i>Tetradron minimum</i> (Brunow) Hansgrig	-	-	-	-	+	-	-	-	-	-	-	-	-	-
2132 <i>Scenedesmus denticulatus</i> Lagerhiem	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2137 <i>Dictyosphaerium simplex</i> Sukja	-	-	+	+	+	-	+	+	+	+	-	+	+	+
2138 <i>Monoraphidium komarkovae</i> (Nyg.) Komarkova-Legnerova	+	-	-	+	-	-	-	-	+	-	-	-	-	-
2141 <i>Monoraphidium contortum</i> (Thur.) Komarkova-Legnerova	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2143 <i>Monoraphidium minutum</i> (Nag.) Komarkova-Legnerova	-	-	-	-	-	-	+	-	-	-	-	-	-	-
2145 <i>Crucigenia quadrata</i> Morr.	-	-	-	-	-	+	+	+	-	-	-	+	+	-
2152 <i>Coelastrum cambricum</i> Archer	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2157 <i>Kichnerella lunaris</i> (Kirchn.) Moeb.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2167 <i>Elakatothrix gelatinosa</i> Willen	-	-	+	-	-	-	+	-	+	-	+	+	+	-
2169 <i>Planctonema lauterbornii</i> Schmidle	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2174 <i>Closterium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2178 <i>Cosmarium</i>	-	-	+	-	-	-	+	-	+	-	-	-	-	+
2182 <i>Euastrum</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-
2185 <i>Micrasterias</i>	-	-	-	-	-	-	-	+	-	-	-	-	-	-
2186 <i>Xanthidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2187 <i>Staurodesmus extensus</i> (Andersson) Telling	-	+	-	-	-	+	+	+	+	-	-	+	+	+
2193 <i>Staurodesmus paradoxum</i> Meyen	+	-	-	-	-	-	-	-	-	-	-	-	-	-
2195 <i>Staurodesmus bullardii</i> G.M. Smith	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2199 <i>Spondylosium planum</i> (Wolle) W. and G.S. West	+	-	-	-	-	-	-	-	+	-	-	-	-	-
2202 <i>Scourfieldia cordiformis</i> Takeda	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2205 <i>Mougeotia</i>	-	+	+	-	-	-	-	-	-	-	+	-	-	-
2206 <i>Botryococcus braunii</i> Kutzing	+	+	-	-	-	-	+	+	+	-	+	+	-	+
2215 <i>Tetradron caudatum</i> (Corda) Hansgrig	-	-	+	-	-	-	-	+	-	-	-	-	-	-
2222 <i>Treubaria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2227 <i>Gonatozygon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2235 <i>Ankistrodesmus spiralis</i> Lemmermann	+	+	+	+	+	+	+	+	-	-	+	+	+	+
2247 <i>Oocystis gigas</i> Archer	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2009.

Species & Code	Third Portage Lake - East Basin					Third Portage Lake - North Basin					Third Portage Lake - South Basin			
	TPE-4-S	TPE-7-S	TPE-8-S	TPE-11-S	TPE-14-S	TPN-4-S	TPN-7-S	TPN-8-S	TPN-11-S	TPN-14-S	TPS-1-S	TPS-4-S	TPS-5-S	TPS-8-S
	16-Jul-09	16-Aug-09	11-Sep-09	27-Nov-09	19-Dec-09	23-Jul-09	21-Aug-09	11-Sep-09	29-Nov-09	19-Dec-09	23-Jul-09	21-Aug-09	11-Sep-09	22-Dec-09
Chrysophyte														
4351 Small chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4352 Large chrysophyceae	+	+	-	+	+	+	+	+	+	+	+	+	+	+
4354 <i>Chromulina</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4355 <i>Chrysochromulina parva</i> Lackey	+	-	-	+	-	+	-	+	-	+	+	-	-	+
4357 <i>Chrysococcus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4358 <i>Chrysosphaerella globulifera</i> Scherffel	+	+	-	-	-	-	-	-	-	+	-	-	-	+
4361 <i>Kephyrion boreale</i> Skuja	+	-	+	+	+	-	-	-	-	-	+	-	-	-
4362 <i>Kephyrion</i>	+	+	-	+	+	+	+	+	+	+	+	+	+	-
4363 <i>Spiniferomonas sirratus</i> *	-	+	-	-	-	+	+	+	-	-	+	-	+	-
4364 <i>Mallomonas caudata</i> Ivanov	-	-	+	-	-	-	-	-	-	-	-	-	-	-
4367 <i>Mallomonas duerschmidtiae</i> Siver, Hamer and Kling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4368 <i>Mallomonas crassiquama</i> (Asmund) Fott	-	-	+	+	-	-	-	-	+	-	-	-	-	-
4370 <i>Mallomonas akrokomos</i> Asmund and Kristiansen	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4372 <i>Mallomonas tonsurata</i> Teiling and Krieger	-	-	-	+	+	-	-	+	+	+	-	-	-	-
4375 <i>Synura sphagnicola</i> Korschikow	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4378 <i>Dinobryon borgei</i> Lemmermann	+	+	-	+	+	+	-	+	-	-	-	+	-	+
4380 <i>Dinobryon suecicum</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4381 <i>Dinobryon mucronutum</i> Nygaard	-	+	-	-	-	-	+	+	+	-	-	+	+	+
4383 <i>Dinobryon bavaricum</i> Imhof	+	+	-	-	+	+	-	+	-	-	-	+	-	-
4384 <i>Dinobryon bavaricum</i> v <i>vanhoeffenii</i> (Bachmann) Krieger	-	-	-	-	-	-	-	-	-	-	-	+	-	-
4388 <i>Dinobryon sertularia</i> Ehrenberg	+	+	+	-	+	+	+	+	-	-	+	-	-	+
4390 <i>Dinobryon sociale</i> Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4394 <i>Epiphyxis</i>	-	+	-	-	-	-	-	+	-	-	-	+	-	-
4396 <i>Chrysosolus</i> skuja (Nauwerck) Willen	+	+	+	+	+	+	+	+	-	+	+	+	+	-
4400 <i>Ochromonas</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-
4401 <i>Uroglena volvox</i> Ehrenberg	+	+	+	-	-	+	+	+	-	-	+	+	+	-
4403 <i>Chrysosphaerella longispina</i> Lauterborn	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4411 <i>Bitrichia chodatii</i> (Reverdin) Chodat	-	-	+	-	-	+	-	+	-	-	+	+	+	+
4413 <i>Chrysochromulina laurentiana</i> Kling	+	+	+	+	+	+	+	+	+	-	+	+	+	-
4414 <i>Stichogloea</i>	+	+	-	-	-	+	+	+	+	-	+	+	-	-
4416 <i>Bicoeca ainikkiae</i> Jarnefelt	-	+	-	-	-	-	-	-	-	-	-	-	-	-
4418 <i>Salpingoeca frequentissima</i> (Zach.) Lemmermann	-	-	-	-	-	-	-	-	-	-	+	+	-	-
4425 <i>Mallomonas hamata</i> Asmund	-	-	-	-	-	-	-	-	-	-	-	+	-	-
4436 <i>Dinobryon attenuatum</i> Hill	+	-	-	-	-	+	+	-	-	-	-	-	-	-
4437 <i>Pteridomonas</i>	-	-	+	-	-	-	+	-	-	-	-	-	-	-
4444 <i>Dinobryon pediforme</i> (Lemmermann) Steineche	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4453 <i>Desmarella brachycalyx</i> Skuja	-	-	-	+	+	-	-	-	-	+	-	-	-	+
4456 <i>Hydrurus</i> Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2009.

Species & Code	Third Portage Lake - East Basin					Third Portage Lake - North Basin					Third Portage Lake - South Basin				
	TPE-4-S 16-Jul-09	TPE-7-S 16-Aug-09	TPE-8-S 11-Sep-09	TPE-11-S 27-Nov-09	TPE-14-S 19-Dec-09	TPN-4-S 23-Jul-09	TPN-7-S 21-Aug-09	TPN-8-S 11-Sep-09	TPN-11-S 29-Nov-09	TPN-14-S 19-Dec-09	TPS-1-S 23-Jul-09	TPS-4-S 21-Aug-09	TPS-5-S 11-Sep-09	TPS-8-S 22-Dec-09	
Diatom															
5306 <i>Navicula minima</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5446 <i>Gomphonema constrictum</i> v <i>capitata</i> (Ehrenberg) Cleve	-	-	+	-	-	-	-	+	-	-	-	-	-	-	
5507 <i>Cyclotella stelligera</i> Cleve and Grunow	+	-	+	+	-	+	+	+	+	+	+	+	+	+	
5509 <i>Cyclotella ocellata</i> Pant.	-	-	-	+	-	-	-	-	-	-	-	-	-	+	
5511 <i>Rhizosolenia erienne</i> H.L. Smith	+	+	-	+	-	+	+	+	-	-	+	+	+	-	
5513 <i>Tabellaria fenestrata</i> (Lyngbye) Kutzing	-	-	-	-	-	-	-	-	+	-	-	-	-	-	
5514 <i>Tabellaria flocculsa</i> (Roth) Kutzing	-	-	+	-	-	-	-	+	-	-	-	-	+	-	
5515 <i>Fragilaria crotonensis</i> Kitton	-	-	-	-	-	+	-	-	-	-	-	-	-	-	
5518 <i>Synedra acus</i> Kutzing	+	+	+	+	-	-	-	-	-	+	+	-	-	+	
5523 <i>Synedra ulna</i> (Nitzsch) Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5524 <i>Asterionella formosa</i> Hassall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5540 <i>Aulacoseira italica</i> v <i>subarctica</i> (O. Muller) Simonsen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5546 <i>Gyrosigma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5547 <i>Frustulia rhomboides</i> (Ehrenberg) de Toni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5550 <i>Fragilaria capucina</i> v. <i>rumpensis</i> (Kutzing) Lange-Bertalot	-	-	-	-	-	-	-	-	-	-	+	-	-	-	
5551 <i>Cyclotella michiganiana</i> Skvortzow	+	+	+	+	+	+	+	-	+	+	+	+	+	+	
5702 <i>Achnanthes minutissima</i> Kutzing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5720 <i>Cyclotella bodanica</i> Eulens.	-	-	-	-	-	-	+	-	+	-	-	-	-	-	
5767 <i>Nitzschia fonticola</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5825 <i>Fragilaria pinata</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5854 <i>Pinnularia borealis</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5860 <i>Diatoma vulgare</i> Bory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5865 <i>Cymbella prostata</i> (Berkeley) Cleve	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5887 <i>Navicula pupula</i> Kutzing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5916 <i>Fragilaria capucina</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cryptophyte															
6554 <i>Rhodomonas minuta</i> Skuja	+	-	+	+	+	-	+	+	+	+	-	+	+	+	
6558 <i>Cryptomonas erosa</i> Ehrenberg	+	+	+	+	+	-	+	+	+	+	+	+	+	+	
6559 <i>Cryptomonas ovata</i> Ehrenberg	-	+	-	-	-	-	-	-	-	-	-	-	+	-	
6562 <i>Cryptomonas reflexa</i> (Marsson) Skuja	+	+	-	+	-	-	-	+	+	-	-	-	+	+	
6565 <i>Cryptomonas rostratiformis</i> Skuja	+	+	-	+	+	+	+	-	+	+	+	-	+	+	
6568 <i>Katablepharis ovalis</i> Skuja	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Dinoflagellate															
7628 <i>Gymnodinium mirabile</i> Penard	-	+	+	-	-	-	+	-	-	-	-	+	+	-	
7631 <i>Gymnodinium helveticum</i> Penard	-	-	+	+	-	-	-	-	-	-	+	-	-	-	
7632 <i>Gymnodinium</i>	+	+	-	+	-	+	+	+	-	-	+	+	-	+	
7635 <i>Peridinium willei</i> Huitfeldt-Kaas	-	-	-	-	-	-	-	-	-	-	+	-	-	-	
7636 <i>Peridinium palustre</i> (Lindemann) Lefevre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7638 <i>Peridinium inconspicuum</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	+	-	-	-	
7639 <i>Peridinium pusillum</i> (Penard) Lemmermann	+	+	+	-	-	+	+	-	+	+	-	+	-	-	
7640 <i>Peridinium goslawiense</i> Woloszynska	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7641 <i>Peridinium aciculiferum</i> Lemmermann	+	-	-	-	-	+	-	-	-	-	-	-	-	-	

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2009.

Species & Code	Second Portage Lake					Tehok Lake					Tehok Lake - Farfield			Inuggugayualik Lake			
	SP-4-S	SP-7-S	SP-8-S	SP-11-S	SP-14-S	TE-4-S	TE-7-S	TE-8-S	TE-11-S	TE-14-S	TEFF-1-S	TEFF-4-S	TEFF-5-S	INUG-4-S	INUG-7-S	INUG-8-S	INUG-11-S
	18-Jul-09	12-Aug-09	15-Sep-09	25-Nov-09	18-Dec-09	19-Jul-09	15-Aug-09	12-Sep-09	26-Nov-09	21-Dec-09	20-Jul-09	14-Aug-09	12-Sep-09	24-Jul-09	19-Aug-09	16-Sep-09	28-Nov-09
Cyanophyte																	
1012 <i>Aphanothece</i>	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-	-
1014 <i>Chroococcus limneticus</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
1030 <i>Synechococcus</i>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1033 <i>Rhabdogloea lineare</i> Schmidle and Lauterborn	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	-
1054 <i>Planktolyngbya limnetica</i>	-	-	-	+	+	-	+	+	-	-	-	+	+	-	+	-	-
1064 <i>Anabaena lavendrii</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1073 <i>Snowella</i>	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1089 <i>Cyanodictyon</i>	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	+	-
1097 <i>Snowella lacustris</i> (Chodat) Komarek and Hindak	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
1122 <i>Phormidium autumnale</i> Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorophyte																	
2100 <i>Pyramidomonas tetrahynchus</i> Schmarda	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	+	+
2101 <i>Carteria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2105 <i>Chlamydomonas</i>	+	+	+	-	+	-	-	-	+	+	-	+	-	-	-	-	-
2112 <i>Sphaerocystis Schroeteri</i> Chodat	-	+	+	-	-	-	+	+	-	-	+	-	-	-	+	+	-
2121 <i>Oocystis lacustris</i> Chodat	+	+	+	+	-	+	-	+	+	+	+	+	+	-	+	-	+
2123 <i>Oocystis borgei</i> Snow	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
2127 <i>Tetradron minimum</i> (Brunow) Hansgrig	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-
2132 <i>Scenedesmus denticulatus</i> Lagerhiem	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
2137 <i>Dictyosphaerium simplex</i> Sukja	+	+	+	+	+	-	+	-	+	+	-	+	-	-	-	-	+
2138 <i>Monoraphidium komarkovae</i> (Nyg.) Komarkova-Legnerova	-	-	+	+	-	+	-	-	-	-	+	-	-	-	-	-	-
2141 <i>Monoraphidium contortum</i> (Thur.) Komarkova-Legnerova	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2143 <i>Monoraphidium minutum</i> (Nag.) Komarkova-Legnerova	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
2145 <i>Crucigenia quadrata</i> Morr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2152 <i>Coelastrum cambricum</i> Archer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2157 <i>Kichnerella lunaris</i> (Kirchn.) Moeb.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2167 <i>Elakatothrix gelatinosa</i> Willen	-	+	+	-	-	-	+	+	-	-	+	+	+	+	+	+	+
2169 <i>Planctonema lauterbornii</i> Schmidle	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
2174 <i>Closterium</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
2178 <i>Cosmarium</i>	+	-	-	-	-	-	+	+	-	+	-	-	-	+	+	+	-
2182 <i>Euastrum</i>	-	-	-	-	-	-	-	+	-	-	-	+	+	-	+	-	-
2185 <i>Micrasterias</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2186 <i>Xanthidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2187 <i>Staurodesmus extensus</i> (Andersson) Telling	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+	+	+
2193 <i>Staurodesmus paradoxum</i> Meyen	+	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
2195 <i>Staurodesmus bullardii</i> G.M. Smith	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
2199 <i>Spondylosium planum</i> (Wolle) W. and G.S. West	+	+	+	-	-	+	+	+	-	+	+	+	+	+	+	-	-
2202 <i>Scourfieldia cordiformis</i> Takeda	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2205 <i>Mougeotia</i>	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2206 <i>Botryococcus braunii</i> Kutzing	-	+	+	+	-	+	-	-	+	-	-	-	-	-	-	+	-
2215 <i>Tetradron caudatum</i> (Corda) Hansgrig	+	+	-	-	-	-	+	+	-	-	-	+	-	-	-	-	-
2222 <i>Treubaria</i>	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
2227 <i>Gonatozygon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2235 <i>Ankistrodesmus spiralis</i> Lemmermann	-	+	+	-	+	+	+	+	-	+	-	-	+	-	-	-	+
2247 <i>Oocystis gigas</i> Archer	-	+	+	-	-	-	+	-	-	-	-	+	-	+	-	+	-

Appendix A. Presence (+) / absence (-) matrix of phytoplankton species in Meadowbank study lakes and Baker Lake, 2009.

Species & Code	Second Portage Lake						Tehok Lake				Tehok Lake - Farfield			Inuggugayualik Lake			
	SP-4-S	SP-7-S	SP-8-S	SP-11-S	SP-14-S	TE-4-S	TE-7-S	TE-8-S	TE-11-S	TE-14-S	TEFF-1-S	TEFF-4-S	TEFF-5-S	INUG-4-S	INUG-7-S	INUG-8-S	INUG-11-S
	18-Jul-09	12-Aug-09	15-Sep-09	25-Nov-09	18-Dec-09	19-Jul-09	15-Aug-09	12-Sep-09	26-Nov-09	21-Dec-09	20-Jul-09	14-Aug-09	12-Sep-09	24-Jul-09	19-Aug-09	16-Sep-09	28-Nov-09
Chrysophyte																	
4351 Small chrysophyceae	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4352 Large chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4354 <i>Chromulina</i>	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
4355 <i>Chrysochromulina parva</i> Lackey	+	+	+	+	-	+	+	+	-	-	+	+	+	+	+	-	-
4357 <i>Chrysococcus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4358 <i>Chrysosphaerella globulifera</i> Scherffel	-	+	+	+	-	-	-	-	-	-	+	-	-	-	+	+	-
4361 <i>Kephyrion boreale</i> Skuja	-	+	-	-	-	+	-	+	+	-	-	+	+	+	-	+	+
4362 <i>Kephyrion</i>	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	+
4363 <i>Spiniferomonas sirratus</i> *	+	+	-	-	-	+	-	+	-	-	-	-	+	+	+	+	-
4364 <i>Mallomonas caudata</i> Ivanov	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4367 <i>Mallomonas duerschmidtiae</i> Siver, Hamer and Kling	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
4368 <i>Mallomonas crassiquama</i> (Asmund) Fott	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+
4370 <i>Mallomonas akrokomos</i> Asmund and Kristiansen	-	-	-	-	-	-	-	-	-	-	-	-	+	-	+	-	-
4372 <i>Mallomonas tonsurata</i> Teiling and Krieger	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
4375 <i>Synura sphagnicola</i> Korschikow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4378 <i>Dinobryon borgei</i> Lemmermann	+	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+
4380 <i>Dinobryon suecicum</i> Lemmermann	-	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-
4381 <i>Dinobryon mucronutum</i> Nygaard	+	+	+	-	+	+	+	+	+	-	+	+	+	+	+	+	+
4383 <i>Dinobryon bavaricum</i> Imhof	+	-	+	-	-	-	+	-	-	-	-	+	+	+	-	-	-
4384 <i>Dinobryon bavaricum v. vanhoeffenii</i> (Bachmann) Krieger	-	-	-	-	-	-	+	-	-	-	-	+	+	+	-	-	+
4388 <i>Dinobryon sertularia</i> Ehrenberg	+	+	+	+	-	+	+	+	-	-	+	+	+	+	+	+	-
4390 <i>Dinobryon sociale</i> Ehrenberg	+	+	+	+	-	+	+	+	+	-	+	+	+	+	+	+	+
4394 <i>Epiphyxis</i>	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
4396 <i>Chrysosolus skuja</i> (Nauwerck) Willen	+	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+
4400 <i>Ochromonas</i>	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
4401 <i>Uroglena volvox</i> Ehrenberg	+	+	+	-	-	+	+	+	-	-	+	-	-	+	+	-	-
4403 <i>Chrysosphaerella longispina</i> Lauterborn	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
4411 <i>Bitrichia chodatii</i> (Reverdin) Chodat	-	+	-	-	-	-	-	+	-	-	-	-	+	+	+	+	-
4413 <i>Chrysochromulina laurentiana</i> Kling	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4414 <i>Stichogloea</i>	-	+	+	-	-	+	+	+	+	-	-	+	-	+	+	+	-
4416 <i>Bicoeca ainikkiae</i> Jarnefelt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4418 <i>Salpingoeca frequentissima</i> (Zach.) Lemmermann	+	+	+	+	+	+	-	-	-	+	-	-	-	-	+	+	+
4425 <i>Mallomonas hamata</i> Asmund	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4436 <i>Dinobryon attenuatum</i> Hill	-	-	-	+	-	-	+	-	-	-	+	-	-	-	+	-	+
4437 <i>Pteridomonas</i>	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-
4444 <i>Dinobryon pediforme</i> (Lemmermann) Steineche	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
4453 <i>Desmarella brachycalyx</i> Skuja	-	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	+
4456 <i>Hydrurus</i> Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-

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Species & Code	Second Portage Lake					Tehek Lake					Tehek Lake - Farfield			Inuggugayualik Lake			
	SP-4-S	SP-7-S	SP-8-S	SP-11-S	SP-14-S	TE-4-S	TE-7-S	TE-8-S	TE-11-S	TE-14-S	TEFF-1-S	TEFF-4-S	TEFF-5-S	INUG-4-S	INUG-7-S	INUG-8-S	INUG-11-S
	18-Jul-09	12-Aug-09	15-Sep-09	25-Nov-09	18-Dec-09	19-Jul-09	15-Aug-09	12-Sep-09	26-Nov-09	21-Dec-09	20-Jul-09	14-Aug-09	12-Sep-09	24-Jul-09	19-Aug-09	16-Sep-09	28-Nov-09
Diatom																	
5306 <i>Navicula minima</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
5446 <i>Gomphonema constrictum</i> v <i>capitata</i> (Ehrenberg) Cleve	-	-	+	-	-	-	+	-	-	-	-	+	-	-	+	-	-
5507 <i>Cyclotella stelligera</i> Cleve and Grunow	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+
5509 <i>Cyclotella ocellata</i> Pant.	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+
5511 <i>Rhizosolenia erienne</i> H.L. Smith	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5513 <i>Tabellaria fenestrata</i> (Lyngbye) Kutzing	-	+	+	-	-	-	-	+	-	-	+	-	-	-	+	-	-
5514 <i>Tabellaria flocculsa</i> (Roth) Kutzing	-	-	+	+	-	-	-	+	-	+	-	-	+	-	+	+	-
5515 <i>Fragilaria crotonensis</i> Kitton	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5518 <i>Synedra acus</i> Kutzing	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+
5523 <i>Synedra ulna</i> (Nitzsch) Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5524 <i>Asterionella formosa</i> Hassall	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5540 <i>Aulacoseira italica</i> v <i>subarctica</i> (O. Muller) Simonsen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5546 <i>Gyrosigma</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
5547 <i>Frustulia rhomboides</i> (Ehrenberg) de Toni	-	-	-	-	-	-	-	-	-	-	+	-	+	+	-	-	-
5550 <i>Fragilaria capucina</i> v. <i>rumpens</i> (Kutzing) Lange-Bertalot	-	-	-	-	-	+	-	-	-	-	+	-	-	+	-	-	-
5551 <i>Cyclotella michiganiana</i> Skvortzow	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5702 <i>Achnanthes minutissima</i> Kutzing	+	+	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-
5720 <i>Cyclotella bodanica</i> Eulens.	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
5767 <i>Nitzschia fonticola</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5825 <i>Fragilaria pinata</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
5854 <i>Pinnularia borealis</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
5860 <i>Diatoma vulgare</i> Bory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5865 <i>Cymbella prostata</i> (Berkeley) Cleve	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5887 <i>Navicula pupula</i> Kutzing	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
5916 <i>Fragilaria capucina</i> Grunow	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
Cryptophyte																	
6554 <i>Rhodomonas minuta</i> Skuja	+	+	+	+	+	-	+	+	+	+	-	+	+	+	+	+	+
6558 <i>Cryptomonas erosa</i> Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6559 <i>Cryptomonas ovata</i> Ehrenberg	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
6562 <i>Cryptomonas reflexa</i> (Marsson) Skuja	+	+	+	+	+	-	+	+	+	+	+	+	-	+	+	+	-
6565 <i>Cryptomonas rostratiformis</i> Skuja	+	+	+	+	+	-	-	+	+	+	-	+	-	+	-	-	-
6568 <i>Katablepharis ovalis</i> Skuja	+	+	+	+	+	+	+	+	+	+	-	+	+	+	-	+	+
Dinoflagellate																	
7628 <i>Gymnodinium mirabile</i> Penard	-	+	+	-	-	-	+	-	-	-	+	+	+	-	+	-	-
7631 <i>Gymnodinium helveticum</i> Penard	-	-	+	+	+	-	-	-	-	+	-	-	-	-	-	+	-
7632 <i>Gymnodinium</i>	-	+	+	+	-	+	+	+	+	+	+	+	+	+	-	+	+
7635 <i>Peridinium willei</i> Huitfeldt-Kaas	+	-	-	-	-	+	+	-	-	-	-	+	+	-	-	+	+
7636 <i>Peridinium palustre</i> (Lindemann) Lefevre	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7638 <i>Peridinium inconspicuum</i> Lemmermann	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7639 <i>Peridinium pusillum</i> (Penard) Lemmermann	+	+	+	+	+	+	+	+	+	+	-	+	+	-	-	-	+
7640 <i>Peridinium goslawiense</i> Woloszynska	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7641 <i>Peridinium aciculiferum</i> Lemmermann	+	-	-	-	-	+	+	-	-	-	+	-	-	+	-	-	-

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Species & Code	Wally Lake			Pipedream Lake			Baker Lake - Barge Dock			Baker Lake - Proposed Jetty			Baker Lake - Akilahaarjuk Point		
	WAL-1-S	WAL-4-S	WAL-5-S	PDL-1-S	PDL-4-S	PDL-5-S	BBD-1-S	BBD-4-S	BBD-5-S	BPJ-1-S	BPJ-4-S	BPJ-5-S	BAP-1-S	BAP-4-S	BAP-5-S
	21-Jul-09	16-Aug-09	13-Sep-09	26-Jul-09	17-Aug-09	14-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09
Cyanophyte															
1012 <i>Aphanothece</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+
1014 <i>Chroococcus limneticus</i> Lemmermann	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1030 <i>Synechococcus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1033 <i>Rhabdoglea lineare</i> Schmidle and Lauterborn	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-
1054 <i>Planktolyngbya limnetica</i>	-	-	-	-	-	-	-	-	+	-	+	+	-	-	+
1064 <i>Anabaena lavendrii</i> Lemmermann	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
1073 <i>Snowella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1089 <i>Cyanodictyon</i>	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
1097 <i>Snowella lacustris</i> (Chodat) Komarek and Hindak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1122 <i>Phormidium autumnale</i> Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorophyte															
2100 <i>Pyramidomonas tetrahynchus</i> Schmarda	-	-	+	-	-	-	-	+	-	-	+	-	-	-	-
2101 <i>Carteria</i>	+	-	-	-	-	-	+	-	-	+	-	-	-	-	-
2105 <i>Chlamydomonas</i>	-	+	+	-	-	+	+	+	+	+	+	+	+	+	+
2112 <i>Sphaerocystis Schroeteri</i> Chodat	+	+	+	-	-	-	+	+	-	+	-	-	-	-	+
2121 <i>Oocystis lacustris</i> Chodat	-	+	+	+	-	-	+	-	-	+	+	+	+	+	-
2123 <i>Oocystis borgei</i> Snow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2127 <i>Tetradron minimum</i> (Brunow) Hansgrig	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
2132 <i>Scenedesmus denticulatus</i> Lagerhiem	-	-	-	-	-	-	-	+	+	-	+	+	+	+	+
2137 <i>Dictyosphaerium simplex</i> Sukja	-	+	-	+	+	+	-	-	-	-	+	+	+	+	+
2138 <i>Monoraphidium komarkovae</i> (Nyg.) Komarkova-Legnerova	-	-	+	-	-	-	+	-	-	+	-	-	+	-	+
2141 <i>Monoraphidium contortum</i> (Thur.) Komarkova-Legnerova	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2143 <i>Monoraphidium minutum</i> (Nag.) Komarkova-Legnerova	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
2145 <i>Crucigenia quadrata</i> Morr.	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
2152 <i>Coelastrum cambricum</i> Archer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2157 <i>Kichnerella lunaris</i> (Kirchn.) Moeb.	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-
2167 <i>Elakatothrix gelatinosa</i> Willen	-	+	+	+	+	+	-	+	+	-	-	+	-	+	+
2169 <i>Planctonema lauterbornii</i> Schmidle	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
2174 <i>Closterium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2178 <i>Cosmarium</i>	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-
2182 <i>Euastrum</i>	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-
2185 <i>Micrasterias</i>	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
2186 <i>Xanthidium</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2187 <i>Staurodesmus extensus</i> (Andersson) Telling	+	-	+	+	+	+	+	+	+	-	-	+	-	-	+
2193 <i>Staurodesmus paradoxum</i> Meyen	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-
2195 <i>Staurodesmus bullardii</i> G.M. Smith	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
2199 <i>Spondylosium planum</i> (Wolle) W. and G.S. West	+	+	+	+	-	+	-	-	-	+	-	-	-	-	-
2202 <i>Scourfieldia cordiformis</i> Takeda	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2205 <i>Mougeotia</i>	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-
2206 <i>Botryococcus braunii</i> Kutzing	-	+	+	+	+	-	-	-	+	-	-	+	-	-	+
2215 <i>Tetradron caudatum</i> (Corda) Hansgrig	-	-	+	-	-	-	+	+	+	-	+	+	+	+	+
2222 <i>Treubaria</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2227 <i>Gonatozygon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
2235 <i>Ankistrodesmus spiralis</i> Lemmermann	-	+	+	-	+	+	-	+	+	-	+	+	-	+	+
2247 <i>Oocystis gigas</i> Archer	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-

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Species & Code	Wally Lake			Pipedream Lake			Baker Lake - Barge Dock			Baker Lake - Proposed Jetty			Baker Lake - Akilahaarjuk Point		
	WAL-1-S	WAL-4-S	WAL-5-S	PDL-1-S	PDL-4-S	PDL-5-S	BBD-1-S	BBD-4-S	BBD-5-S	BPJ-1-S	BPJ-4-S	BPJ-5-S	BAP-1-S	BAP-4-S	BAP-5-S
	21-Jul-09	16-Aug-09	13-Sep-09	26-Jul-09	17-Aug-09	14-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09
Chrysophyte															
4351 Small chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4352 Large chrysophyceae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4354 <i>Chromulina</i>	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
4355 <i>Chrysochromulina parva</i> Lackey	+	+	+	+	+	+	+	+	-	+	-	-	+	+	-
4357 <i>Chrysococcus</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4358 <i>Chrysosphaerella globulifera</i> Scherffel	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
4361 <i>Kephyrion boreale</i> Skuja	-	+	+	+	-	+	+	-	-	+	-	-	-	-	-
4362 <i>Kephyrion</i>	+	+	+	-	-	+	+	+	+	+	+	+	+	+	+
4363 <i>Spiniferomonas sirratus</i> *	-	-	-	+	-	+	+	-	+	+	+	+	+	+	-
4364 <i>Mallomonas caudata</i> Ivanov	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
4367 <i>Mallomonas duerschmidtiae</i> Siver, Hamer and Kling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4368 <i>Mallomonas crassisquama</i> (Asmund) Fott	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-
4370 <i>Mallomonas akrokomos</i> Asmund and Kristiansen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4372 <i>Mallomonas tonsurata</i> Teiling and Krieger	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-
4375 <i>Synura sphagnicola</i> Korschikow	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4378 <i>Dinobryon borgei</i> Lemmermann	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+
4380 <i>Dinobryon suecicum</i> Lemmermann	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
4381 <i>Dinobryon mucronutum</i> Nygaard	+	-	+	+	+	+	-	+	-	-	-	-	-	-	-
4383 <i>Dinobryon bavaricum</i> Imhof	-	+	+	+	+	+	+	+	-	+	-	+	+	+	+
4384 <i>Dinobryon bavaricum</i> v <i>vanhoeffenii</i> (Bachmann) Krieger	-	+	-	-	-	+	-	-	-	-	-	-	-	+	-
4388 <i>Dinobryon sertularia</i> Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4390 <i>Dinobryon sociale</i> Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+
4394 <i>Epiphyxis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4396 <i>Chrysosolus skuja</i> (Nauwerck) Willen	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
4400 <i>Ochromonas</i>	-	-	-	-	-	-	-	-	-	-	-	+	-	+	+
4401 <i>Uroglena volvox</i> Ehrenberg	+	+	+	+	+	-	+	+	+	+	+	+	+	+	+
4403 <i>Chrysosphaerella longispina</i> Lauterborn	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-
4411 <i>Bitrichia chodatii</i> (Reverdin) Chodat	-	+	-	+	-	+	-	-	-	+	-	-	-	-	-
4413 <i>Chrysochromulina laurentiana</i> Kling	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
4414 <i>Stichogloea</i>	+	+	+	+	-	+	-	+	-	-	-	-	-	+	-
4416 <i>Bicoeca ainikkiae</i> Jarnefelt	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
4418 <i>Salpingoeca frequentissima</i> (Zach.) Lemmermann	+	+	+	+	+	-	+	-	-	+	-	+	+	+	+
4425 <i>Mallomonas hamata</i> Asmund	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
4436 <i>Dinobryon attenuatum</i> Hill	+	-	-	+	-	-	+	-	-	+	-	-	-	-	-
4437 <i>Pteridomonas</i>	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
4444 <i>Dinobryon pediforme</i> (Lemmermann) Steineche	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4453 <i>Desmarella brachycalyx</i> Skuja	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4456 <i>Hydrurus</i> Agardh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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	21-Jul-09	16-Aug-09	13-Sep-09	26-Jul-09	17-Aug-09	14-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09	28-Jul-09	24-Aug-09	19-Sep-09
Diatom															
5306 <i>Navicula minima</i> Grunow	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
5446 <i>Gomphonema constrictum</i> v <i>capitata</i> (Ehrenberg) Cleve	-	-	+	-	-	+	-	-	-	-	+	+	-	-	+
5507 <i>Cyclotella stelligera</i> Cleve and Grunow	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5509 <i>Cyclotella ocellata</i> Pant.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5511 <i>Rhizosolenia erienne</i> H.L. Smith	-	+	-	+	+	+	+	+	+	+	+	+	-	+	+
5513 <i>Tabellaria fenestrata</i> (Lyngbye) Kutzing	-	-	-	-	-	-	-	+	+	+	+	+	-	+	+
5514 <i>Tabellaria flocculsa</i> (Roth) Kutzing	-	-	+	-	+	-	+	+	+	+	+	+	-	+	+
5515 <i>Fragilaria crotonensis</i> Kitton	-	-	-	-	-	-	-	-	-	+	-	-	+	-	+
5518 <i>Synedra acus</i> Kutzing	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5523 <i>Synedra ulna</i> (Nitzsch) Ehrenberg	-	-	+	-	-	-	-	-	-	-	-	-	-	+	+
5524 <i>Asterionella formosa</i> Hassall	-	-	-	+	-	-	+	+	+	+	+	+	+	+	+
5540 <i>Aulacoseira italica</i> v <i>subarctica</i> (O. Muller) Simonsen	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+
5546 <i>Gyrosigma</i>	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-
5547 <i>Frustulia rhomboides</i> (Ehrenberg) de Toni	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5550 <i>Fragilaria capucina</i> v. <i>rumpens</i> (Kutzing) Lange-Bertalot	-	-	-	+	-	-	+	-	-	+	-	-	+	-	-
5551 <i>Cyclotella michiganiana</i> Skvortzow	+	+	+	+	+	+	+	+	-	+	+	-	+	+	+
5702 <i>Achnanthes minutissima</i> Kutzing	-	-	-	-	-	-	+	+	+	-	-	-	-	+	-
5720 <i>Cyclotella bodanica</i> Eulens.	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-
5767 <i>Nitzschia fonticola</i> Grunow	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
5825 <i>Fragilaria pinata</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5854 <i>Pinnularia borealis</i> Ehrenberg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5860 <i>Diatoma vulgare</i> Bory	-	-	-	-	-	-	+	-	-	+	-	+	+	-	-
5865 <i>Cymbella prostata</i> (Berkeley) Cleve	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5887 <i>Navicula pupula</i> Kutzing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5916 <i>Fragilaria capucina</i> Grunow	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
Cryptophyte															
6554 <i>Rhodomonas minuta</i> Skuja	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6558 <i>Cryptomonas erosa</i> Ehrenberg	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6559 <i>Cryptomonas ovata</i> Ehrenberg	-	-	-	-	-	-	-	+	-	+	-	+	-	+	-
6562 <i>Cryptomonas reflexa</i> (Marsson) Skuja	+	+	+	-	+	+	-	-	-	-	-	-	-	-	-
6565 <i>Cryptomonas rostratiformis</i> Skuja	-	-	-	-	-	-	+	+	-	+	+	-	+	+	-
6568 <i>Katablepharis ovalis</i> Skuja	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+
Dinoflagellate															
7628 <i>Gymnodinium mirabile</i> Penard	-	-	-	+	-	+	+	+	-	-	+	+	-	-	-
7631 <i>Gymnodinium helveticum</i> Penard	-	-	+	+	+	-	-	+	-	-	-	-	-	-	-
7632 <i>Gymnodinium</i>	-	+	+	+	+	+	+	+	-	+	+	+	+	+	+
7635 <i>Peridinium willei</i> Huitfeldt-Kaas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7636 <i>Peridinium palustre</i> (Lindemann) Lefevre	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
7638 <i>Peridinium inconspicuum</i> Lemmermann	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7639 <i>Peridinium pusillum</i> (Penard) Lemmermann	+	+	-	+	-	-	+	+	-	+	+	+	+	+	+
7640 <i>Peridinium goslawiense</i> Woloszyńska	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7641 <i>Peridinium aciculiferum</i> Lemmermann	+	-	-	+	-	-	+	+	-	+	+	-	-	+	-

APPENDIX B

BENTHIC INVERTEBRATE RAW DATA, MEADOWBANK STUDY LAKES AND BAKER LAKE, 2009



Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023m² grabs), Meadowbank study lakes and Baker Lake, August 2009.

Station	BAP	BAP	BAP	BAP	BAP	BBD	BBD	BBD	BBD	BBD	BPJ	BPJ	BPJ	BPJ	BPJ	INUG	INUG	INUG	INUG	INUG
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	8.3	7.9	6.8	7.5	8.0	6.5	7.5	7.6	7.6	8.0	7.6	6.6	6.9	7.3	6.7	7.6	7.9	7.0	6.9	6.9
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	26-Aug-09	26-Aug-09	26-Aug-09	26-Aug-09	26-Aug-09	20-Aug-09	20-Aug-09	20-Aug-09	20-Aug-09	20-Aug-09
ROUNDWORMS																				
P. Nemata	13	24	40	28	31	1	1	-	4	3	23	18	-	8	8	1	1	-	3	-
FLATWORMS																				
P. Platyhelminthes																				
Cl. Turbellaria																				
indeterminate	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	1
ANNELIDS																				
P. Annelida																				
WORMS																				
Cl. Oligochaeta																				
F. Enchytraeidae	-	-	9	6	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Naididae																				
Nais communis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nais	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slavina appendiculata	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Tubificidae																				
Limnodrilus hoffmeisteri	2	-	-	2	-	2	-	-	1	-	-	-	-	-	1	-	-	-	-	-
Rhyacodrilus coccineus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Rhyacodrilus montana	9	13	53	21	26	-	1	-	1	10	3	5	-	-	-	-	-	-	-	-
Tasserkidrilus americanus	-	6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
immatures with hair chaetae	26	77	22	-	2	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-
immatures without hair chaetae	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Lumbriculidae																				
Lumbriculus	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	4	3	-	-	1
indeterminate	5	32	4	2	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
ARTHROPODS																				
P. Arthropoda																				
MITES																				
Cl. Arachnida																				
O. Acarina	-	3	6	13	9	-	-	-	-	7	5	1	-	-	-	1	3	3	-	3
HARPACTICOIDS																				
O. Harpacticoida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEED SHRIMPS																				
Cl. Ostracoda	24	5	6	15	5	-	2	-	-	4	-	-	-	-	-	10	9	10	-	-
TADPOLE SHRIMP																				
O. Notostraca																				
Lepidurus arcticus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
WATER SCUDS																				
O. Amphipoda																				
F. Gammaracanthidae																				
Gammaracanthus	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
INSECTS																				
Cl. Insecta																				
CADDISFLIES																				
O. Trichoptera																				
F. Limnephilidae																				
Grensia praeterita	-	4	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-
pupae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
immature	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023m² grabs), Meadowbank study lakes and Baker Lake, August 2009.

Station	BAP	BAP	BAP	BAP	BAP	BBD	BBD	BBD	BBD	BBD	BPJ	BPJ	BPJ	BPJ	BPJ	INUG	INUG	INUG	INUG	INUG
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	8.3	7.9	6.8	7.5	8.0	6.5	7.5	7.6	7.6	8.0	7.6	6.6	6.9	7.3	6.7	7.6	7.9	7.0	6.9	6.9
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	25-Aug-09	26-Aug-09	26-Aug-09	26-Aug-09	26-Aug-09	26-Aug-09	20-Aug-09	20-Aug-09	20-Aug-09	20-Aug-09	20-Aug-09
TRUE FLIES																				
O. Diptera																				
MIDGES																				
F. Chironomidae																				
chironomid pupae	32	38	13	19	14	3	2	1	2	17	13	3	-	2	4	-	2	1	-	-
S.F. Chironominae																				
Chironomus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cladotanytarsus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Constempellina	2	1	-	4	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Corynocera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dicrotendipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Micropsectra	19	-	5	10	2	-	-	-	-	3	4	-	-	-	-	-	1	3	2	1
Paracladopelma	-	1	1	1	2	1	-	-	-	1	1	1	-	-	-	-	-	-	-	-
Paratanytarsus	77	59	30	21	35	-	-	-	-	-	4	-	-	-	1	-	1	-	-	1
Polypedium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sergentia	-	-	-	-	-	-	1	-	-	4	-	1	-	-	-	-	-	-	-	-
Stempellinella	-	-	-	-	-	-	1	-	-	-	-	19	-	-	-	-	-	-	-	1
Stictochironomus	13	16	6	21	18	7	-	-	1	83	41	-	-	1	-	2	16	8	-	7
Tanytarsus	-	7	5	5	-	-	-	-	-	20	4	-	-	-	-	3	1	12	1	-
indeterminate	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
S.F. Diamesinae																				
Pothastia	2	6	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Protanypus	-	-	3	-	1	-	-	-	-	1	3	-	-	-	-	-	1	1	-	-
Pseudodiamesa	4	-	5	6	3	-	1	-	-	-	1	-	1	1	1	-	-	-	-	-
S.F. Orthocladinae																				
Abiskomyia	7	1	6	2	1	1	-	-	-	9	105	5	-	1	-	1	6	1	-	1
Corynoneura	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cricotopus	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cricotopus/Orthocladus	-	-	-	-	2	-	-	-	-	1	1	-	-	2	-	-	-	-	-	-
Heterotrissocladius	-	2	1	3	2	1	-	-	-	5	10	-	-	1	2	5	-	9	3	3
Hydrobaenus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mesocricotopus	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Paracladius	-	1	6	12	1	-	-	-	-	1	3	-	-	1	-	-	-	1	-	-
Parakiefferiella	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Psectrocladius	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Zalutschia	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-
indeterminate	2	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.F. Prodiamesinae																				
Monodiamesa	-	1	6	2	2	2	1	-	-	8	4	-	-	3	1	3	2	1	2	3
S.F. Tanypodinae																				
Ablabesmyia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Procladius	15	11	7	11	8	-	-	-	-	3	7	-	-	1	-	8	12	12	5	7
Thienemannimyia complex	-	-	2	1	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Empididae																				
Chelifera/Neoplasta	1	2	6	9	4	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Wiedemannia	-	-	1	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pupae	-	1	-	1	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	-
MOLLUSCS																				
P. Mollusca																				
CLAMS																				
Cl. Bivalvia																				
F. Sphaeriidae																				
Cyclocalyx/Neopisidium	-	14	16	28	21	-	-	-	-	1	8	-	-	1	2	18	13	16	14	8
Cyclocalyx	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	6	3	1	8
Sphaerium nitidum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	2	-	1
TOTAL NUMBER OF TAXA ¹	14	21	21	20	19	7	6	0	4	18	17	6	2	9	7	15	15	15	8	15
TOTAL NUMBER OF ORGANISMS ²	221	328	219	211	167	18	8	1	6	181	220	35	2	15	13	52	71	75	29	47

Notes:

¹ Number of taxa totals exclude nematodes & ostracods, immatures & pupae (Tubificidae, Limnephilidae, Chironomidae, Empididae), and indeterminates (Lumbriculidae, Chironominae, Orthocladinae, Tanypodinae).

² Number of organisms totals exclude nematodes (P. Nemata) & ostracods (Cl. Ostracoda).

TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Farfield;

INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake;

BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilahaarjuk Point.

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023m² grabs), Meadowbank study lakes and Baker Lake, August 2009.

Station	PDL	PDL	PDL	PDL	PDL	SP	SP	SP	SP	SP	TE	TE	TE	TE	TE	TEFF	TEFF	TEFF	TEFF	TEFF
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	7.2	8.0	8.3	7.3	7.5	7.5	7.7	6.8	7.1	8.1	7.0	7.4	6.9	8.2	7.9	6.9	6.6	7.8	7.2	6.9
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	17-Aug-09	17-Aug-09	17-Aug-09	17-Aug-09	17-Aug-09	12-Aug-09	12-Aug-09	12-Aug-09	12-Aug-09	12-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09
ROUNDWORMS																				
P. Nemata	3	-	3	-	-	-	1	-	-	-	1	-	-	-	-	-	1	-	3	1
FLATWORMS																				
P. Platyhelminthes																				
Cl. Turbellaria																				
indeterminate	-	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
ANNELIDS																				
P. Annelida																				
WORMS																				
Cl. Oligochaeta																				
F. Enchytraeidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Naididae																				
Nais communis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nais	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slavina appendiculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Tubificidae																				
Limnodrilus hoffmeisteri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhyacodrilus coccineus	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	1	-	-	-
Rhyacodrilus montana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tasserkidrilus americanus	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
immatures with hair chaetae	-	-	-	9	7	-	-	3	2	1	-	5	-	-	-	-	-	-	-	-
immatures without hair chaetae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Lumbricidae																				
Lumbriculus	-	1	1	-	3	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARTHROPODS																				
P. Arthropoda																				
MITES																				
Cl. Arachnida																				
O. Acarina	1	1	1	5	1	6	1	5	2	-	4	3	-	5	6	9	2	-	2	2
HARPACTICOIDS																				
O. Harpacticoida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEED SHRIMPS																				
Cl. Ostracoda	18	3	9	5	6	4	6	8	2	-	7	11	12	6	3	12	16	23	20	13
TADPOLE SHRIMP																				
O. Notostraca																				
Lepidurus arcticus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WATER SCUDS																				
O. Amphipoda																				
F. Gammaracanthidae																				
Gammaracanthus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INSECTS																				
Cl. Insecta																				
CADDISFLIES																				
O. Trichoptera																				
F. Limnephilidae																				
Grensia praeterita	-	1	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
pupae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
immature	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023m² grabs), Meadowbank study lakes and Baker Lake, August 2009.

Station	PDL	PDL	PDL	PDL	PDL	SP	SP	SP	SP	SP	TE	TE	TE	TE	TE	TEFF	TEFF	TEFF	TEFF	TEFF
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	7.2	8.0	8.3	7.3	7.5	7.5	7.7	6.8	7.1	8.1	7.0	7.4	6.9	8.2	7.9	6.9	6.6	7.8	7.2	6.9
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	17-Aug-09	17-Aug-09	17-Aug-09	17-Aug-09	17-Aug-09	12-Aug-09	12-Aug-09	12-Aug-09	12-Aug-09	12-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09
TRUE FLIES																				
O. Diptera																				
MIDGES																				
F. Chironomidae																				
chironomid pupae	25	2	4	2	1	-	-	-	-	-	-	4	-	7	4	9	13	19	5	8
S.F. Chironominae																				
Chironomus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cladotanytarsus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Constempellina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Corynocera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dicrotendipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Micropsectra	2	-	7	-	1	-	-	-	-	-	2	-	1	1	1	6	12	9	10	
Paracladopelma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paratanytarsus	11	7	2	-	-	-	-	-	-	-	-	-	-	-	7	30	7	1	8	
Polypedium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sergentia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stempellinella	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Stictochironomus	-	9	1	91	23	-	5	4	3	3	-	1	-	-	-	1	-	-	-	-
Tanytarsus	-	-	2	-	-	-	-	2	-	-	-	-	-	-	1	2	-	2	1	4
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.F. Diamesinae																				
Pothastia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Protanytus	-	-	-	-	1	-	-	-	-	-	1	-	-	1	-	-	-	-	-	3
Pseudodiamesa	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.F. Orthocladinae																				
Abiskomyia	1	1	-	1	-	2	-	-	-	2	-	-	-	-	-	1	1	2	1	-
Corynoneura	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cricotopus	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Cricotopus/Orthocladus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heterotrissocladius	5	7	2	2	-	-	-	-	3	3	2	-	3	4	7	-	4	3	5	8
Hydrobaenus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mesocricotopus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Paraccladius	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
Parakiefferiella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psectrocladius	3	-	1	4	1	-	-	1	1	-	-	5	1	-	-	-	1	-	1	-
Zalutschia	-	-	-	1	-	-	3	-	-	3	-	-	-	-	1	-	1	-	1	-
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.F. Prodiamesinae																				
Monodiamesa	1	1	-	3	3	-	1	3	-	-	-	-	-	3	1	2	2	2	-	1
S.F. Tanytopodinae																				
Ablabesmyia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Procladius	6	1	-	9	8	14	9	9	11	6	2	5	2	2	4	-	3	4	1	-
Thienemannimyia complex	8	1	3	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	2	-
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Empididae																				
Chelifera/Neoplasta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Wiedemannia	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
pupae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOLLUSCS																				
P. Mollusca																				
CLAMS																				
Cl. Bivalvia																				
F. Sphaeriidae																				
Cyclocalyx/Neopisidium	29	21	9	25	7	12	12	14	15	11	27	9	17	16	14	11	6	15	15	10
Cyclocalyx	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-
Sphaerium nitidum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL NUMBER OF TAXA ¹	10	12	11	10	11	5	7	8	8	6	7	7	5	8	8	11	12	8	12	9
TOTAL NUMBER OF ORGANISMS ²	92	55	35	153	62	37	32	42	39	29	39	35	24	40	39	47	71	66	45	55

Notes:

¹ Number of taxa totals exclude nematodes & ostracods, immatures & pupae (Tubificidae, Limnephilidae, Chironomidae, Empididae), and indeterminates (Lumbriculidae, Chironominae, Orthocladinae, Tanytopodinae).

² Number of organisms totals exclude nematodes (P. Nemata) & ostracods (Cl. Ostracoda).

TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Farfield;

INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake;

BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilahaarjuk Point.

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023m² grabs), Meadowbank study lakes and Baker Lake, August 2009.

Station	TPE	TPE	TPE	TPE	TPE	TPN	TPN	TPN	TPN	TPN	TPS	TPS	TPS	TPS	TPS	WAL	WAL	WAL	WAL	WAL
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	6.9	7.7	7.8	6.5	6.5	8.7	7.1	8.5	7.8	8.8	8.0	6.8	7.3	7.3	9.7	4.8	7.4	7.3	7.3	7.5
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	13-Aug-09	13-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	16-Aug-09	16-Aug-09	16-Aug-09	16-Aug-09	16-Aug-09
ROUNDWORMS																				
P. Nematoda	3	3	-	6	5	6	-	-	-	-	-	10	1	8	4	2	-	-	3	1
FLATWORMS																				
P. Platyhelminthes																				
Cl. Turbellaria																				
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	2	1	-	1
ANNELIDS																				
P. Annelida																				
WORMS																				
Cl. Oligochaeta																				
F. Enchytraeidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Naididae																				
Nais communis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nais	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slavina appendiculata	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Tubificidae																				
Limnodrilus hoffmeisteri	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rhyacodrilus coccineus	1	-	-	-	4	1	-	-	-	-	-	1	-	-	2	6	-	-	-	-
Rhyacodrilus montana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tasserkidrilus americanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
immatures with hair chaetae	3	-	-	8	-	-	-	-	-	-	2	-	11	-	-	8	-	-	-	-
immatures without hair chaetae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Lumbricidae																				
Lumbriculus	1	-	-	-	1	-	-	-	-	-	2	-	2	-	-	2	-	1	-	4
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARTHROPODS																				
P. Arthropoda																				
MITES																				
Cl. Arachnida																				
O. Acarina	4	-	1	9	4	-	2	2	1	1	-	-	-	-	-	2	4	3	1	2
HARPACTICOIDS																				
O. Harpacticoida	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEED SHRIMPS																				
Cl. Ostracoda	67	20	18	35	50	3	2	1	11	6	28	25	24	32	19	19	16	20	24	11
TADPOLE SHRIMP																				
O. Notostraca																				
Lepidurus arcticus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WATER SCUDS																				
O. Amphipoda																				
F. Gammaracanthidae																				
Gammaracanthus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
INSECTS																				
Cl. Insecta																				
CADDISFLIES																				
O. Trichoptera																				
F. Limnephilidae																				
Grensia praeterita	-	-	-	-	-	1	-	-	1	-	-	-	-	1	-	-	-	1	1	2
pupae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
immature	-	-	-	1	-	-	1	-	-	-	1	1	-	-	-	-	-	-	-	-

Appendix B. Benthic invertebrate raw data (total number of organisms in two 0.023m² grabs), Meadowbank study lakes and Baker Lake, August 2009.

Station	TPE	TPE	TPE	TPE	TPE	TPN	TPN	TPN	TPN	TPN	TPS	TPS	TPS	TPS	TPS	WAL	WAL	WAL	WAL	WAL
Replicate	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Depth (m)	6.9	7.7	7.8	6.5	6.5	8.7	7.1	8.5	7.8	8.8	8.0	6.8	7.3	7.3	9.7	4.8	7.4	7.3	7.3	7.5
# Grabs/sample	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mesh Size (µm)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Date	13-Aug-09	13-Aug-09	14-Aug-09	14-Aug-09	14-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	21-Aug-09	16-Aug-09	16-Aug-09	16-Aug-09	16-Aug-09	16-Aug-09
TRUE FLIES																				
O. Diptera																				
MIDGES																				
F. Chironomidae																				
chironomid pupae	3	5	10	1	-	8	15	5	8	1	3	20	17	10	4	1	-	1	-	-
S.F. Chironominae																				
Chironomus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cladotanytarsus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	1	-	-
Constempellina	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Corynocera	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	129	-	-	-	-
Dicrotendipes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Micropsectra	3	3	2	1	1	-	1	-	-	-	3	2	3	4	-	-	-	-	-	-
Paracladopelma	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paratanytarsus	7	7	5	-	14	4	-	-	5	-	6	25	37	41	-	25	2	-	-	-
Polypedilum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sergentia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stempellinella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stictochironomus	4	1	-	1	2	1	1	8	-	8	3	3	10	1	-	16	13	14	14	24
Tanytarsus	5	4	4	4	17	10	1	11	10	1	6	12	3	1	1	3	1	-	-	-
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.F. Diamesinae																				
Pothastia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Protanypus	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	1	-	-	1
Pseudodiamesa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.F. Orthocladinae																				
Abiskomyia	-	1	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Corynoneura	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cricotopus	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	1	-	-	1	-
Cricotopus/Orthocladus	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heterotrissocladius	-	7	-	2	8	10	3	5	-	3	6	11	10	4	3	-	-	-	-	-
Hydrobaenus	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	-	-	-	-
Mesocricotopus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paraccladius	-	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parakiefferiella	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psectrocladius	1	-	-	5	-	-	-	-	-	1	3	7	4	1	1	-	1	-	2	-
Zalutschia	-	-	-	-	-	-	3	-	-	2	-	-	-	-	-	-	-	-	-	-
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S.F. Prodiamesinae																				
Monodiamesa	2	1	-	1	-	-	-	1	-	1	-	-	-	-	-	11	1	-	-	2
S.F. Tanypodinae																				
Ablabesmyia	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Procladius	17	13	2	15	7	2	3	4	3	3	4	1	2	3	1	1	20	18	12	9
Thienemannimyia complex	10	11	1	7	11	8	3	4	3	1	8	8	11	12	3	-	-	-	-	-
indeterminate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Empididae																				
Chelifera/Neoplasta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wiedemannia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pupae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MOLLUSCS																				
P. Mollusca																				
CLAMS																				
Cl. Bivalvia																				
F. Sphaeriidae																				
Cyclocalyx/Neopisidium	10	32	21	27	33	24	21	28	19	18	8	23	42	14	17	50	26	19	12	17
Cyclocalyx	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	5	5	6
Sphaerium nitidum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL NUMBER OF TAXA ¹	12	11	9	12	12	11	9	8	7	11	11	11	11	11	8	15	11	9	9	10
TOTAL NUMBER OF ORGANISMS ²	71	87	49	84	103	72	54	68	50	41	56	116	153	93	33	264	76	64	49	68

Notes:

¹ Number of taxa totals exclude nematodes & ostracods, immatures & pupae (Tubificidae, Limnephilidae, Chironomidae, Empididae), and indeterminates (Lumbriculidae, Chironominae, Orthocladinae, Tanypodinae).

² Number of organisms totals exclude nematodes (P. Nemata) & ostracods (Cl. Ostracoda).

TPE,TPN,TPS=Third Portage Lake - East, North, South basins; SP=Second Portage Lake; TE,TEFF=Tehek Lake - Farfield;

INUG=Inuggugayualik Lake; WAL=Wally Lake; PDL=Pipedream Lake;

BBD,BPJ,BAP=Baker Lake - Barge Dock, Proposed Jetty, Akilahaarjuk Point.

APPENDIX C

LABORATORY REPORTS, 2009





Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 11-JUN-09 16:13 (MT)

Version: FINAL REV. 2

Lab Work Order #: L764640

Date Received: 15-MAY-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: ADDITIONAL 09-JUN-09 13:34 Please note that this report has been revised since its initial approval. Silicate has been analyzed for all samples as per the client's request. No other data has been changed.

Please note that the DOC and TOC results for samples "TPN-3-S" and "EB-2" have been confirmed by re-analysis.

LINDSAY JONES
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-1	L764640-2	L764640-3	L764640-4	L764640-5
		05-MAY-09 11:00 SP-1-S	06-MAY-09 17:00 SP-2-S	05-MAY-09 12:00 SP-3-S	05-MAY-09 15:00 TPE-1-S	05-MAY-09 13:15 TPE-2-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	29.6	29.4	30.4	18.1	20.6
	Hardness (as CaCO3) (mg/L)	12.0	12.1	12.0	6.6	7.5
	pH (pH)	6.95	6.99	7.03	6.34	6.88
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	12	20	19	14	15
	Turbidity (NTU)	0.50	0.48	0.32	0.46	0.16
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	0.022	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.66	0.64	0.63	0.60	0.68
	Fluoride (F) (mg/L)	0.079	0.076	0.076	0.075	0.084
	Nitrate (as N) (mg/L)	0.0348	0.0385	0.0381	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.118	0.131	0.086	0.060	0.113
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	2.89	2.85	2.86	1.83	2.06
	Dissolved Organic Carbon (mg/L)	1.78	1.64	1.70	1.40	1.58
	Total Organic Carbon (mg/L)	1.71	1.70	1.79	1.49	1.61
Total Metals	Aluminum (Al)-Total (mg/L)	0.0233	0.0310	0.0254	<0.0050	<0.010
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	3.11	3.06	3.13	1.48	1.70
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	0.032	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.98	0.94	0.96	0.64	0.73
	Manganese (Mn)-Total (mg/L)	0.00102	0.00108	0.00098	0.00034	0.00039
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-6	L764640-7	L764640-8	L764640-9	L764640-10
		05-MAY-09 14:00 TPE-3-S	03-MAY-09 14:50 TPN-1-S	03-MAY-09 18:15 TPN-2-S	03-MAY-09 18:30 TPN-3-S	04-MAY-09 16:00 TE-1-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	20.1	20.1	15.4	17.4	27.7
	Hardness (as CaCO3) (mg/L)	7.3	7.3	5.5	6.9	10.3
	pH (pH)	6.86	6.81	6.82	6.80	7.01
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	12	<10	10	15
	Turbidity (NTU)	0.16	0.37	0.15	0.21	0.24
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.66	0.69	0.52	0.59	0.91
	Fluoride (F) (mg/L)	0.083	0.082	0.065	0.073	0.088
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.096	0.203	0.070	0.070	0.114
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	2.01	2.07	1.57	1.81	3.30
	Dissolved Organic Carbon (mg/L)	1.84	2.33	1.22	1.90	1.81
	Total Organic Carbon (mg/L)	1.69	2.53	1.29	1.49	1.92
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.010	<0.0050	<0.0050	<0.010
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.71	1.60	1.26	1.45	2.52
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.75	0.71	0.57	0.65	0.97
	Manganese (Mn)-Total (mg/L)	<0.00030	0.00059	<0.00030	0.00035	0.00047
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-11	L764640-12	L764640-13	L764640-14	L764640-15
		04-MAY-09 16:00 TE-1-INT	04-MAY-09 13:30 TE-2-S	04-MAY-09 13:30 TE-2-INT	04-MAY-09 13:30 TE-2-D	04-MAY-09 15:00 TE-3-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	29.3	24.2	24.8	24.3	13.9
	Hardness (as CaCO3) (mg/L)	11.3	9.0	9.6	9.5	8.7
	pH (pH)	7.04	6.94	6.98	6.94	6.82
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	17	14	13	14	11
	Turbidity (NTU)	0.32	0.30	0.34	0.39	0.19
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.93	0.91	0.77	0.72	<0.50
	Fluoride (F) (mg/L)	0.090	0.086	0.077	0.075	0.064
	Nitrate (as N) (mg/L)	0.0060	<0.0050	0.0114	0.0175	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.145	0.104	0.089	0.129	0.135
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	3.43	3.14	2.88	2.76	1.66
	Dissolved Organic Carbon (mg/L)	2.54	1.81	1.67	1.58	1.79
	Total Organic Carbon (mg/L)	2.13	1.84	1.69	1.67	1.83
Total Metals	Aluminum (Al)-Total (mg/L)	0.0119	<0.010	0.0112	0.0129	<0.010
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	0.000114	<0.000017
	Calcium (Ca)-Total (mg/L)	2.73	2.11	2.34	2.32	2.06
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.01	0.89	0.87	0.84	0.84
	Manganese (Mn)-Total (mg/L)	0.00059	<0.00030	0.00056	0.00063	0.00038
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-16	L764640-17	L764640-18	L764640-19	L764640-20
		04-MAY-09	06-MAY-09	05-MAY-09	03-MAY-09 11:35	03-MAY-09 11:35
		EB-1	EB-2	DUP-1	INUG-1-S	INUG-1-INT
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	<2.0	17.6	21.7	18.1
	Hardness (as CaCO3) (mg/L)	<1.1	<1.1	6.7	8.2	6.8
	pH (pH)	5.81	5.76	6.38	6.94	6.40
	Total Suspended Solids (mg/L)				<1.0	<1.0
	Total Dissolved Solids (mg/L)				10	11
	Turbidity (NTU)				0.16	0.15
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	0.027	0.027	0.021
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	0.60	1.07	0.85
	Fluoride (F) (mg/L)	<0.020	<0.020	0.075	0.084	0.067
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0111
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	0.175	0.243	0.190
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	<0.50	<0.50	1.82	1.39	1.14
	Dissolved Organic Carbon (mg/L)	<0.50	6.80	1.45	2.53	2.08
	Total Organic Carbon (mg/L)	<0.50	<0.50	1.52	2.56	2.09
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.010	<0.010
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	<0.10	<0.10	1.50	1.60	1.32
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	0.00079	<0.00050	<0.00050	<0.00050	0.00055
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10	0.66	0.97	0.80
	Manganese (Mn)-Total (mg/L)	<0.00030	<0.00030	0.00046	0.00040	0.00148
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-21	L764640-22	L764640-23	L764640-24	L764640-25
		03-MAY-09 11:35 INUG-1-D	03-MAY-09 12:30 INUG-2-S	03-MAY-09 12:30 INUG-2-INT	03-MAY-09 12:30 INUG-2-D	03-MAY-09 13:40 INUG-3-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	19.1	20.5	16.9	17.9	16.2
	Hardness (as CaCO3) (mg/L)	7.2	7.9	6.2	6.6	6.0
	pH (pH)	6.26	6.92	6.43	6.40	6.50
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	13	<10	<10	11
	Turbidity (NTU)	0.17	0.20	0.21	0.16	0.17
Anions and Nutrients	Ammonia as N (mg/L)	0.025	0.020	0.027	<0.020	0.027
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.84	1.00	0.81	0.83	0.77
	Fluoride (F) (mg/L)	0.062	0.079	0.067	0.064	0.095
	Nitrate (as N) (mg/L)	0.0557	<0.0050	<0.0050	0.0166	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.188	0.188	0.178	0.169	0.140
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	1.18	1.32	1.06	1.12	1.02
	Dissolved Organic Carbon (mg/L)	1.74	2.44	1.83	1.88	1.76
Total Metals	Total Organic Carbon (mg/L)	1.71	2.29	1.90	1.90	1.77
	Aluminum (Al)-Total (mg/L)	0.0112	<0.010	<0.010	<0.010	<0.010
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	0.000022	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.44	1.50	1.22	1.32	1.14
	Chromium (Cr)-Total (mg/L)	0.0013	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	0.00459	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.83	0.91	0.73	0.78	0.69
	Manganese (Mn)-Total (mg/L)	0.0107	0.00040	0.00051	0.00102	0.00043
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L764640-26 TRAVEL BLANK 1	L764640-27 TRAVEL BLANK 2			
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		<2.0	<2.0			
	Hardness (as CaCO3) (mg/L)		<1.1	<1.1			
	pH (pH)		5.83	5.61			
	Total Suspended Solids (mg/L)		<1.0	<1.0			
	Total Dissolved Solids (mg/L)		<10	<10			
	Turbidity (NTU)		<0.10	<0.10			
Anions and Nutrients	Ammonia as N (mg/L)		<0.020	<0.020			
	Bromide (Br) (mg/L)		<0.050	<0.050			
	Chloride (Cl) (mg/L)		<0.50	<0.50			
	Fluoride (F) (mg/L)		<0.020	<0.020			
	Nitrate (as N) (mg/L)		<0.0050	<0.0050			
	Nitrite (as N) (mg/L)		<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)		<0.050	<0.050			
	Silicate (as SiO2) (mg/L)		<1.0	<1.0			
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)		<0.50	<0.50			
	Dissolved Organic Carbon (mg/L)						
Total Metals	Total Organic Carbon (mg/L)		<0.50	<0.50			
	Aluminum (Al)-Total (mg/L)		<0.0050	<0.0050			
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050			
	Barium (Ba)-Total (mg/L)		<0.020	<0.020			
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010			
	Bismuth (Bi)-Total (mg/L)		<0.20	<0.20			
	Boron (B)-Total (mg/L)		<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017			
	Calcium (Ca)-Total (mg/L)		<0.10	<0.10			
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010			
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030			
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010			
	Iron (Fe)-Total (mg/L)		<0.030	<0.030			
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050			
	Lithium (Li)-Total (mg/L)		<0.0050	<0.0050			
	Magnesium (Mg)-Total (mg/L)		<0.10	<0.10			
	Manganese (Mn)-Total (mg/L)		<0.00030	<0.00030			
	Mercury (Hg)-Total (mg/L)		<0.000020	<0.000020			
	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010			
	Phosphorus (P)-Total (mg/L)		<0.30	<0.30			
	Potassium (K)-Total (mg/L)		<2.0	<2.0			
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010			

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-1	L764640-2	L764640-3	L764640-4	L764640-5
		05-MAY-09 11:00 SP-1-S	06-MAY-09 17:00 SP-2-S	05-MAY-09 12:00 SP-3-S	05-MAY-09 15:00 TPE-1-S	05-MAY-09 13:15 TPE-2-S
Grouping	Analyte					
WATER						
Total Metals	Silicon (Si)-Total (mg/L)	0.395	0.409	0.405	0.114	0.140
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Total (mg/L)	0.0154	0.0153	0.0155	0.0070	0.0080
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	3.18	3.23	3.20	1.52	1.75
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.99	0.99	0.97	0.68	0.76
	Manganese (Mn)-Dissolved (mg/L)	0.00049	0.00040	0.00038	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silicon (Si)-Dissolved (mg/L)	0.375	0.383	0.377	0.117	0.142
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Dissolved (mg/L)	0.0155	0.0158	0.0158	0.0074	0.0083
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

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Sample ID Description Sampled Date Sampled Time Client ID		L764640-6	L764640-7	L764640-8	L764640-9	L764640-10
		05-MAY-09 14:00 TPE-3-S	03-MAY-09 14:50 TPN-1-S	03-MAY-09 18:15 TPN-2-S	03-MAY-09 18:30 TPN-3-S	04-MAY-09 16:00 TE-1-S
Grouping	Analyte					
WATER						
Total Metals	Silicon (Si)-Total (mg/L)	0.139	0.113	0.099	0.098	0.248
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Total (mg/L)	0.0081	0.0076	0.0058	0.0068	0.0135
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.71	1.68	1.25	1.58	2.53
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.74	0.76	0.57	0.72	0.97
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silicon (Si)-Dissolved (mg/L)	0.138	0.112	0.092	0.104	0.243
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Dissolved (mg/L)	0.0080	0.0078	0.0060	0.0074	0.0141
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

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Sample ID Description Sampled Date Sampled Time Client ID		L764640-11	L764640-12	L764640-13	L764640-14	L764640-15
		04-MAY-09 16:00 TE-1-INT	04-MAY-09 13:30 TE-2-S	04-MAY-09 13:30 TE-2-INT	04-MAY-09 13:30 TE-2-D	04-MAY-09 15:00 TE-3-S
Grouping	Analyte					
WATER						
Total Metals	Silicon (Si)-Total (mg/L)	0.271	0.181	0.278	0.299	0.183
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Total (mg/L)	0.0147	0.0116	0.0125	0.0122	0.0113
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	0.0051	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.82	2.12	2.39	2.37	2.09
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	0.0019	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.05	0.90	0.88	0.86	0.85
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silicon (Si)-Dissolved (mg/L)	0.274	0.178	0.279	0.302	0.184
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Dissolved (mg/L)	0.0148	0.0117	0.0125	0.0123	0.0114
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

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Sample ID Description Sampled Date Sampled Time Client ID		L764640-16	L764640-17	L764640-18	L764640-19	L764640-20
		04-MAY-09	06-MAY-09	05-MAY-09	03-MAY-09 11:35	03-MAY-09 11:35
		EB-1	EB-2	DUP-1	INUG-1-S	INUG-1-INT
Grouping	Analyte					
WATER						
Total Metals	Silicon (Si)-Total (mg/L)	<0.050	<0.050	0.112	0.190	0.203
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Total (mg/L)	<0.0050	<0.0050	0.0070	0.0091	0.0076
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	0.14	<0.10	1.54	1.63	1.37
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	0.061	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	<0.10	<0.10	0.68	1.00	0.81
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	0.00128
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silicon (Si)-Dissolved (mg/L)	<0.050	<0.050	0.118	0.205	0.223
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Dissolved (mg/L)	<0.0050	<0.0050	0.0072	0.0093	0.0076
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-21	L764640-22	L764640-23	L764640-24	L764640-25
		03-MAY-09 11:35 INUG-1-D	03-MAY-09 12:30 INUG-2-S	03-MAY-09 12:30 INUG-2-INT	03-MAY-09 12:30 INUG-2-D	03-MAY-09 13:40 INUG-3-S
Grouping	Analyte					
WATER						
Total Metals	Silicon (Si)-Total (mg/L)	0.349	0.181	0.161	0.218	0.153
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Total (mg/L)	0.0083	0.0084	0.0068	0.0074	0.0064
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.46	1.57	1.25	1.32	1.21
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.86	0.96	0.76	0.80	0.73
	Manganese (Mn)-Dissolved (mg/L)	0.00682	<0.00030	<0.00030	0.00045	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silicon (Si)-Dissolved (mg/L)	0.355	0.194	0.163	0.218	0.156
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Strontium (Sr)-Dissolved (mg/L)	0.0084	0.0089	0.0070	0.0074	0.0069
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L764640-26 TRAVEL BLANK 1	L764640-27 TRAVEL BLANK 2			
Grouping	Analyte						
WATER							
Total Metals	Silicon (Si)-Total (mg/L)		<0.050	<0.050			
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)		<2.0	<2.0			
	Strontium (Sr)-Total (mg/L)		<0.0050	<0.0050			
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010			
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)						
	Antimony (Sb)-Dissolved (mg/L)						
	Arsenic (As)-Dissolved (mg/L)						
	Barium (Ba)-Dissolved (mg/L)						
	Beryllium (Be)-Dissolved (mg/L)						
	Bismuth (Bi)-Dissolved (mg/L)						
	Boron (B)-Dissolved (mg/L)						
	Cadmium (Cd)-Dissolved (mg/L)						
	Calcium (Ca)-Dissolved (mg/L)						
	Chromium (Cr)-Dissolved (mg/L)						
	Cobalt (Co)-Dissolved (mg/L)						
	Copper (Cu)-Dissolved (mg/L)						
	Iron (Fe)-Dissolved (mg/L)						
	Lead (Pb)-Dissolved (mg/L)						
	Lithium (Li)-Dissolved (mg/L)						
	Magnesium (Mg)-Dissolved (mg/L)						
	Manganese (Mn)-Dissolved (mg/L)						
	Mercury (Hg)-Dissolved (mg/L)						
	Molybdenum (Mo)-Dissolved (mg/L)						
	Nickel (Ni)-Dissolved (mg/L)						
	Phosphorus (P)-Dissolved (mg/L)						
	Potassium (K)-Dissolved (mg/L)						
	Selenium (Se)-Dissolved (mg/L)						
	Silicon (Si)-Dissolved (mg/L)						
	Silver (Ag)-Dissolved (mg/L)						
	Sodium (Na)-Dissolved (mg/L)						
	Strontium (Sr)-Dissolved (mg/L)						
	Thallium (Tl)-Dissolved (mg/L)						
	Tin (Sn)-Dissolved (mg/L)						
	Titanium (Ti)-Dissolved (mg/L)						
	Uranium (U)-Dissolved (mg/L)						

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L764640-1	L764640-2	L764640-3	L764640-4	L764640-5
	Description					
	Sampled Date	05-MAY-09	06-MAY-09	05-MAY-09	05-MAY-09	05-MAY-09
	Sampled Time	11:00	17:00	12:00	15:00	13:15
	Client ID	SP-1-S	SP-2-S	SP-3-S	TPE-1-S	TPE-2-S
Grouping	Analyte					
WATER						
Dissolved Metals	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.564	0.488	0.376	0.127	0.189

Sample ID Description Sampled Date Sampled Time Client ID		L764640-6	L764640-7	L764640-8	L764640-9	L764640-10
		05-MAY-09	03-MAY-09	03-MAY-09	03-MAY-09	04-MAY-09
		14:00	14:50	18:15	18:30	16:00
		TPE-3-S	TPN-1-S	TPN-2-S	TPN-3-S	TE-1-S
Grouping	Analyte					
WATER						
Dissolved Metals	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.124	0.330	0.254	0.355	0.340

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-11	L764640-12	L764640-13	L764640-14	L764640-15
		04-MAY-09	04-MAY-09	04-MAY-09	04-MAY-09	04-MAY-09
		16:00	13:30	13:30	13:30	15:00
		TE-1-INT	TE-2-S	TE-2-INT	TE-2-D	TE-3-S
Grouping	Analyte					
WATER						
Dissolved Metals	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.484	0.348	0.587	0.820	0.086

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-16	L764640-17	L764640-18	L764640-19	L764640-20
		04-MAY-09	06-MAY-09	05-MAY-09	03-MAY-09 11:35	03-MAY-09 11:35
		EB-1	EB-2	DUP-1	INUG-1-S	INUG-1-INT
Grouping	Analyte					
WATER						
Dissolved Metals	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)				0.168	0.178

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L764640-21	L764640-22	L764640-23	L764640-24	L764640-25
		03-MAY-09	03-MAY-09	03-MAY-09	03-MAY-09	03-MAY-09
		11:35	12:30	12:30	12:30	13:40
		INUG-1-D	INUG-2-S	INUG-2-INT	INUG-2-D	INUG-3-S
Grouping	Analyte					
WATER						
Dissolved Metals	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug/L)	0.070	0.317	0.194	0.106	0.367

	Sample ID Description Sampled Date Sampled Time Client ID	L764640-26 TRAVEL BLANK 1	L764640-27 TRAVEL BLANK 2			
Grouping	Analyte					
WATER						
Dissolved Metals	Vanadium (V)-Dissolved (mg/L) Zinc (Zn)-Dissolved (mg/L)					
Plant Pigments	Chlorophyll a (ug/L)					

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments
Methods Listed (if applicable):			
ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-DIS-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
NH3-SIE-VA			
	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA			
	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA			
	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA			
	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA			
	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
SILICATE-COL-VA			
	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA			
	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA			
	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.			
TSS-LOW-VA			
	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.			
TURBIDITY-VA			
	Water	Turbidity by Meter	APHA 2130 "Turbidity"
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
TURBIDITY-VA			
	Water	Turbidity by Meter	APHA 2130 Turbidity
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

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Phone:	604-730-1220	Fax:				☐	Emergency Service (<1 Day / Wkend) - Contact ALS										
Invoice To: ☒ Same as Report						Analysis Request											
Company:						P	F	F	P								
Contact:																	
Address:																	
Sample																	
Phone:		Fax:															
Lab Work Order # (lab use only) 1264650																	
Sample Identification (This description will appear on the report)																	
Sample #	Inug-1-S	Date	dd-mm-yy	Sampler (Initials):	Time hh:mm	T-Metals (CCME)	D-Metals (CCME)	TKN, Ammonia	TDS, TSS-low	Alk (SPECIATED)	Anion Scan, Si, pH, EC	T-PO ₄ , ortho-PO ₄	Chlorophyll-a	Turbidity	Hazardous?	Highly Contaminated?	
19		03-May-09	11:35	Natasha MM	Water	X	X	X	X	X	X	X	X	X	X	X	
20		03-May-09	11:35		Water	X	X	X	X	X	X	X	X	X	X	X	
21		03-May-09	11:35		Water	X	X	X	X	X	X	X	X	X	X	X	
22		03-May-09	12:30		Water	X	X	X	X	X	X	X	X	X	X	X	
23		03-May-09	12:30		Water	X	X	X	X	X	X	X	X	X	X	X	
24		03-May-09	12:30		Water	X	X	X	X	X	X	X	X	X	X	X	
25		03-May-09	13:40		Water	X	X	X	X	X	X	X	X	X	X	X	
					Water												
					Water												
					Water												
					Water												
Guidelines / Regulations						Special Instructions / Hazardous Details											
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																	
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																	
Relinquished By:	Date & Time:	Received By:	Date & Time:	Received By:	Date & Time:	Temperature						Samples Received in Good Condition? Y/N (if no number in parentheses)					
						8/28/19											



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 19-JUN-09 10:29 (MT)

Version: FINAL

Lab Work Order #: L773504

Date Received: 04-JUN-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: For some of the submitted water samples, the measured concentration of specific dissolved parameters is greater than the corresponding total parameters concentration. The explanation for these findings is one or a combination of the following:

- laboratory method variability;
- analytical bias introduced during sample filtration;
- analytical bias introduced during general handling, storage, transportation and/or analysis of the sample;
- sample grab bias - where separate grab samples are processed to produce total and dissolved samples;
- sample split bias - where total and dissolved parameters samples are produced from the same grab sample.



NATASHA MARKOVIC-MIROVIC
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-1	L773504-2	L773504-3	L773504-4	L773504-5
		28-MAY-09 14:00 SP-1-S	28-MAY-09 14:30 SP-2-S	28-MAY-09 15:15 SP-3-S	28-MAY-09 12:30 TPE-1-S	28-MAY-09 11:45 TPE-2-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	31.4	31.0	30.3	17.4	22.5
	Hardness (as CaCO3) (mg/L)	10.9	11.6	11.2	5.7	7.5
	pH (pH)	8.01	7.64	7.53	6.60	7.25
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	16	18	14	<10	14
	Turbidity (NTU)	0.87	0.97	1.13	0.39	0.40
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.71	0.67	0.65	0.59	0.78
	Fluoride (F) (mg/L)	0.081	0.078	0.076	0.070	0.090
	Nitrate (as N) (mg/L)	0.0250	0.0371	0.0369	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.170	0.129	0.149	0.086	0.128
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	2.88	2.92	2.86	1.74	2.24
	Dissolved Organic Carbon (mg/L)	1.65	1.67	1.63	1.28	1.66
	Total Organic Carbon (mg/L)	1.77	1.65	1.67	1.30	1.67
Total Metals	Aluminum (Al)-Total (mg/L)	0.0198	0.0481	0.0585	<0.0050	0.0062
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.83	3.01	3.00	1.32	1.78
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	0.043	0.050	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.94	0.96	0.95	0.60	0.77
	Manganese (Mn)-Total (mg/L)	0.00157	0.00212	0.00209	<0.00030	0.00048
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-6	L773504-7	L773504-8	L773504-9	L773504-10
		28-MAY-09 10:15 TPE-3-S	29-MAY-09 17:30 TPN-1-S	29-MAY-09 18:00 TPN-2-S	29-MAY-09 15:45 TPN-3-S	30-MAY-09 16:30 TE-1-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	18.5	16.4	16.0	17.7	32.1
	Hardness (as CaCO3) (mg/L)	6.3	5.6	5.4	5.9	11.8
	pH (pH)	6.70	6.76	6.68	6.80	7.12
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	10	<10	<10	<10	33
	Turbidity (NTU)	0.33	0.26	0.25	0.28	0.51
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.64	0.54	0.54	0.59	0.79
	Fluoride (F) (mg/L)	0.079	0.066	0.065	0.070	0.084
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0242
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.118	0.118	0.113	0.109	0.135
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	1.92	1.65	1.62	1.78	3.27
	Dissolved Organic Carbon (mg/L)	1.34	1.19	1.18	1.34	1.79
	Total Organic Carbon (mg/L)	1.30	1.21	1.22	1.38	1.80
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0164
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.46	1.22	1.22	1.34	3.03
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.65	0.55	0.56	0.61	1.02
	Manganese (Mn)-Total (mg/L)	0.00035	<0.00030	<0.00030	<0.00030	0.00255
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-11	L773504-12	L773504-13	L773504-14	L773504-15
Grouping Analyte						
WATER						
Physical Tests	Conductivity (uS/cm)	28.9	28.6	31.6	31.3	26.9
	Hardness (as CaCO3) (mg/L)	10.4	10.2	11.5	11.1	10.1
	pH (pH)	7.09	7.05	7.08	7.07	7.02
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	22	26	24	25	22
	Turbidity (NTU)	0.54	0.34	0.60	0.71	0.36
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.82	0.85	0.81	0.87	0.82
	Fluoride (F) (mg/L)	0.081	0.082	0.084	0.080	0.080
	Nitrate (as N) (mg/L)	0.0110	<0.0050	0.0199	0.0183	0.0065
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.138	0.120	0.121	0.442	0.158
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	3.13	3.21	3.29	3.25	3.07
	Dissolved Organic Carbon (mg/L)	1.72	1.72	1.79	2.11	1.64
	Total Organic Carbon (mg/L)	1.72	1.69	1.82	2.18	1.62
Total Metals	Aluminum (Al)-Total (mg/L)	0.0130	0.0071	0.0142	0.0217	0.0103
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	0.000026	<0.000017
	Calcium (Ca)-Total (mg/L)	2.60	2.57	2.99	2.75	2.31
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	0.0016	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	0.033	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.92	0.94	1.02	0.94	0.86
	Manganese (Mn)-Total (mg/L)	0.00118	0.00037	0.00246	0.00287	0.00115
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-16	L773504-17	L773504-18	L773504-19	L773504-20
		30-MAY-09 14:00 TE-3-S	29-MAY-09 EB-1	30-MAY-09 EB-2	28-MAY-09 11:30 INUG-1-S	28-MAY-09 11:30 INUG-1-INT
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	30.3	<2.0	<2.0	17.9	18.8
	Hardness (as CaCO3) (mg/L)	11.7	<1.1	<1.1	6.3	6.4
	pH (pH)	6.70	5.55	5.56	6.68	6.61
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	20	<10	<10	12	<10
	Turbidity (NTU)	0.50	0.19	0.14	0.18	0.30
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.77	<0.50	<0.50	0.89	0.95
	Fluoride (F) (mg/L)	0.083	<0.020	<0.020	0.069	0.076
	Nitrate (as N) (mg/L)	0.0248	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.164	<0.050	<0.050	0.166	0.177
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	3.26	<0.50	<0.50	1.16	1.19
	Dissolved Organic Carbon (mg/L)	1.66	<0.50	<0.50	1.80	1.91
	Total Organic Carbon (mg/L)	1.77	<0.50	<0.50	1.92	1.98
Total Metals	Aluminum (Al)-Total (mg/L)	0.0179	<0.0050	<0.0050	0.0055	0.0068
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	0.000018
	Calcium (Ca)-Total (mg/L)	3.06	<0.10	<0.10	1.24	1.27
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.01	<0.10	<0.10	0.77	0.78
	Manganese (Mn)-Total (mg/L)	0.00294	<0.00030	<0.00030	<0.00030	0.00048
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-21	L773504-22	L773504-23	L773504-24	L773504-25
Grouping Analyte						
WATER						
Physical Tests	Conductivity (uS/cm)	18.3	21.8	20.0	18.4	17.0
	Hardness (as CaCO3) (mg/L)	6.3	7.3	6.7	6.3	5.8
	pH (pH)	6.50	6.79	6.81	6.62	6.63
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	14	14	12	<10
	Turbidity (NTU)	0.20	0.20	0.22	0.18	0.15
Anions and Nutrients	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.87	1.08	0.97	0.88	0.81
	Fluoride (F) (mg/L)	0.065	0.081	0.083	0.067	0.064
	Nitrate (as N) (mg/L)	0.0104	<0.0050	<0.0050	0.0065	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.222	0.139	0.189	0.095	0.072
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)	1.14	1.37	1.23	1.14	1.07
	Dissolved Organic Carbon (mg/L)	1.71	2.12	2.02	1.79	1.72
	Total Organic Carbon (mg/L)	1.80	2.26	2.05	1.81	1.74
Total Metals	Aluminum (Al)-Total (mg/L)	0.0058	0.0056	0.0058	<0.0050	0.0063
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.22	1.46	1.34	1.25	1.11
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.74	0.90	0.84	0.77	0.67
	Manganese (Mn)-Total (mg/L)	0.00069	<0.00030	0.00040	0.00048	0.00040
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L773504-26	L773504-27	L773504-28	L773504-29	
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		30.7	16.1	<2.0		
	Hardness (as CaCO3) (mg/L)		11.5	5.4	<1.1		
	pH (pH)		6.98	6.72	5.68		
	Total Suspended Solids (mg/L)		<1.0	<1.0	<1.0		
	Total Dissolved Solids (mg/L)		19	<10	<10		
	Turbidity (NTU)		0.93	0.14	<0.10		
Anions and Nutrients	Ammonia as N (mg/L)		<0.020	<0.020	<0.020		
	Bromide (Br) (mg/L)		<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)		0.69	0.54	<0.50		
	Fluoride (F) (mg/L)		0.080	0.066	<0.020		
	Nitrate (as N) (mg/L)		0.0358	<0.0050	<0.0050		
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)		0.062	0.083	<0.050		
	Silicate (as SiO2) (mg/L)		<1.0	<1.0	<1.0		
Organic / Inorganic Carbon	Sulfate (SO4) (mg/L)		2.96	1.64	<0.50		
	Dissolved Organic Carbon (mg/L)		1.53	1.20	<0.50		
	Total Organic Carbon (mg/L)		1.63	1.19	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)		0.0510	<0.0050	<0.0050		
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)		<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010		
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)		<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)		3.03	1.21	<0.10		
	Chromium (Cr)-Total (mg/L)		<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)		<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)		<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Total (mg/L)		0.040	<0.030	<0.030		
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Total (mg/L)		<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)		0.96	0.56	<0.10		
	Manganese (Mn)-Total (mg/L)		0.00214	<0.00030	<0.00030		
	Mercury (Hg)-Total (mg/L)		<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010	<0.0010		
	Potassium (K)-Total (mg/L)		<2.0	<2.0	<2.0		
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010	<0.0010		
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020		
	Sodium (Na)-Total (mg/L)		<2.0	<2.0	<2.0		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-1	L773504-2	L773504-3	L773504-4	L773504-5
Grouping Analyte						
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.82	3.04	2.95	1.31	1.74
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.94	0.96	0.93	0.59	0.77
	Manganese (Mn)-Dissolved (mg/L)	0.00129	0.00157	0.00116	<0.00030	0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.702		1.04	0.032	0.125

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-6	L773504-7	L773504-8	L773504-9	L773504-10
Grouping Analyte						
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.45	1.27	1.22	1.34	3.07
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.64	0.58	0.56	0.61	1.01
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	0.00224
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.244	0.394	0.399	0.636	0.284

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-11	L773504-12	L773504-13	L773504-14	L773504-15
Grouping Analyte						
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	0.0063	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	0.000021	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.61	2.55	2.96	2.85	2.54
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.93	0.94	1.01	0.97	0.91
	Manganese (Mn)-Dissolved (mg/L)	0.00088	<0.00030	0.00205	0.00198	0.00134
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.599	0.571	0.535	0.618	0.735

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-16	L773504-17	L773504-18	L773504-19	L773504-20
Grouping Analyte						
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0079
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	3.05	<0.10	<0.10	1.26	1.29
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.00	<0.10	<0.10	0.77	0.78
	Manganese (Mn)-Dissolved (mg/L)	0.00250	<0.00030	<0.00030	<0.00030	0.00034
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.756			0.096	0.349

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L773504-21	L773504-22	L773504-23	L773504-24	L773504-25
Grouping Analyte						
WATER						
Total Metals	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	0.0056	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.29	1.45	1.33	1.25	1.14
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.76	0.90	0.82	0.77	0.71
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Plant Pigments	Chlorophyll a (ug)	0.596	0.378	0.741	0.684	0.368

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L773504-26	L773504-27	L773504-28	L773504-29	
Grouping	Analyte						
WATER							
Total Metals	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050		
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010		
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050	<0.0050		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050	<0.0050			
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050			
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050			
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020			
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010			
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10			
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017			
	Calcium (Ca)-Dissolved (mg/L)		3.01	1.24			
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010			
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030			
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010			
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030			
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050			
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050			
	Magnesium (Mg)-Dissolved (mg/L)		0.97	0.57			
	Manganese (Mn)-Dissolved (mg/L)		0.00150	<0.00030			
	Mercury (Hg)-Dissolved (mg/L)		<0.000020	<0.000020			
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010			
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010			
	Potassium (K)-Dissolved (mg/L)		<2.0	<2.0			
	Selenium (Se)-Dissolved (mg/L)		<0.0010	<0.0010			
	Silver (Ag)-Dissolved (mg/L)		<0.000020	<0.000020			
	Sodium (Na)-Dissolved (mg/L)		<2.0	<2.0			
	Thallium (Tl)-Dissolved (mg/L)		<0.00020	<0.00020			
	Tin (Sn)-Dissolved (mg/L)		<0.00050	<0.00050			
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)		<0.00020	<0.00020			
	Vanadium (V)-Dissolved (mg/L)		<0.0010	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)		<0.0050	<0.0050			
Plant Pigments	Chlorophyll a (ug)		0.478	0.321		0.602	

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments
Methods Listed (if applicable):			
ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SIO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-COL-VA	Water	Total Kjeldahl Nitrogen by Auto. Colour	APHA 4500-Norg (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.			
TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.			
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			
** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:			
Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Randy Baker, Ryan VanEngen (AEM)		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: Vancouver		Email 1: rbaker@azimuthgroup.ca, rvanengen@agnico-eagle.com		☐ Priority Service (1 Day or ASAP)	
Phone: 604-730-1220 Fax:		Email 2: gmann@azimuthgroup.ca, rmmccormell@azimuthgroup.ca		☐ Emergency Service (< 1 Day / Weekend) - Contact ALS	
Invoice To: ☒ Same as Report		Indicate Bottles: Filtered / Preserved (F/P) →			
Company:		Client / Project Information:			
Contact:		Job #: Meadowbank Mine AEMP			
Address:		PO/AFE:			
Sample:		Legal Site Description:			
Phone:		Quote #: ALSEC09-077			
Lab Work Order # (lab use only)		ALS Contact: Natasha MM		Sampler (Initials): RV	
Sample #		Sample Identification (This description will appear on the report)		Sample Type (Select from drop-down list)	
SP-1-S	dd-mm-yy	14:00	Water	X	X
SP-2-S	28-May-09	14:30	Water	X	X
SP-3-S	28-May-09	15:15	Water	X	X
TPE-1-S	28-May-09	12:30	Water	X	X
TPE-2-S	28-May-09	11:45	Water	X	X
TPE-3-S	28-May-09	10:15	Water	X	X
TPN-1-S	29-May-09	17:30	Water	X	X
TPN-2-S	29-May-09	18:00	Water	X	X
TPN-3-S	29-May-09	15:45	Water	X	X
Guidelines / Regulations					
Special Instructions / Hazardous Details					
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
Relinquished By:		Date & Time:		Received By:	
[Signature]		May 31/09 9:34		[Signature]	
Relinquished By:		Date & Time:		Received By:	
[Signature]		11/25/09		[Signature]	
Temperature		Samples Received in Good Condition (Y/N)		Sample Condition (lab use only)	
14 cools		Y		Y	



Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Randy Baker, Ryan Vanengen (AEM)		☒ PDF ☐ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: Vancouver		Email 1: rbaker@azimuthgroup.ca, rvanengen@agnico-eagle.com		☐ Priority Service (1 Day or ASAP)	
Phone: 604-730-1220 Fax:		Email 2: gmann@azimuthgroup.ca, rmmccormell@azimuthgroup.ca		☐ Emergency Service (<1 Day / Weekend) - Contact ALS	
Invoice To: ☒ Same as Report		Indicate Bottles: Filtered / Preserved (F/P) →		Analysis Request	
Company:		Client / Project Information:			
Contact:		Job #:			
Address:		PO/AFE:			
Sample		Legal Site Description:			
Phone:		Quote #:			
Fax:		ALS			
Lab Work Order # (lab use only)		Natalasha MM		Sampler (Initials) RV	
Sample #	Sample Identification (This description will appear on the report)	Date	Time	Sample Type (Select from drop-down list)	
TE-1-S		dd-mm-yy	hh:mm		
TE-1-S		30-May-09	16:30	Water	X
TE-1-Int		30-May-09	16:30	Water	X
TE-1-D		30-May-09	16:30	Water	X
TE-2-S		30-May-09	15:00	Water	X
TE-2-Int		30-May-09	15:00	Water	X
TE-2-D		30-May-09	15:00	Water	X
TE-3-S		30-May-09	14:00	Water	X
EB-1		29-May-09	-	Water	X
EB-2		30-May-09	-	Water	X
Guidelines / Regulations					
Special Instructions / Hazardous Details					
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.					
Relinquished By:	Date & Time:	Received By:	Date & Time:	Temperature	Sample Condition (lab use only)
By:	May 3/09 9:30	By:	9/6/4	all 14 cells	Samples Received in Good Condition (Y/N) (if no provided details)
Relinquished By:	Date & Time:	Received By:	Date & Time:		
By:		By:	11:35		



Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)			
Contact: Randy Baker, Ryan VanEngen (AEM)				☒ PDF ☐ Excel ☐ Fax				☐ Rush Service (2-3 Days)			
Address: Vancouver				Email 1: rbaker@azimuthgroup.ca, rvanengen@agnico-eagle.com				☐ Priority Service (1 Day or ASAP)			
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca, mmccconnell@azimuthgroup.ca				☐ Emergency Service (<1 Day / Weekend) - Contact ALS			
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) ->->				Analysis Request			
Company:				Client / Project Information:							
Contact:				Job #:							
Address:				PO/A/E:							
Sample:				Legal Site Description:							
Phone:				Quote #: ALSEC09-077							
Lab Work Order # (lab use only)				ALS Contact: Natasha MM				Sampler (initials): RV			
Sample Identification (This description will appear on the report)		Date		Time		Sample Type (Select from drop-down list)					
#		dd-mm-yy		hh:mm							
Inug-1-S		28-May-09		11:30		Water		☒ T-Metals (CCME)			
Inug-1-Int		28-May-09		11:30		Water		☒ D-Metals (CCME)			
Inug-1-D		28-May-09		11:30		Water		☒ TOC, DOC			
Inug-2-S		28-May-09		13:30		Water		☒ TKN, Ammonia			
Inug-2-Int		28-May-09		13:30		Water		☒ TDS, TSS-low			
Inug-2-D		28-May-09		13:30		Water		☒ Alk (SPECIATED)			
Inug-3-S		28-May-09		12:30		Water		☒ Anion Scan, Si, pH, EC			
Dup-1		28-May-09				Water		☒ T-PO4, ortho-PO4			
Dup-2		28-May-09				Water		☒ Chlorophyll-a			
								☒ Turbidity			
								☒ Hazardous?			
								☒ Highly Contaminated?			
								☒ Number of Containers			
Guidelines / Regulations											
Special Instructions / Hazardous Details											
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.											
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Relinquished By:		Date & Time:		Received By:		Date & Time:		Temperature		Samples Condition (lab use only)	
Relinquished By:		Date & Time:		Received By:		Date & Time:		14 0116		Condition: ☒ In Good (if no provided details)	



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 01-SEP-09 15:41 (MT)

Version: FINAL REV. 2

Lab Work Order #: L797346

Date Received: 27-JUL-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: Please note that certain metals detection limits have been increased for some of the samples due to the interferences encountered during the analysis.
Please note that this report has been revised since its initial approval. Mercury and Phosphorus have been analyzed for samples #19 to #66. All other data remains unchanged.

LINDSAY JONES
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-19	L797346-20	L797346-21	L797346-22	L797346-23
		18-JUL-09	18-JUL-09	18-JUL-09	18-JUL-09	18-JUL-09
		SP-SC-1	SP-SC-2	SP-SC-3	SP-SC-4	SP-SC-5
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.85	6.57	6.46	6.46	6.38
Organic / Inorganic Carbon	Total Organic Carbon (%)	5.45	4.59	5.57	4.78	2.61
Metals	Aluminum (Al) (mg/kg)	28500	31400	31600	28700	34500
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	33.2	31.1	33.7	60.4	34.0
	Barium (Ba) (mg/kg)	141	149	151	135	161
	Beryllium (Be) (mg/kg)	2.28	2.46	2.48	2.29	2.58
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)	81.7	85.3	87.2	78.9	84.6
	Cobalt (Co) (mg/kg)	15.4	16.2	16.8	18.0	17.7
	Copper (Cu) (mg/kg)	92.8	101	104	94.0	104
	Lead (Pb) (mg/kg)	30	<30	<30	<30	31
	Mercury (Hg) (mg/kg)	0.0490	0.0429	0.0540	0.0435	0.0403
	Molybdenum (Mo) (mg/kg)	6.7	6.2	6.6	7.3	10.1
	Nickel (Ni) (mg/kg)	59.7	61.2	61.3	61.3	71.3
	Phosphorus (P) (mg/kg)	766	730	782	665	567
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<3.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg)	42.9	45.8	46.5	43.7	50.9
	Zinc (Zn) (mg/kg)	120	124	126	119	132

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-24	L797346-25	L797346-26	L797346-27	L797346-28
		18-JUL-09	18-JUL-09	18-JUL-09	18-JUL-09	18-JUL-09
		SP-SC-6	SP-SC-7	SP-SC-8	SP-SC-9	SP-SC-10
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.31	6.37	6.31	6.36	6.29
Organic / Inorganic Carbon	Total Organic Carbon (%)	4.08	4.21	4.96	4.05	3.18
Metals	Aluminum (Al) (mg/kg)	30400	28300	27800	32100	36200
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	30.9	28.0	29.3	24.3	36.7
	Barium (Ba) (mg/kg)	138	139	132	149	163
	Beryllium (Be) (mg/kg)	2.33	2.35	2.16	2.50	2.67
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)	85.1	82.7	77.3	88.0	95.0
	Cobalt (Co) (mg/kg)	15.8	16.5	14.2	14.8	17.9
	Copper (Cu) (mg/kg)	101	95.5	89.6	105	114
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0495	0.048	0.0596	0.0581	0.0378
	Molybdenum (Mo) (mg/kg)	6.8	6.1	6.6	6.2	8.3
	Nickel (Ni) (mg/kg)	55.5	70.0	59.3	72.1	63.0
	Phosphorus (P) (mg/kg)	666	610	668	707	659
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.5
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg)	45.3	44.4	41.8	47.3	52.2
	Zinc (Zn) (mg/kg)	123	130	119	132	139

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-29	L797346-30	L797346-31	L797346-32	L797346-33
		18-JUL-09	18-JUL-09	18-JUL-09	18-JUL-09	18-JUL-09
		SP-SC-11	SP-SC-12	SP-SC-13	SP-SC-14	SP-SC-15
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.38	6.42	6.47	6.26	6.28
Organic / Inorganic Carbon	Total Organic Carbon (%)	4.38	5.78	4.95	5.69	4.69
Metals	Aluminum (Al) (mg/kg)	27400	19700	29000	22000	25000
	Antimony (Sb) (mg/kg)	<10	<20	<10	<10	<10
	Arsenic (As) (mg/kg)	29.2	93	32.4	63.4	43.0
	Barium (Ba) (mg/kg)	129	312	151	160	116
	Beryllium (Be) (mg/kg)	2.07	1.5	2.21	1.77	2.06
	Cadmium (Cd) (mg/kg)	<0.50	1.1	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)	78.8	58.5	83.4	62.8	72.0
	Cobalt (Co) (mg/kg)	16.9	28.9	18.1	19.6	14.2
	Copper (Cu) (mg/kg)	84.1	75.0	96.3	79.6	78.9
	Lead (Pb) (mg/kg)	<30	<60	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0453	0.0684	0.0565	0.0651	0.052
	Molybdenum (Mo) (mg/kg)	6.7	22.8	7.3	10.8	8.0
	Nickel (Ni) (mg/kg)	63.4	94	87.6	81.4	52.8
	Phosphorus (P) (mg/kg)	587	890	745	747	596
	Selenium (Se) (mg/kg)	<2.5	<2.5	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)	<2.0	<4.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<10	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg)	42.8	28.7	45.1	36.1	40.4
	Zinc (Zn) (mg/kg)	121	107	126	104	110

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-34	L797346-35	L797346-36	L797346-37	L797346-38
		18-JUL-09	17-JUL-09	17-JUL-09	17-JUL-09	17-JUL-09
		SP-SC-DUP	TPE-SC-1	TPE-SC-2	TPE-SC-3	TPE-SC-4
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.36	5.96	6.30	6.26	6.15
Organic / Inorganic Carbon	Total Organic Carbon (%)	4.83	3.06	3.72	4.97	4.92
Metals	Aluminum (Al) (mg/kg)	28700	27200	25800	25200	19000
	Antimony (Sb) (mg/kg)	<10	<10	<20	<10	<10
	Arsenic (As) (mg/kg)	32.5	16.9	23	16.2	30.8
	Barium (Ba) (mg/kg)	141	127	153	124	321
	Beryllium (Be) (mg/kg)	2.36	2.10	2.0	1.96	1.44
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<1.0	<0.50	<0.50
	Chromium (Cr) (mg/kg)	84.9	94.1	88.3	90.4	61.9
	Cobalt (Co) (mg/kg)	16.8	16.4	17.7	15.0	28.6
	Copper (Cu) (mg/kg)	94.6	56.0	62.7	54.0	63.6
	Lead (Pb) (mg/kg)	<30	<30	<60	<30	<30
	Mercury (Hg) (mg/kg)	0.047	0.0143	0.028	0.0213	0.0425
	Molybdenum (Mo) (mg/kg)	6.0	4.4	<8.0	<4.0	6.6
	Nickel (Ni) (mg/kg)	64.3	58.9	118	58.7	260
	Phosphorus (P) (mg/kg)	684	362	460	409	548
	Selenium (Se) (mg/kg)	<2.0	<3.0	<2.5	<2.0	<2.5
	Silver (Ag) (mg/kg)	<2.0	<3.0	<4.0	<2.0	<3.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<10	<5.0	<5.0
	Vanadium (V) (mg/kg)	45.0	43.8	41.5	40.3	31.7
	Zinc (Zn) (mg/kg)	127	111	121	106	122

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L797346-39	L797346-40	L797346-41	L797346-42	L797346-43
		Description					
		Sampled Date	17-JUL-09	17-JUL-09	17-JUL-09	17-JUL-09	17-JUL-09
		Sampled Time					
		Client ID	TPE-SC-5	TPE-SC-6	TPE-SC-7	TPE-SC-8	TPE-SC-9
Grouping	Analyte						
SOIL							
Physical Tests	pH (pH)		6.34	5.52	5.75	6.33	6.09
Organic / Inorganic Carbon	Total Organic Carbon (%)		5.07	4.94	4.65	5.12	4.29
Metals	Aluminum (Al) (mg/kg)		23400	25200	25800	23400	26700
	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		15.4	39.2	9.1	16.1	33.4
	Barium (Ba) (mg/kg)		118	137	151	121	150
	Beryllium (Be) (mg/kg)		1.85	2.18	1.88	1.86	2.18
	Cadmium (Cd) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)		85.1	91.0	91.7	92.3	94.5
	Cobalt (Co) (mg/kg)		14.5	19.9	8.7	15.2	15.9
	Copper (Cu) (mg/kg)		49.6	81.5	58.9	50.2	84.5
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)		0.0211	0.0453	0.0309	0.029	0.037
	Molybdenum (Mo) (mg/kg)		<4.0	11.3	4.6	4.1	8.3
	Nickel (Ni) (mg/kg)		59.0	82.8	63.6	60.4	96.1
	Phosphorus (P) (mg/kg)		405	478	362	434	1060
	Selenium (Se) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.5
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg)		37.9	42.3	40.3	38.8	44.7
	Zinc (Zn) (mg/kg)		103	148	112	108	127

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-44	L797346-45	L797346-46	L797346-47	L797346-48
		17-JUL-09	17-JUL-09	17-JUL-09	17-JUL-09	17-JUL-09
		TPE-SC-10	TPE-SC-11	TPE-SC-12	TPE-SC-13	TPE-SC-14
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.08	6.01	5.98	6.20	6.02
Organic / Inorganic Carbon	Total Organic Carbon (%)	3.52	3.47	4.16	4.88	5.63
Metals	Aluminum (Al) (mg/kg)	26900	25600	27800	24900	21500
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	17.6	17.3	18.6	17.7	15.9
	Barium (Ba) (mg/kg)	123	119	128	136	105
	Beryllium (Be) (mg/kg)	2.11	2.04	1.91	1.83	1.60
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	0.65	<0.50
	Chromium (Cr) (mg/kg)	94.7	90.9	94.6	84.7	79.5
	Cobalt (Co) (mg/kg)	16.0	15.5	15.4	13.5	11.8
	Copper (Cu) (mg/kg)	55.2	55.4	58.7	54.1	45.4
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0162	0.0173	0.0237	0.0397	0.029
	Molybdenum (Mo) (mg/kg)	4.3	4.6	4.2	4.5	<4.0
	Nickel (Ni) (mg/kg)	56.6	55.3	60.2	64.5	51.2
	Phosphorus (P) (mg/kg)	380	365	469	451	429
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.5	<2.5	<2.0
	Silver (Ag) (mg/kg)	<2.0	<3.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg)	43.1	41.5	41.1	37.4	32.9
	Zinc (Zn) (mg/kg)	112	106	104	105	89.9

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-49	L797346-50	L797346-51	L797346-52	L797346-53
Grouping Analyte						
SOIL						
Physical Tests	pH (pH)	5.91	5.13	6.00	6.02	6.05
Organic / Inorganic Carbon	Total Organic Carbon (%)	4.56	4.83	4.16	3.83	4.90
Metals	Aluminum (Al) (mg/kg)	26900	28400	21300	22900	27800
	Antimony (Sb) (mg/kg)	<10	<10	<20	<20	<10
	Arsenic (As) (mg/kg)	15.7	33.0	40	25	16.6
	Barium (Ba) (mg/kg)	123	142	206	203	166
	Beryllium (Be) (mg/kg)	1.97	2.22	1.8	1.9	2.36
	Cadmium (Cd) (mg/kg)	<0.50	0.77	1.3	<1.0	0.63
	Chromium (Cr) (mg/kg)	93.0	99.6	45.4	49.2	62.7
	Cobalt (Co) (mg/kg)	15.6	26.1	16.8	23.0	10.0
	Copper (Cu) (mg/kg)	52.6	89.1	76.4	66.9	79.0
	Lead (Pb) (mg/kg)	<30	<30	<60	<60	<30
	Mercury (Hg) (mg/kg)	0.0188	0.045	0.0431	0.0335	0.064
	Molybdenum (Mo) (mg/kg)	<4.0	9.6	13.8	10.4	4.2
	Nickel (Ni) (mg/kg)	57.7	85.7	92	65	49.9
	Phosphorus (P) (mg/kg)	411	675	770	710	1140
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.5	<1.3	<3.0
	Silver (Ag) (mg/kg)	<2.0	<3.0	<4.0	<6.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<10	<10	<5.0
	Vanadium (V) (mg/kg)	40.7	42.3	28.6	30.4	39.9
	Zinc (Zn) (mg/kg)	106	145	117	101	115

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-54	L797346-55	L797346-56	L797346-57	L797346-58
		20-JUL-09	20-JUL-09	20-JUL-09	20-JUL-09	20-JUL-09
		TE-SC-4	TE-SC-5	TE-SC-6	TE-SC-7	TE-SC-8
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.08	6.05	6.06	5.81	5.80
Organic / Inorganic Carbon	Total Organic Carbon (%)	3.74	5.01	4.05	3.36	3.08
Metals	Aluminum (Al) (mg/kg)	29900	28100	22400	21100	19100
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	23.9	9.6	41.1	12.1	27.6
	Barium (Ba) (mg/kg)	156	163	150	97.0	84.9
	Beryllium (Be) (mg/kg)	2.44	2.21	1.94	1.79	1.60
	Cadmium (Cd) (mg/kg)	0.77	<0.50	0.74	<0.50	<0.50
	Chromium (Cr) (mg/kg)	62.3	60.1	48.1	48.6	43.5
	Cobalt (Co) (mg/kg)	14.5	8.6	15.3	8.4	8.4
	Copper (Cu) (mg/kg)	78.1	70.1	65.0	55.6	51.8
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0316	0.0577	0.046	0.0386	0.0316
	Molybdenum (Mo) (mg/kg)	6.8	<4.0	11.4	<4.0	6.3
	Nickel (Ni) (mg/kg)	72.6	46.9	54.7	34.6	29.6
	Phosphorus (P) (mg/kg)	629	707	696	704	673
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.5	<2.0	<2.0
	Silver (Ag) (mg/kg)	<3.0	<2.0	<5.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg)	41.1	38.8	31.8	32.2	28.0
	Zinc (Zn) (mg/kg)	121	108	95.1	86.5	79.6

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L797346-59	L797346-60	L797346-61	L797346-62	L797346-63
		Description					
		Sampled Date	20-JUL-09	20-JUL-09	20-JUL-09	20-JUL-09	20-JUL-09
		Sampled Time					
		Client ID	TE-SC-9	TE-SC-10	TE-SC-11	TE-SC-12	TE-SC-13
Grouping	Analyte						
SOIL							
Physical Tests	pH (pH)		5.90	5.94	5.83	5.99	6.15
Organic / Inorganic Carbon	Total Organic Carbon (%)		3.15	4.43	3.18	4.04	4.65
Metals	Aluminum (Al) (mg/kg)		27400	28000	27500	29400	28300
	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		20.0	21.5	24.2	20.8	20.3
	Barium (Ba) (mg/kg)		254	154	182	154	145
	Beryllium (Be) (mg/kg)		2.23	2.39	2.31	2.50	2.47
	Cadmium (Cd) (mg/kg)		0.53	0.71	0.60	0.54	0.59
	Chromium (Cr) (mg/kg)		58.6	62.5	57.4	64.1	61.3
	Cobalt (Co) (mg/kg)		19.2	14.6	20.8	14.3	13.7
	Copper (Cu) (mg/kg)		73.6	80.4	71.2	77.7	74.0
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)		0.034	0.041	0.0301	0.037	0.041
	Molybdenum (Mo) (mg/kg)		7.4	6.0	7.2	6.6	6.3
	Nickel (Ni) (mg/kg)		61.3	73.3	63.2	58.0	54.1
	Phosphorus (P) (mg/kg)		604	690	567	687	721
	Selenium (Se) (mg/kg)		<2.5	<2.5	<2.5	<2.5	<3.0
	Silver (Ag) (mg/kg)		<6.0	<3.0	<5.0	<2.0	<3.0
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg)		39.9	40.4	38.3	41.0	39.9
	Zinc (Zn) (mg/kg)		114	125	108	123	122

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-64	L797346-65	L797346-66		
Grouping	Analyte					
SOIL						
Physical Tests	pH (pH)	6.02	6.08	6.10		
Organic / Inorganic Carbon	Total Organic Carbon (%)	4.21	4.46	3.79		
Metals	Aluminum (Al) (mg/kg)	23100	19300	22900		
	Antimony (Sb) (mg/kg)	<10	<10	<10		
	Arsenic (As) (mg/kg)	45.4	52.6	30.1		
	Barium (Ba) (mg/kg)	134	110	135		
	Beryllium (Be) (mg/kg)	1.92	1.66	1.87		
	Cadmium (Cd) (mg/kg)	0.71	0.85	0.52		
	Chromium (Cr) (mg/kg)	49.3	42.8	51.0		
	Cobalt (Co) (mg/kg)	14.8	15.3	12.7		
	Copper (Cu) (mg/kg)	64.9	62.8	61.6		
	Lead (Pb) (mg/kg)	<30	<30	<30		
	Mercury (Hg) (mg/kg)	0.0442	0.048	0.0400		
	Molybdenum (Mo) (mg/kg)	14.8	18.7	9.3		
	Nickel (Ni) (mg/kg)	49.1	47.4	43.2		
	Phosphorus (P) (mg/kg)	722	1050	624		
	Selenium (Se) (mg/kg)	<2.5	<2.5	<2.5		
	Silver (Ag) (mg/kg)	<4.0	<4.0	<4.0		
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0		
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0		
	Vanadium (V) (mg/kg)	31.5	27.5	32.4		
	Zinc (Zn) (mg/kg)	93.9	88.9	90.7		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-1	L797346-2	L797346-3	L797346-4	L797346-5
		16-JUL-09	16-JUL-09	16-JUL-09	18-JUL-09	18-JUL-09
		TPE-4-S	TPE-5-S	TPE-6-S	SP-4-S	SP-5-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	17.0	14.7	14.8	23.3	22.1
	Hardness (as CaCO3) (mg/L)	5.4	5.3	5.2	9.6	8.8
	pH (pH)	6.73	6.74	6.75	6.89	6.96
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	<10	<10	14	<10
	Turbidity (NTU)	0.39	0.37	0.44	0.68	1.12
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.5	4.3	4.3	7.3	6.8
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.5	4.3	4.3	7.3	6.8
	Ammonia as N (mg/L)	<0.020	<0.020	0.030	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.054	0.054	0.054	0.047	0.050
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	0.0066	0.0064
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.101	0.094	0.101	0.119	0.186
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.39	1.37	1.38	2.31	2.06
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.47	1.40	1.33	1.57	1.69
	Total Organic Carbon (mg/L)	1.43	1.33	1.42	1.81	1.57
Total Metals	Aluminum (Al)-Total (mg/L)	0.0081	0.0081	0.0082	0.0250	0.0341
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.26	1.24	1.25	2.48	2.31
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	0.031	0.045
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.55	0.54	0.55	0.80	0.75
	Manganese (Mn)-Total (mg/L)	0.00168	0.00154	0.00155	0.00168	0.00209
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-6	L797346-7	L797346-8	L797346-9	L797346-10
		18-JUL-09	19-JUL-09	19-JUL-09	19-JUL-09	19-JUL-09
		SP-6-S	TE-4-S	TE-4-INT	TE-4-D	TE-5-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	23.3	18.8	18.9	18.7	18.6
	Hardness (as CaCO3) (mg/L)	9.4	7.1	7.1	7.1	7.1
	pH (pH)	7.02	6.91	6.88	6.87	6.88
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	14	12	12	10	<10
	Turbidity (NTU)	0.77	0.56	0.51	0.50	0.53
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.0	5.9	5.7	5.4	5.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.0	5.9	5.7	5.4	5.9
	Ammonia as N (mg/L)	<0.020	0.024	<0.020	0.056	0.024
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.048	0.049	0.049	0.049	0.053
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0086
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0021
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.158	0.130	0.087	0.123
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.26	1.88	1.87	1.89	2.06
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.99	1.66	1.71	1.67	1.70
	Total Organic Carbon (mg/L)	1.64	1.68	1.67	1.79	1.77
Total Metals	Aluminum (Al)-Total (mg/L)	0.0253	0.0142	0.0143	0.0162	0.0169
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.47	1.80	1.80	1.73	1.74
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.037	<0.030	<0.030	0.032	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.79	0.63	0.63	0.61	0.61
	Manganese (Mn)-Total (mg/L)	0.00174	0.00160	0.00168	0.00201	0.00182
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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Sample ID Description Sampled Date Sampled Time Client ID		L797346-11	L797346-12	L797346-13	L797346-14	L797346-15
		19-JUL-09	19-JUL-09	20-JUL-09	20-JUL-09	20-JUL-09
		TE-5-INT	TE-5-D	TE-6-S	TEFF-1-S	TEFF-2-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	18.8	18.7	18.6	15.3	18.1
	Hardness (as CaCO3) (mg/L)	7.1	7.0	7.0	5.3	6.7
	pH (pH)	6.85	6.70	6.94	6.84	6.77
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	16	14	16	11	11
	Turbidity (NTU)	0.54	0.52	0.50	0.24	0.43
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.6	5.6	5.3	4.1	5.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.6	5.6	5.3	4.1	5.1
	Ammonia as N (mg/L)	0.023	0.020	0.022	0.021	0.022
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	0.50
	Fluoride (F) (mg/L)	0.049	0.049	0.049	0.045	0.048
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.196	0.196	0.207	0.150	0.251
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.86	1.90	1.84	1.71	1.89
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.56	1.57	1.49	1.35	1.37
	Total Organic Carbon (mg/L)	1.64	1.71	1.56	1.20	1.40
Total Metals	Aluminum (Al)-Total (mg/L)	0.0170	0.0144	0.0172	<0.0050	0.0102
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.76	1.80	1.77	1.29	1.65
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	0.038	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.63	0.63	0.63	0.52	0.61
	Manganese (Mn)-Total (mg/L)	0.00186	0.00169	0.00198	0.00098	0.00142
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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Sample ID Description Sampled Date Sampled Time Client ID		L797346-16	L797346-17	L797346-18		
		19-JUL-09	20-JUL-09			
		JULY AEMP DUP-1	JULY AEMP EB-1	TRAVEL BLANKS		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	18.7	<2.0	<2.0		
	Hardness (as CaCO3) (mg/L)	7.0	<1.1	<1.1		
	pH (pH)	6.85	5.69	5.60		
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0		
	Total Dissolved Solids (mg/L)	<10	<10	<10		
	Turbidity (NTU)	0.53				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.5	<2.0	<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)	5.5	<2.0	<2.0		
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020		
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50		
	Fluoride (F) (mg/L)	0.049	<0.020	<0.020		
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	0.127	<0.050	<0.050		
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020		
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0		
	Sulfate (SO4) (mg/L)	1.84	<0.50	<0.50		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.54	<0.50	<0.50		
	Total Organic Carbon (mg/L)	1.74	<0.50	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0158	<0.0050	<0.0050		
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)	1.79	<0.10	<0.10		
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030		
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)	0.63	<0.10	<0.10		
	Manganese (Mn)-Total (mg/L)	0.00165	<0.00030	<0.00030		
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L797346-1	L797346-2	L797346-3	L797346-4	L797346-5
Grouping Analyte						
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.27	1.23	1.23	2.55	2.31
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.55	0.53	0.53	0.79	0.74
	Manganese (Mn)-Dissolved (mg/L)	0.00138	0.00128	0.00127	0.00097	0.00113
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L797346-6	L797346-7	L797346-8	L797346-9	L797346-10
Grouping Analyte						
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.48	1.80	1.80	1.79	1.79
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.78	0.63	0.63	0.63	0.63
	Manganese (Mn)-Dissolved (mg/L)	0.00093	0.00115	0.00119	0.00115	0.00112
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L797346-11	L797346-12	L797346-13	L797346-14	L797346-15
		19-JUL-09	19-JUL-09	20-JUL-09	20-JUL-09	20-JUL-09
		TE-5-INT	TE-5-D	TE-6-S	TEFF-1-S	TEFF-2-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.80	1.79	1.79	1.28	1.67
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.64	0.63	0.63	0.52	0.62
	Manganese (Mn)-Dissolved (mg/L)	0.00115	0.00113	0.00110	0.00083	0.00106
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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		Sample ID Description Sampled Date Sampled Time Client ID	L797346-16 19-JUL-09 JULY AEMP DUP-1	L797346-17 20-JUL-09 JULY AEMP EB-1	L797346-18 TRAVEL BLANKS		
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	1.79	<0.10				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	0.63	<0.10				
	Manganese (Mn)-Dissolved (mg/L)	0.00114	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010				
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050				
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010				
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020				
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050				

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		Sample ID Description Sampled Date Sampled Time Client ID	L797346-1 16-JUL-09 TPE-4-S	L797346-2 16-JUL-09 TPE-5-S	L797346-3 16-JUL-09 TPE-6-S	L797346-4 18-JUL-09 SP-4-S	L797346-5 18-JUL-09 SP-5-S
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)		0.382	0.457	0.383	0.771	0.690

	Sample ID	L797346-6	L797346-7	L797346-8	L797346-9	L797346-10
	Description					
	Sampled Date	18-JUL-09	19-JUL-09	19-JUL-09	19-JUL-09	19-JUL-09
	Sampled Time					
	Client ID	SP-6-S	TE-4-S	TE-4-INT	TE-4-D	TE-5-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.689	0.587	0.440	0.357	0.434

		Sample ID Description Sampled Date Sampled Time Client ID	L797346-11 19-JUL-09 TE-5-INT	L797346-12 19-JUL-09 TE-5-D	L797346-13 20-JUL-09 TE-6-S	L797346-14 20-JUL-09 TEFF-1-S	L797346-15 20-JUL-09 TEFF-2-S
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)	0.487	0.565	0.509	0.288	0.365	

		Sample ID Description Sampled Date Sampled Time Client ID	L797346-16 19-JUL-09 JULY AEMP DUP-1	L797346-17 20-JUL-09 JULY AEMP EB-1	L797346-18 TRAVEL BLANKS		
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)		0.528				

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

AL-CSR-ICP-VA Soil Al in Soil by ICPOES (CSR SALM) BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

ALK-SCR-VA Water Alkalinity by colour or titration EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA Water Bromide by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA Water Chloride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA Water Fluoride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA Water Nitrite by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA Water Nitrate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

C-TOT-ORG-LECO-SK Soil Organic Carbon by combustion method SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5 Reference for Inorganic C: Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-CCME-CVAFS-VA	Soil	CVAFS Hg in Soil (CCME)	BCMELP CSR SALM METHOD 8/EPA 245.7
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA Method 7000 series).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-CSR-FULL-ICP-VA	Soil	Metals in Soil by ICPOES (CSR SALM)	BCMELP CSR SALM METHOD 8
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B). Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-1:2-VA	Soil	CSR pH by 1:2 Water Leach	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL
This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SE-SALM-HVAF-VA	Soil	Se in Soil by HVAFS (CSR SALM)	BCMELP CSR SALM METHOD 8
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Water Quality - Determination of As/Se/Sb, Part 1 - Hydride Generation Atomic Fluorescence Spectrometry (HG-AFS)", by the International Organization for Standardization (ISO). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry.			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-COL-VA	Water	Total Kjeldahl Nitrogen by Auto. Colour	APHA 4500-Norg (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

TKN-SIE-VA Water Total Kjeldahl Nitrogen by SIE APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TL-CSR-MS-VA Soil ICPMS TI in Soil by CSR SALM BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by either hotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

TSS-LOW-VA Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:**

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA	SK	ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 17-AUG-09 17:13 (MT)

Version: FINAL

Lab Work Order #: L800546

Date Received: 04-AUG-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:



NATASHA MARKOVIC-MIROVIC
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L800546-1	L800546-2	L800546-3	L800546-4	L800546-5
		21-JUL-09	21-JUL-09	21-JUL-09	23-JUL-09	23-JUL-09
		WAL-1-S	WAL-2-S	WAL-3-S	TPS-1-S	TPS-2-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	26.3	26.2	25.7	14.3	20.6
	Hardness (as CaCO3) (mg/L)	11.8	11.7	11.4	5.0	5.2
	pH (pH)	6.99	7.02	7.00	6.77	7.11
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	20	23	23	14	<10
	Turbidity (NTU)	0.26	0.27	0.27	0.21	0.19
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	9.4	9.1	8.2	4.7	4.4
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	9.4	9.1	8.2	4.7	4.4
	Ammonia as N (mg/L)	0.028	<0.020	0.028	0.024	0.031
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.038	0.036	0.037	0.056	0.057
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.112	0.121	0.136	0.092	0.069
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.42	2.34	2.28	1.42	1.42
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.87	1.74	1.58	1.14	1.39
	Total Organic Carbon (mg/L)	1.85	1.65	1.66	1.36	1.27
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0053
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	3.19	3.09	2.76	1.17	1.18
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.95	0.95	0.85	0.55	0.55
	Manganese (Mn)-Total (mg/L)	0.00099	0.00113	0.00192	0.00058	0.00059
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L800546-6	L800546-7	L800546-8	L800546-9	L800546-10
		23-JUL-09	23-JUL-09	24-JUL-09	24-JUL-09	24-JUL-09
		TPS-3-S	TPN-4-S	TPN-5-S	TPN-6-S	AEMP JULY DUP-3
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	14.3	13.8	14.5	14.3	14.3
	Hardness (as CaCO3) (mg/L)	5.2	4.9	5.2	5.1	5.1
	pH (pH)	6.80	6.76	6.82	6.75	6.79
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	13	<10	<10	<10	<10
	Turbidity (NTU)	0.19	0.32	0.34	0.32	0.31
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.3	4.2	4.5	4.4	4.5
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.3	4.2	4.5	4.4	4.5
	Ammonia as N (mg/L)	0.033	<0.020	<0.020	0.056	0.027
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.057	0.052	0.055	0.055	0.055
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.074	0.087	0.087	0.079	0.180
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	0.0011	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.40	1.33	1.38	1.36	1.36
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.23	1.16	1.49	1.25	1.35
	Total Organic Carbon (mg/L)	1.24	1.15	1.37	1.16	1.21
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	0.0085	0.0066	0.0062	0.0064
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.18	1.16	1.18	1.18	1.18
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.55	0.53	0.54	0.54	0.54
	Manganese (Mn)-Total (mg/L)	0.00058	0.00066	0.00067	0.00066	0.00066
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L800546-11	L800546-12	L800546-13	L800546-14	L800546-15
		24-JUL-09	24-JUL-09	24-JUL-09	24-JUL-09	24-JUL-09
		INUG-4-S	INUG-4-D	INUG-4-INT	INUG-5-S	INUG-5-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	13.9	13.7	13.7	13.5	13.4
	Hardness (as CaCO3) (mg/L)	5.0	4.9	5.1	5.0	5.0
	pH (pH)	6.78	6.77	6.79	6.78	6.80
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	10	19	<10	<10
	Turbidity (NTU)	0.29	0.29	0.29	0.30	0.35
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.6	4.5	4.5	4.3	4.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.6	4.5	4.5	4.3	4.3
	Ammonia as N (mg/L)	0.024	0.029	<0.020	<0.020	0.025
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.63	0.63	0.62	0.64	0.65
	Fluoride (F) (mg/L)	0.051	0.051	0.051	0.052	0.052
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.114	0.175	0.176	0.104	0.133
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0021	<0.0020	<0.0020	0.0044	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.80	0.80	0.79	0.80	0.81
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.61	1.63	1.68	1.69	1.69
	Total Organic Carbon (mg/L)	1.76	1.68	1.79	1.81	1.73
Total Metals	Aluminum (Al)-Total (mg/L)	0.0062	0.0060	0.0065	0.0069	0.0070
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	0.99	0.98	0.98	1.00	0.99
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.63	0.59	0.62	0.63	0.62
	Manganese (Mn)-Total (mg/L)	0.00226	0.00240	0.00236	0.00249	0.00246
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L800546-16	L800546-17	L800546-18	L800546-19	L800546-20
		24-JUL-09	24-JUL-09			21-JUL-09
		INUG-5-INT	INUG-6-S	TRAVEL BLANKS	AEMP JULY EB-1	AEMP JULY DUP2
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	13.5	13.7	<2.0		26.4
	Hardness (as CaCO3) (mg/L)	5.0	5.1	<1.1		9.3
	pH (pH)	6.78	6.77	5.61		6.97
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0		<1.0
	Total Dissolved Solids (mg/L)	<10	<10	<10		19
	Turbidity (NTU)	0.32	0.32	<0.10		0.28
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.4	4.5	<2.0		9.5
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.4	4.5	<2.0		9.5
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020		0.027
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		<0.050
	Chloride (Cl) (mg/L)	0.66	0.65	<0.50		<0.50
	Fluoride (F) (mg/L)	0.053	0.052	<0.020		0.036
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050		<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.126	0.140	<0.050		0.135
	Ortho Phosphate as P (mg/L)	<0.0010	0.0012	<0.0010		<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020		0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0		<1.0
	Sulfate (SO4) (mg/L)	0.83	0.84	<0.50		2.33
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.75	1.64	<0.50		1.76
	Total Organic Carbon (mg/L)	1.73	1.85	<0.50		1.90
Total Metals	Aluminum (Al)-Total (mg/L)	0.0063	0.0063	<0.0050		<0.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020		<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017		<0.000017
	Calcium (Ca)-Total (mg/L)	0.99	1.01	<0.10		3.18
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030		<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030		<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050		<0.0050
	Magnesium (Mg)-Total (mg/L)	0.62	0.63	<0.10		0.94
	Manganese (Mn)-Total (mg/L)	0.00229	0.00207	<0.00030		0.00113
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020		<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L800546-1	L800546-2	L800546-3	L800546-4	L800546-5
Grouping Analyte						
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	0.109	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	3.17	3.13	3.04	1.14	1.17
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.94	0.95	0.93	0.53	0.55
	Manganese (Mn)-Dissolved (mg/L)	0.00066	0.00074	0.00151	0.00044	0.00044
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L800546-6	L800546-7	L800546-8	L800546-9	L800546-10
		23-JUL-09	23-JUL-09	24-JUL-09	24-JUL-09	24-JUL-09
		TPS-3-S	TPN-4-S	TPN-5-S	TPN-6-S	AEMP JULY DUP-3
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.18	1.12	1.20	1.17	1.17
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.55	0.51	0.54	0.53	0.54
	Manganese (Mn)-Dissolved (mg/L)	0.00044	0.00046	0.00059	0.00049	0.00048
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L800546-11	L800546-12	L800546-13	L800546-14	L800546-15
		24-JUL-09	24-JUL-09	24-JUL-09	24-JUL-09	24-JUL-09
		INUG-4-S	INUG-4-D	INUG-4-INT	INUG-5-S	INUG-5-D
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	0.99	0.98	1.00	0.99	0.98
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.62	0.60	0.62	0.61	0.61
	Manganese (Mn)-Dissolved (mg/L)	0.00162	0.00163	0.00161	0.00172	0.00164
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L800546-16	L800546-17	L800546-18	L800546-19	L800546-20
			24-JUL-09	24-JUL-09			21-JUL-09
			INUG-5-INT	INUG-6-S	TRAVEL BLANKS	AEMP JULY EB-1	AEMP JULY DUP2
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)		<0.0010	<0.0010	<0.0010		<0.0010
	Nickel (Ni)-Total (mg/L)		<0.0010	<0.0010	<0.0010		<0.0010
	Potassium (K)-Total (mg/L)		<2.0	<2.0	<2.0		<2.0
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010	<0.0010		<0.0010
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020		<0.000020
	Sodium (Na)-Total (mg/L)		<2.0	<2.0	<2.0		<2.0
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020		<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050		<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010		<0.010
	Uranium (U)-Total (mg/L)		<0.00020	<0.00020	<0.00020		<0.00020
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010		<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0050	<0.0050	<0.0050		<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050	<0.0050		<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050		<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050		<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020		<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010		<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10		<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017		<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)		0.98	1.02		<0.10	2.51
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010		<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030		<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010		<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030		<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050		<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050		<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		0.61	0.63		<0.10	0.74
	Manganese (Mn)-Dissolved (mg/L)		0.00168	0.00140		<0.00030	0.00058
	Mercury (Hg)-Dissolved (mg/L)		<0.000020	<0.000020		<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010		<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010		<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)		<2.0	<2.0		<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)		<0.0010	<0.0010		<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)		<0.000020	<0.000020		<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)		<2.0	<2.0		<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)		<0.00020	<0.00020		<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)		<0.00050	<0.00050		<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010		<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)		<0.00020	<0.00020		<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)		<0.0010	<0.0010		<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)		<0.0050	<0.0050		<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L800546-1	L800546-2	L800546-3	L800546-4	L800546-5
		21-JUL-09	21-JUL-09	21-JUL-09	23-JUL-09	23-JUL-09
		WAL-1-S	WAL-2-S	WAL-3-S	TPS-1-S	TPS-2-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.414	0.624	0.640	0.347	0.315

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L800546-6	L800546-7	L800546-8	L800546-9	L800546-10
		23-JUL-09	23-JUL-09	24-JUL-09	24-JUL-09	24-JUL-09
		TPS-3-S	TPN-4-S	TPN-5-S	TPN-6-S	AEMP JULY DUP-3
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.271	0.208	0.158	0.236	0.156

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L800546-11 24-JUL-09 INUG-4-S	L800546-12 24-JUL-09 INUG-4-D	L800546-13 24-JUL-09 INUG-4-INT	L800546-14 24-JUL-09 INUG-5-S	L800546-15 24-JUL-09 INUG-5-D
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)		0.362	0.492	0.435	0.347	0.547

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L800546-16 24-JUL-09 INUG-5-INT	L800546-17 24-JUL-09 INUG-6-S	L800546-18 TRAVEL BLANKS	L800546-19 AEMP JULY EB-1	L800546-20 21-JUL-09 AEMP JULY DUP2
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)		0.446	0.445			0.390

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

ALK-SCR-VA

Water

Alkalinity by colour or titration

EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA

Water

Bromide by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA

Water

Chloride by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA

Water

Fluoride by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA

Water

Nitrite by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA

Water

Nitrate by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA

Water

Sulfate by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DOC-VA

Water

Dissolved organic carbon by combustion

APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA

Water

Dissolved organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-COL-VA	Water	Total Kjeldahl Nitrogen by Auto. Colour	APHA 4500-Norg (TKN)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.

TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.**

The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Short Holding Time

Rush Processing Required

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division



Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____

Page 1 of 2

Report to:		Report Format / Distribution		Service Requested:																																																																																																																																																													
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)																																																																																																																																																													
Contact: Randy Baker		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)																																																																																																																																																													
Address: Vancouver		Email 1: rbaker@azimuthgroup.ca		☐ Priority Service (1 Day or ASAP)																																																																																																																																																													
		Email 2: gmann@azimuthgroup.ca, mmccconnell@azimuthgroup.ca		☐ Emergency Service (<1 Day / Wkend) - Contact ALS																																																																																																																																																													
Phone: 604-730-1220 Fax:				Analysis Request																																																																																																																																																													
Invoice To: ☒ Same as Report		Indicate Bottles: Filtered / Preserved (F/P) →																																																																																																																																																															
Company:		Client / Project Information:																																																																																																																																																															
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Lab Work Order # (Lab use only): 1880546		ALS Contact: Natasha MM		Sampler (Initials):																																																																																																																																																													
Sample	Sample Identification (This description will appear on the report)	Date dd-mm-yy	Time hh:mm	Sample Type (Select from drop-down list)	<table border="1"> <tr> <td>T-Metals (CCME)</td> <td>D-Metals (CCME)</td> <td>TOC, DOC</td> <td>TKN, Ammonia</td> <td>TDS, TSS-low</td> <td>Alk (SPECIATED)</td> <td>Anion Scan, Si, pH, EC</td> <td>T-PO4, ortho-PO4</td> <td>Chlorophyll-a</td> <td>Turbidity</td> <td>Hazardous?</td> <td>Highly Contaminated?</td> <td>Number of Containers</td> </tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td></tr> </table>	T-Metals (CCME)	D-Metals (CCME)	TOC, DOC	TKN, Ammonia	TDS, TSS-low	Alk (SPECIATED)	Anion Scan, Si, pH, EC	T-PO4, ortho-PO4	Chlorophyll-a	Turbidity	Hazardous?	Highly Contaminated?	Number of Containers	X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X			
T-Metals (CCME)	D-Metals (CCME)	TOC, DOC	TKN, Ammonia	TDS, TSS-low	Alk (SPECIATED)	Anion Scan, Si, pH, EC	T-PO4, ortho-PO4	Chlorophyll-a	Turbidity	Hazardous?	Highly Contaminated?	Number of Containers																																																																																																																																																					
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AEMP July DUP-3		24-Jul-09		Water																																																																																																																																																													
Guidelines / Regulations		Special Instructions / Hazardous Details																																																																																																																																																															
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																																																																																																																																																																	
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																																																																																																																																																																	
Relinquished By:	Date & Time:	Received By:	Date & Time:	Temperature	Sample Condition (Lab use only)																																																																																																																																																												
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Short Holding Time

Rush Processing Required

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

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Page 2 of 2

Report to:			Report Format / Distribution			Service Requested:																			
Company: Azimuth Consulting Group Inc.			☒ Standard ☐ Other			☒ Regular Service (Default)																			
Contact: Randy Baker			☒ PDF ☒ Excel ☐ Fax			☐ Rush Service (2-3 Days)																			
Address: Vancouver			Email 1: rbaker@azimuthgroup.ca			☐ Priority Service (1 Day or ASAP)																			
			Email 2: gmann@azimuthgroup.ca , mmconnell@azimuthgroup.ca			☐ Emergency Service (<1 Day / Wkend) - Contact ALS																			
Phone: 604-730-1220 Fax:						Analysis Request																			
Invoice To: ☒ Same as Report			Indicate Bottles: Filtered / Preserved (F/P) →→																						
Company:			Client / Project Information:																						
Contact:			Job #: Meadowbank Mine AEMP																						
Address:			PO/AFE:																						
Sample			Legal Site Description:																						
Phone: Fax:			Quote #: ALSEQ09-077																						
Lab / Work Order # (lab use only)			ALS Contact: Natasha MM			Sampler (Initials):																			
Sample Identification (This description will appear on the report)			Date dd-mmm-yy		Time hh:mm		Sample Type (Select from drop-down list)		T-Metals (CCME)	D-Metals (CCME)	TOC, DOC	TKN, Ammonia	TDS, TSS-low	Alk (SPECIATED)	Anion Scan, Si, pH, EC	T-PO4, ortho-PO4	Chlorophyll-a	Turbidity	Hazardous?	Highly Contaminated?	Number of Containers				
INUG-4-S			24-Jul-09				Water		X	X	X	X	X	X	X	X	X	X							
INUG-4-D			24-Jul-09				Water		X	X	X	X	X	X	X	X	X	X							
INUG-4-INT			24-Jul-09				Water		X	X	X	X	X	X	X	X	X	X							
INUG-5-S			24-Jul-09				Water		X	X	X	X	X	X	X	X	X	X							
INUG-5-D			24-Jul-09				Water		X	X	X	X	X	X	X	X	X	X							
INUG-5-INT			24-Jul-09				Water		X	X	X	X	X	X	X	X	X	X							
INUG-6-S			24-Jul-09				Water		X	X	X	X	X	X	X	X	X	X							
Travel Blanks							Water		X		X	X	X	X	X	X		X							
AEMP July EB-1							Water			X															
AEMP July DUP2			21-Jul-09				Water		X	X	X	X	X	X	X	X	X	X							
Guidelines / Regulations			Special Instructions / Hazardous Details																						
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																									
Relinquished By:		Date & Time:		Received By:		Date & Time:	09/08/09 11:05	Temperature 24°C														Samples Received in Good Condition? Y / N (if no provided details)			
Relinquished By:		Date & Time:		Received By:		Date & Time:																			



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 26-AUG-09 12:26 (MT)

Version: FINAL

Lab Work Order #: L804640

Date Received: 12-AUG-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:



NATASHA MARKOVIC-MIROVIC
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L804640-1	L804640-2	L804640-3	L804640-4	L804640-5
		26-JUL-09	26-JUL-09	26-JUL-09	28-JUL-09	28-JUL-09
		PDL-1-S	PDL-2-S	PDL-3-S	BBD-1-S	BBD-2-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	23.8	20.1	20.1	30.5	30.1
	Hardness (as CaCO3) (mg/L)	7.3	8.0	8.1	9.9	10.0
	pH (pH)	7.67	7.25	7.01	7.00	7.00
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	19	11	16	23	19
	Turbidity (NTU)	0.31	0.31	0.29	0.55	0.58
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	6.9	6.8	6.6	7.6	7.6
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	6.9	6.8	6.6	7.6	7.6
	Ammonia as N (mg/L)	0.028	0.066	0.030	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.53	0.56	0.54	3.44	3.18
	Fluoride (F) (mg/L)	0.046	0.048	0.047	0.059	0.054
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	0.0058	0.0066
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.077	0.068	0.059	0.112	0.103
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	0.0035	0.0040
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.43	1.51	1.48	0.89	0.84
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.65	1.57	1.56	2.64	2.86
	Total Organic Carbon (mg/L)	1.70	1.62	1.63	2.99	2.98
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	<0.0050	0.0082	0.0083
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.98	1.99	1.90	2.13	2.16
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.71	0.72	0.69	1.12	1.12
	Manganese (Mn)-Total (mg/L)	0.00074	0.00075	0.00061	0.00233	0.00235
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L804640-6	L804640-7	L804640-8	L804640-9	L804640-10
		28-JUL-09	28-JUL-09	28-JUL-09	28-JUL-09	28-JUL-09
		BBD-3-S	BPJ-1-S	BPJ-2-S	BPJ-3-S	BAP-1-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	31.3	72.2	76.4	72.0	92.8
	Hardness (as CaCO3) (mg/L)	10.0	13.7	14.1	13.7	15.7
	pH (pH)	7.01	6.98	6.98	6.99	6.99
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	30	44	40	45	48
	Turbidity (NTU)	0.57	0.60	0.63	0.61	0.61
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.7	7.4	8.0	7.9	7.8
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.7	7.4	8.0	7.9	7.8
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	0.036	0.025
	Bromide (Br) (mg/L)	<0.050	<0.050	0.051	<0.050	0.062
	Chloride (Cl) (mg/L)	3.57	14.5	15.5	14.1	19.6
	Fluoride (F) (mg/L)	0.059	0.060	0.059	0.060	0.060
	Nitrate (as N) (mg/L)	0.0066	0.0112	0.0107	0.0110	0.0143
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.132	0.116	0.118	0.126	0.142
	Ortho Phosphate as P (mg/L)	0.0012	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0034	0.0035	0.0044	0.0036	0.0031
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.91	2.40	2.54	2.33	3.10
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.89	3.07	2.81	2.92	2.90
	Total Organic Carbon (mg/L)	3.02	3.15	2.88	2.97	3.10
Total Metals	Aluminum (Al)-Total (mg/L)	0.0089	0.0083	0.0084	0.0084	0.0098
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.16	2.40	2.43	2.38	2.55
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.14	1.89	1.95	1.87	2.25
	Manganese (Mn)-Total (mg/L)	0.00245	0.00231	0.00230	0.00218	0.00237
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L804640-11	L804640-12	L804640-13	L804640-14	L804640-15
		28-JUL-09	28-JUL-09	28-JUL-09	28-JUL-09	
		BAP-2-S	BAP-3-S	AEMP JULY DUP4	AEMP JULY EB-2	TRAVEL BLANKS
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	78.0	74.6	30.3	<2.0	<2.0
	Hardness (as CaCO3) (mg/L)	14.8	14.1	9.9	<1.1	<1.1
	pH (pH)	7.00	7.00	7.02	5.78	5.57
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	47	39	21	<10	<10
	Turbidity (NTU)	0.60	0.65	0.63		<0.10
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.9	7.9	7.8	<2.0	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.9	7.9	7.8	<2.0	<2.0
	Ammonia as N (mg/L)	<0.020	0.031	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	0.051	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	15.4	15.4	3.34	<0.50	<0.50
	Fluoride (F) (mg/L)	0.061	0.060	0.059	<0.020	<0.020
	Nitrate (as N) (mg/L)	0.0142	0.0137	0.0053	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.097	0.184	0.170	<0.050	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0028	0.0039	0.0035	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.57	2.55	0.87	<0.50	<0.50
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	3.17	3.04	3.09	<0.50	<0.50
	Total Organic Carbon (mg/L)	2.99	3.16	3.09	<0.50	
Total Metals	Aluminum (Al)-Total (mg/L)	0.0080	0.0091	0.0088	<0.0050	<0.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.47	2.44	2.12	<0.10	<0.10
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	1.99	1.94	1.12	<0.10	<0.10
	Manganese (Mn)-Total (mg/L)	0.00230	0.00227	0.00231	<0.00030	<0.00030
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L804640-1	L804640-2	L804640-3	L804640-4	L804640-5
		26-JUL-09	26-JUL-09	26-JUL-09	28-JUL-09	28-JUL-09
		PDL-1-S	PDL-2-S	PDL-3-S	BBD-1-S	BBD-2-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.83	2.00	2.08	2.13	2.14
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.66	0.72	0.71	1.11	1.12
	Manganese (Mn)-Dissolved (mg/L)	0.00043	0.00048	0.00039	0.00086	0.00088
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L804640-6	L804640-7	L804640-8	L804640-9	L804640-10
Grouping Analyte						
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	7.8	8.4	7.7	10.7
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.14	2.40	2.41	2.41	2.55
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	1.13	1.87	1.96	1.88	2.27
	Manganese (Mn)-Dissolved (mg/L)	0.00084	0.00081	0.00081	0.00074	0.00083
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	7.7	8.5	7.7	10.9
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L804640-11	L804640-12	L804640-13	L804640-14	L804640-15
		Description					
		Sampled Date	28-JUL-09	28-JUL-09	28-JUL-09	28-JUL-09	
		Sampled Time					
		Client ID	BAP-2-S	BAP-3-S	AEMP JULY DUP4	AEMP JULY EB-2	TRAVEL BLANKS
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Total (mg/L)	8.5	8.2	<2.0	<2.0	<2.0	
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020		
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Dissolved (mg/L)	2.50	2.44	2.12	<0.10		
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030		
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Dissolved (mg/L)	2.09	1.95	1.12	<0.10		
	Manganese (Mn)-Dissolved (mg/L)	0.00085	0.00083	0.00085	<0.00030		
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0		
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020		
	Sodium (Na)-Dissolved (mg/L)	9.3	8.2	<2.0	<2.0		
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050		

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L804640-1 26-JUL-09 PDL-1-S	L804640-2 26-JUL-09 PDL-2-S	L804640-3 26-JUL-09 PDL-3-S	L804640-4 28-JUL-09 BBD-1-S	L804640-5 28-JUL-09 BBD-2-S
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)	0.517	0.399	0.473	1.11	1.04	

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L804640-6	L804640-7	L804640-8	L804640-9	L804640-10
	Description					
	Sampled Date	28-JUL-09	28-JUL-09	28-JUL-09	28-JUL-09	28-JUL-09
	Sampled Time					
	Client ID	BBD-3-S	BPJ-1-S	BPJ-2-S	BPJ-3-S	BAP-1-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	1.57	1.15	1.21	1.27	1.03

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L804640-11	L804640-12	L804640-13	L804640-14	L804640-15
		28-JUL-09	28-JUL-09	28-JUL-09	28-JUL-09	
		BAP-2-S	BAP-3-S	AEMP JULY DUP4	AEMP JULY EB-2	TRAVEL BLANKS
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.822	0.754	1.03		

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

ALK-SCR-VA

Water

Alkalinity by colour or titration

EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA

Water

Bromide by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA

Water

Chloride by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA

Water

Fluoride by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA

Water

Nitrite by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA

Water

Nitrate by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA

Water

Sulfate by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DOC-VA

Water

Dissolved organic carbon by combustion

APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA

Water

Dissolved organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:**

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location

VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.



Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Randy Baker		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: Vancouver		Email 1: rbaker@azimuthgroup.ca		☐ Priority Service (1 Day or ASAP)	
Phone: 604-730-1220		Email 2: gmann@azimuthgroup.ca, mmccormell@azimuthgroup.ca		☐ Emergency Service (<1 Day / Wkend) - Contact ALS	
Fax: 604-730-1220		Analysis Request			
Invoice To: ☒ Same as Report		Indicate Bottles: Filtered / Preserved (F/P) →			
Company:		Client / Project Information:			
Contact:		Job #: Meadowbank Mine AEMP			
Address:		PO/A/E:			
Sample:		Legal Site Description:			
Phone:		Quote #: ALSEC09-077			
Fax:		ALS Contact: Natasha MM			
Sample Identification (This description will appear on the report)		Date	Time	Sampler (Initials)	Sample Type (Select from drop-down list)
PDL-1-S	26-Jul-09	dd-mm-yy	hh:mm		Water
PDL-2-S	26-Jul-09				Water
PDL-3-S	26-Jul-09				Water
BBD-1-S*	28-Jul-09				Water
BBD-2-S	28-Jul-09				Water
BBD-3-S	28-Jul-09				Water
BPJ-1-S	28-Jul-09				Water
BPJ-2-S	28-Jul-09				Water
BPJ-3-S	28-Jul-09				Water
BAP-1-S	28-Jul-09				Water
Guidelines / Regulations					
*Sample BBD-1-S for DOC was accidentally preserved with sulfuric acid-probably not worth analyzing					
Special Instructions / Hazardous Details					
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.					
Relinquished By: Ryan Hill	Date & Time: 1-Aug-09	Received By: <i>Cady</i>	Date & Time: 08/12/09 11:15	Temperature: 18°C	Samples Received in Good Condition? Y / N (if no provided details)
Relinquished By:	Date & Time:	Received By:	Date & Time:		

+16/He



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 02-SEP-09 16:37 (MT)

Version: FINAL

Lab Work Order #: L809687

Date Received: 24-AUG-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: Please note that some of the metals detection limits have been increased due to interferences encountered during analysis.

Please note that the volume filtered for the chlorophyll a analysis was assumed to be 1L as per the client's request.

LINDSAY JONES
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L809687-1	L809687-2	L809687-3	L809687-4	L809687-5
		12-AUG-09	14-AUG-09	15-AUG-09	15-AUG-09	15-AUG-09
		SP7-S	TEFF-4-S	TE-7-S	TE-7-INT	TE-7-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	21.8	15.1	17.0	17.0	17.0
	Hardness (as CaCO3) (mg/L)	9.5	5.7	6.9	6.8	6.9
	pH (pH)	6.82	6.89	6.97	7.00	6.98
	Total Suspended Solids (mg/L)	1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	15	10	14	<10	19
	Turbidity (NTU)	0.52	0.32	0.43	0.37	0.36
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	6.8	3.8	7.4	5.2	4.5
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	6.8	3.8	7.4	5.2	4.5
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	0.023
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.045	0.040	0.043	0.042	0.043
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.094	0.069	<0.050	0.070	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	0.0048	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.96	1.64	1.68	1.67	1.70
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.61	1.34	1.35	1.45	1.42
	Total Organic Carbon (mg/L)	1.40	1.17	1.48	1.45	1.41
Total Metals	Aluminum (Al)-Total (mg/L)	<0.030	<0.010	0.0111	0.0134	0.0142
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.28	1.30	1.70	1.76	1.77
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.74	0.52	0.61	0.60	0.60
	Manganese (Mn)-Total (mg/L)	0.00134	0.00089	0.00095	0.00109	0.00097
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L809687-6	L809687-7	L809687-8		
		15-AUG-09	15-AUG-09	15-AUG-09		
		AEMP AUG. DUP-1	AEMP JUL. EB-3	TRAVEL BLANKS		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	17.0	<2.0	<2.0		
	Hardness (as CaCO3) (mg/L)	6.8	<1.1	<1.1		
	pH (pH)	6.97	5.83	5.63		
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0		
	Total Dissolved Solids (mg/L)	10	<10	<10		
	Turbidity (NTU)	0.42				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.5	<2.0	<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)	4.5	<2.0	<2.0		
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020		
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50		
	Fluoride (F) (mg/L)	0.043	<0.020	<0.020		
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	0.059	<0.050	<0.050		
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020		
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0		
	Sulfate (SO4) (mg/L)	1.71	<0.50	<0.50		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.42	<0.50	<0.50		
	Total Organic Carbon (mg/L)	1.31	<0.50	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0118	<0.0050	<0.0050		
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)	1.75	<0.10	<0.10		
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030		
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)	0.60	<0.10	<0.10		
	Manganese (Mn)-Total (mg/L)	0.00094	<0.00030	<0.00030		
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L809687-1	L809687-2	L809687-3	L809687-4	L809687-5
		12-AUG-09	14-AUG-09	15-AUG-09	15-AUG-09	15-AUG-09
		SP7-S	TEFF-4-S	TE-7-S	TE-7-INT	TE-7-D
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.55	1.40	1.77	1.75	1.75
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.77	0.53	0.60	0.60	0.60
	Manganese (Mn)-Dissolved (mg/L)	0.00033	0.00048	0.00051	0.00045	0.00049
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L809687-6 15-AUG-09 AEMP AUG. DUP-1	L809687-7 15-AUG-09 AEMP JUL. EB-3	L809687-8 15-AUG-09 TRAVEL BLANKS		
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	1.75	<0.10				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	0.59	<0.10				
	Manganese (Mn)-Dissolved (mg/L)	0.00049	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010				
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050				
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010				
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020				
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L809687-1	L809687-2	L809687-3	L809687-4	L809687-5
		12-AUG-09	14-AUG-09	15-AUG-09	15-AUG-09	15-AUG-09
		SP7-S	TEFF-4-S	TE-7-S	TE-7-INT	TE-7-D
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug/L)	0.485	0.442	0.451	0.471	0.528

		Sample ID Description Sampled Date Sampled Time Client ID	L809687-6 15-AUG-09 AEMP AUG. DUP-1	L809687-7 15-AUG-09 AEMP JUL. EB-3	L809687-8 15-AUG-09 TRAVEL BLANKS		
Grouping		Analyte					
WATER							
Plant Pigments		Chlorophyll a (ug/L)	0.549				

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

ALK-SCR-VA

Water

Alkalinity by colour or titration

EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA

Water

Bromide by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA

Water

Chloride by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA

Water

Fluoride by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA

Water

Nitrite by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA

Water

Nitrate by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA

Water

Sulfate by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DOC-VA

Water

Dissolved organic carbon by combustion

APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA

Water

Dissolved organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:**

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location

VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Report to:				Report Format / Distribution				Service Requested:															
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)															
Contact: Randy Baker				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)															
Address: Vancouver				Email 1: rbaker@azimuthgroup.ca				☐ Priority Service (1 Day or ASAP)															
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca, mmccormell@azimuthgroup.ca				☐ Emergency Service (<1 Day / Weekend) - Contact ALS															
Invoice To: ☒ Same as Report				Client / Project Information:				Analysis Request															
Company:				Job #:																			
Contact:				Meadowbank Mine AEMP																			
Address:				PO/AFE:																			
Sample				Legal Site Description:																			
Phone:				Quote #: ALSEQ09-077																			
Lab Work Order # (lab use only)				ALS Contact: Natasha MM		Sampler (initials)		mum															
Sample #		Sample Identification (This description will appear on the report)		Date dd-mm-yy		Time hh:mm		Sample Type (Select from drop-down list)															
		SP-7-S		12-Aug-09				Water		X T-Metals (CCME)													
		TEFF-4-S		14-Aug-09				Water		X D-Metals (CCME)													
		TE-7-S		15-Aug-09				Water		X TOC, DOC													
		TE-7-INT		15-Aug-09				Water		X TKN, Ammonia													
		TE-7-D		15-Aug-09				Water		X TDS, TSS-low													
		AEMP Aug. DUP-1		15-Aug-09				Water		X Alk (SPECIATED)													
		AEMP Jul. EB-3		15-Aug-09				Water		X Anion Scan, Si, pH, EC													
		Travel Blanks						Water		X T-PO4, ortho-PO4													
										X Chlorophyll-a													
										X Turbidity													
										X Hazardous?													
										X Highly Contaminated?													
										X Number of Containers													
Guidelines / Regulations												Special Instructions / Hazardous Details											
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																							
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																							
Relinquished By:		M. McCormell		Date & Time:		16-Aug-09		Received By:				Date & Time:		9/8/09		Temperature		Samples Received in Good Condition? Y / N (if no provided details)					
Relinquished By:		<i>[Signature]</i>		Date & Time:				Received By:		<i>[Signature]</i>		Date & Time:		13/4/09		80							



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 19-OCT-09 13:18 (MT)

Version: FINAL REV. 2

Lab Work Order #: L809693

Date Received: 24-AUG-09

Project P.O. #:

Job Reference: MEADOWBANK MINE

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: ADDITIONAL 24-SEP-09 12:52

This revision, 2, of the report replaces and supersedes all previous revisions. The detection limit for Oil and Grease in sediment samples has been corrected. Furthermore, Mineral Oil and Grease analysis has been added to the samples identified by ALS as L809693-3 and L809693-8. All other data remains unchanged.


Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L809693-1	L809693-2	L809693-3	L809693-4	L809693-5
		Description					
		Sampled Date	12-AUG-09	12-AUG-09	12-AUG-09	13-AUG-09	13-AUG-09
		Sampled Time					
		Client ID	SP	SP-2	SP-3	TPE	TPE-2
Grouping	Analyte						
SOIL							
Physical Tests	% Moisture (%)		84.5	83.7	84.2	86.7	86.0
	pH (pH)		6.28	5.90	6.16	6.26	6.31
Particle Size	% Gravel (>2mm) (%)		<1.0	<1.0	<1.0	<1.0	<1.0
	% Sand (2.0mm - 0.063mm) (%)		2.0	6.0	3.0	6.0	1.0
	% Silt (0.063mm - 4um) (%)		68.0	63.0	68.0	58.0	62.0
	% Clay (<4um) (%)		30.0	30.0	29.0	36.0	36.0
Organic / Inorganic Carbon	Total Organic Carbon (%)		3.74	3.50	4.06	3.41	3.31
Metals	Aluminum (Al) (mg/kg)		28300	30000	26000	23800	27100
	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		42.5	34.9	50.0	18.1	26.3
	Barium (Ba) (mg/kg)		143	138	131	124	155
	Beryllium (Be) (mg/kg)		2.40	2.61	2.21	1.88	2.04
	Bismuth (Bi) (mg/kg)		<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)		2360	2390	2380	1930	2130
	Chromium (Cr) (mg/kg)		76.9	80.7	73.1	80.7	88.0
	Cobalt (Co) (mg/kg)		17.6	13.9	14.9	16.1	22.8
	Copper (Cu) (mg/kg)		89.5	101	80.3	53.8	64.9
	Iron (Fe) (mg/kg)		76800	66200	87900	50300	85800
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)		51.5	57.3	48.4	48.5	51.8
	Magnesium (Mg) (mg/kg)		10300	10800	9660	9320	10100
	Manganese (Mn) (mg/kg)		2150	821	2320	2900	5200
	Mercury (Hg) (mg/kg)		0.0861	0.113	0.0936	0.0679	0.0415
	Molybdenum (Mo) (mg/kg)		8.1	9.0	9.6	5.4	8.1
	Nickel (Ni) (mg/kg)		72.4	57.6	60.2	65.0	118
	Phosphorus (P) (mg/kg)		681	781	623	400	524
	Potassium (K) (mg/kg)		5170	5520	4770	4350	5050
	Selenium (Se) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<3.0
	Sodium (Na) (mg/kg)		260	270	230	<200	240
	Strontium (Sr) (mg/kg)		21.4	22.5	20.8	17.0	18.7
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)		795	891	732	781	844
	Vanadium (V) (mg/kg)		42.6	45.0	40.4	38.0	42.5
	Zinc (Zn) (mg/kg)		124	125	113	101	114
Aggregate Organics	Oil and Grease (mg/kg)		<1525	<1265	<2805	<3055	<1760
	Mineral Oil and Grease (mg/kg)				<1000		
Hydrocarbons	EPH10-19 (mg/kg)		<440	<400	<420	<500	<480

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L809693-6	L809693-7	L809693-8	L809693-9	L809693-10
		13-AUG-09	14-AUG-09	14-AUG-09	14-AUG-09	14-AUG-09
		TPE-3	TEFF	TEFF-2	TEFF-3	TE
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	81.6	84.5	86.0	85.5	80.7
	pH (pH)	6.24	6.27	6.18	6.02	6.11
Particle Size	% Gravel (>2mm) (%)	<1.0	<1.0	<1.0	3.0	<1.0
	% Sand (2.0mm - 0.063mm) (%)	8.0	5.0	5.0	3.0	5.0
	% Silt (0.063mm - 4um) (%)	59.0	61.0	62.0	65.0	66.0
	% Clay (<4um) (%)	34.0	34.0	33.0	29.0	29.0
Organic / Inorganic Carbon	Total Organic Carbon (%)	2.57	2.87	3.72	3.48	2.49
Metals	Aluminum (Al) (mg/kg)	28700	25400	24800	28500	27700
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	17.7	12.7	11.8	15.5	23.5
	Barium (Ba) (mg/kg)	137	124	125	135	136
	Beryllium (Be) (mg/kg)	2.04	2.15	2.13	2.48	2.52
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	2250	2060	2220	2100	2230
	Chromium (Cr) (mg/kg)	93.9	55.2	54.8	63.4	60.5
	Cobalt (Co) (mg/kg)	15.3	12.3	11.4	15.3	13.2
	Copper (Cu) (mg/kg)	60.2	57.2	55.1	72.4	74.4
	Iron (Fe) (mg/kg)	46600	48000	39500	50400	55800
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	61.9	58.3	57.9	64.7	58.3
	Magnesium (Mg) (mg/kg)	11100	8940	8830	10100	9930
	Manganese (Mn) (mg/kg)	1420	2740	1360	2660	1580
	Mercury (Hg) (mg/kg)	0.0314	0.0555	0.0604	0.0261	0.0275
	Molybdenum (Mo) (mg/kg)	4.8	5.1	4.3	5.5	6.9
	Nickel (Ni) (mg/kg)	61.0	38.7	40.9	43.6	48.7
	Phosphorus (P) (mg/kg)	393	438	465	514	792
	Potassium (K) (mg/kg)	5490	5090	4970	5560	5400
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<3.0	<2.0
	Sodium (Na) (mg/kg)	220	240	230	230	260
	Strontium (Sr) (mg/kg)	21.5	19.8	20.5	20.1	19.9
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	1020	862	843	853	953
	Vanadium (V) (mg/kg)	46.3	39.2	38.3	44.2	42.7
	Zinc (Zn) (mg/kg)	111	104	106	122	116
Aggregate Organics	Oil and Grease (mg/kg)	<1225	<275	<1515	<500	<500
	Mineral Oil and Grease (mg/kg)			<1100		
Hydrocarbons	EPH10-19 (mg/kg)	<400	<420	<480	<460	<360

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L809693-11	L809693-12			
		14-AUG-09	14-AUG-09			
		TE-2	TE-3			
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	77.3	81.2			
	pH (pH)	5.45	6.17			
Particle Size	% Gravel (>2mm) (%)	2.0	<1.0			
	% Sand (2.0mm - 0.063mm) (%)	25.0	12.0			
	% Silt (0.063mm - 4um) (%)	54.0	66.0			
	% Clay (<4um) (%)	19.0	21.0			
Organic / Inorganic Carbon	Total Organic Carbon (%)	2.31	2.72			
Metals	Aluminum (Al) (mg/kg)	21700	20200			
	Antimony (Sb) (mg/kg)	<10	<10			
	Arsenic (As) (mg/kg)	17.6	21.3			
	Barium (Ba) (mg/kg)	108	102			
	Beryllium (Be) (mg/kg)	1.93	1.83			
	Bismuth (Bi) (mg/kg)	<20	<20			
	Cadmium (Cd) (mg/kg)	<0.50	<0.50			
	Calcium (Ca) (mg/kg)	2010	2120			
	Chromium (Cr) (mg/kg)	49.4	44.0			
	Cobalt (Co) (mg/kg)	8.6	9.4			
	Copper (Cu) (mg/kg)	56.5	50.9			
	Iron (Fe) (mg/kg)	46100	79000			
	Lead (Pb) (mg/kg)	<30	<30			
	Lithium (Li) (mg/kg)	45.3	42.2			
	Magnesium (Mg) (mg/kg)	8240	7610			
	Manganese (Mn) (mg/kg)	559	2020			
	Mercury (Hg) (mg/kg)	0.0720	0.0564			
	Molybdenum (Mo) (mg/kg)	<4.0	10.7			
	Nickel (Ni) (mg/kg)	36.5	35.6			
	Phosphorus (P) (mg/kg)	1050	543			
	Potassium (K) (mg/kg)	4350	3930			
	Selenium (Se) (mg/kg)	<2.0	<2.0			
	Silver (Ag) (mg/kg)	<2.0	<2.0			
	Sodium (Na) (mg/kg)	220	200			
	Strontium (Sr) (mg/kg)	18.0	17.5			
	Thallium (Tl) (mg/kg)	<1.0	<1.0			
	Tin (Sn) (mg/kg)	<5.0	<5.0			
	Titanium (Ti) (mg/kg)	852	785			
	Vanadium (V) (mg/kg)	34.2	33.3			
	Zinc (Zn) (mg/kg)	91.5	85.3			
Aggregate Organics	Oil and Grease (mg/kg)	500	<500			
	Mineral Oil and Grease (mg/kg)					
Hydrocarbons	EPH10-19 (mg/kg)	<300	<360			

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L809693-1	L809693-2	L809693-3	L809693-4	L809693-5
		12-AUG-09	12-AUG-09	12-AUG-09	13-AUG-09	13-AUG-09
		SP	SP-2	SP-3	TPE	TPE-2
Grouping	Analyte					
SOIL						
Hydrocarbons	EPH19-32 (mg/kg)	<440	<400	<420	<500	<480
	LEPH (mg/kg)	<440	<400	<420	<500	<480
	HEPH (mg/kg)	<440	<400	<420	<500	<480
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Acenaphthylene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Anthracene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Benz(a)anthracene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Benzo(a)pyrene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Benzo(b)fluoranthene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Benzo(g,h,i)perylene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Benzo(k)fluoranthene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Chrysene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Dibenz(a,h)anthracene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Fluoranthene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Fluorene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	2-Methylnaphthalene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Naphthalene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Phenanthrene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Pyrene (mg/kg)	<0.10	<0.10	<0.10	<0.13	<0.10
	Surrogate: d10-Acenaphthene (SS) (%)	109	114	116	108	121
	Surrogate: d12-Chrysene (SS) (%)	101	106	104	98	109
	Surrogate: d8-Naphthalene (SS) (%)	105	114	116	107	121
	Surrogate: d10-Phenanthrene (SS) (%)	114	120	119	112	124

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L809693-6	L809693-7	L809693-8	L809693-9	L809693-10
		13-AUG-09	14-AUG-09	14-AUG-09	14-AUG-09	14-AUG-09
		TPE-3	TEFF	TEFF-2	TEFF-3	TE
Grouping	Analyte					
SOIL						
Hydrocarbons	EPH19-32 (mg/kg)	<400	<420	<480	<460	<360
	LEPH (mg/kg)	<400	<420	<480	<460	<360
	HEPH (mg/kg)	<400	<420	<480	<460	<360
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Acenaphthylene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Anthracene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Benz(a)anthracene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Benzo(a)pyrene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Benzo(b)fluoranthene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Benzo(g,h,i)perylene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Benzo(k)fluoranthene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Chrysene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Dibenz(a,h)anthracene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Fluoranthene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Fluorene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	2-Methylnaphthalene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Naphthalene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Phenanthrene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Pyrene (mg/kg)	<0.10	<0.10	<0.13	<0.10	<0.10
	Surrogate: d10-Acenaphthene (SS) (%)	101	103	92	108	105
	Surrogate: d12-Chrysene (SS) (%)	89	90	82	97	93
	Surrogate: d8-Naphthalene (SS) (%)	101	102	92	106	101
	Surrogate: d10-Phenanthrene (SS) (%)	104	106	94	109	107

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L809693-11	L809693-12			
		14-AUG-09	14-AUG-09			
		TE-2	TE-3			
Grouping	Analyte					
SOIL						
Hydrocarbons	EPH19-32 (mg/kg)	<300	<360			
	LEPH (mg/kg)	<300	<360			
	HEPH (mg/kg)	<300	<360			
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.075	<0.10			
	Acenaphthylene (mg/kg)	<0.075	<0.10			
	Anthracene (mg/kg)	<0.075	<0.10			
	Benz(a)anthracene (mg/kg)	<0.075	<0.10			
	Benzo(a)pyrene (mg/kg)	<0.075	<0.10			
	Benzo(b)fluoranthene (mg/kg)	<0.075	<0.10			
	Benzo(g,h,i)perylene (mg/kg)	<0.075	<0.10			
	Benzo(k)fluoranthene (mg/kg)	<0.075	<0.10			
	Chrysene (mg/kg)	<0.075	<0.10			
	Dibenz(a,h)anthracene (mg/kg)	<0.075	<0.10			
	Fluoranthene (mg/kg)	<0.075	<0.10			
	Fluorene (mg/kg)	<0.075	<0.10			
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.075	<0.10			
	2-Methylnaphthalene (mg/kg)	<0.075	<0.10			
	Naphthalene (mg/kg)	<0.075	<0.10			
	Phenanthrene (mg/kg)	<0.075	<0.10			
	Pyrene (mg/kg)	<0.075	<0.10			
	Surrogate: d10-Acenaphthene (SS) (%)	102	91			
	Surrogate: d12-Chrysene (SS) (%)	90	79			
	Surrogate: d8-Naphthalene (SS) (%)	101	93			
	Surrogate: d10-Phenanthrene (SS) (%)	105	94			

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

C-TOT-ORG-LECO-SK Soil Organic Carbon by combustion method SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:

Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:

Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

EPH-TUMB-FID-VA Soil EPH in Solids by Tumbler and GCFID BCMELP CSR

Extractable Hydrocarbons in Sediment/Soil

This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Solids by GC/FID, Version 2.1 July 1999". The procedure, based on EPA 3570, uses a rotary extraction technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene or kept in hexane/acetone and analyzed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).

Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.

HG-CCME-CVAFS-VA Soil CVAFS Hg in Soil (CCME) BCMELP CSR SALM METHOD 8/EPA 245.7

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA Method 7000 series).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

LEPH/HEPH-CALC-VA Soil LEPHs and HEPHs BC MOE LABORATORY MANUAL (2005)

Light and Heavy Extractable Petroleum Hydrocarbons in Solids. These results are determined according to the British Columbia Ministry of Environment, Lands, and Parks Analytical Method for Contaminated Sites "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water". According to this method, LEPH and HEPH are calculated by subtracting selected Polycyclic Aromatic Hydrocarbon results from Extractable Petroleum Hydrocarbon results. To calculate LEPH, the individual results for Naphthalene and Phenanthrene are subtracted from EPH(C10-19). To calculate HEPH, the individual results for Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, and Pyrene are subtracted from EPH(C19-32). Analysis of Extractable Petroleum Hydrocarbons adheres to all prescribed elements of the BCMELP method "Extractable Petroleum Hydrocarbons in Solids by GC/FID" (Version 2.1, July 20, 1999).

MET-CSR-FULL-ICP-VA Soil Metals in Soil by ICPOES (CSR SALM) BCMELP CSR SALM METHOD 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

MOISTURE-VA	Soil	Moisture content	ASTM METHOD D2974-00

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

OG-TMB-VA	Soil	Oil & Grease in Soils by Tumbler	NATM1100 V03 CCME PHC F2-F4G

A subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extraction apparatus. The extract is analyzed gravimetrically.

Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.

OGG-TUMB-SG-VA	Soil	CWS MOG with Silica Gel	CCME PETROLEUM HYDROCARBONS- GRAVIMETRIC

This analysis is carried out in accordance with the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2000." A subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extraction apparatus. The extract undergoes a silica-gel clean-up to remove polar compounds, and is analyzed gravimetrically. Mineral Oil and Grease is equivalent to fraction F4G of the Canada-wide Standard for Petroleum Hydrocarbons.

Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.

PAH-SURR-MS-VA	Soil	PAH Surrogates for Soils	EPA METHODS 3570, 3545A & 8270

PAH-TUMB-H/A-MS-VA	Soil	PAH by Tumbler HEX/ACE with GCMS	EPA METHODS 3570 & 8270.

Polycyclic Aromatic Hydrocarbons in Sediment/Soil

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation.

PH-1:2-VA	Soil	CSR pH by 1:2 Water Leach	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL

This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.

PSA-PIPET+GRAVEL-SK	Soil	Particle size - Sieve and Pipette	FORESTRY CANADA (1991) P. 46-48 MOD

Particle size analysis involves the measurement of the proportions of the various primary soil particle sizes (ie. clay < 0.004 mm, silt 0.004-0.063 mm, sand 0.063-2.0 mm and gravel > 2.0 mm). In this method, the gravel and sand portions are determined by sieving, while the clay portion is determined by sedimentation using Stokes Law, which relates the radius of the particles to the velocity of the sedimentation in water. Silt is calculated as 100% - (sand% + clay%)

Pretreatment of the soil with Calgon (sodium hexametaphosphate) is used to ensure the complete dispersion of the primary soil particles. Additional pretreatment may be necessary to remove cementing materials such as CaCO₃ and organic matter.

Reference
Y.P. Kalra, and D.G. Maynard, 1991. Methods Manual For Forest Soil and Plant Analysis, Northwest Region. Forestry Canada (modified sand, silt and clay size ranges)

TL-CSR-MS-VA	Soil	ICPMS TI in Soil by CSR SALM	BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by either hotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma -

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:**

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA	SK	ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

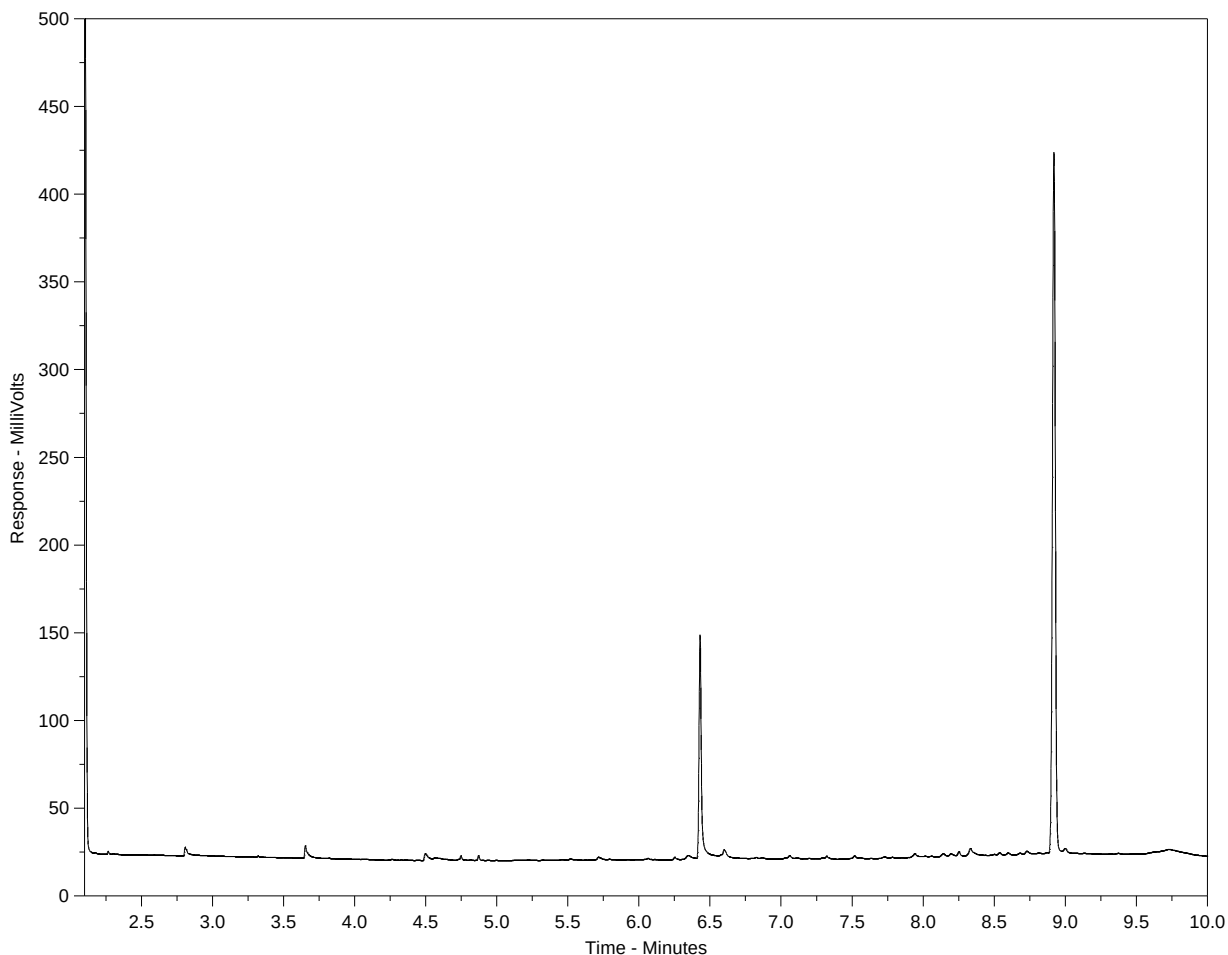
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-1
Client ID: SP



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

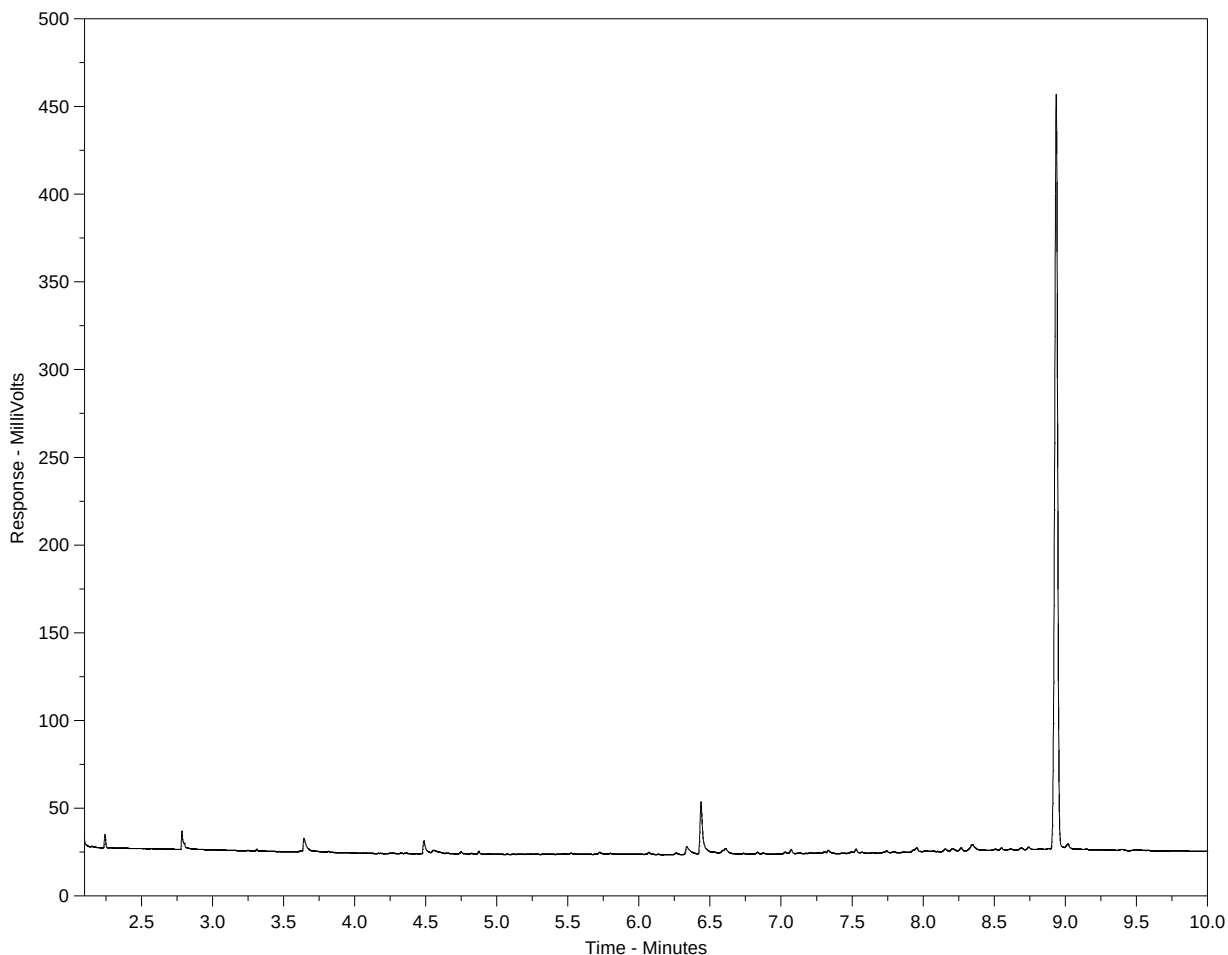
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-2
Client ID: SP-2



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

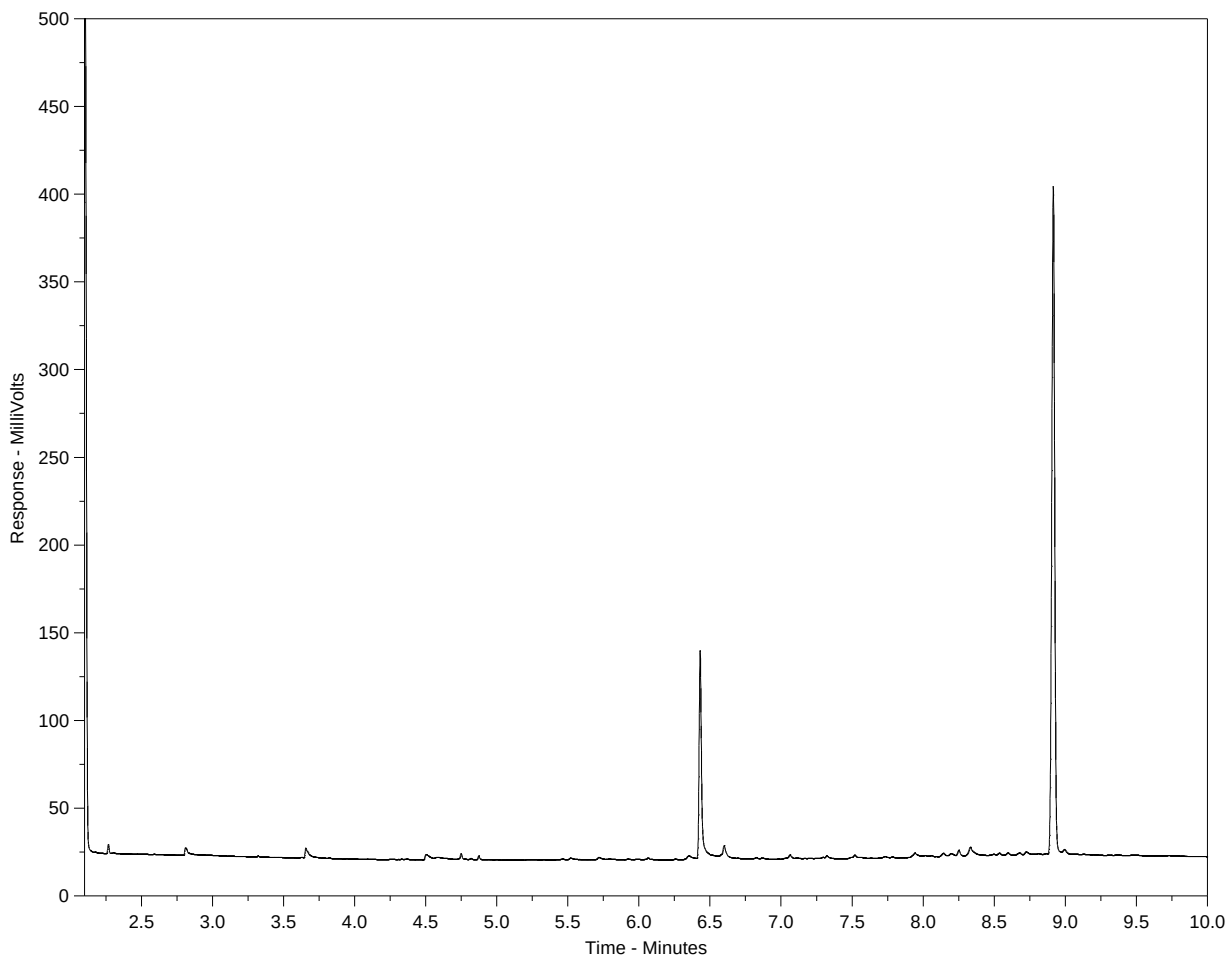
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-3
Client ID: SP-3



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

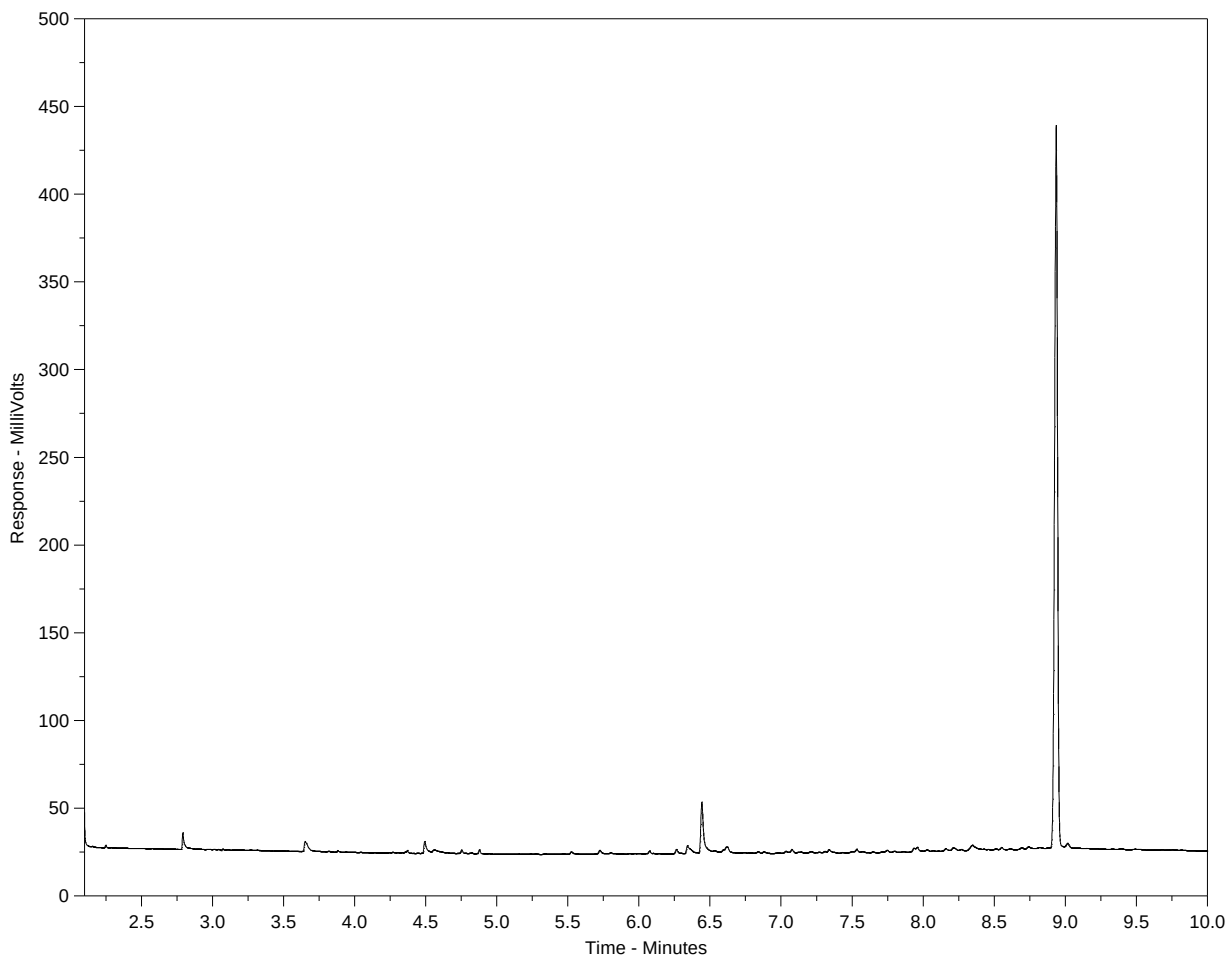
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-4
Client ID: TPE



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

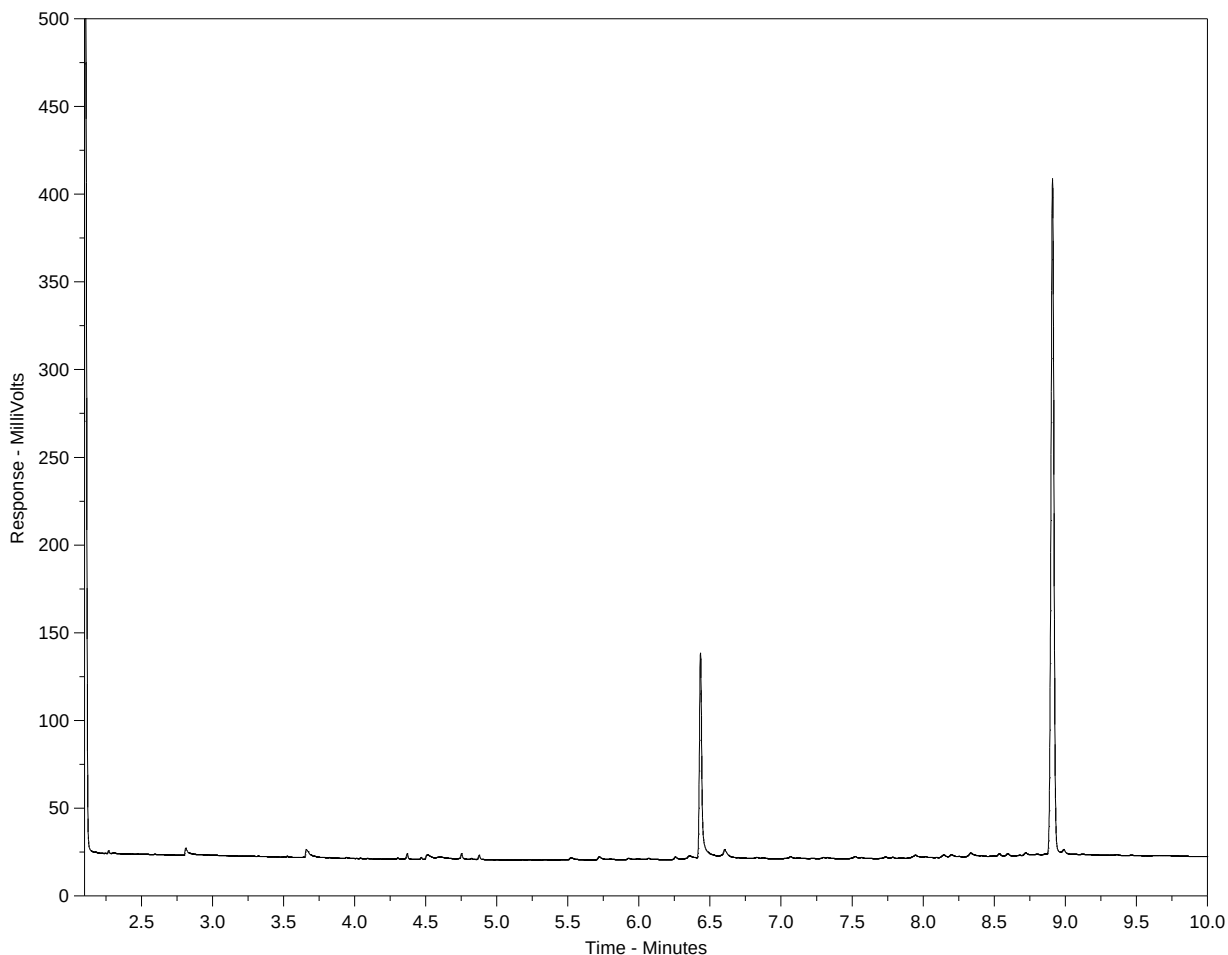
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-5
Client ID: TPE-2



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

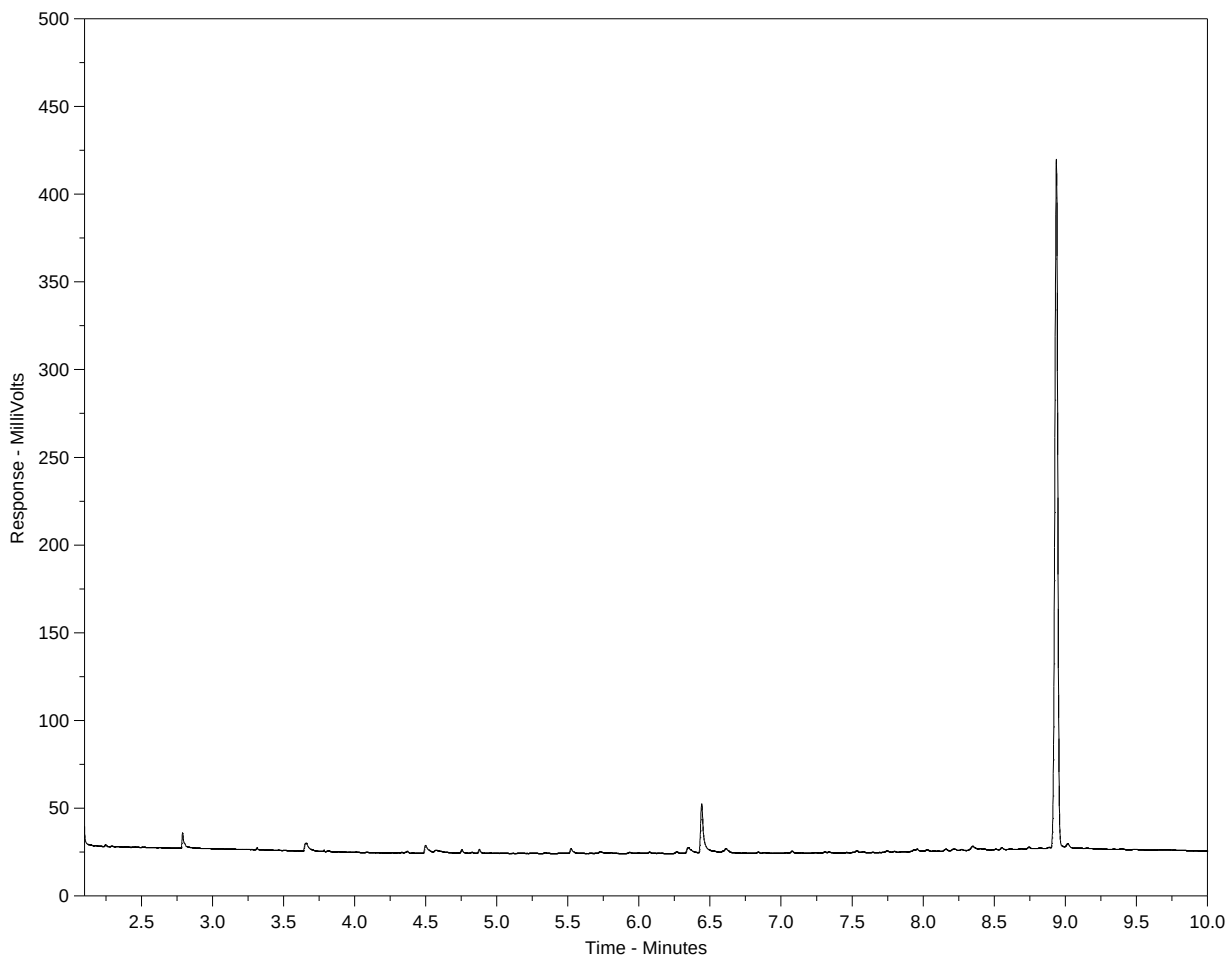
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-6
Client ID: TPE-3



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

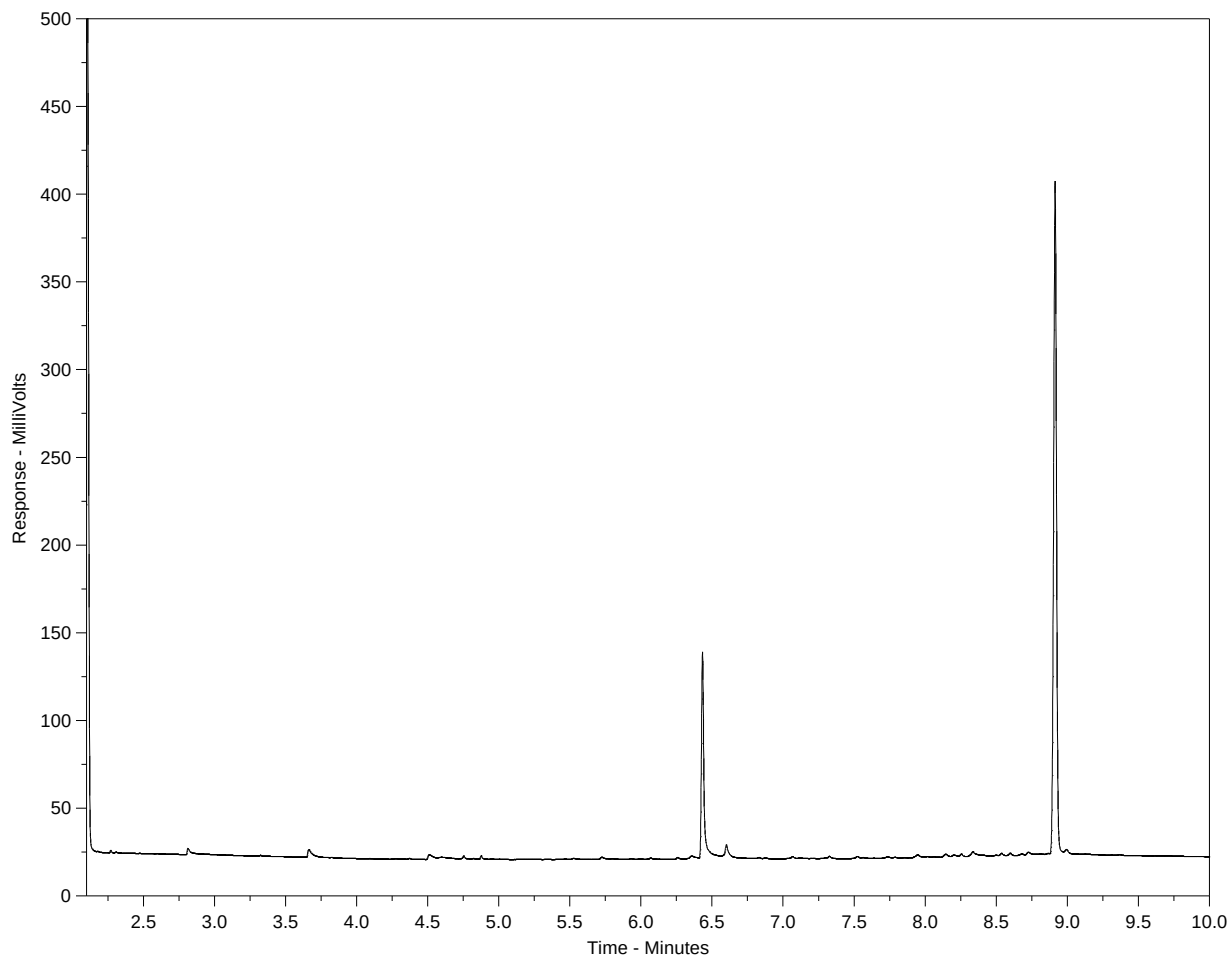
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-7
Client ID: TEFF



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

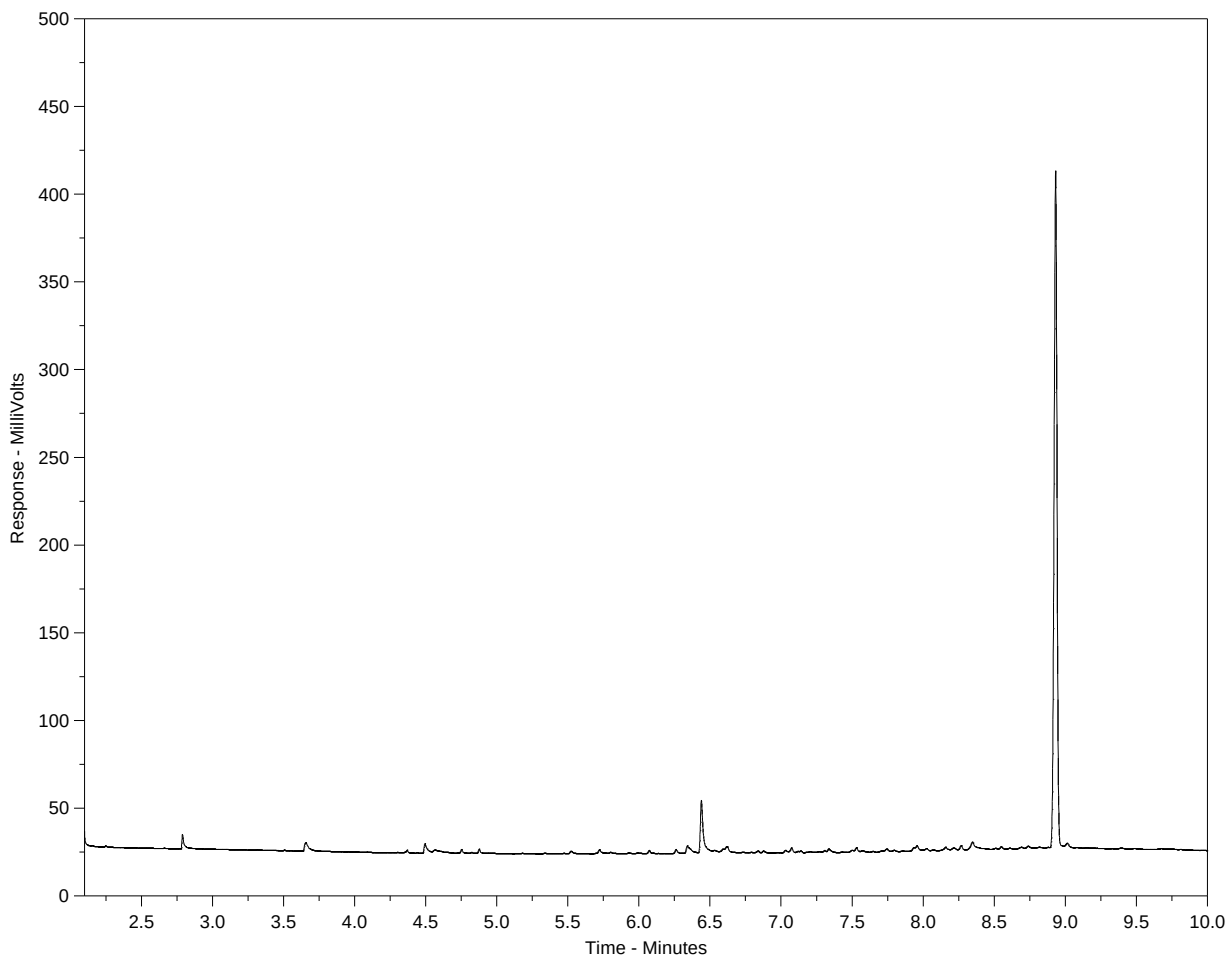
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-8
Client ID: TEFF-2



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

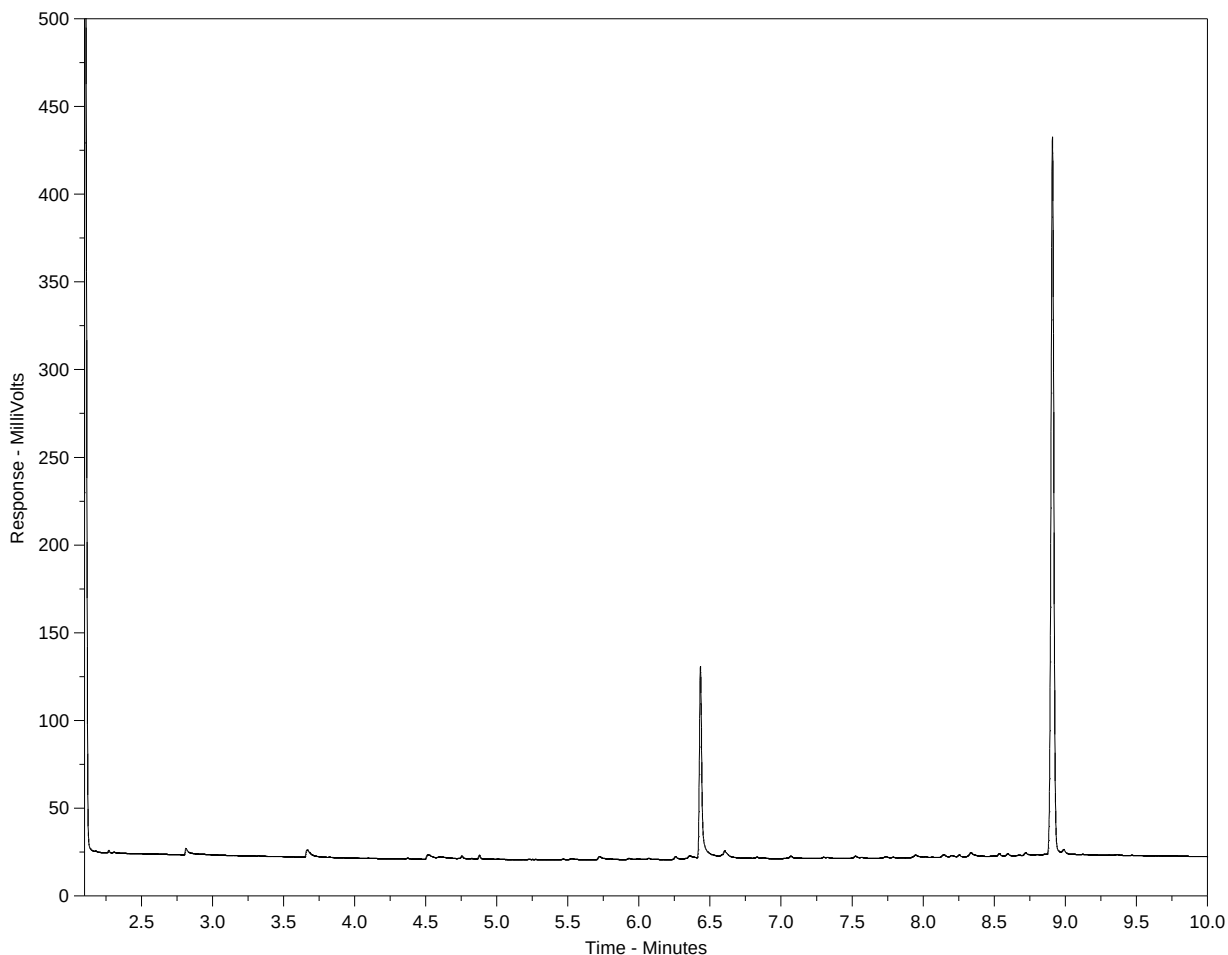
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-9
Client ID: TEFF-3



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

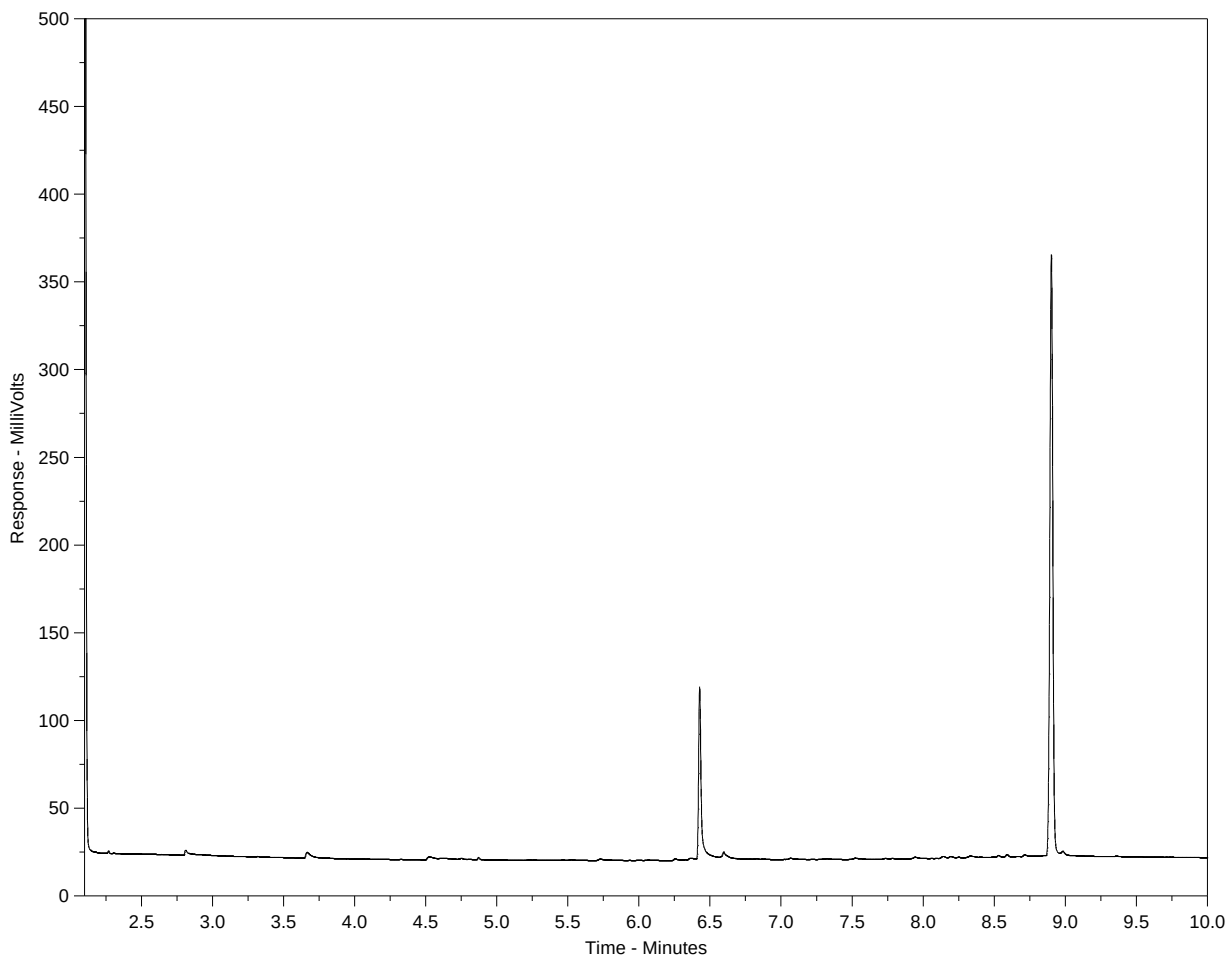
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-10
Client ID: TE



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

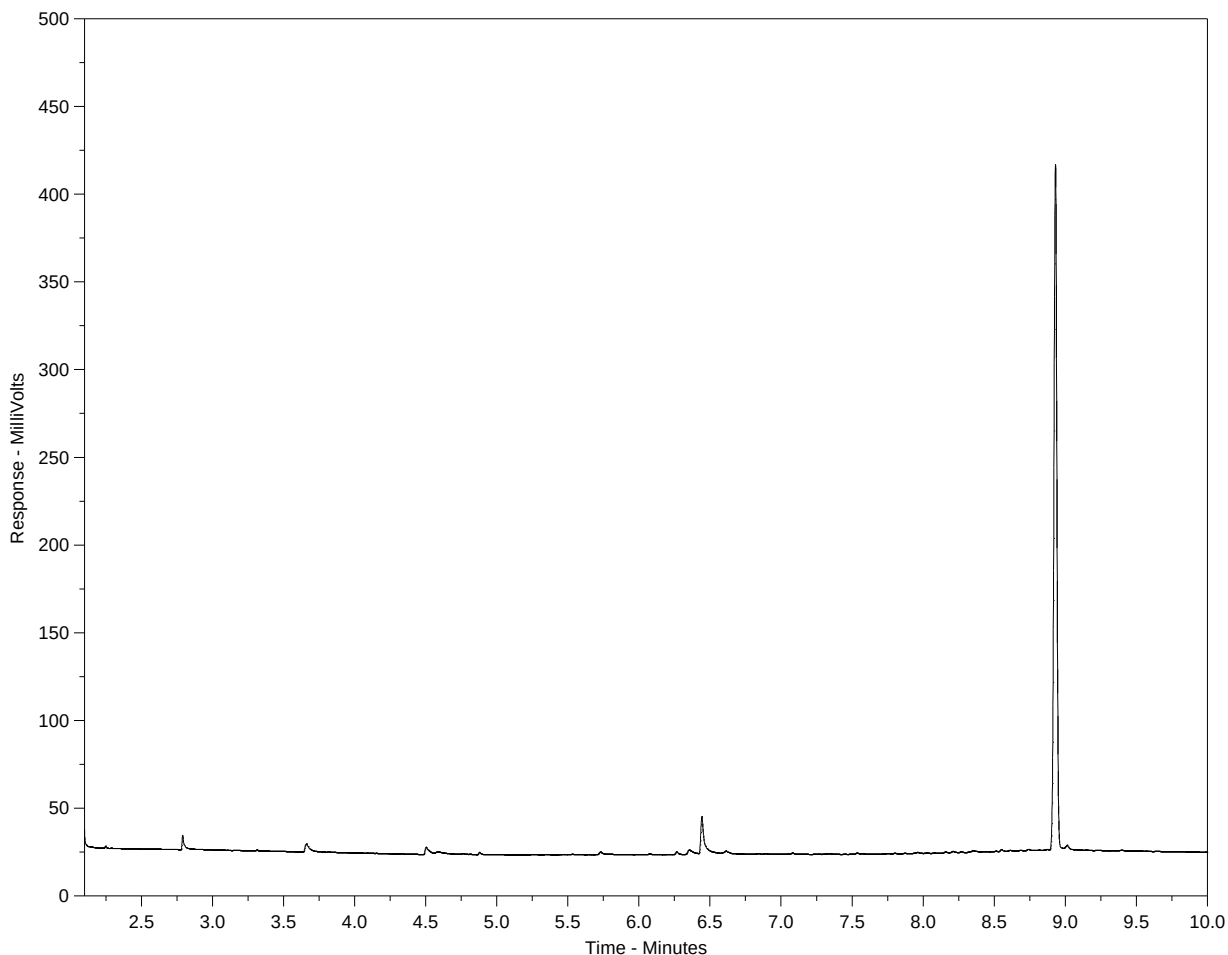
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-11
Client ID: TE-2



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

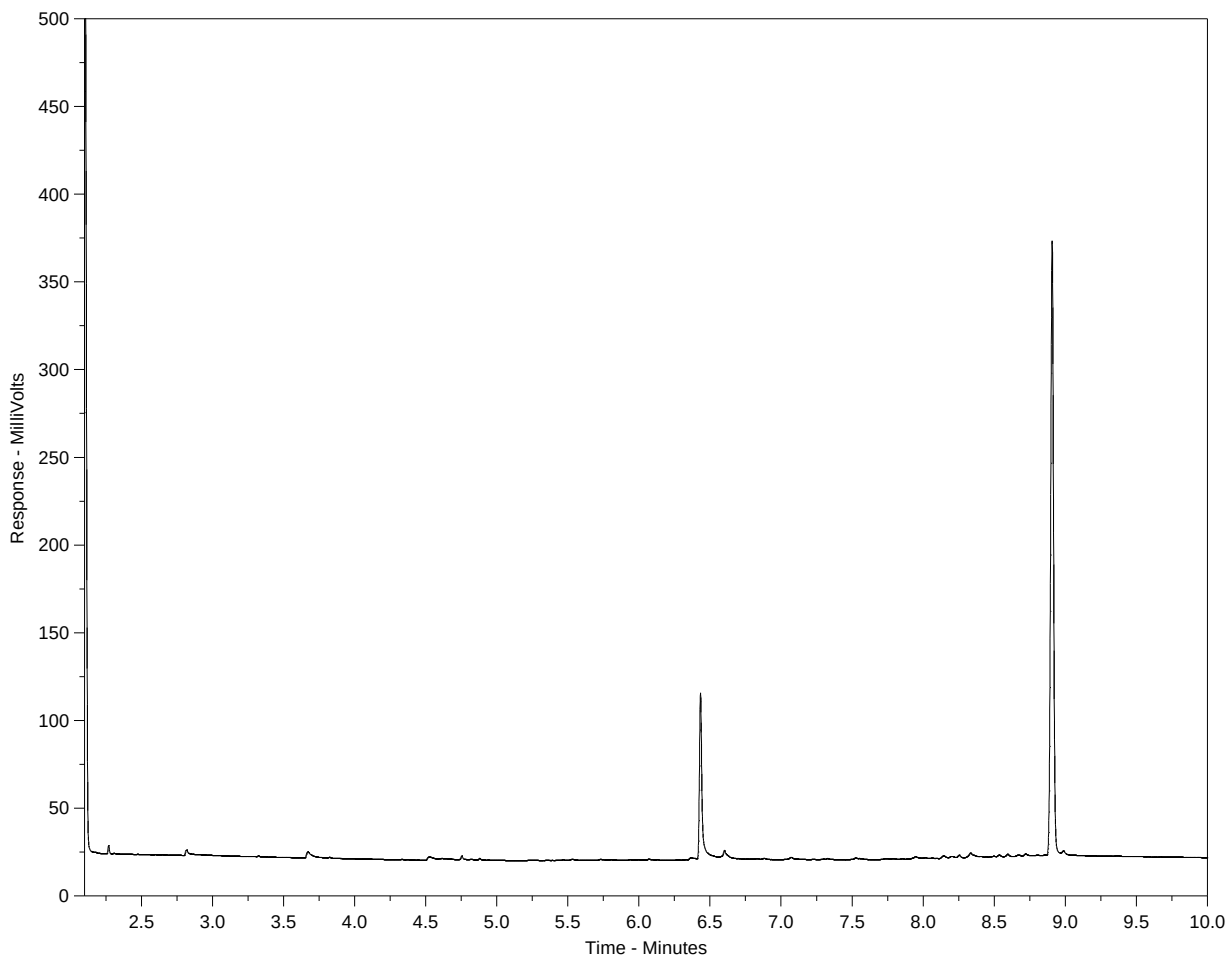
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L809693-12
Client ID: TE-3



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Randy Baker		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: Vancouver		Email 1: rbaker@azimuthgroup.ca		☐ Priority Service (1 Day or ASAP)	
Phone: 604-730-1220 Fax:		Email 2: gmann@azimuthgroup.ca , rmcconnell@azimuthgroup.ca		☐ Emergency Service (<1 Day / Weekend) - Contact ALS	
Invoice To: ☒ Same as Report		Indicate Bottles: Filtered / Preserved (F/P) ->		Analysis Request	
Company:		Client / Project Information:			
Contact:		Job #:			
Address:		PO/AFE:			
Sample		Legal Site Description:			
Phone:		Quote #: ALSEQ09-077			
Lab Work Order # (lab use only)		ALS Contact: Natasha MM			
Sample Identification (This description will appear on the report)		Date		Sampler (Initials)	
#		dd-mm-yy		hh:mm	
				Sample Type (Select from drop-down list)	
SP		12-Aug-09		Sediment	
SP-2		12-Aug-09		Sediment	
SP-3		12-Aug-09		Sediment	
TPE		13-Aug-09		Sediment	
TPE-2		13-Aug-09		Sediment	
TPE-3		13-Aug-09		Sediment	
TEFF		14-Aug-09		Sediment	
TEFF-2		14-Aug-09		Sediment	
TEFF-3		14-Aug-09		Sediment	
Guidelines / Regulations		Special Instructions / Hazardous Details			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.					
Relinquished By: M. McConnell		Date & Time: 16-Aug-09		Received By: [Signature]	
Relinquished By: [Signature]		Date & Time: 16-Aug-09		Date & Time: 16-Aug-09	
				Temperature	
				Samples Received in Good Condition? (if no provided details)	

[illegible]



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 07-OCT-09 16:29 (MT)

Version: FINAL

Lab Work Order #: L811546

Date Received: 27-AUG-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: Please note that certain Oil and Grease, Hydrocarbons and Polycyclic Aromatic Hydrocarbons detection limits have been increased for some of the samples due to the high moisture content (70-89%).


Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L811546-12	L811546-13	L811546-14	L811546-15	L811546-16
		16-AUG-09	16-AUG-09	16-AUG-09	17-AUG-09	17-AUG-09
		WAL	WAL-2	WAL-3	PDL	PDL-2
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	88.4	89.7	89.3	57.8	73.9
	pH (pH)	6.40	6.53	6.52	6.50	6.39
Particle Size	% Gravel (>2mm) (%)	<1.0	<1.0	<1.0	<1.0	<1.0
	% Sand (2.0mm - 0.063mm) (%)	6.0	2.0	4.0	20.0	11.0
	% Silt (0.063mm - 4um) (%)	60.0	67.0	70.0	46.0	66.0
	% Clay (<4um) (%)	34.0	31.0	26.0	33.0	23.0
Organic / Inorganic Carbon	Total Organic Carbon (%)	8.72	8.00	8.50	0.72	1.84
Metals	Aluminum (Al) (mg/kg)	22500	25800	21800	27400	23300
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	41.5	49.0	37.7	23.1	47.6
	Barium (Ba) (mg/kg)	108	143	115	133	97.9
	Beryllium (Be) (mg/kg)	1.53	1.96	1.65	1.18	1.11
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	0.55	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	4250	4320	4330	2220	1860
	Chromium (Cr) (mg/kg)	60.5	67.2	56.0	125	142
	Cobalt (Co) (mg/kg)	9.2	10.3	8.5	22.0	18.7
	Copper (Cu) (mg/kg)	119	202	156	47.5	59.0
	Iron (Fe) (mg/kg)	32000	45300	36900	41300	47000
	Lead (Pb) (mg/kg)	37	43	36	<30	<30
	Lithium (Li) (mg/kg)	42.5	45.6	40.5	49.3	35.6
	Magnesium (Mg) (mg/kg)	9370	9390	8330	13400	12500
	Manganese (Mn) (mg/kg)	287	394	343	1730	1440
	Mercury (Hg) (mg/kg)	0.0506	0.0632	0.0639	0.0070	0.0093
	Molybdenum (Mo) (mg/kg)	7.8	12.1	9.6	4.7	4.7
	Nickel (Ni) (mg/kg)	51.1	62.6	50.3	103	93.0
	Phosphorus (P) (mg/kg)	611	856	799	364	516
	Potassium (K) (mg/kg)	3870	4230	3710	4620	3190
	Selenium (Se) (mg/kg)	<3.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	220	220	210	250	<200
	Strontium (Sr) (mg/kg)	29.1	28.0	26.5	24.6	20.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	654	618	574	938	538
	Vanadium (V) (mg/kg)	30.5	35.8	31.4	45.9	40.3
	Zinc (Zn) (mg/kg)	127	136	112	92.6	84.4
Aggregate Organics	Mineral Oil and Grease (mg/kg)	<2100	<2200	<2300	<500	<900
Hydrocarbons	EPH10-19 (mg/kg)	<570	<640	<620	<200	<240
	EPH19-32 (mg/kg)	<570	<640	<620	<200	<240

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L811546-17	L811546-18	L811546-19	L811546-20	L811546-21
		Description					
		Sampled Date	17-AUG-09	17-AUG-09	20-AUG-09	20-AUG-09	20-AUG-09
		Sampled Time					
		Client ID	PDL-3	DUP-1	INUG	INUG-2	INUG-3
Grouping	Analyte						
SOIL							
Physical Tests	% Moisture (%)		73.4	79.6	80.8	83.3	83.7
	pH (pH)		5.73	6.31	5.95	5.65	5.78
Particle Size	% Gravel (>2mm) (%)		<1.0	<1.0	<1.0	<1.0	<1.0
	% Sand (2.0mm - 0.063mm) (%)		20.0	16.0	7.0	4.0	3.0
	% Silt (0.063mm - 4um) (%)		68.0	67.0	69.0	65.0	68.0
	% Clay (<4um) (%)		12.0	17.0	24.0	31.0	29.0
Organic / Inorganic Carbon	Total Organic Carbon (%)		1.97	2.64	3.52	4.38	4.22
Metals	Aluminum (Al) (mg/kg)		16500	22500	25800	24000	22800
	Antimony (Sb) (mg/kg)		<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)		172	38.7	16.3	29.2	92.6
	Barium (Ba) (mg/kg)		73.5	95.9	139	139	143
	Beryllium (Be) (mg/kg)		0.70	1.01	1.59	1.47	1.48
	Bismuth (Bi) (mg/kg)		<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)		1770	2090	2110	1980	1900
	Chromium (Cr) (mg/kg)		100	143	115	107	101
	Cobalt (Co) (mg/kg)		11.5	16.7	12.1	13.0	15.5
	Copper (Cu) (mg/kg)		33.2	54.8	55.2	54.3	51.8
	Iron (Fe) (mg/kg)		62300	44900	46500	61300	94600
	Lead (Pb) (mg/kg)		<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)		24.4	34.5	34.7	30.9	29.6
	Magnesium (Mg) (mg/kg)		9460	11900	11100	10400	9810
	Manganese (Mn) (mg/kg)		542	1240	768	881	2110
	Mercury (Hg) (mg/kg)		0.0114	0.0145	0.0236	0.0324	0.0312
	Molybdenum (Mo) (mg/kg)		<4.0	<4.0	<4.0	4.2	6.3
	Nickel (Ni) (mg/kg)		58.9	90.5	79.8	86.0	85.8
	Phosphorus (P) (mg/kg)		1720	493	1070	1320	2390
	Potassium (K) (mg/kg)		2260	3190	4070	3820	3680
	Selenium (Se) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<3.0
	Silver (Ag) (mg/kg)		<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)		<200	<200	220	210	210
	Strontium (Sr) (mg/kg)		18.0	21.6	25.8	24.3	24.1
	Thallium (Tl) (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)		<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)		434	524	632	569	541
	Vanadium (V) (mg/kg)		29.2	37.4	39.6	37.3	35.7
	Zinc (Zn) (mg/kg)		57.5	78.3	90.0	93.5	84.6
Aggregate Organics	Mineral Oil and Grease (mg/kg)		<900	<1200	<1300	<1500	<1500
Hydrocarbons	EPH10-19 (mg/kg)		<260	<350	<360	<390	<400
	EPH19-32 (mg/kg)		<260	<350	<360	<390	<400

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L811546-22	L811546-23	L811546-24	L811546-25	L811546-26
		21-AUG-09	21-AUG-09	21-AUG-09	21-AUG-09	21-AUG-09
		TPN	TPN-2	TPN-3	TPS	TPS-2
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	81.4	79.8	80.9	85.6	82.8
	pH (pH)	6.00	5.91	5.96	6.05	5.91
Particle Size	% Gravel (>2mm) (%)	<1.0	<1.0	<1.0	<1.0	<1.0
	% Sand (2.0mm - 0.063mm) (%)	25.0	32.0	17.0	5.0	36.0
	% Silt (0.063mm - 4um) (%)	54.0	48.0	60.0	62.0	49.0
	% Clay (<4um) (%)	21.0	20.0	24.0	33.0	15.0
Organic / Inorganic Carbon	Total Organic Carbon (%)	2.86	2.84	2.69	4.22	4.40
Metals	Aluminum (Al) (mg/kg)	16700	17000	20600	25100	18000
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	9.8	8.9	18.5	18.0	10.3
	Barium (Ba) (mg/kg)	66.5	68.0	83.1	108	86.4
	Beryllium (Be) (mg/kg)	0.97	0.99	1.23	1.50	1.20
	Bismuth (Bi) (mg/kg)	<20	<20	<20	<20	<20
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Calcium (Ca) (mg/kg)	1390	1500	1430	1880	2380
	Chromium (Cr) (mg/kg)	101	98.8	118	112	80.6
	Cobalt (Co) (mg/kg)	8.8	9.4	12.2	13.4	10.0
	Copper (Cu) (mg/kg)	46.7	46.9	58.5	70.6	45.7
	Iron (Fe) (mg/kg)	24600	24700	34400	33300	23500
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Lithium (Li) (mg/kg)	29.0	30.5	36.4	43.4	34.1
	Magnesium (Mg) (mg/kg)	7960	8180	9480	10500	8480
	Manganese (Mn) (mg/kg)	300	406	441	578	343
	Mercury (Hg) (mg/kg)	0.0116	0.0149	0.0149	0.0208	0.0188
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	49.7	52.8	61.8	71.9	56.7
	Phosphorus (P) (mg/kg)	507	504	567	551	400
	Potassium (K) (mg/kg)	2500	2620	3110	4160	3030
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Sodium (Na) (mg/kg)	<200	<200	<200	<200	<200
	Strontium (Sr) (mg/kg)	12.7	13.8	14.0	16.9	16.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Titanium (Ti) (mg/kg)	450	461	524	684	654
	Vanadium (V) (mg/kg)	29.2	29.2	35.1	39.3	30.1
	Zinc (Zn) (mg/kg)	62.8	66.3	83.5	95.3	81.8
Aggregate Organics	Mineral Oil and Grease (mg/kg)	<1300	<1200	<1300	<1700	<1400
Hydrocarbons	EPH10-19 (mg/kg)	<370	<320	<340	<440	<390
	EPH19-32 (mg/kg)	<370	<320	<340	<440	<390

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L811546-27		L811546-28		
		21-AUG-09		21-AUG-09		
		TPS-3		DUP-2		
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	78.9		82.0		
	pH (pH)	6.13		5.92		
Particle Size	% Gravel (>2mm) (%)	3.0		<1.0		
	% Sand (2.0mm - 0.063mm) (%)	22.0		25.0		
	% Silt (0.063mm - 4um) (%)	54.0		55.0		
	% Clay (<4um) (%)	21.0		20.0		
Organic / Inorganic Carbon	Total Organic Carbon (%)	2.69		4.11		
Metals	Aluminum (Al) (mg/kg)	23100		18500		
	Antimony (Sb) (mg/kg)	<10		<10		
	Arsenic (As) (mg/kg)	13.6		12.3		
	Barium (Ba) (mg/kg)	103		83.3		
	Beryllium (Be) (mg/kg)	1.42		1.24		
	Bismuth (Bi) (mg/kg)	<20		<20		
	Cadmium (Cd) (mg/kg)	<0.50		<0.50		
	Calcium (Ca) (mg/kg)	1960		2070		
	Chromium (Cr) (mg/kg)	103		85.2		
	Cobalt (Co) (mg/kg)	12.9		10.6		
	Copper (Cu) (mg/kg)	55.2		46.1		
	Iron (Fe) (mg/kg)	31000		26900		
	Lead (Pb) (mg/kg)	<30		<30		
	Lithium (Li) (mg/kg)	43.0		34.6		
	Magnesium (Mg) (mg/kg)	10300		8780		
	Manganese (Mn) (mg/kg)	454		442		
	Mercury (Hg) (mg/kg)	0.0140		0.0185		
	Molybdenum (Mo) (mg/kg)	<4.0		<4.0		
	Nickel (Ni) (mg/kg)	69.8		56.4		
	Phosphorus (P) (mg/kg)	558		412		
	Potassium (K) (mg/kg)	3850		3040		
	Selenium (Se) (mg/kg)	<2.0		<0.50		
	Silver (Ag) (mg/kg)	<2.0		<2.0		
	Sodium (Na) (mg/kg)	<200		<200		
	Strontium (Sr) (mg/kg)	16.6		15.0		
	Thallium (Tl) (mg/kg)	<1.0		<1.0		
	Tin (Sn) (mg/kg)	<5.0		<5.0		
	Titanium (Ti) (mg/kg)	722		664		
	Vanadium (V) (mg/kg)	37.1		31.2		
	Zinc (Zn) (mg/kg)	95.5		80.4		
Aggregate Organics	Mineral Oil and Grease (mg/kg)	<1200		<1400		
Hydrocarbons	EPH10-19 (mg/kg)	<400		<380		
	EPH19-32 (mg/kg)	<400		<380		

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Sample ID Description Sampled Date Sampled Time Client ID		L811546-12	L811546-13	L811546-14	L811546-15	L811546-16
		16-AUG-09	16-AUG-09	16-AUG-09	17-AUG-09	17-AUG-09
		WAL	WAL-2	WAL-3	PDL	PDL-2
Grouping	Analyte					
SOIL						
Hydrocarbons	LEPH (mg/kg)	<570	<640	<620	<200	<240
	HEPH (mg/kg)	<570	<640	<620	<200	<240
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Anthracene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Benz(a)anthracene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Fluorene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	2-Methylnaphthalene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.18	0.055	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Pyrene (mg/kg)	<0.050	<0.18	<0.050	<0.050	<0.050
	Surrogate: d10-Acenaphthene (SS) (%)	86	80	86	92	86
	Surrogate: d12-Chrysene (SS) (%)	78	70	77	82	71
	Surrogate: d8-Naphthalene (SS) (%)	85	78	88	92	82
	Surrogate: d10-Phenanthrene (SS) (%)	90	87	89	95	90

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L811546-17	L811546-18	L811546-19	L811546-20	L811546-21
		Description					
		Sampled Date	17-AUG-09	17-AUG-09	20-AUG-09	20-AUG-09	20-AUG-09
		Sampled Time					
		Client ID	PDL-3	DUP-1	INUG	INUG-2	INUG-3
Grouping	Analyte						
SOIL							
Hydrocarbons	LEPH (mg/kg)	<260	<350	<360	<390	<400	
	HEPH (mg/kg)	<260	<350	<360	<390	<400	
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Acenaphthylene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Anthracene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Benz(a)anthracene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Benzo(a)pyrene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Benzo(b)fluoranthene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Benzo(g,h,i)perylene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Benzo(k)fluoranthene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Chrysene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Dibenz(a,h)anthracene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Fluoranthene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Fluorene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	2-Methylnaphthalene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Naphthalene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Phenanthrene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Pyrene (mg/kg)	<0.075	<0.050	<0.10	<0.10	<0.050	
	Surrogate: d10-Acenaphthene (SS) (%)	104	81	90	91	81	
	Surrogate: d12-Chrysene (SS) (%)	88	71	82	84	88	
	Surrogate: d8-Naphthalene (SS) (%)	103	79	89	94	83	
	Surrogate: d10-Phenanthrene (SS) (%)	101	84	99	104	86	

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Sample ID Description Sampled Date Sampled Time Client ID		L811546-22	L811546-23	L811546-24	L811546-25	L811546-26
		21-AUG-09	21-AUG-09	21-AUG-09	21-AUG-09	21-AUG-09
		TPN	TPN-2	TPN-3	TPS	TPS-2
Grouping	Analyte					
SOIL						
Hydrocarbons	LEPH (mg/kg)	<370	<320	<340	<440	<390
	HEPH (mg/kg)	<370	<320	<340	<440	<390
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Acenaphthylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benz(a)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chrysene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluoranthene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Fluorene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	2-Methylnaphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Naphthalene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Phenanthrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Pyrene (mg/kg)	<0.050	<0.050	<0.050	<0.050	<0.050
	Surrogate: d10-Acenaphthene (SS) (%)	86	91	85	80	83
	Surrogate: d12-Chrysene (SS) (%)	73	89	75	71	72
	Surrogate: d8-Naphthalene (SS) (%)	84	92	85	80	81
	Surrogate: d10-Phenanthrene (SS) (%)	87	96	90	85	87

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		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
SOIL						
Hydrocarbons	LEPH (mg/kg)	<400	<380			
	HEPH (mg/kg)	<400	<380			
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.050	<0.050			
	Acenaphthylene (mg/kg)	<0.050	<0.050			
	Anthracene (mg/kg)	<0.050	<0.050			
	Benz(a)anthracene (mg/kg)	<0.050	<0.050			
	Benzo(a)pyrene (mg/kg)	<0.050	<0.050			
	Benzo(b)fluoranthene (mg/kg)	<0.050	<0.050			
	Benzo(g,h,i)perylene (mg/kg)	<0.050	<0.050			
	Benzo(k)fluoranthene (mg/kg)	<0.050	<0.050			
	Chrysene (mg/kg)	<0.050	<0.050			
	Dibenz(a,h)anthracene (mg/kg)	<0.050	<0.050			
	Fluoranthene (mg/kg)	<0.050	<0.050			
	Fluorene (mg/kg)	<0.050	<0.050			
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.050	<0.050			
	2-Methylnaphthalene (mg/kg)	<0.050	<0.050			
	Naphthalene (mg/kg)	<0.050	<0.050			
	Phenanthrene (mg/kg)	<0.050	<0.050			
	Pyrene (mg/kg)	<0.050	<0.050			
	Surrogate: d10-Acenaphthene (SS) (%)	95	85			
	Surrogate: d12-Chrysene (SS) (%)	81	72			
	Surrogate: d8-Naphthalene (SS) (%)	100	85			
	Surrogate: d10-Phenanthrene (SS) (%)	95	89			

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Sample ID Description Sampled Date Sampled Time Client ID		L811546-1	L811546-2	L811546-3	L811546-4	L811546-5
		16-AUG-09	17-AUG-09	16-AUG-09	19-AUG-09	19-AUG-09
		WAL-4-S	PDL-4-S	TPE-7-S	INUG-7-S	INUG-7-INT
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	27.3	19.5	14.6	13.7	13.7
	Hardness (as CaCO3) (mg/L)	12.5	8.2	5.6	5.3	5.2
	pH (pH)	6.93	6.90	6.89	6.81	6.86
	Total Suspended Solids (mg/L)	<1.0	<1.0	2.3	1.8	2.3
	Total Dissolved Solids (mg/L)	16	12	<10	11	<10
	Turbidity (NTU)	0.27	0.22	0.98	0.41	0.45
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	9.2	7.3	4.7	4.9	4.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	9.2	7.3	4.7	4.9	4.1
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	0.56	0.56
	Fluoride (F) (mg/L)	0.027	0.023	0.045	0.039	0.039
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.137	0.100	0.077	<0.10	0.113
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	0.0030	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.23	1.35	1.22	0.72	0.78
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.29	1.43	1.19	1.64	1.67
	Total Organic Carbon (mg/L)	1.75	1.41	1.25	1.64	1.66
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	0.0253	0.0061	0.0081
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	3.40	2.08	1.32	1.03	1.03
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	0.043	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.98	0.74	0.59	0.65	0.65
	Manganese (Mn)-Total (mg/L)	0.00060	0.00067	0.00135	0.00159	0.00164
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L811546-6	L811546-7	L811546-8	L811546-9	L811546-10
		19-AUG-09	21-AUG-09	19-AUG-09		21-AUG-09
		INUG-7-D	AEMP AUG DUP 2	AEMP JUL EB-4	TRAVEL BLANK	TPN-7-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	13.8	14.2	<2.0	<2.0	13.7
	Hardness (as CaCO3) (mg/L)	5.2	5.2	<1.1	<1.1	5.2
	pH (pH)	6.83	6.64	5.79	5.67	6.68
	Total Suspended Solids (mg/L)	1.3	1.3	<1.0	<1.0	2.3
	Total Dissolved Solids (mg/L)	<10	<10	<10	<10	<10
	Turbidity (NTU)	0.30	0.29			0.31
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.1	3.8	<2.0	<2.0	3.5
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.1	3.8	<2.0	<2.0	3.5
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	0.035	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.55	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.038	0.040	<0.020	<0.020	0.041
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.114	0.081	<0.050	<0.050	0.081
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	0.0011	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.76	1.28	<0.50	<0.50	1.23
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.72	1.18	<0.50	<0.50	1.19
	Total Organic Carbon (mg/L)	1.65	1.19	<0.50	<0.50	1.21
Total Metals	Aluminum (Al)-Total (mg/L)	0.0059	0.0070	<0.0050	<0.0050	0.0066
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.03	1.10	<0.10	<0.10	1.09
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.65	0.54	<0.10	<0.10	0.54
	Manganese (Mn)-Total (mg/L)	0.00165	0.00072	<0.00030	<0.00030	0.00074
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L811546-11 21-AUG-09 TPS-4-S				
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)	13.5					
	Hardness (as CaCO3) (mg/L)	5.3					
	pH (pH)	6.78					
	Total Suspended Solids (mg/L)	2.3					
	Total Dissolved Solids (mg/L)	<10					
	Turbidity (NTU)	0.27					
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.1					
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0					
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0					
	Alkalinity, Total (as CaCO3) (mg/L)	4.1					
	Ammonia as N (mg/L)	<0.020					
	Bromide (Br) (mg/L)	<0.050					
	Chloride (Cl) (mg/L)	<0.50					
	Fluoride (F) (mg/L)	0.041					
	Nitrate (as N) (mg/L)	<0.0050					
	Nitrite (as N) (mg/L)	<0.0010					
	Total Kjeldahl Nitrogen (mg/L)	0.073					
	Ortho Phosphate as P (mg/L)	<0.0010					
	Total Phosphate as P (mg/L)	<0.0020					
	Silicate (as SiO2) (mg/L)	<1.0					
	Sulfate (SO4) (mg/L)	1.26					
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.03					
	Total Organic Carbon (mg/L)	1.19					
Total Metals	Aluminum (Al)-Total (mg/L)	0.0070					
	Antimony (Sb)-Total (mg/L)	<0.00050					
	Arsenic (As)-Total (mg/L)	<0.00050					
	Barium (Ba)-Total (mg/L)	<0.020					
	Beryllium (Be)-Total (mg/L)	<0.0010					
	Boron (B)-Total (mg/L)	<0.10					
	Cadmium (Cd)-Total (mg/L)	<0.000017					
	Calcium (Ca)-Total (mg/L)	1.08					
	Chromium (Cr)-Total (mg/L)	<0.0010					
	Cobalt (Co)-Total (mg/L)	<0.00030					
	Copper (Cu)-Total (mg/L)	<0.0010					
	Iron (Fe)-Total (mg/L)	<0.030					
	Lead (Pb)-Total (mg/L)	<0.00050					
	Lithium (Li)-Total (mg/L)	<0.0050					
	Magnesium (Mg)-Total (mg/L)	0.54					
	Manganese (Mn)-Total (mg/L)	0.00074					
	Mercury (Hg)-Total (mg/L)	<0.000020					

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L811546-1	L811546-2	L811546-3	L811546-4	L811546-5
		16-AUG-09	17-AUG-09	16-AUG-09	19-AUG-09	19-AUG-09
		WAL-4-S	PDL-4-S	TPE-7-S	INUG-7-S	INUG-7-INT
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	3.37	2.06	1.31	1.06	1.01
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.98	0.75	0.56	0.64	0.65
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	0.00050	0.00036	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L811546-6	L811546-7	L811546-8	L811546-9	L811546-10
		19-AUG-09	21-AUG-09	19-AUG-09		21-AUG-09
		INUG-7-D	AEMP AUG DUP 2	AEMP JUL EB-4	TRAVEL BLANK	TPN-7-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020		<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10		<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017		<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.01	1.20	<0.10		1.20
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030		<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.64	0.55	<0.10		0.55
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0		<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0		<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010		<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010				
	Nickel (Ni)-Total (mg/L)	<0.0010				
	Potassium (K)-Total (mg/L)	<2.0				
	Selenium (Se)-Total (mg/L)	<0.0010				
	Silver (Ag)-Total (mg/L)	<0.000020				
	Sodium (Na)-Total (mg/L)	<2.0				
	Thallium (Tl)-Total (mg/L)	<0.00020				
	Tin (Sn)-Total (mg/L)	<0.00050				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	<0.00020				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0050				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	1.19				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	0.56				
	Manganese (Mn)-Dissolved (mg/L)	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000020				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010				
	Silver (Ag)-Dissolved (mg/L)	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	<2.0				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00050				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	<0.00020				
	Vanadium (V)-Dissolved (mg/L)	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	<0.0050				

Sample ID Description Sampled Date Sampled Time Client ID		L811546-1	L811546-2	L811546-3	L811546-4	L811546-5
		16-AUG-09	17-AUG-09	16-AUG-09	19-AUG-09	19-AUG-09
		WAL-4-S	PDL-4-S	TPE-7-S	INUG-7-S	INUG-7-INT
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.320	0.233	0.340	0.336	0.376

		Sample ID Description Sampled Date Sampled Time Client ID	L811546-6 19-AUG-09 INUG-7-D	L811546-7 21-AUG-09 AEMP AUG DUP 2	L811546-8 19-AUG-09 AEMP JUL EB-4	L811546-9 TRAVEL BLANK	L811546-10 21-AUG-09 TPN-7-S
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)		0.380	0.385			0.369

		Sample ID Description Sampled Date Sampled Time Client ID	L811546-11 21-AUG-09 TPS-4-S				
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)	0.340					

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

AL-CSR-ICP-VA Soil Al in Soil by ICPOES (CSR SALM) BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

ALK-SCR-VA Water Alkalinity by colour or titration EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA Water Bromide by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA Water Chloride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA Water Fluoride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA Water Nitrite by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA Water Nitrate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

C-TOT-ORG-LECO-SK Soil Organic Carbon by combustion method SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:

Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0

Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

EPH-TUMB-FID-VA	Soil	EPH in Solids by Tumbler and GCFID	BCMELP CSR

Extractable Hydrocarbons in Sediment/Soil

This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Solids by GC/FID, Version 2.1 July 1999". The procedure, based on EPA 3570, uses a rotary extraction technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene or kept in hexane/acetone and analyzed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).

Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-CCME-CVAFS-VA	Soil	CVAFS Hg in Soil (CCME)	BCMELP CSR SALM METHOD 8/EPA 245.7

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

Method 7000 series).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

LEPH/HEPH-CALC-VA	Soil	LEPHs and HEPHs	BC MOE LABORATORY MANUAL (2005)

Light and Heavy Extractable Petroleum Hydrocarbons in Solids. These results are determined according to the British Columbia Ministry of Environment, Lands, and Parks Analytical Method for Contaminated Sites "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water". According to this method, LEPH and HEPH are calculated by subtracting selected Polycyclic Aromatic Hydrocarbon results from Extractable Petroleum Hydrocarbon results. To calculate LEPH, the individual results for Naphthalene and Phenanthrene are subtracted from EPH(C10-19). To calculate HEPH, the individual results for Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, and Pyrene are subtracted from EPH(C19-32). Analysis of Extractable Petroleum Hydrocarbons adheres to all prescribed elements of the BCMELP method "Extractable Petroleum Hydrocarbons in Solids by GC/FID" (Version 2.1, July 20, 1999).

MET-CSR-FULL-ICP-VA	Soil	Metals in Soil by ICPOES (CSR SALM)	BCMELP CSR SALM METHOD 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MOISTURE-VA	Soil	Moisture content	ASTM METHOD D2974-00
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
OGG-TUMB-SG-VA	Soil	CWS MOG with Silica Gel	CCME PETROLEUM HYDROCARBONS- GRAVIMETRIC
This analysis is carried out in accordance with the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2000." A subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extraction apparatus. The extract undergoes a silica-gel clean-up to remove polar compounds, and is analyzed gravimetrically. Mineral Oil and Grease is equivalent to fraction F4G of the Canada-wide Standard for Petroleum Hydrocarbons.			
Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.			
PAH-SURR-MS-VA	Soil	PAH Surrogates for Soils	EPA METHODS 3570, 3545A & 8270
PAH-TUMB-H/A-MS-VA	Soil	PAH by Tumbler HEX/ACE with GCMS	EPA METHODS 3570 & 8270.
Polycyclic Aromatic Hydrocarbons in Sediment/Soil This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3570 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation.			
PH-1:2-VA	Soil	CSR pH by 1:2 Water Leach	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL
This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PSA-PIPET+GRAVEL-SK	Soil	Particle size - Sieve and Pipette	FORESTRY CANADA (1991) P. 46-48 MOD
Particle size analysis involves the measurement of the proportions of the various primary soil particle sizes (ie. clay < 0.004 mm, silt 0.004-0.063 mm, sand 0.063-2.0 mm and gravel > 2.0 mm). In this method, the gravel and sand portions are determined by sieving, while the clay portion is determined by sedimentation using Stokes Law, which relates the radius of the particles to the velocity of the sedimentation in water. Silt is calculated as 100% - (sand% + clay%) Pretreatment of the soil with Calgon (sodium hexametaphosphate) is used to ensure the complete dispersion of the primary soil particles. Additional pretreatment may be necessary to remove cementing materials such as CaCO3 and organic matter.			
Reference Y.P. Kalra, and D.G. Maynard, 1991. Methods Manual For Forest Soil and Plant Analysis, Northwest Region. Forestry Canada (modified sand, silt and clay size ranges)			
SE-SALM-HVAF-VA	Soil	Se in Soil by HVAFS (CSR SALM)	BCMELP CSR SALM METHOD 8
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Water Quality - Determination of As/Se/Sb, Part 1 - Hydride Generation Atomic Fluorescence Spectrometry (HG-AFS)", by the International Organization for Standardization (ISO). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry.			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SIO2 D.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 4500-SiO₂ D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TL-CSR-MS-VA	Soil	ICPMS TI in Soil by CSR SALM	BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by either hotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.

The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA	SK	ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, CANADA

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

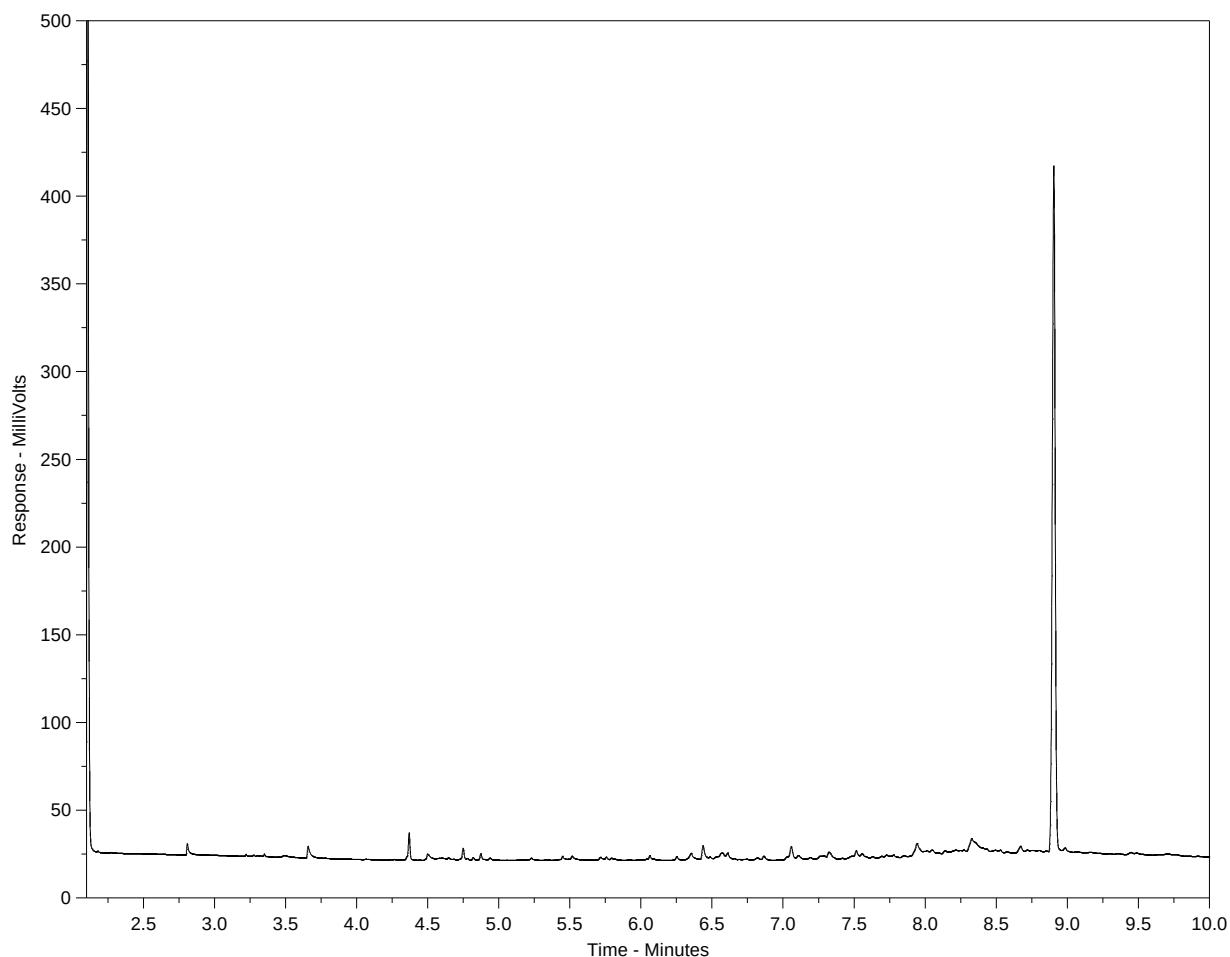
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-12
Client ID: WAL



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

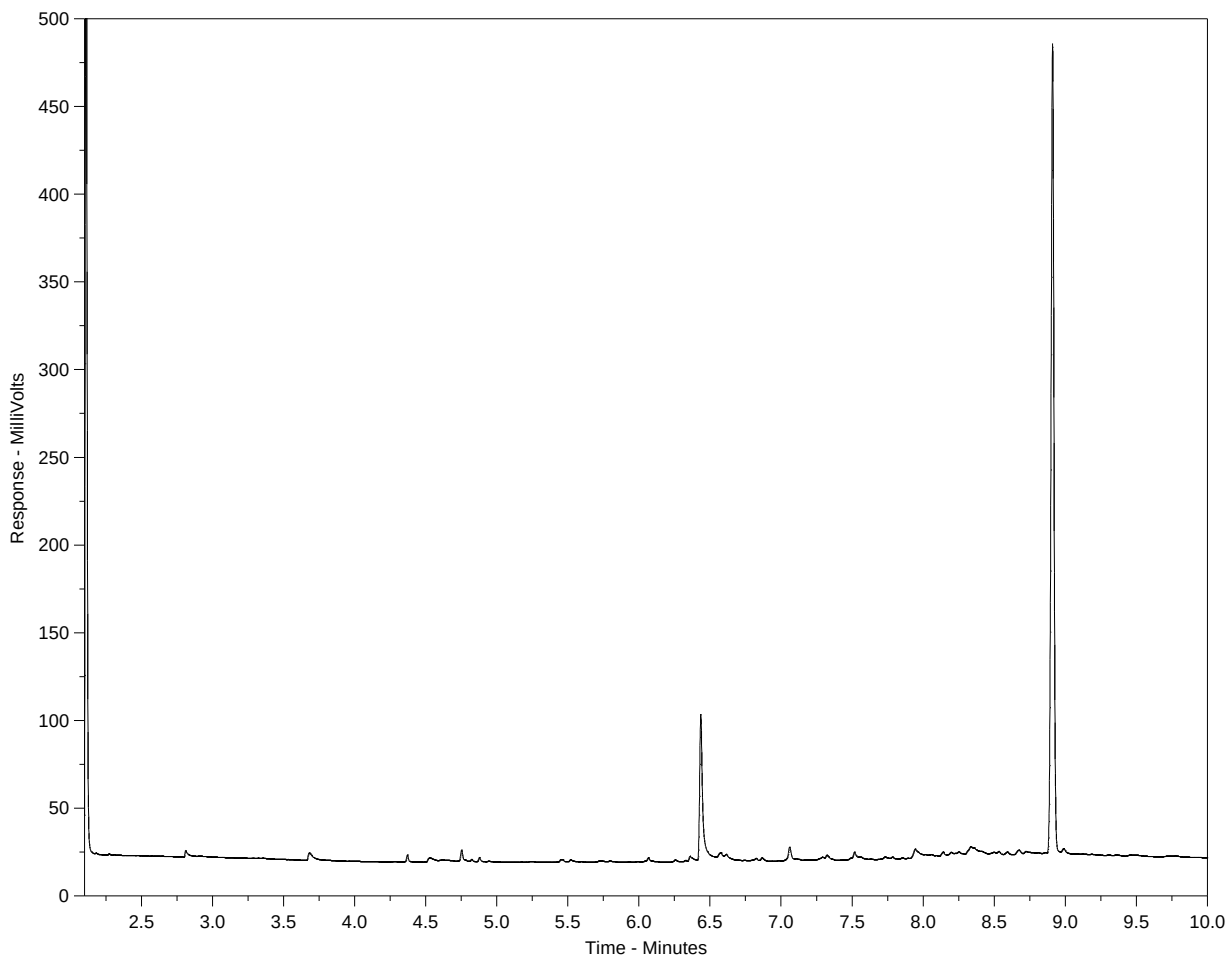
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-13
Client ID: WAL-2



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
345°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

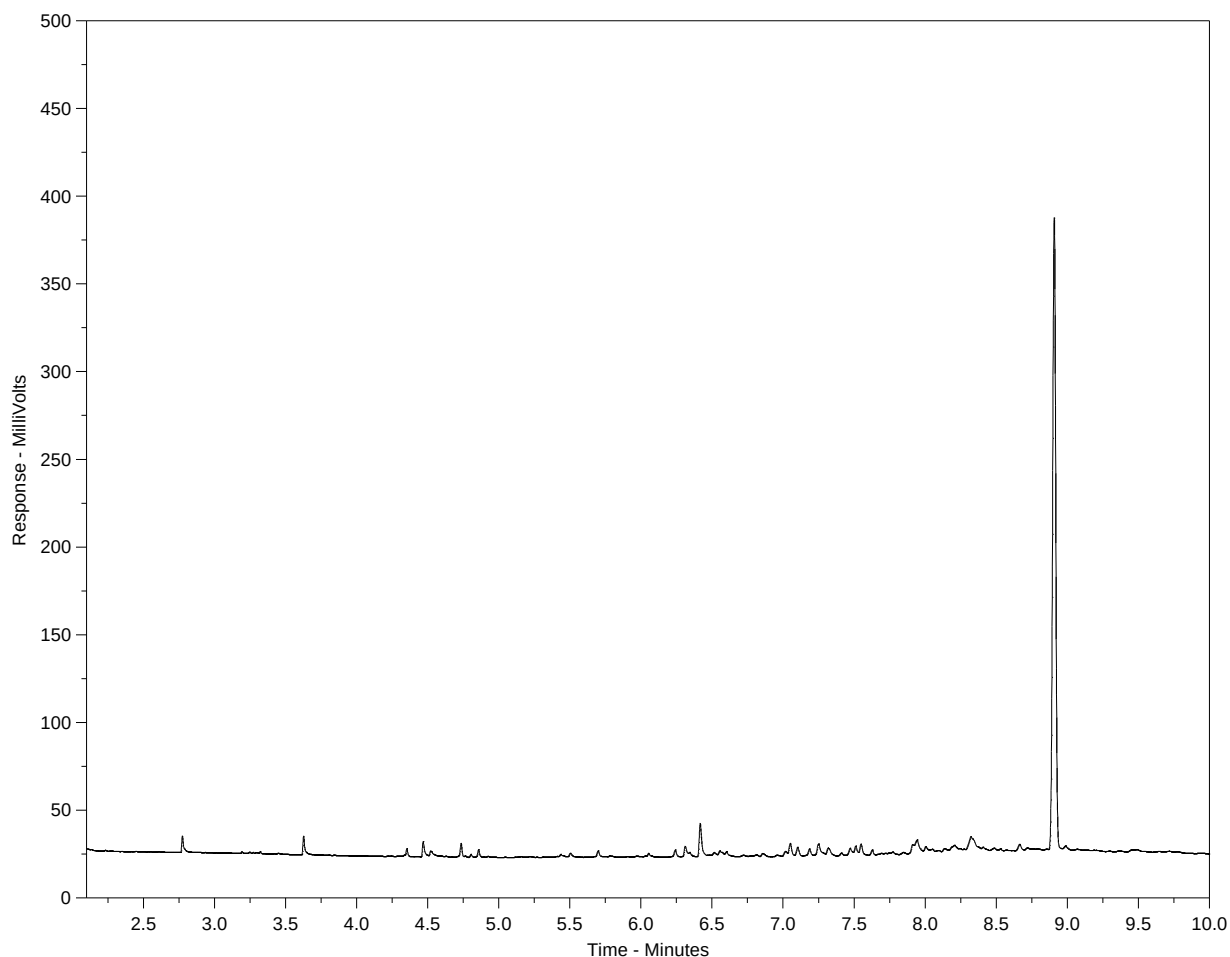
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-14
Client ID: WAL-3



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

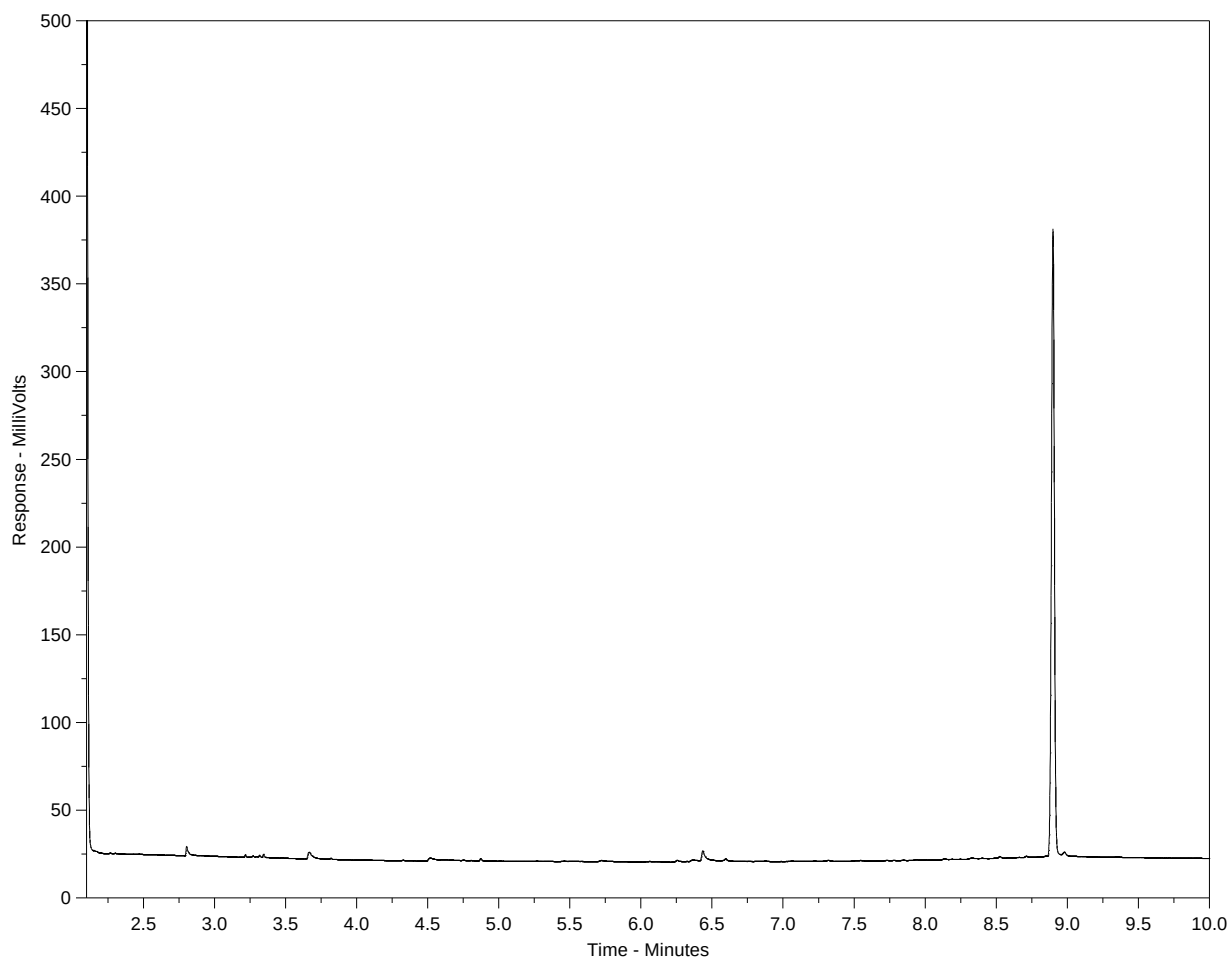
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-15
Client ID: PDL



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

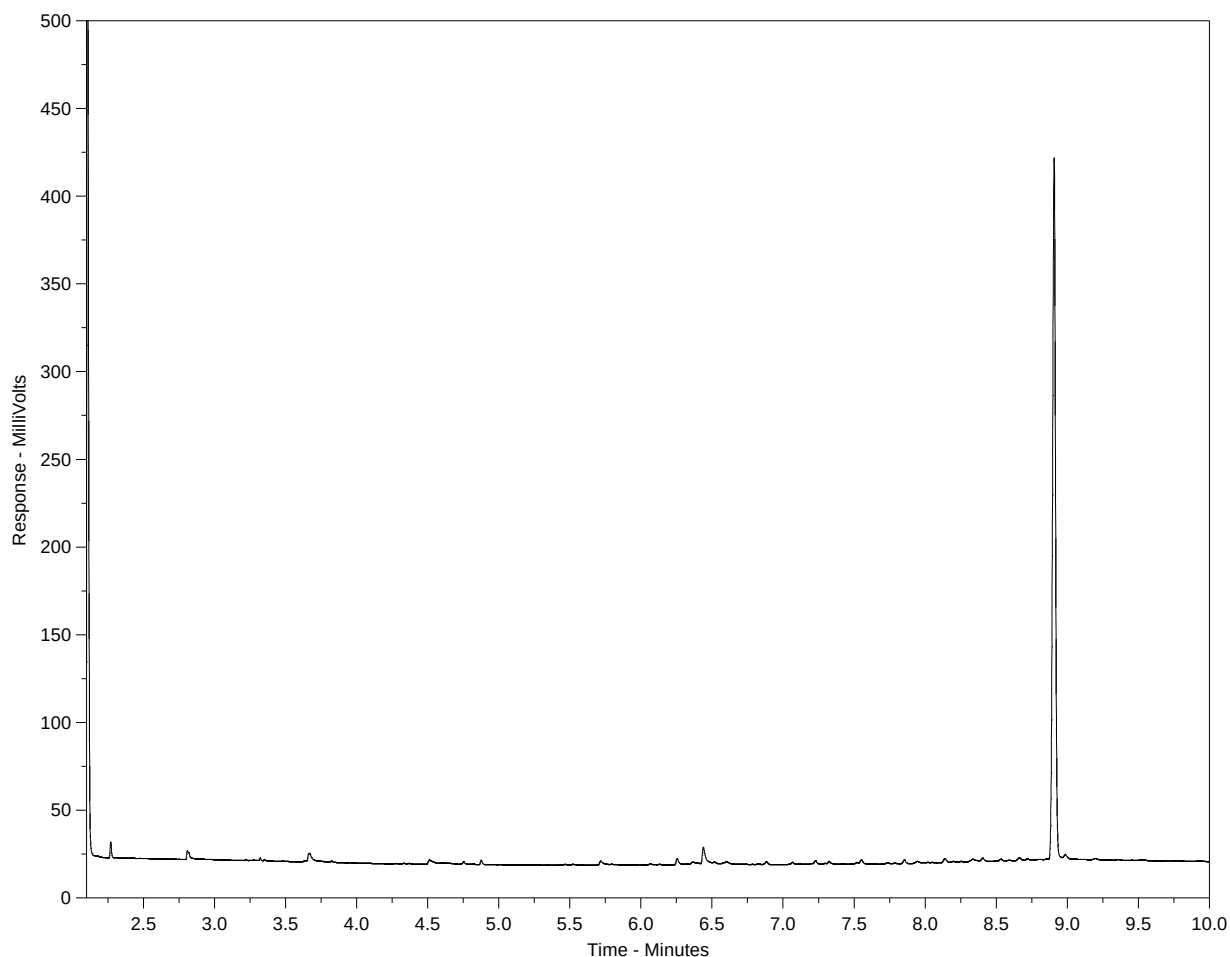
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-16
Client ID: PDL-2



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

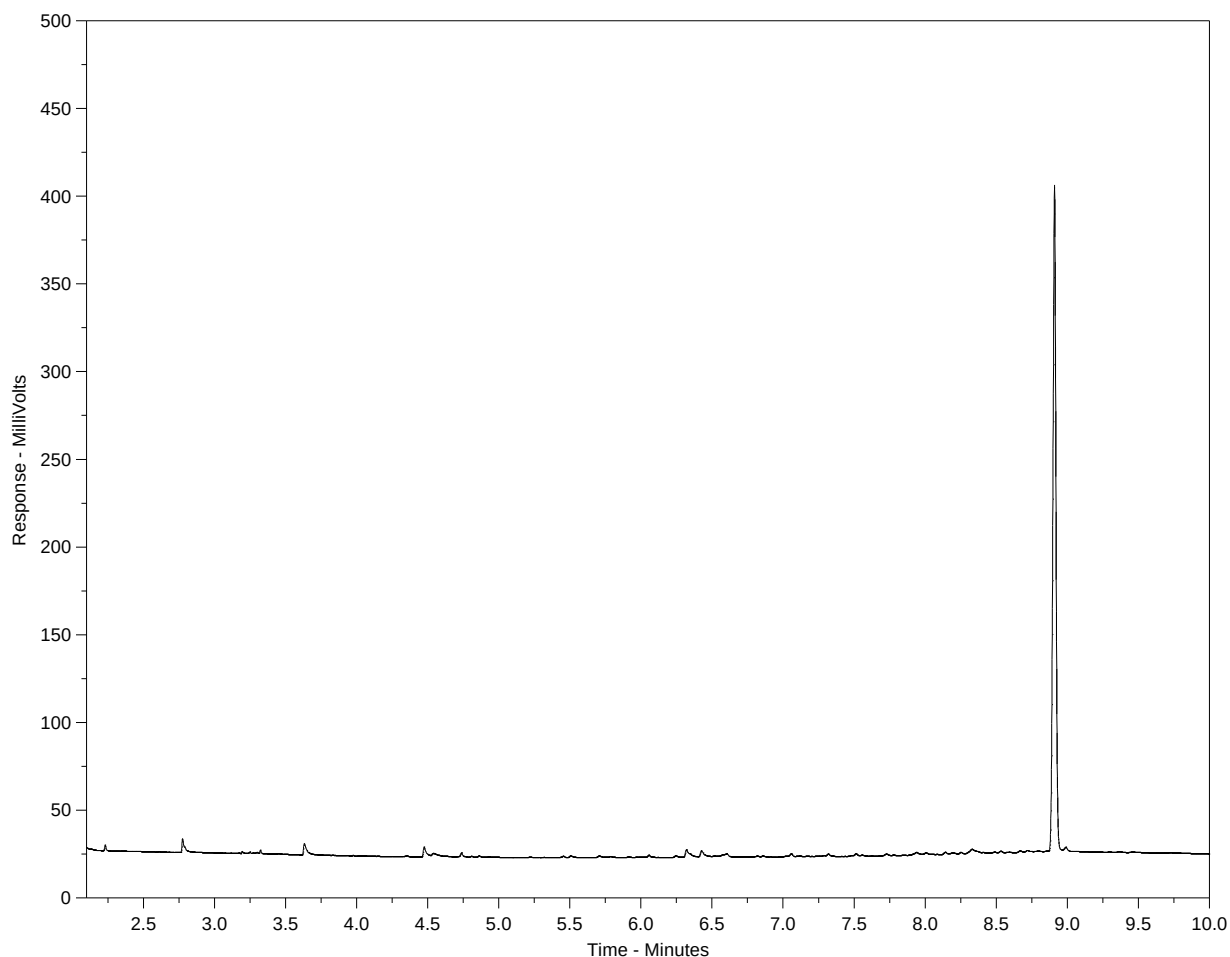
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-17
Client ID: PDL-3



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
345°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

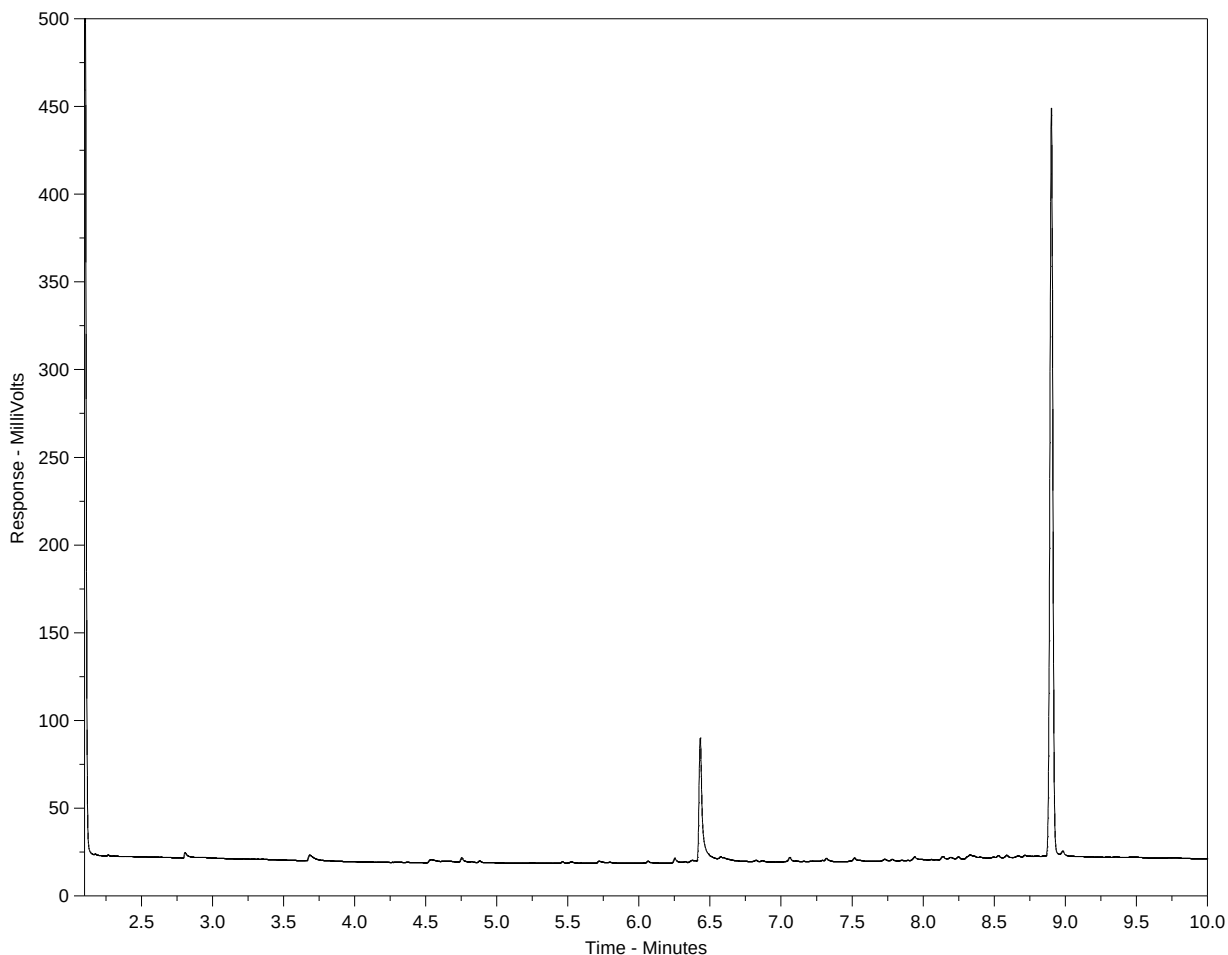
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-19
Client ID: INUG



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

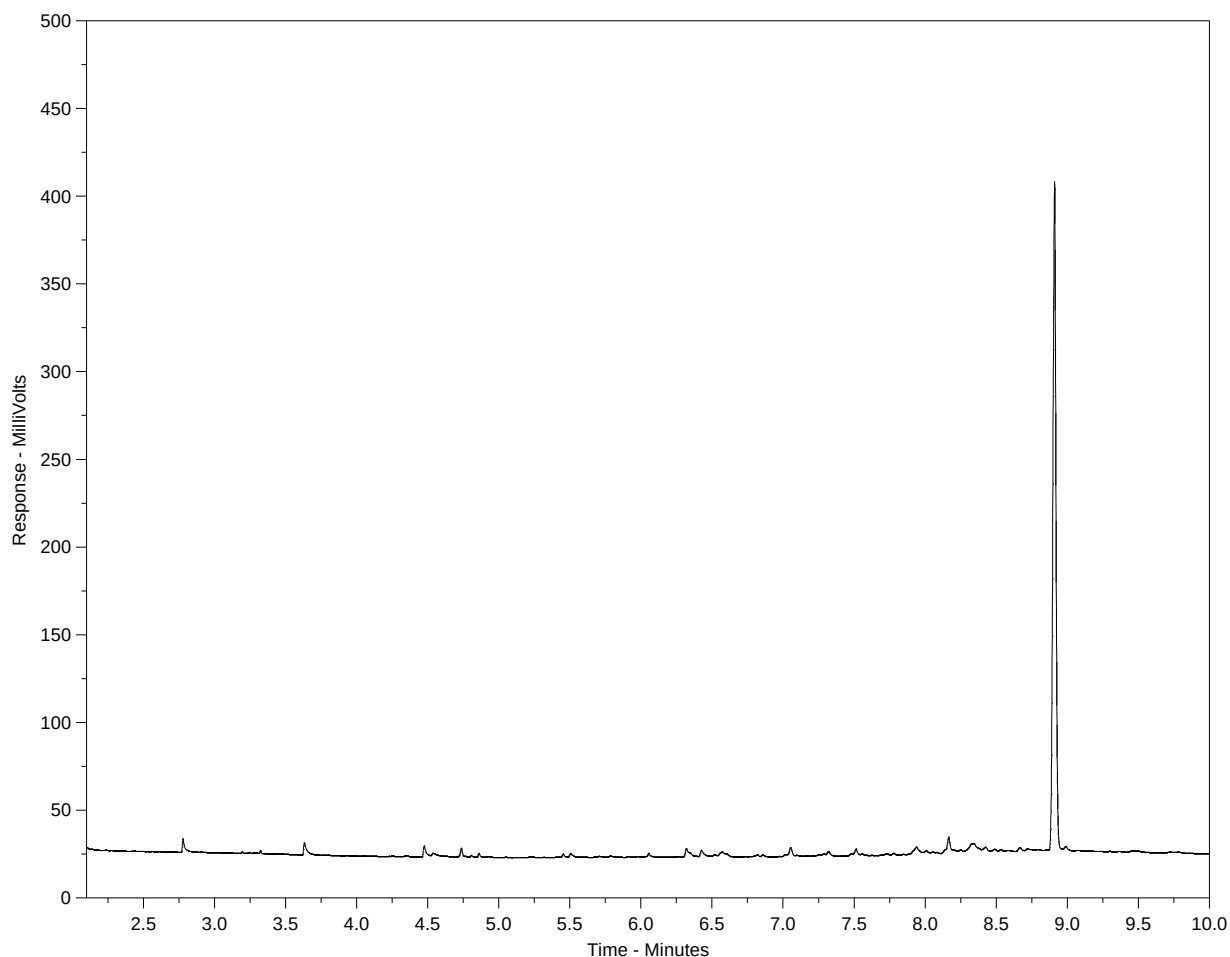
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-20
Client ID: INUG-2



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

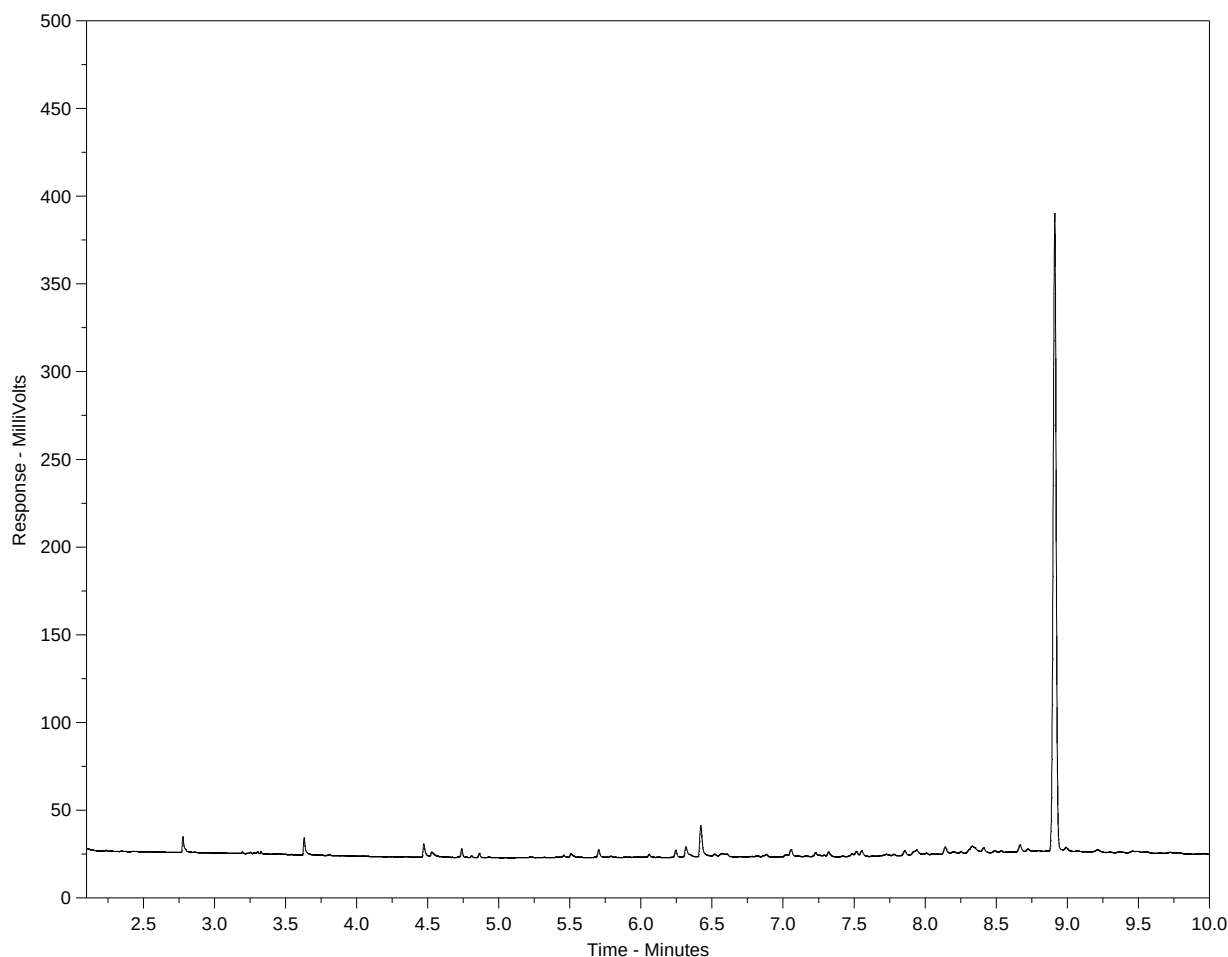
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-21
Client ID: INUG-3



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

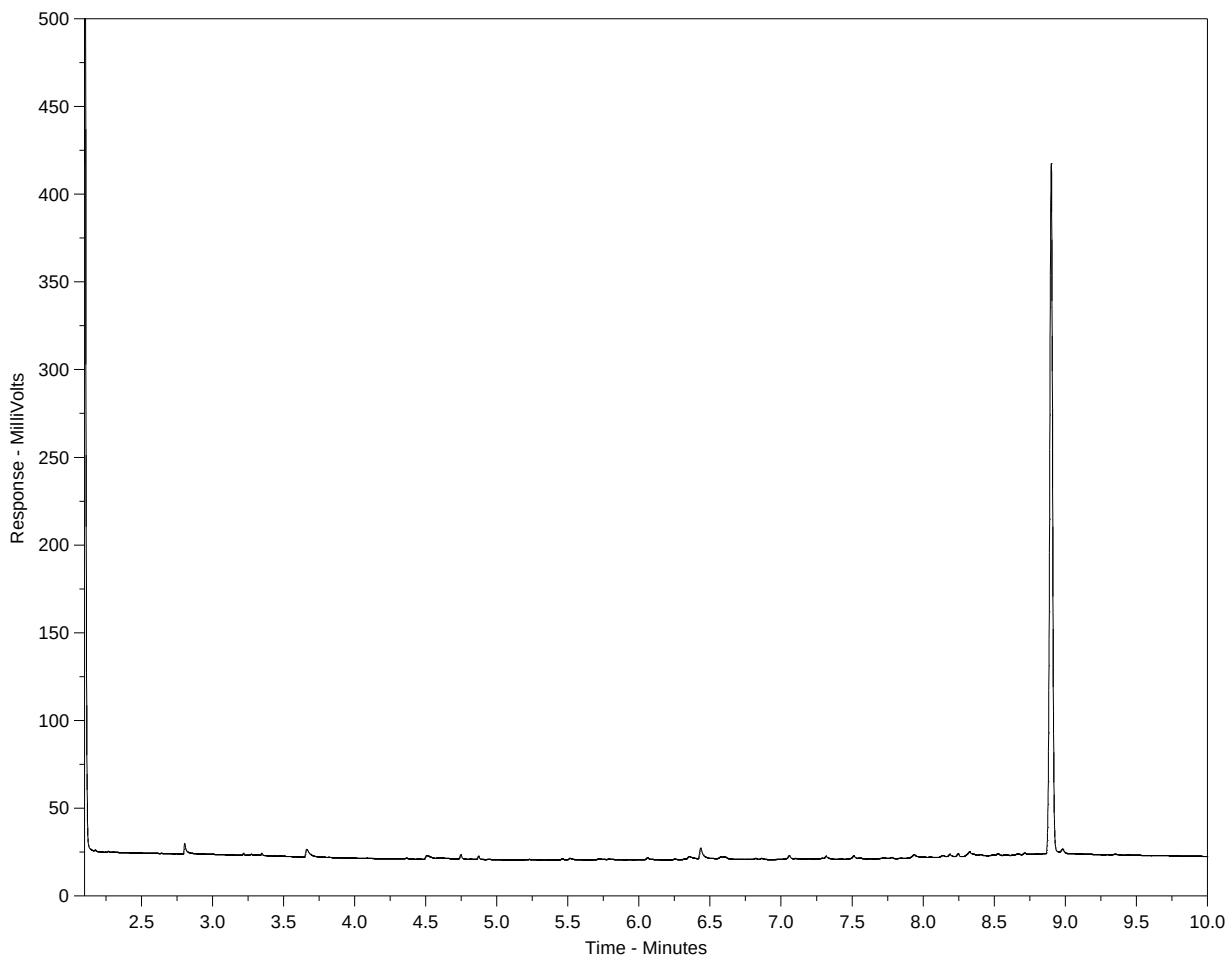
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-22
Client ID: TPN



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

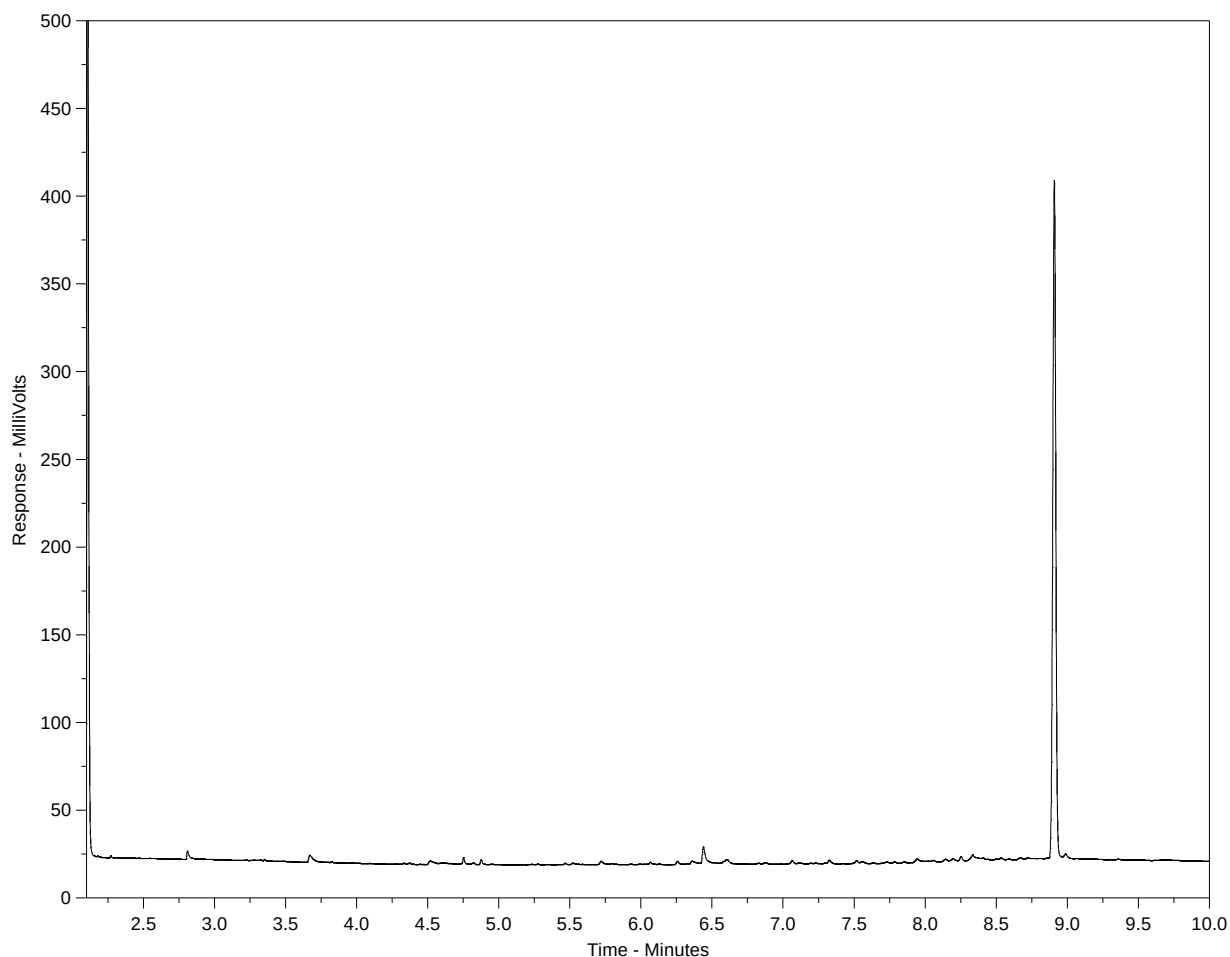
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-23
Client ID: TPN-2



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

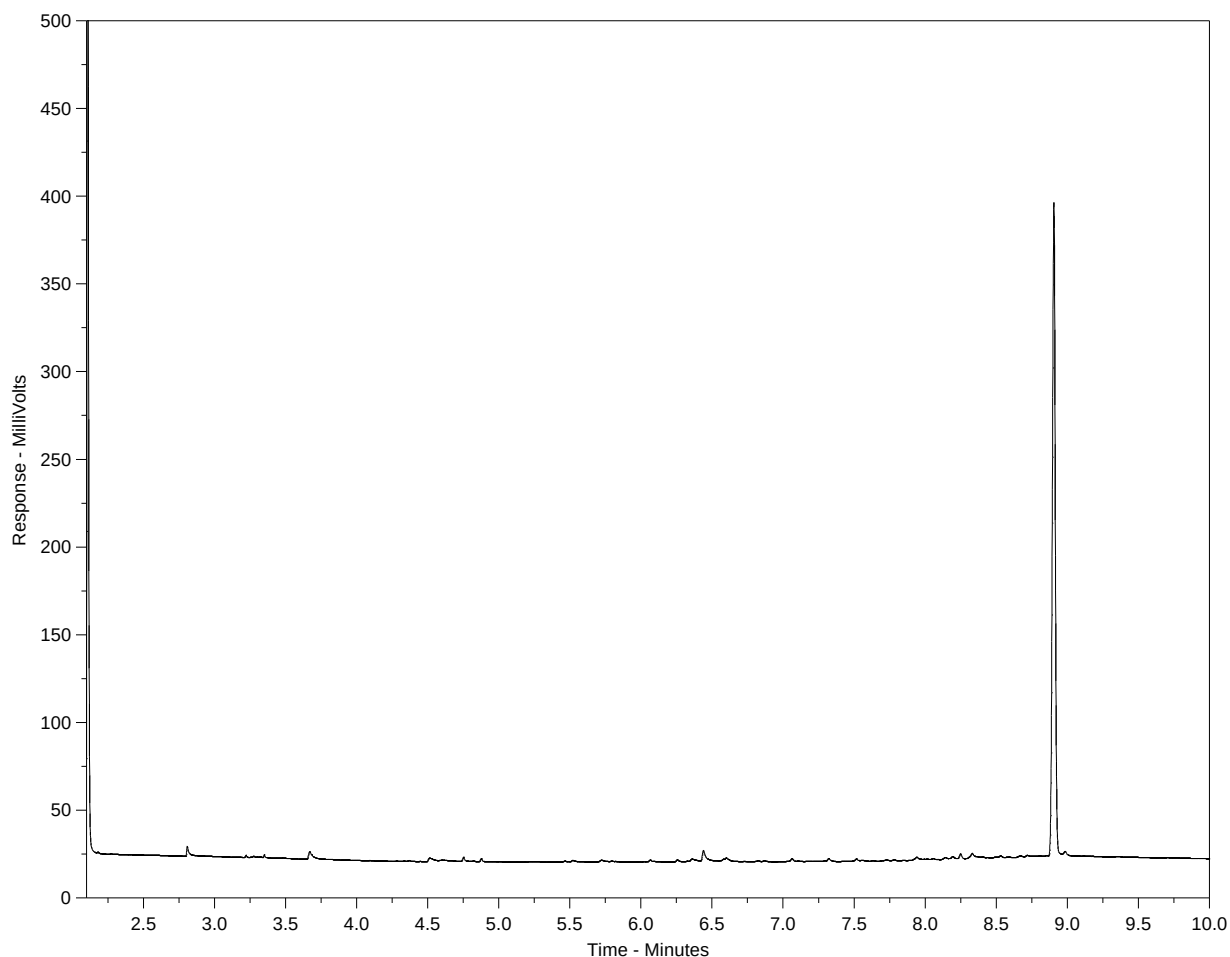
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-24
Client ID: TPN-3



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

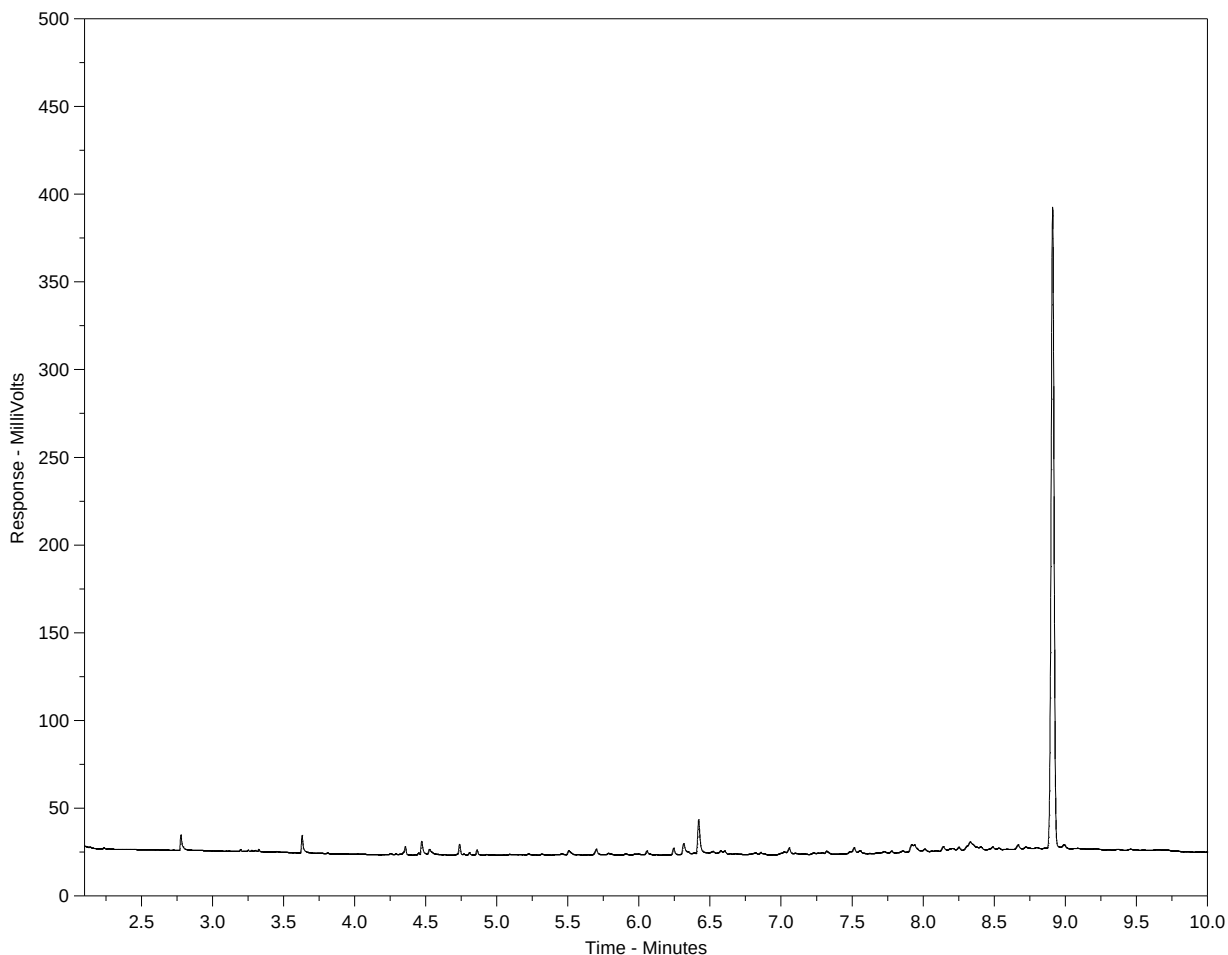
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-25
Client ID: TPS



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

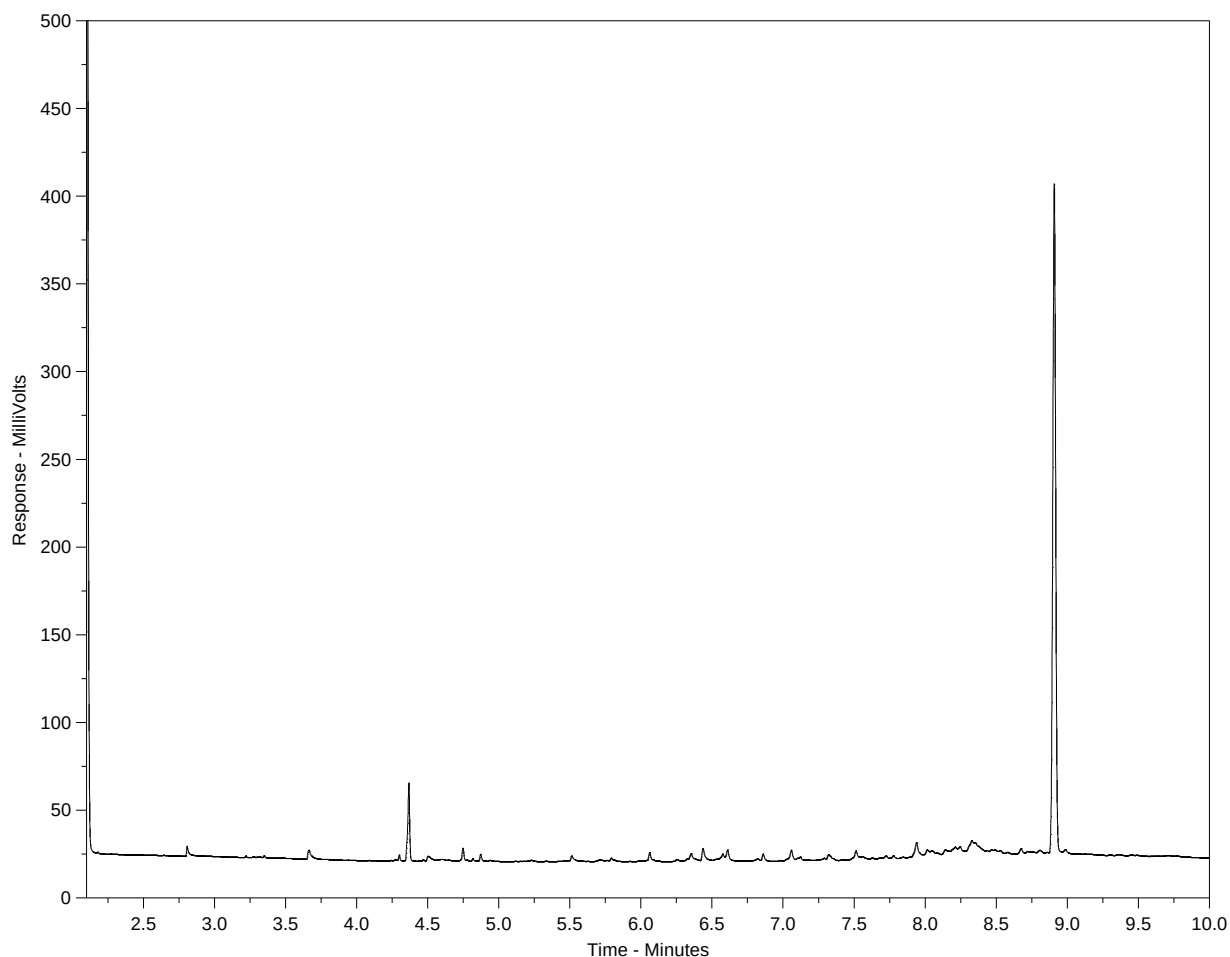
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-26
Client ID: TPS-2



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

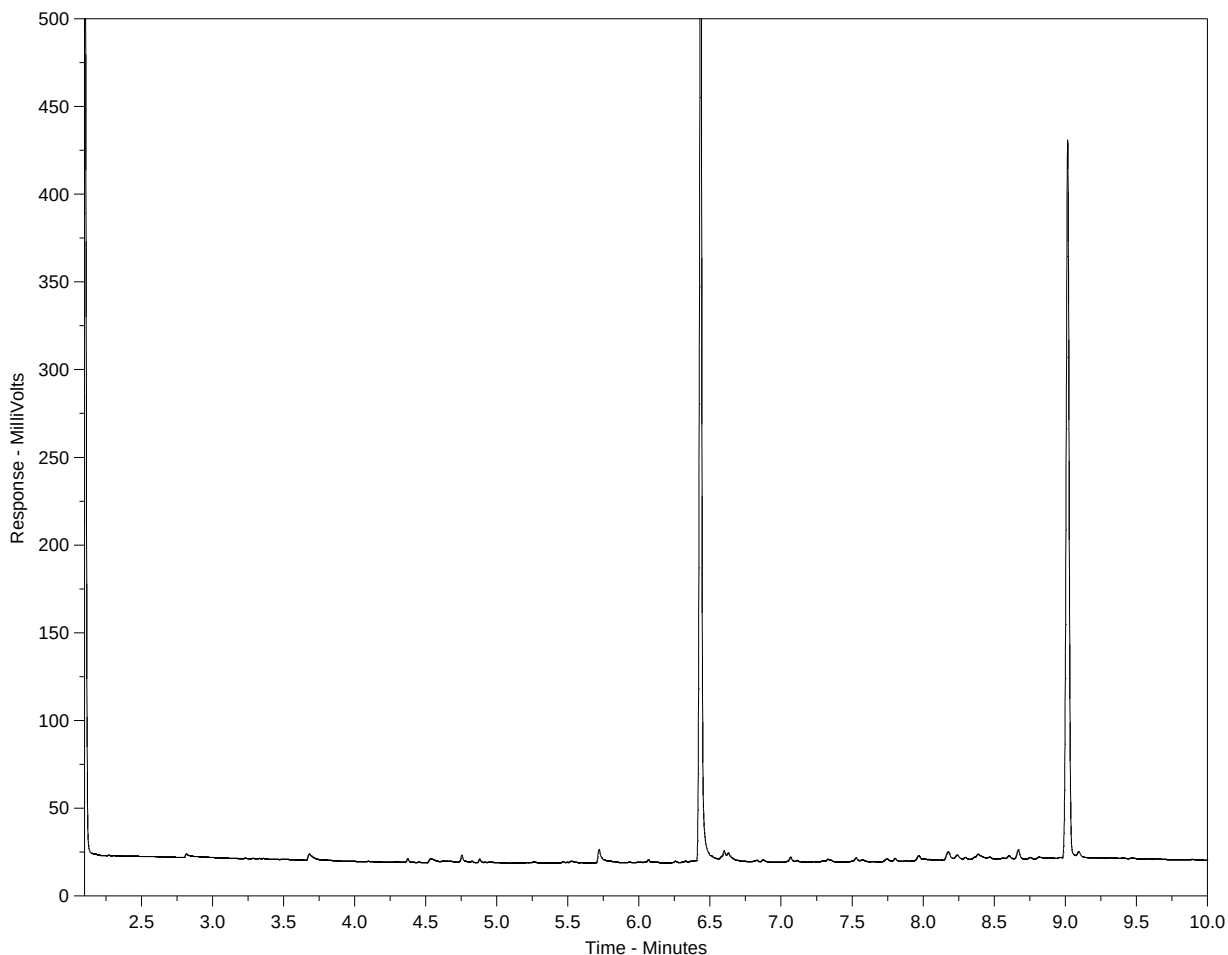
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-27
Client ID: TPS-3



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

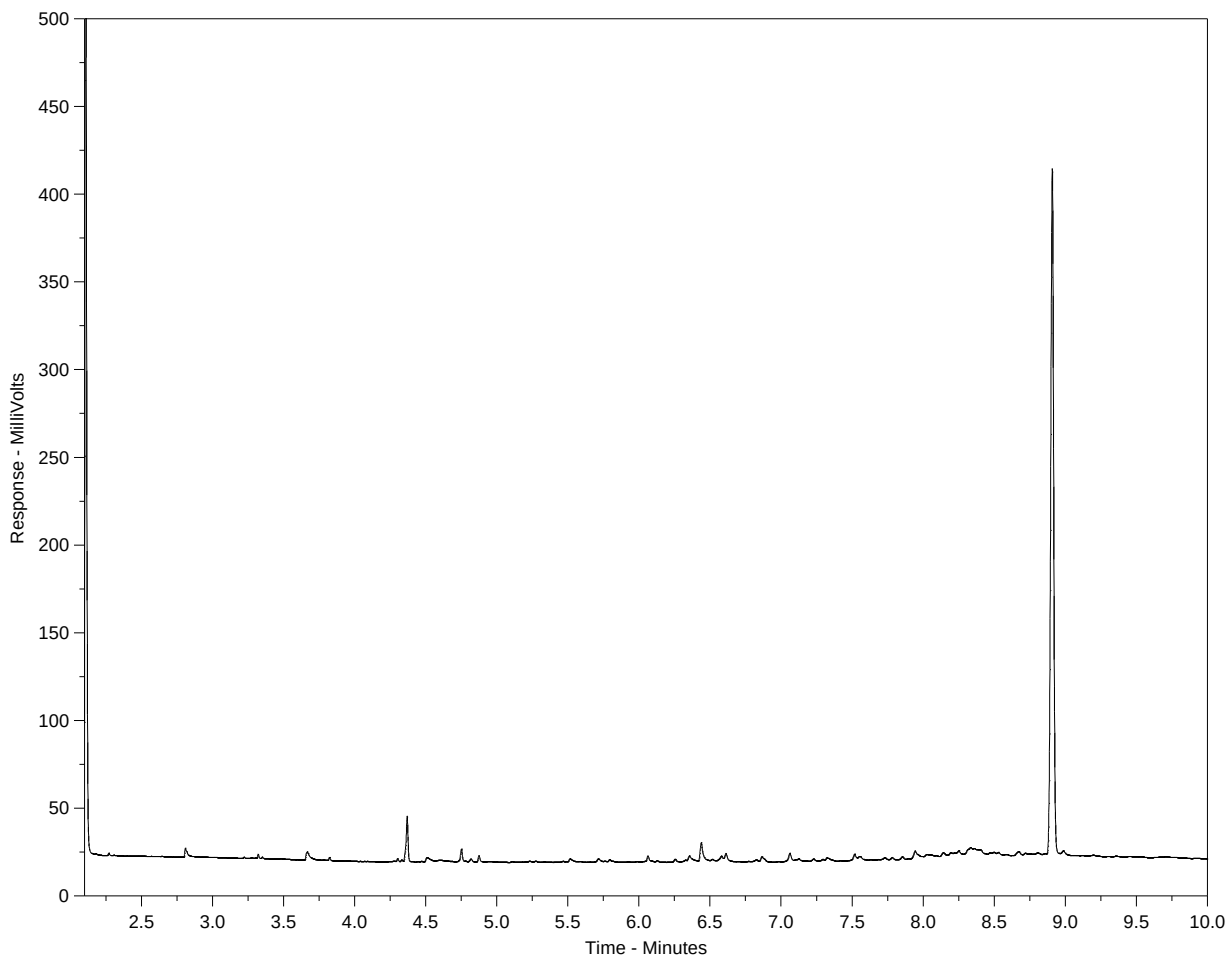
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L811546-28
Client ID: DUP-2



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Rush Processing Required

COC
#Page 1 of 4

Report to:						Report Format / Distribution						Service Requested:																	
Company: Azimuth Consulting Group Inc.						☒ Standard ☐ Other						☒ Regular Service (Default)																	
Contact: Randy Baker						☒ PDF ☒ Excel ☐ Fax						☐ Rush Service (2-3 Days)																	
Address: Vancouver						Email 1: rbaker@azimuthgroup.ca						☐ Priority Service (1 Day or ASAP)																	
						Email 2: gmann@azimuthgroup.ca						☐ Emergency Service (<1 Day / Weekend) - Contact ALS																	
Phone: 604-730-1220 Fax:												Analysis Request																	
Invoice To: Same as Report						Indicate Bottles Filled / Preserved (F/P) -->																							
Company:						Client / Project Information:																							
Contact:						Job #:						Meadowbank Mine AEMP																	
Address:						PO/AEE:																							
Sample:						Legal Site Description:																							
Phone:						Quote #: ALSEC09-077																							
Fax:						ALS																							
Lab Work Order # (lab use only)						Contact: Natasha MM						Sampler (Initials)																	
Sample #		Sample Identification (This description will appear on the report)				Date		Time		Sample Type																			
						dd-mm-yy		hh:mm		(Select from drop-down list)		T-Metals (CCME)																	
		W/L 4-S				16-Aug-09				Water		D-Metals (CCME)																	
		PDL 4-S				17-Aug-09				Water		TOC, DOC (F)																	
		TPE-7-S				16-Aug-09				Water		TKN, Ammonia																	
		INUG-7-S				19-Aug-09				Water		TDS, TSS-low																	
		INUG-7-INT				19-Aug-09				Water		Alk (SPECIATED)																	
		INUG-7-D				19-Aug-09				Water		Anion Scan, Si, pH, EC																	
		AEMP Aug. DUP-2				21-Aug-09				Water		T-PO4, ortho-PO4																	
		AEMP Jul. EB 4				19-Aug-09				Water		Chlorophyll-a																	
		Travel Blanks										Turbidity																	
												Hazardous?																	
												Highly Contaminated?																	
												Number of Containers																	
Guidelines / Regulations														Special Instructions / Hazardous Details															
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																													
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																													
Relinquished By: IM McConnell						Date & Time: 23-Aug-09						Received By: HD						Date & Time: 09/06/23						Temperature: 14					
Relinquished By:						Date & Time:						Received By:						Date & Time:						Samples Received in Good Condition? Y/N (if no provided details)					

Report to:						
Company: Azimuth Consulting Group Inc.						
Contact:	Randy Baker			Report Format / Distribution ☒ Standard ☐ Other		
Address:	Vancouver			☒ PDF ☒ Excel ☐ Fax		
Phone:	604-730-1220	Fax:		Email 1:	rbaker@azimutgroup.ca	
Invoice To:	☒ Same as Report			Email 2:	gmann@azimutgroup.ca , mmccconnell@azimutgroup.ca	
Company:				Indicate Bottles: Filtered / Preserved (F/P) -->		
Contact:				Client / Project Information: Job #: Meadowbank Mine AEMP		
Address:				PO/AFE:		
Sample				Legal Site Description:		
Phone:	Fax:			Quote # : ALSEQ09-077		
Lab Work Order # (lab use only)		L81546	ALS Contact:	Natasha MM	Sampler (initials)	
Sample #	Sample Identification (This description will appear on the report)		Date	Time hh:mm	Sample Type (Select from drop-down list)	T-Metals (CCME)
	TPN-7-S		21-Aug-09		Water	D-Metals (CCME)
	TPS-4-S		21-Aug-09		Water	TOC, DOC (<i>E</i>)
						TKN, Ammonia
						TDS, TSS-low
						Aik (SPECIATED)
						Anion Scan, Si, pH, EC
						T-PO4, ortho-PO4
						Chlorophyll-a
						Turbidity
						Hazardous?
						Highly Contaminated?
						Number of Containers
Guidelines / Regulations						
Special Instructions / Hazardous Details						
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.						
Relinquished By:	M. McConnell	Date & Time:	23-Aug-09	Received By:	HD	Date & Time:
Relinquished By:	[Signature]	Date & Time:		Received By:	JG/BK/CTZ	Date & Time:
						Temperature
						Samples Received in Good Condition? Y / N (if no provided details)

Report to:						Report Format / Distribution						Service Requested:					
Company: Arizona Consulting Group Inc.						☒ Standard ☐ Other						☒ Regular Service (Default)					
Contact: Scott Baker						☒ PDF ☒ Email ☐ Fax						Rush Service (2-3 Days)					
Address: Vancouver						Email 1: mbaker@azconsulting.com.ca						Priority Service (1 Day or ASAP)					
						Email 2: gwynne@azconsulting.com.ca						Emergency Service (<1 Day, if required) Contact ALS					
Phone: 604-790-1970						Fax:						Analysis Request					
Invoice To: ✓ Same as Report						Client / Project Information:											
Company:						Job #:						Methodology / Time					
Contact:						PO/A/E:											
Address:						Legal Site Description:											
Sample:						Quote #: ALS009-077											
Phone:						ALS Contract:											
Lab Work Order # (lab use only)						Nataasha MM						Sampler (Inches)					
Sample Identification (This description will appear on the report)						Date						Time					
#						(hh:mm:ss)						Sample Type (Select from drop-down list)					
WAL						16-Aug-09						dd-mm-yy hh mm Sediment					
WAL-2						16-Aug-09						Sediment					
WAL-3						16-Aug-09						Sediment					
PDL						17-Aug-09						Sediment					
PDL-2						17-Aug-09						Sediment					
PDL-3						17-Aug-09						Sediment					
DUP-1						17-Aug-09						Sediment					
INUG						20-Aug-09						Sediment					
INUG-2						20-Aug-09						Sediment					
INUG-3						20-Aug-09						Sediment					
Guidelines / Regulations						Special Instructions / Hazardous Details											
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.																	
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																	
Requisitioned By: H McCannell						Date & Time: 23-Aug-09						Received By:					
Relinquished By:						Date & Time:						Temperature:					
												Samples Received in Good Condition? Y N (if no provided details)					

Report to:		Report Format / Distribution		Service Requested:	
Company: Azimuth Consulting Group Inc.		☒ Standard ☐ Other		☒ Regular Service (Default)	
Contact: Randy Baker		☒ PDF ☒ Excel ☐ Fax		☐ Rush Service (2-3 Days)	
Address: Vancouver		Email 1: rbaker@azimuthgroup.ca		☐ Priority Service (1 Day or ASAP)	
Phone: 604-730-1220 Fax:		Email 2: gmann@azimuthgroup.ca mconnell@azimuthgroup.ca		☐ Emergency Service (<1 Day / Weekend) - Contact ALS	
Invoice To: ☒ Same as Report		Analysis Request			
Company:		Indicate Bottles: Filtered / Preserved (F/P) -->			
Contact:		Client / Project Information:			
Address:		Job #:			
Sample:		PO/A/E:			
Phone:		Legal Site Description:			
Fax:		Quote #: ALSEC09-077			
Lab Work Order # (lab use only)		ALS Contact: Natasha MM		Sampler (Initials)	
Sample Identification (This description will appear on the report)		Date		Time	
#		dd-mm-yy		hh:mm	
				(Select from drop-down list)	
TPN		21-Aug-09		Sediment	
TPN-2		21-Aug-09		Sediment	
TPN-3		21-Aug-09		Sediment	
TPS		21-Aug-09		Sediment	
TPS-2		21-Aug-09		Sediment	
TPS-3		21-Aug-09		Sediment	
DUP-2		21-Aug-09		Sediment	
Filter Swipe		17-Aug-09		Other	
Filter Swipe-2		21-Aug-09		Other	
Guidelines / Regulations					
Special Instructions / Hazardous Details					
Please call Azimuth to discuss filter swipe analyses					
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.					
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.					
Relinquished By:	M. McConnell	Date & Time:	23-Aug-09	Received By:	(h)
Relinquished By:		Date & Time:		Received By:	09/08/27
			Date & Time:	07:38	
			Temperature	14	
			Samples Received in Good Condition? Y / N (if no provided details)		



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: GARY MANN

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 29-OCT-09 09:43 (MT)

Version: FINAL

Lab Work Order #: L819561

Date Received: 17-SEP-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers: 08-023294, 08-023295

Other Information:

Comments: Please note that certain Polycyclic Aromatic Hydrocarbons detection limits have been increased for some of the samples due to the interferences encountered during the analysis.



Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L819561-4	L819561-5	L819561-6	L819561-7	L819561-8
		25-AUG-09	25-AUG-09	25-AUG-09	26-AUG-09	26-AUG-09
		BBD-3	BBD-2	BBD	BPJ-3	BPJ-2
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	31.7	32.5	33.1	43.9	32.1
	pH (pH)	5.78	5.86	6.73	6.45	6.14
Particle Size	% Gravel (>2mm) (%)	<1.0	<1.0	1.0	1.0	1.0
	% Sand (2.0mm - 0.063mm) (%)	40.0	41.0	61.0	21.0	23.0
	% Silt (0.063mm - 4um) (%)	54.0	55.0	35.0	61.0	67.0
	% Clay (<4um) (%)	7.0	4.0	3.0	16.0	10.0
	MUST PSA % > 75um (%)	32.0	31.0	77.0	16.0	18.0
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.77	0.33	0.20	0.54	0.41
Metals	Aluminum (Al) (mg/kg)	9110	8960	6060	12700	10300
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	<10
	Arsenic (As) (mg/kg)	5.7	<5.0	8.6	17.7	26.6
	Barium (Ba) (mg/kg)	224	81.6	83.4	200	109
	Beryllium (Be) (mg/kg)	<0.50	<0.50	<0.50	0.58	<0.50
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Chromium (Cr) (mg/kg)	19.9	18.2	11.0	24.6	20.4
	Cobalt (Co) (mg/kg)	6.1	6.0	4.6	8.8	6.2
	Copper (Cu) (mg/kg)	8.7	8.4	4.8	11.7	10.0
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	<30
	Mercury (Hg) (mg/kg)	0.0053	<0.0050	<0.0050	0.0069	0.0087
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	<4.0
	Nickel (Ni) (mg/kg)	11.1	10.2	7.9	14.6	12.3
	Phosphorus (P) (mg/kg)	1100	791	544	1230	1210
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Vanadium (V) (mg/kg)	27.5	23.4	14.8	34.3	22.7
	Zinc (Zn) (mg/kg)	30.2	29.9	21.7	41.8	38.2
Aggregate Organics	Oil and Grease (mg/kg)	<500	<500	<500	<500	<500
Hydrocarbons	EPH10-19 (mg/kg)	<200	<200	<200	<200	<200
	EPH19-32 (mg/kg)	<200	<200	<200	<200	<200
	LEPH (mg/kg)	<200	<200	<200	<200	<200
	HEPH (mg/kg)	<200	<200	<200	<200	<200
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Anthracene (mg/kg)	<0.0040	<0.0040	<0.0040	0.0145	<0.0040
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010	0.111	<0.010
	Benzo(a)pyrene (mg/kg)	<0.050	<0.010	<0.010	0.079	<0.010
	Benzo(b)fluoranthene (mg/kg)	<0.15	<0.010	<0.010	0.075	<0.010

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L819561-9	L819561-10	L819561-11	L819561-12	
		26-AUG-09	25-AUG-09	25-AUG-09	25-AUG-09	
		BPJ	BAP-3	BAP-2	BAP	
Grouping	Analyte					
SOIL						
Physical Tests	% Moisture (%)	42.3	31.6	44.2	46.6	
	pH (pH)	7.24	6.16	6.15	6.20	
Particle Size	% Gravel (>2mm) (%)	<1.0	<1.0	<1.0	<1.0	
	% Sand (2.0mm - 0.063mm) (%)	55.0	75.0	64.0	68.0	
	% Silt (0.063mm - 4um) (%)	38.0	21.0	32.0	28.0	
	% Clay (<4um) (%)	6.0	3.0	5.0	4.0	
	MUST PSA % > 75um (%)	55.0	74.0	63.0	70.0	
Organic / Inorganic Carbon	Total Organic Carbon (%)	0.38	0.30	0.60	0.93	
Metals	Aluminum (Al) (mg/kg)	7020	5540	6940	6410	
	Antimony (Sb) (mg/kg)	<10	<10	<10	<10	
	Arsenic (As) (mg/kg)	7.6	5.4	<5.0	<5.0	
	Barium (Ba) (mg/kg)	80.1	388	380	343	
	Beryllium (Be) (mg/kg)	<0.50	<0.50	<0.50	<0.50	
	Cadmium (Cd) (mg/kg)	<0.50	<0.50	<0.50	<0.50	
	Chromium (Cr) (mg/kg)	16.1	14.1	16.3	16.4	
	Cobalt (Co) (mg/kg)	5.4	4.0	4.8	4.2	
	Copper (Cu) (mg/kg)	6.9	5.1	7.6	7.4	
	Lead (Pb) (mg/kg)	<30	<30	<30	<30	
	Mercury (Hg) (mg/kg)	0.0068	<0.0050	0.0059	0.0051	
	Molybdenum (Mo) (mg/kg)	<4.0	<4.0	<4.0	<4.0	
	Nickel (Ni) (mg/kg)	9.8	8.6	10.6	9.9	
	Phosphorus (P) (mg/kg)	807	790	743	708	
	Selenium (Se) (mg/kg)	<2.0	<2.0	<2.0	<2.0	
	Silver (Ag) (mg/kg)	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl) (mg/kg)	<1.0	<1.0	<1.0	<1.0	
	Tin (Sn) (mg/kg)	<5.0	<5.0	<5.0	<5.0	
	Vanadium (V) (mg/kg)	19.6	18.8	22.9	20.7	
	Zinc (Zn) (mg/kg)	29.1	21.1	26.5	24.8	
Aggregate Organics	Oil and Grease (mg/kg)	<500	<500	<500	770	
Hydrocarbons	EPH10-19 (mg/kg)	<200	<200	<200	<200	
	EPH19-32 (mg/kg)	<200	<200	<200	<200	
	LEPH (mg/kg)	<200	<200	<200	<200	
	HEPH (mg/kg)	<200	<200	<200	<200	
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	
	Acenaphthylene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	
	Anthracene (mg/kg)	<0.0040	<0.0040	<0.0040	<0.0040	
	Benz(a)anthracene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Benzo(a)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Benzo(b)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L819561-4	L819561-5	L819561-6	L819561-7	L819561-8
		25-AUG-09	25-AUG-09	25-AUG-09	26-AUG-09	26-AUG-09
		BBD-3	BBD-2	BBD	BPJ-3	BPJ-2
Grouping	Analyte					
SOIL						
Polycyclic Aromatic Hydrocarbons	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010	0.033	<0.010
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	0.029	<0.010
	Chrysene (mg/kg)	<0.020	<0.010	<0.010	0.157	<0.010
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	0.0105	<0.0050
	Fluoranthene (mg/kg)	<0.010	<0.010	<0.010	0.117	<0.010
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	0.032	<0.010
	2-Methylnaphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Naphthalene (mg/kg)	<0.020	<0.010	<0.010	<0.010	<0.010
	Phenanthrene (mg/kg)	<0.010	<0.010	<0.010	0.050	<0.010
	Pyrene (mg/kg)	<0.010	<0.010	<0.010	0.197	<0.010
	Surrogate: d10-Acenaphthene (SS) (%)	96	97	94	96	96
	Surrogate: d12-Chrysene (SS) (%)	94	93	90	90	97
	Surrogate: d8-Naphthalene (SS) (%)	96	66	95	60	73
	Surrogate: d10-Phenanthrene (SS) (%)	105	105	104	100	107

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L819561-9	L819561-10	L819561-11	L819561-12	
		26-AUG-09	25-AUG-09	25-AUG-09	25-AUG-09	
		BPJ	BAP-3	BAP-2	BAP	
Grouping	Analyte					
SOIL						
Polycyclic Aromatic Hydrocarbons	Benzo(g,h,i)perylene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Benzo(k)fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Chrysene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Dibenz(a,h)anthracene (mg/kg)	<0.0050	<0.0050	<0.0050	<0.0050	
	Fluoranthene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Fluorene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Indeno(1,2,3-c,d)pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	2-Methylnaphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Naphthalene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Phenanthrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Pyrene (mg/kg)	<0.010	<0.010	<0.010	<0.010	
	Surrogate: d10-Acenaphthene (SS) (%)	99	96	91	88	
	Surrogate: d12-Chrysene (SS) (%)	103	103	88	86	
	Surrogate: d8-Naphthalene (SS) (%)	78	98	80	89	
	Surrogate: d10-Phenanthrene (SS) (%)	108	109	97	93	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
SWAB						
Metals	Aluminum (Al)-Total (ug)	11				
	Antimony (Sb)-Total (ug)	<10				
	Arsenic (As)-Total (ug)	<10				
	Barium (Ba)-Total (ug)	1.29				
	Beryllium (Be)-Total (ug)	<0.30				
	Bismuth (Bi)-Total (ug)	<10				
	Cadmium (Cd)-Total (ug)	<0.50				
	Calcium (Ca)-Total (ug)	22.1				
	Chromium (Cr)-Total (ug)	<1.0				
	Cobalt (Co)-Total (ug)	<0.50				
	Copper (Cu)-Total (ug)	<0.50				
	Iron (Fe)-Total (ug)	9.7				
	Lead (Pb)-Total (ug)	<3.0				
	Lithium (Li)-Total (ug)	<0.50				
	Magnesium (Mg)-Total (ug)	8.2				
	Manganese (Mn)-Total (ug)	<0.30				
	Molybdenum (Mo)-Total (ug)	<2.0				
	Nickel (Ni)-Total (ug)	<3.0				
	Phosphorus (P)-Total (ug)	<20				
	Potassium (K)-Total (ug)	<100				
	Selenium (Se)-Total (ug)	<10				
	Silver (Ag)-Total (ug)	<0.50				
	Sodium (Na)-Total (ug)	<100				
	Strontium (Sr)-Total (ug)	<0.30				
	Thallium (Tl)-Total (ug)	<10				
	Tin (Sn)-Total (ug)	<2.0				
	Titanium (Ti)-Total (ug)	<0.50				
	Vanadium (V)-Total (ug)	<2.0				
	Zinc (Zn)-Total (ug)	<2.0				

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID			
		Description			
		Sampled Date			
		Sampled Time			
		Client ID			
Grouping	Analyte				
WATER					
Physical Tests	Conductivity (uS/cm)	42.7	222	179	
	Hardness (as CaCO3) (mg/L)	11.6	22.9	10.7	
	pH (pH)	7.13	6.89	6.96	
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	
	Total Dissolved Solids (mg/L)	26	124	100	
	Turbidity (NTU)	0.39	0.67	0.49	
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	8.8	9.1	8.9	
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	
	Alkalinity, Total (as CaCO3) (mg/L)	8.8	9.1	8.9	
	Ammonia as N (mg/L)	0.023	<0.020	<0.020	
	Bromide (Br) (mg/L)	<0.050	0.157	0.121	
	Chloride (Cl) (mg/L)	5.22	57.4	44.7	
	Fluoride (F) (mg/L)	0.053	0.056	0.055	
	Nitrate (as N) (mg/L)	<0.0050	0.0138	0.0093	
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	
	Total Kjeldahl Nitrogen (mg/L)	0.188	0.177	0.167	
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	
	Total Phosphate as P (mg/L)	0.0084	0.0021	0.0032	
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	
	Sulfate (SO4) (mg/L)	1.18	8.49	6.73	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.96	2.84	2.86	
	Total Organic Carbon (mg/L)	3.07	2.91	2.98	
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	0.0057	<0.0050	
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	
	Calcium (Ca)-Total (mg/L)	1.15	3.48	2.14	
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	
	Magnesium (Mg)-Total (mg/L)	0.61	4.72	2.61	
	Manganese (Mn)-Total (mg/L)	0.00109	0.00203	0.00129	
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L819561-1	L819561-2	L819561-3		
		Description					
		Sampled Date	24-AUG-09	24-AUG-09	24-AUG-09		
		Sampled Time					
		Client ID	BBD-4-S	BPJ-4-S	BAP-4-S		
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	30.1	15.8			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020			
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10			
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017			
	Calcium (Ca)-Dissolved (mg/L)	2.49	2.81	1.41			
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030			
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030			
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			
	Magnesium (Mg)-Dissolved (mg/L)	1.32	3.85	1.73			
	Manganese (Mn)-Dissolved (mg/L)	0.00035	<0.00030	<0.00030			
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020			
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0			
	Selenium (Se)-Dissolved (mg/L)	<0.0010	0.0010	<0.0010			
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020			
	Sodium (Na)-Dissolved (mg/L)	2.9	24.9	10.3			
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020			
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050			
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020			
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050			

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L819561-1	L819561-2	L819561-3		
		24-AUG-09	24-AUG-09	24-AUG-09		
		BBD-4-S	BPJ-4-S	BAP-4-S		
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	1.03	1.01	1.19		

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

AL-CSR-ICP-VA Soil Al in Soil by ICPOES (CSR SALM) BCMELP CSR SALM Method 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

ALK-SCR-VA Water Alkalinity by colour or titration EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA Water Bromide by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA Water Chloride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA Water Fluoride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA Water Nitrite by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA Water Nitrate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

C-TOT-ORG-LECO-SK Soil Organic Carbon by combustion method SSSA (1996) p. 973

Total Organic Carbon (C-TOT-ORG-LECO-SK, C-TOT-ORG-SK)

Total C and inorganic C are determined on separate samples. The total C is determined by combustion and thermal conductivity detection, while inorganic C is determined by weight loss after addition of hydrochloric acid. Organic C is calculated by the difference between these two determinations.

Reference for Total C:

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

Nelson, D.W. and Sommers, L.E. 1996. Total Carbon, organic carbon and organic matter. P. 961-1010 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

Reference for Inorganic C:

Loeppert, R.H. and Suarez, D.L. 1996. Gravimetric Method for Loss of Carbon Dioxide. P. 455-456 In: J.M. Bartels et al. (ed.) Methods of soil analysis: Part 3 Chemical methods. (3rd ed.) ASA and SSSA, Madison, WI. Book series no. 5

CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0

Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

EPH-TUMB-FID-VA	Soil	EPH in Solids by Tumbler and GCFID	BCMELP CSR

Extractable Hydrocarbons in Sediment/Soil

This analysis is carried out in accordance with the British Columbia Ministry of Environment, Lands and Parks (BCMELP) Analytical Method for Contaminated Sites "Extractable Petroleum Hydrocarbons in Solids by GC/FID, Version 2.1 July 1999". The procedure, based on EPA 3570, uses a rotary extraction technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene or kept in hexane/acetone and analyzed by capillary column gas chromatography with flame ionization detection (GC/FID). EPH results include Polycyclic Aromatic Hydrocarbons (PAH) and are therefore not equivalent to Light and Heavy Extractable Petroleum Hydrocarbons (LEPH/HEPH).

Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-CCME-CVAFS-VA	Soil	CVAFS Hg in Soil (CCME)	BCMELP CSR SALM METHOD 8/EPA 245.7

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic fluorescence spectrophotometry (EPA

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

Method 7000 series).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

LEPH/HEPH-CALC-VA	Soil	LEPHs and HEPHs	BC MOE LABORATORY MANUAL (2005)

Light and Heavy Extractable Petroleum Hydrocarbons in Solids. These results are determined according to the British Columbia Ministry of Environment, Lands, and Parks Analytical Method for Contaminated Sites "Calculation of Light and Heavy Extractable Petroleum Hydrocarbons in Solids or Water". According to this method, LEPH and HEPH are calculated by subtracting selected Polycyclic Aromatic Hydrocarbon results from Extractable Petroleum Hydrocarbon results. To calculate LEPH, the individual results for Naphthalene and Phenanthrene are subtracted from EPH(C10-19). To calculate HEPH, the individual results for Benz(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-c,d)pyrene, and Pyrene are subtracted from EPH(C19-32). Analysis of Extractable Petroleum Hydrocarbons adheres to all prescribed elements of the BCMELP method "Extractable Petroleum Hydrocarbons in Solids by GC/FID" (Version 2.1, July 20, 1999).

MET-CSR-FULL-ICP-VA	Soil	Metals in Soil by ICPOES (CSR SALM)	BCMELP CSR SALM METHOD 8

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA).

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-UG-ICP-VA	Swab	Metals in Swab by ICPOES	NIOSH 7303/EPA 6010B
This analysis is carried out using procedures adapted from Method 7303 in the NIOSH Manual of Analytical Methods (NMAM). The procedure involves a hot block digestion of the swab material, using a combination of nitric acid and hydrochloric acid. Instrumental analysis of the swab extract is by inductively coupled plasma - optical emission spectrophotometry (EPA 6010B).			
MOISTURE-VA	Soil	Moisture content	ASTM METHOD D2974-00
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
OG-TMB-VA	Soil	Oil & Grease in Soils by Tumbler	NATM1100 V03 CCME PHC F2-F4G
A subsample of the sediment/soil is extracted with 1:1 hexane:acetone using a rotary extraction apparatus. The extract is analyzed gravimetrically. Accuracy target values for Reference Materials used in this method are derived from averages of long-term method performance, as certified values do not exist for the reported parameters.			
PAH-L-TMB-MS-VA	Soil	LL PAH by Rotary Extraction and GCMS	EPA METHODS 3570 & 8270.
This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Methods 3545 & 8270, published by the United States Environmental Protection Agency (EPA). The procedure uses a mechanical shaking technique to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract is analysed by capillary column gas chromatography with mass spectrometric detection (GC/MS). Surrogate recoveries may not be reported in cases where interferences from the sample matrix prevent accurate quantitation.			
PAH-SURR-MS-VA	Soil	PAH Surrogates for Soils	EPA METHODS 3570, 3545A & 8270
PH-1:2-VA	Soil	CSR pH by 1:2 Water Leach	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL
This analysis is carried out in accordance with procedures described in the pH, Electrometric in Soil and Sediment method - Section B Physical/Inorganic and Misc. Constituents, BC Environmental Laboratory Manual 2007. The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water. The pH of the solution is then measured using a standard pH probe.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PSA-MUST-SK	Soil	Particle Size - Sieve %>75um	ASTM D422-63-SIEVE
An air-dried sample is reduced to < 2 mm size and mixed with a dispersing agent (Calgon solution). The sample is washed through a 200 mesh (75 µm) sieve. The retained mass of sample is used to determine % sand fraction. Reference: ASTM D422-63			
PSA-PIPET+GRAVEL-SK	Soil	Particle size - Sieve and Pipette	FORESTRY CANADA (1991) P. 46-48 MOD
Particle size analysis involves the measurement of the proportions of the various primary soil particle sizes (ie. clay < 0.004 mm, silt 0.004-0.063 mm, sand 0.063-2.0 mm and gravel > 2.0 mm). In this method, the gravel and sand portions are determined by sieving, while the clay portion is determined by sedimentation using Stokes Law, which relates the radius of the particles to the velocity of the sedimentation in water. Silt is calculated as 100% - (sand% + clay%) Pretreatment of the soil with Calgon (sodium hexametaphosphate) is used to ensure the complete dispersion of the primary soil particles. Additional pretreatment may be necessary to remove cementing materials such as CaCO₃ and organic matter. Reference Y.P. Kalra, and D.G. Maynard, 1991. Methods Manual For Forest Soil and Plant Analysis, Northwest Region. Forestry Canada (modified sand, silt and clay size ranges)			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO ₂ D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO₂ D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.			
ICPMS TI in Soil by CSR SALM		BCMELP CSR SALM Method 8	

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

TL-CSR-MS-VA

Soil
This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by either hotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

TSS-LOW-VA

Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA

Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA

Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.**

The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA	SK	ALS LABORATORY GROUP - SASKATOON, SASKATCHEWAN, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in environmental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

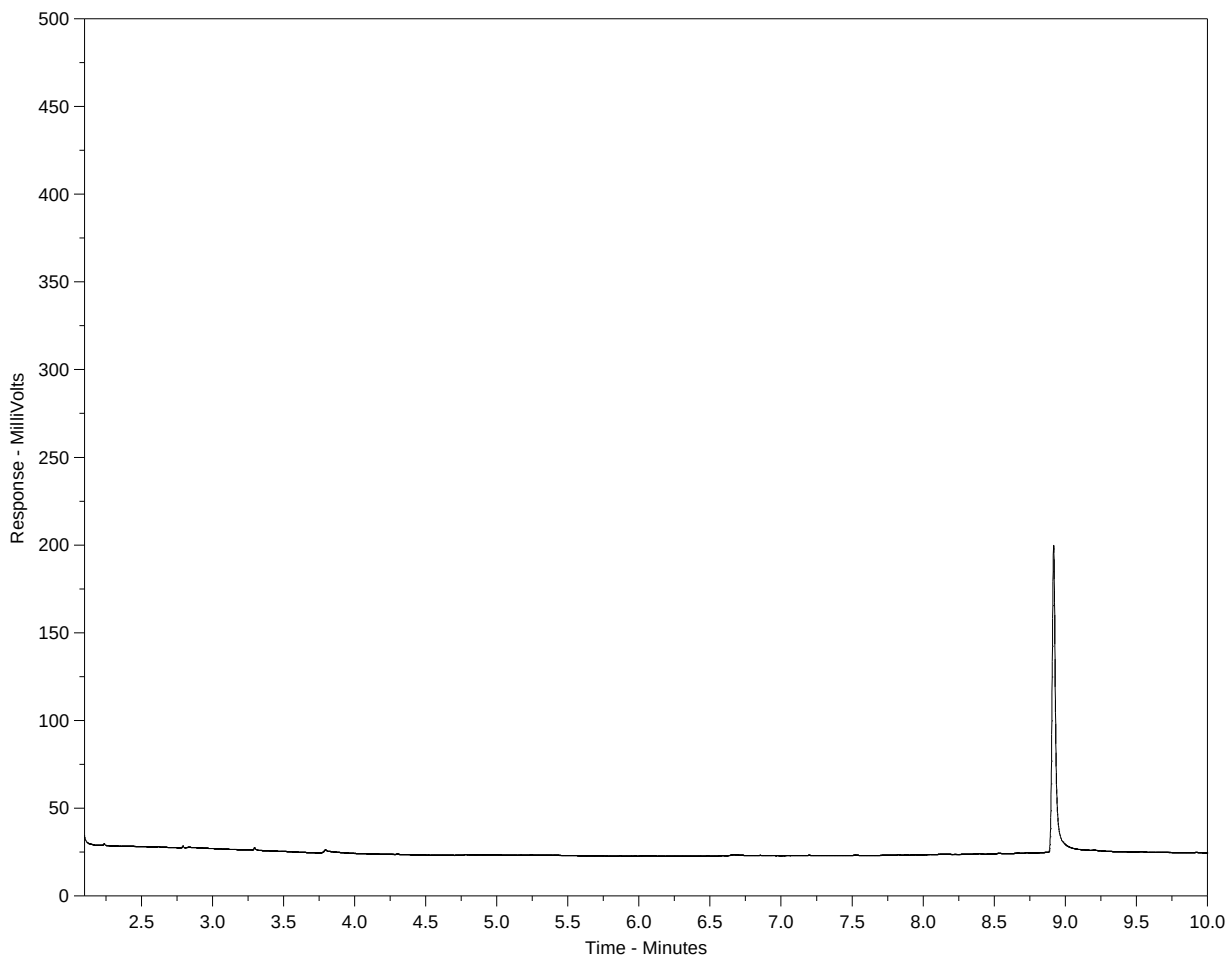
Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-4
Client ID: BBD-3



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

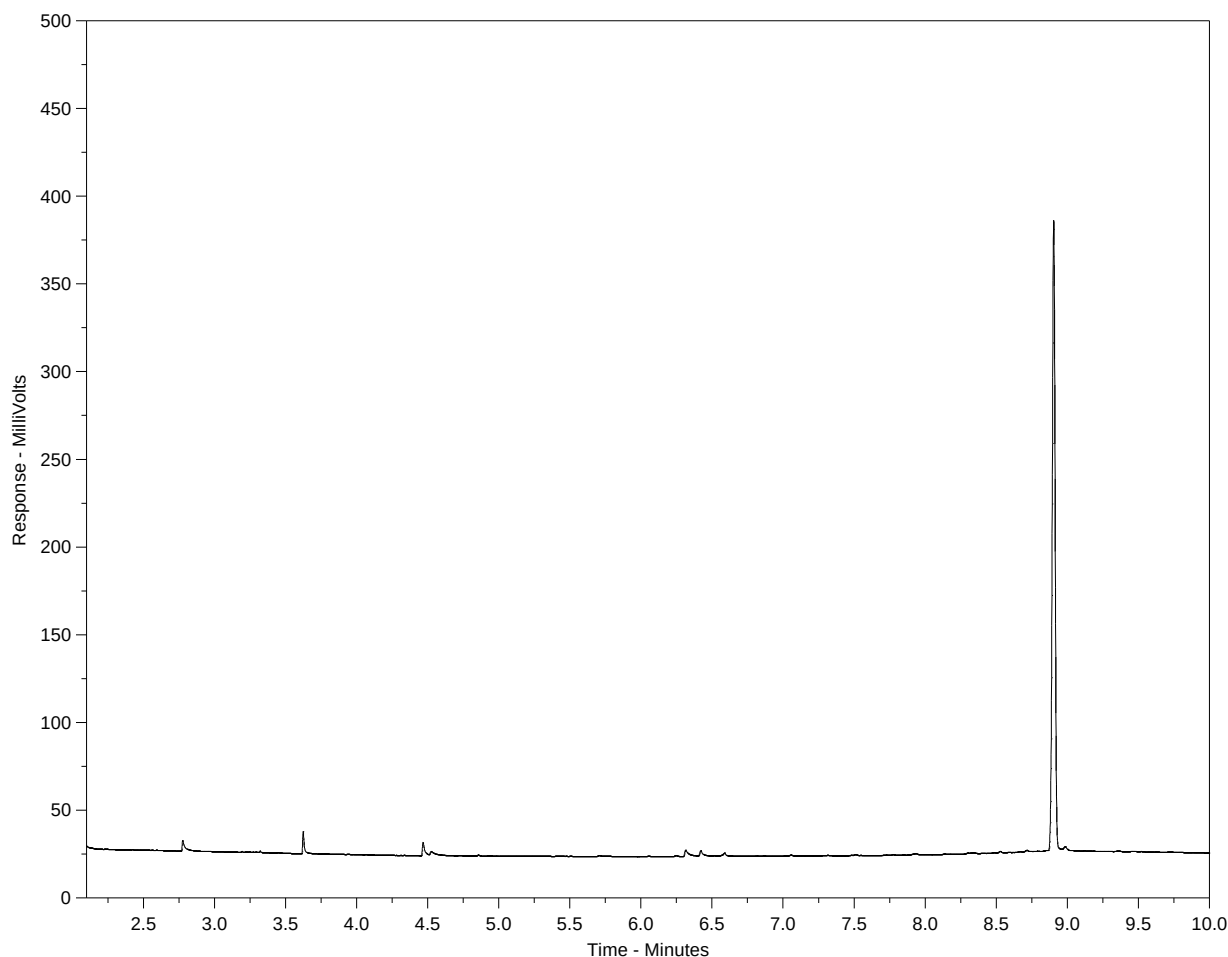
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-5
Client ID: BBD-2



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

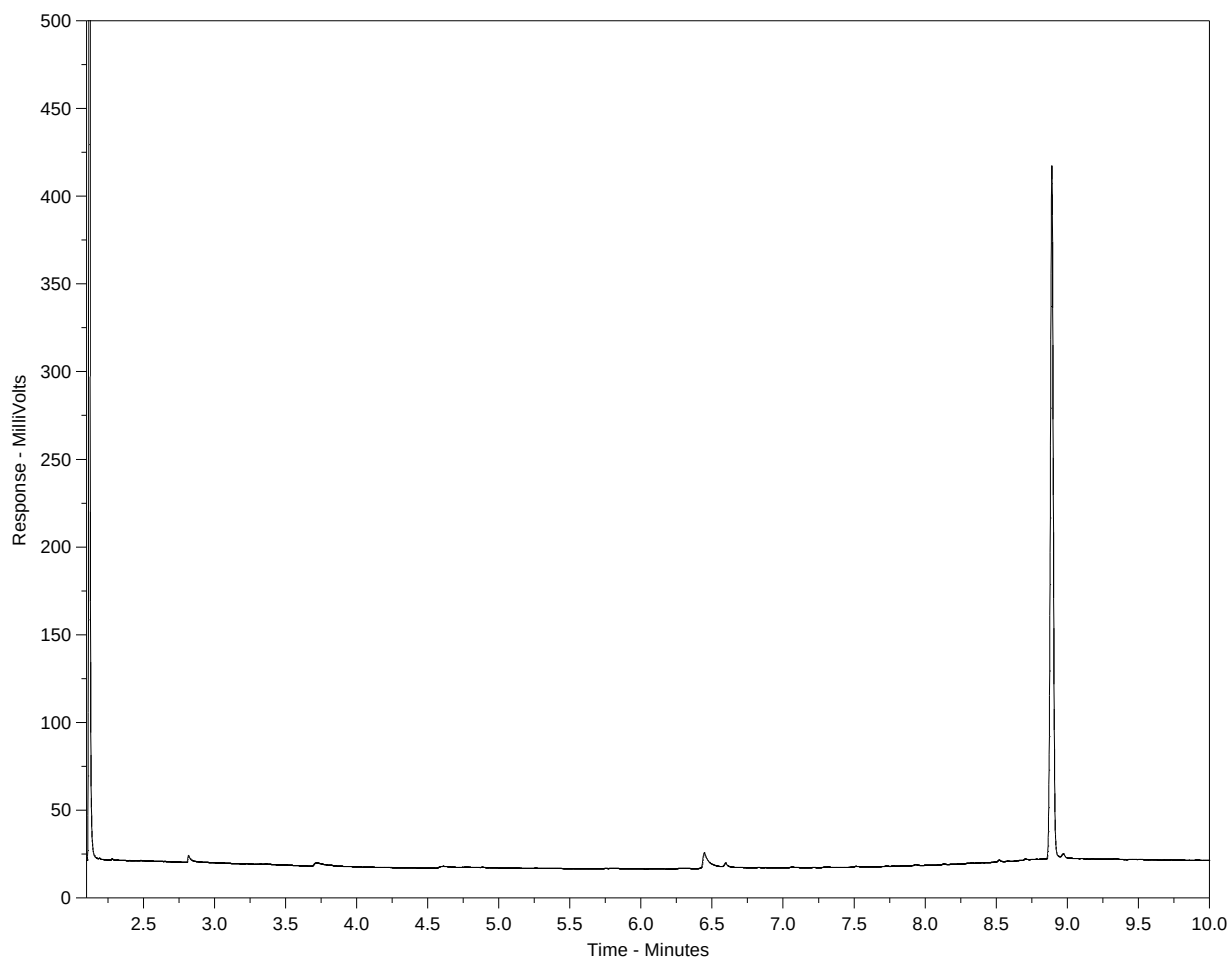
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-6
Client ID: BBD



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

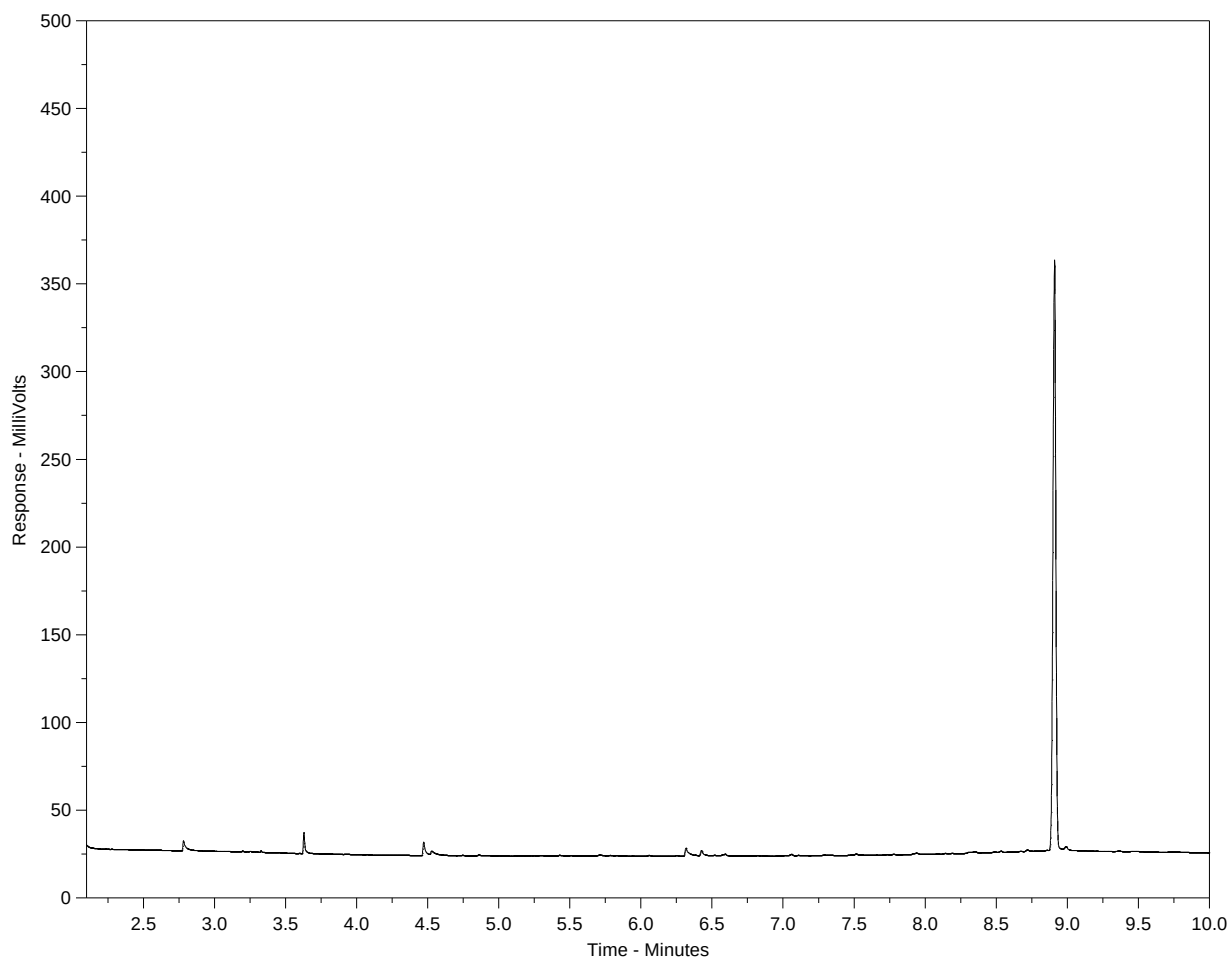
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-7
Client ID: BPJ-3



nC10	nC19	nC32	Surrogate	nC40
174°C 345°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

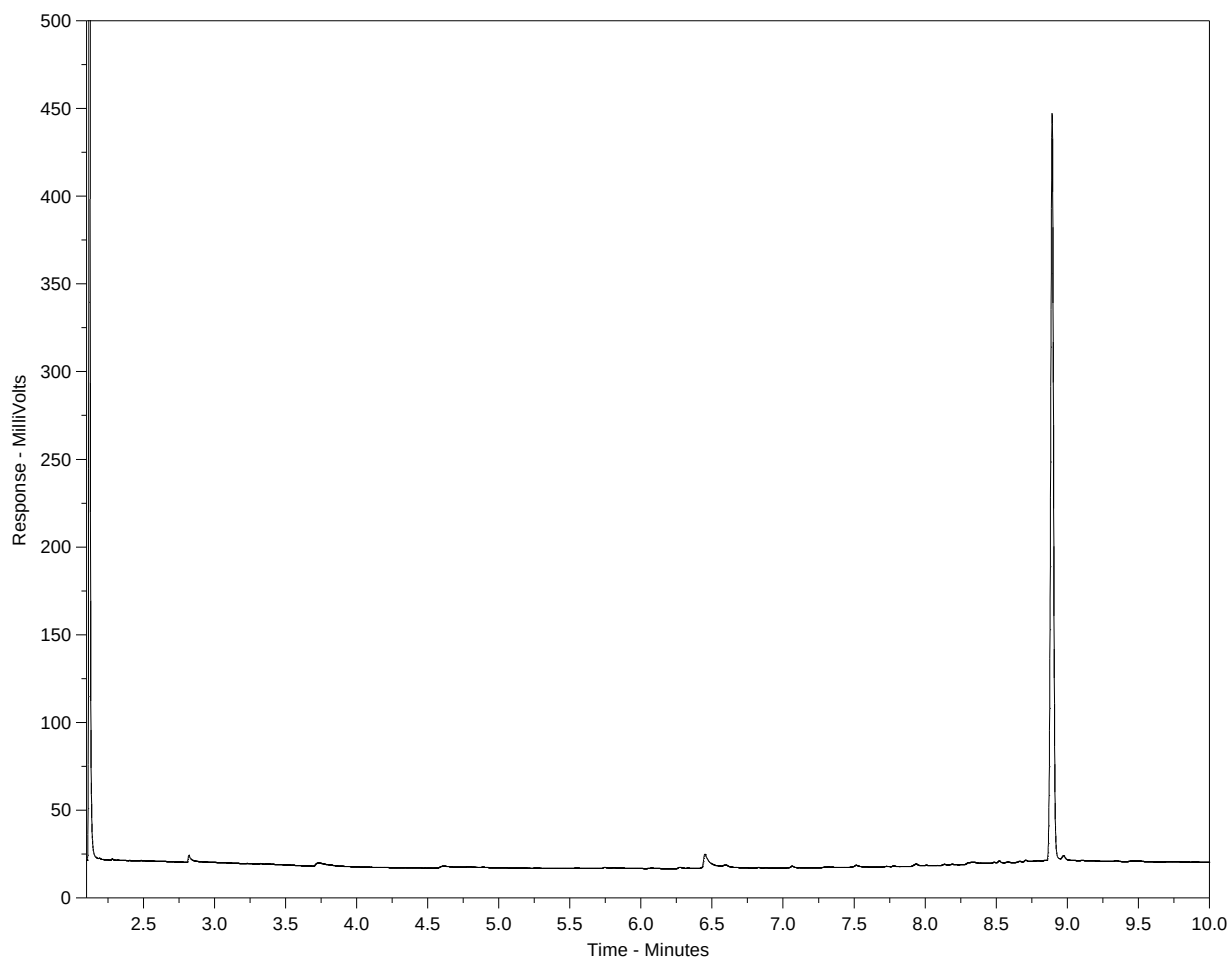
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-8
Client ID: BPJ-2



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

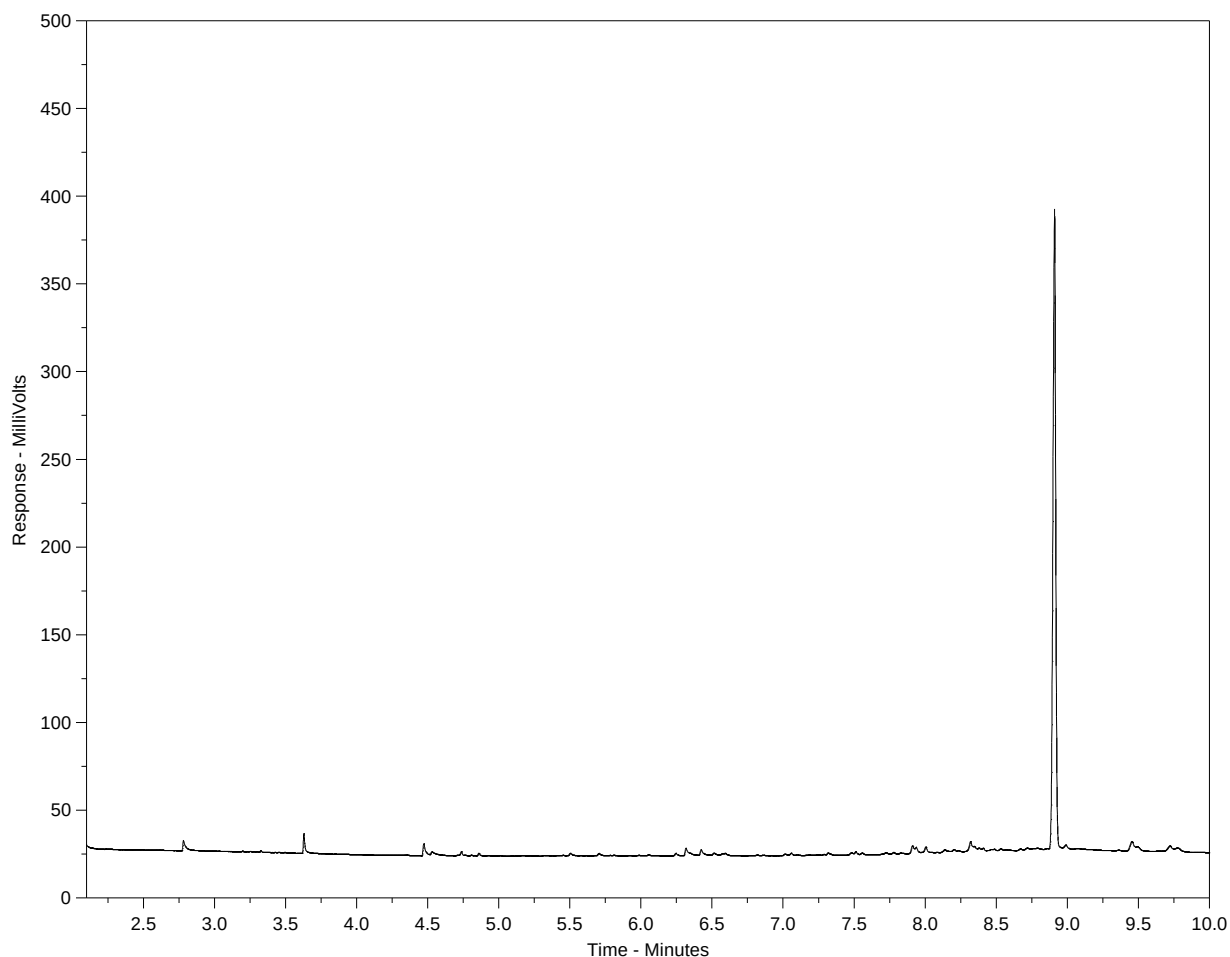
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-9
Client ID: BPJ



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

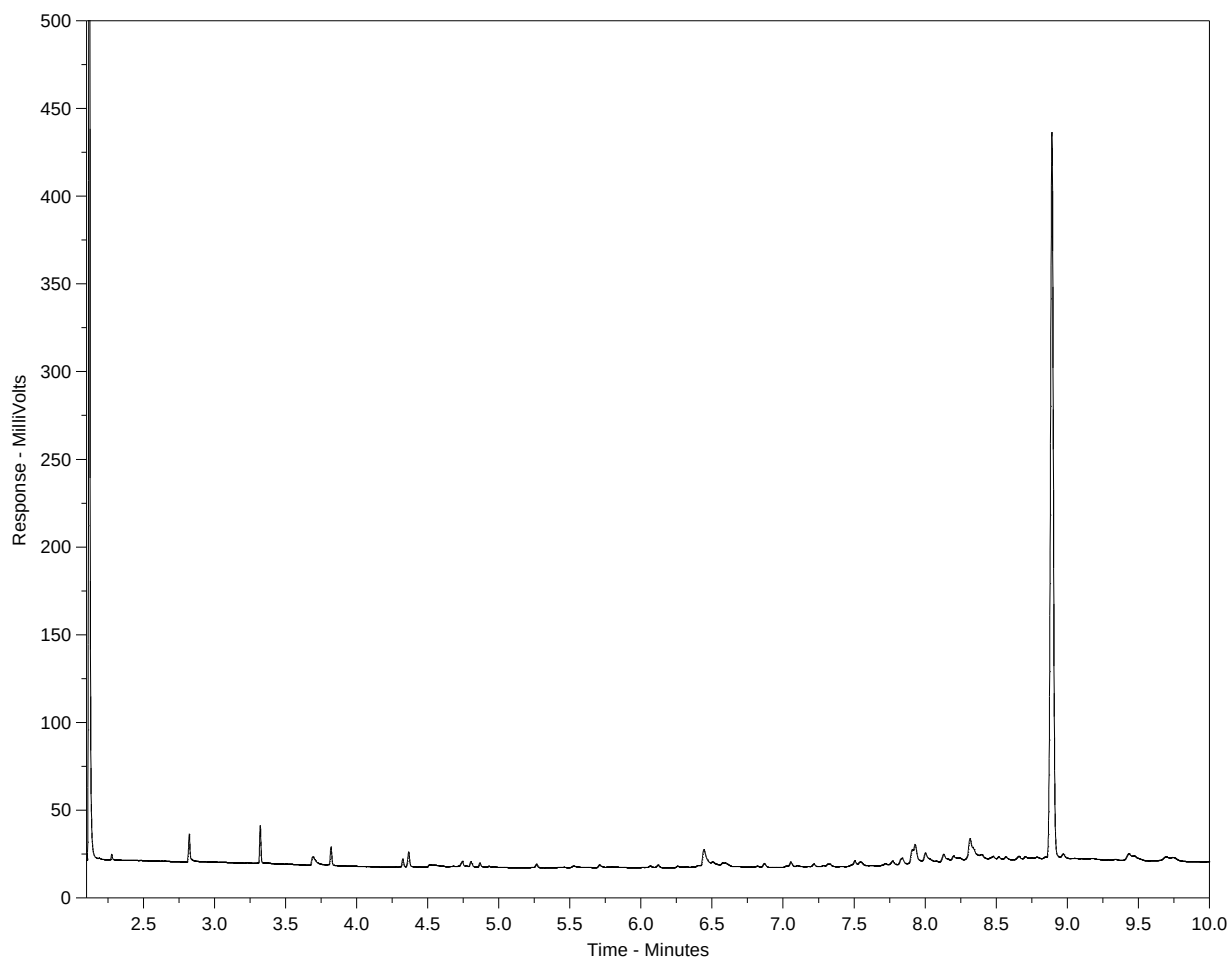
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-10
Client ID: BAP-3



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

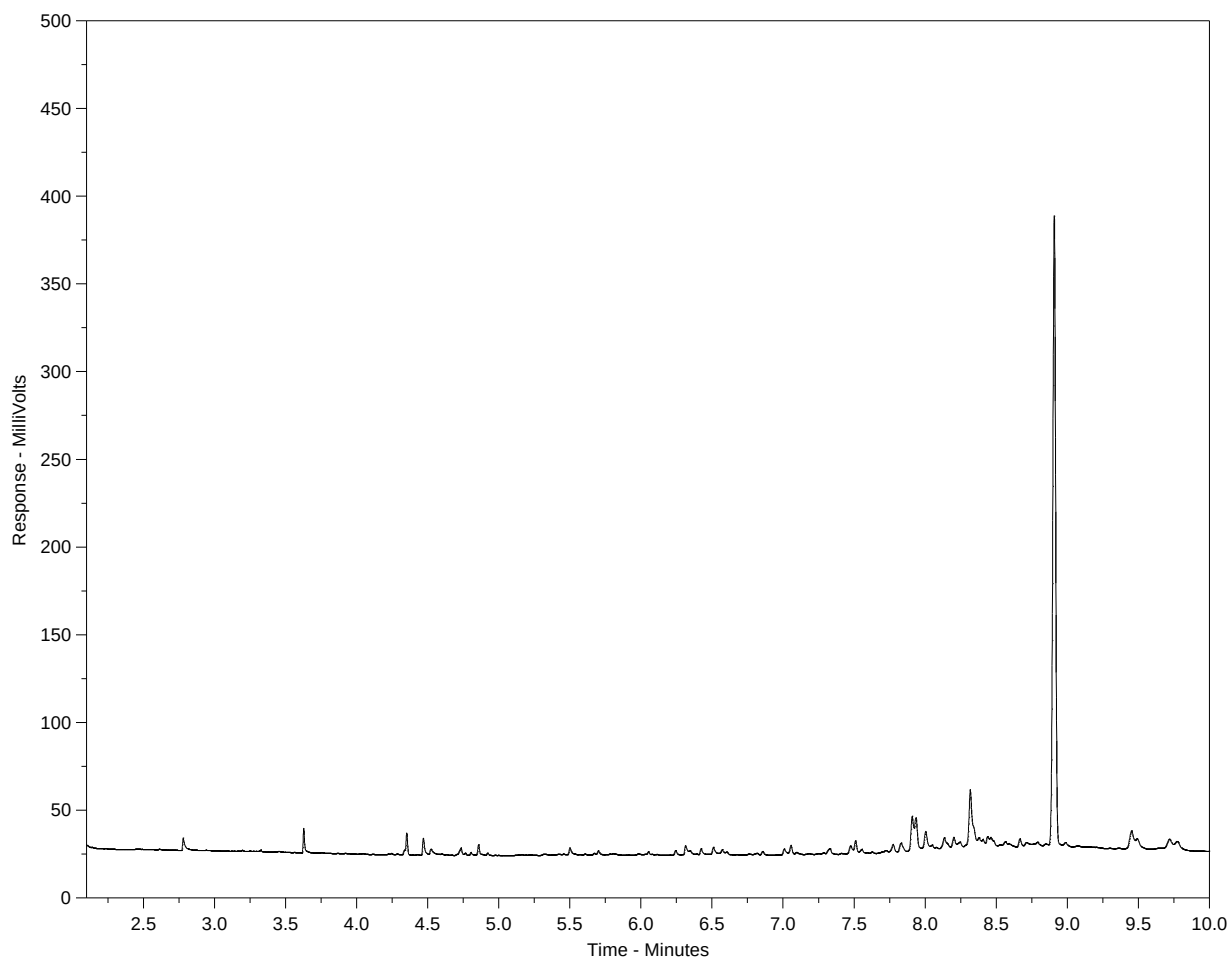
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-11
Client ID: BAP-2



nC10	nC19	nC32	Surrogate	nC40
174°C	330°C	467°C		522°C
346°F	626°F	873°F		972°F
← Gasoline →		← Motor Oils / Lube Oils / Grease →		
← Diesel / Jet Fuels →				

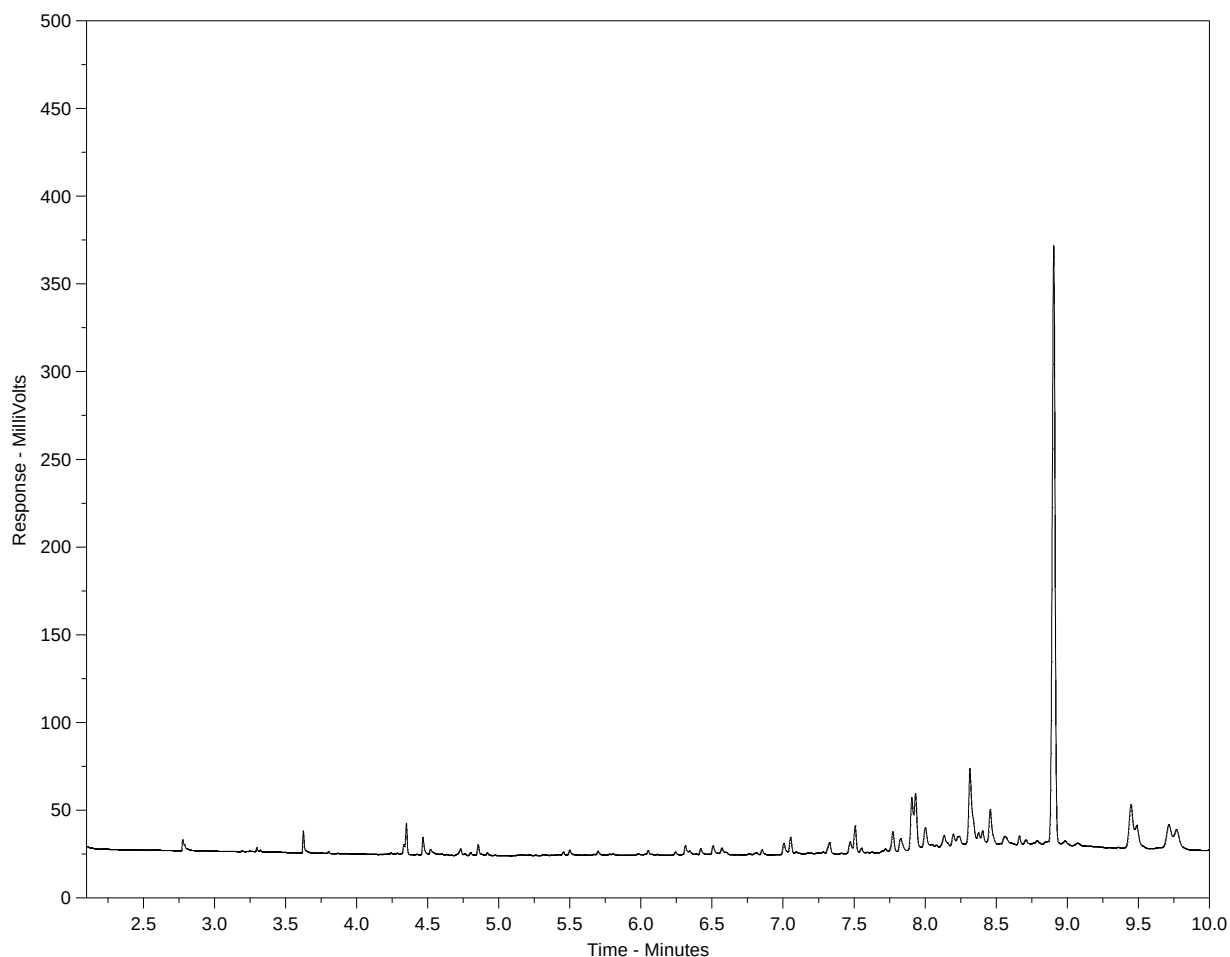
Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

Hydrocarbon Distribution Report



ALS Sample ID: L819561-12
Client ID: BAP



nC10	nC19	nC32	Surrogate	nC40
174°C 346°F	330°C 626°F	467°C 873°F		522°C 972°F
← Gasoline →		← Diesel / Jet Fuels →		
		← Motor Oils / Lube Oils / Grease →		

Chromatograms from the ALS HDR Reference Library indicate the patterns of hydrocarbon compounds found in petroleum products, reference standards, and some examples of natural plant and organic materials. The chromatogram from left to right roughly corresponds to increasing boiling point from approximately 174°C to 522°C, a range encompassing most middle distillate and residual petroleum products (diesel, fuel oils, lubricating oils, etc). Comparison of library chromatograms with those of unknown samples may aid in the identification of contaminants. Surrogate compounds, which are added to samples by the laboratory, are not present in HDR library chromatograms.

Please note that retention times may vary between samples by as much as 0.5 minutes.

c) Short Holding Time

100

[illegible]

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy

Released by:	Date & Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date & Time:	Observations:
M. J. [Signature]	Aug 27/09	[Signature]	09116/09	434 PM	5°C			Yes / No ? If Yes attach SIF
REFERENCE TO BACK PAGE FOR ALL LOCATIONS AND SAMPLING INFORMATION WHITE - REPORT COPY, PINK - FILE COPY, YELLOW - CLIENT COPY GENF 18:00 Front								

WHITE - REPORT COPY, PINK - FILE COPY, YELLOW - CLIENT COPY

GENF 18.00 Front



Report to:		Report Format / Distribution		Service Requested: (rush - subject to availability)	
Company:		Standard:	☒ Regular (Default)		
Contact:		Select:	☒ PDF ☒ Excel ☒ Digital		
Address:		Email 1:	vhakee@azimut.org	Priority (2-3 Business Days) - 50% Surcharge	
Phone:		Email 2:	gman@azimut.org	Emergency (1 Business Day) - 100% Surcharge	
			hman@azimut.org	For Emergency < 1 Day, ASAP or Weekend - Contact ALS	
Invoice To:	Same as Report ?	Yes / No ?		Analysis Request	
Company:		Client / Project Information:	(Indicate Filtered or Preserved, F/P)		
Contact:		Job #:			
Address:		PO / A/E:			
		Legal Site Description:			
Phone:		Quote #:	ALS EQ09-077		
		ALS Contact:	Votava MM		
		Sampler:	MLM		
Sample Identification (This description will appear on the report)		Date	Time	Sample Type	
BBD-3		Aug 25/08		Sediment	X
BBD-2		"		"	X
BBD		"		"	X
BPDJ-3		Aug 26/08		"	X
BPDJ-2		"		"	X
BPDJ		"		"	X
BAP-3		Aug 25/08		"	X
BAP-2		"		"	X
BAP		"		"	X
Filter Swipe -3		"		filter	X

* Call AZimut before doing filter Swipe analysis & MTS.

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

Released by:	Date & Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date & Time:	Observations: Yes / No ? If Yes attach SIF
M. J. Villanueva	Aug-27/08							

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Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 08-OCT-09 18:19 (MT)

Version: FINAL

Lab Work Order #: L820698

Date Received: 21-SEP-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: Please note that chlorophyll-A filters were not received for the following samples listed on the chain of custody and could not be analyzed: EB-1, EB-2, DUP-1.

Please note that some of the metals detection limits have been increased due to interferences encountered during analysis.

Lindsay Jones
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-1	L820698-2	L820698-3	L820698-4	L820698-5
		11-SEP-09 14:00 TPE-8-S	11-SEP-09 13:30 TPE-9-S	11-SEP-09 12:35 TPE-10-S	11-SEP-09 17:45 TPN-8-S	11-SEP-09 17:00 TPN-9-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	16.9	15.9	15.8	14.3	14.4
	Hardness (as CaCO3) (mg/L)	5.9	6.0	6.0	5.1	5.1
	pH (pH)	7.06	7.00	6.96	6.95	6.95
	Total Suspended Solids (mg/L)	5.7	5.3	5.5	1.7	<1.0
	Total Dissolved Solids (mg/L)	11	<10	<10	16	<10
	Turbidity (NTU)	12.2	11.1	11.0	0.70	0.52
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.9	4.9	5.0	4.3	4.2
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.9	4.9	5.0	4.3	4.2
	Ammonia as N (mg/L)	<0.020	0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.067	0.066	0.066	0.059	0.059
	Nitrate (as N) (mg/L)	0.0096	0.0058	0.0071	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.062	0.063	0.080	0.061	0.085
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0043	0.0037	0.0046	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.46	1.46	1.47	1.41	1.42
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.19	1.25	1.34	1.43	1.32
	Total Organic Carbon (mg/L)	1.22	1.31	1.22	1.38	1.28
Total Metals	Aluminum (Al)-Total (mg/L)	0.565	0.442	0.430	0.0157	0.0107
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00056	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.40	1.38	1.39	1.20	1.20
	Chromium (Cr)-Total (mg/L)	0.0024	0.0018	0.0019	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	0.00031	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	0.0026	<0.0020	0.0205	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.695	0.571	0.588	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.80	0.77	0.79	0.51	0.51
	Manganese (Mn)-Total (mg/L)	0.0115	0.00930	0.00969	0.00086	0.00068
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-6	L820698-7	L820698-8	L820698-9	L820698-10
		11-SEP-09 17:30 TPN-10-S	11-SEP-09 14:45 TPS-5-S	11-SEP-09 15:30 TPS-6-S	11-SEP-09 16:00 TPS-7-S	12-SEP-09 15:45 TEFF-5-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	14.4	14.4	14.5	14.5	14.3
	Hardness (as CaCO3) (mg/L)	5.1	5.0	5.0	5.8	4.9
	pH (pH)	6.92	6.92	6.85	6.91	6.83
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	1.3	<3.0
	Total Dissolved Solids (mg/L)	<10	<10	13	11	<10
	Turbidity (NTU)	0.52	0.40	0.29	0.43	0.33
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.0	4.8	4.3	4.5	4.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.0	4.8	4.3	4.5	4.0
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	0.51
	Fluoride (F) (mg/L)	0.059	0.060	0.059	0.059	0.053
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.082	0.066	0.070	0.081	0.073
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.43	1.43	1.43	1.44	1.67
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.30	1.41	1.38	1.26	1.33
	Total Organic Carbon (mg/L)	1.35	1.32	1.36	1.42	1.32
Total Metals	Aluminum (Al)-Total (mg/L)	0.0125	0.0069	0.0063	0.0059	0.0070
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.19	1.18	1.19	1.18	1.41
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.51	0.51	0.50	0.50	0.45
	Manganese (Mn)-Total (mg/L)	0.00070	0.00061	0.00058	0.00058	0.00074
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-11	L820698-12	L820698-13	L820698-14	L820698-15
		12-SEP-09 15:15 TEFF-6-S	12-SEP-09 14:50 TEFF-7-S	12-SEP-09 18:15 TE-8-S	12-SEP-09 18:15 TE-8-INT	12-SEP-09 18:15 TE-8-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	14.4	14.2	18.8	18.9	18.9
	Hardness (as CaCO3) (mg/L)	4.8	4.7	7.0	7.1	8.2
	pH (pH)	6.83	6.81	6.96	6.97	7.04
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	1.5	1.7
	Total Dissolved Solids (mg/L)	<10	<10	<10	13	<10
	Turbidity (NTU)	0.26	0.35	0.69	0.80	0.78
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	3.9	3.7	6.0	5.8	6.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	3.9	3.7	6.0	5.8	6.0
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.51	0.51	<0.50	0.51	<0.50
	Fluoride (F) (mg/L)	0.053	0.053	0.062	0.062	0.062
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.074	0.061	0.077	<0.050	0.091
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.68	1.67	1.90	1.91	1.90
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.30	1.26	1.44	1.89	1.43
	Total Organic Carbon (mg/L)	1.26	1.26	1.50	1.93	1.52
Total Metals	Aluminum (Al)-Total (mg/L)	0.0065	0.0072	0.0287	0.0215	0.0252
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	0.000019	<0.000017
	Calcium (Ca)-Total (mg/L)	1.17	1.16	1.82	1.83	1.84
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.46	0.45	0.62	0.62	0.62
	Manganese (Mn)-Total (mg/L)	0.00066	0.00068	0.00127	0.00148	0.00132
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-16	L820698-17	L820698-18	L820698-19	L820698-20
		12-SEP-09 17:30 TE-9-S	12-SEP-09 17:30 TE-9-INT	12-SEP-09 17:30 TE-9-D	12-SEP-09 17:00 TE-10-S	09-SEP-09 14:30 WAL-5-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	17.9	17.9	17.9	19.2	29.1
	Hardness (as CaCO3) (mg/L)	6.5	6.6	6.5	8.2	12.2
	pH (pH)	7.03	6.98	6.95	7.01	7.14
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	11	<10	14	15
	Turbidity (NTU)	0.37	0.55	0.56	0.74	0.32
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.6	5.2	5.2	5.8	9.9
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	5.6	5.2	5.2	5.8	9.9
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.060	0.060	0.040	0.063	0.044
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.087	0.105	0.084	0.074	0.092
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.84	1.85	1.22	1.92	2.56
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.45	1.48	1.39	1.42	1.91
	Total Organic Carbon (mg/L)	1.44	1.48	1.45	1.49	1.91
Total Metals	Aluminum (Al)-Total (mg/L)	0.0154	0.0221	0.0171	0.0255	0.0057
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.04	1.76	1.67	1.85	4.02
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	0.058	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.58	0.58	0.58	0.62	0.94
	Manganese (Mn)-Total (mg/L)	0.00119	0.00196	0.00111	0.00129	0.00104
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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Sample ID Description Sampled Date Sampled Time Client ID		L820698-21	L820698-22	L820698-23	L820698-24	L820698-25
		09-SEP-09 13:30 WAL-6-S	09-SEP-09 14:00 WAL-7-S	09-SEP-09 EB-1	14-SEP-09 EB-2	09-SEP-09 DUP-1
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	29.7	29.9	<2.0	<2.0	16.4
	Hardness (as CaCO3) (mg/L)	12.5	12.5	<1.1	<1.1	5.9
	pH (pH)	7.19	7.21	6.07	5.75	6.92
	Total Suspended Solids (mg/L)	1.3	<1.0	<1.0	<1.0	7.7
	Total Dissolved Solids (mg/L)	16	16	<10	<10	<10
	Turbidity (NTU)	0.29	0.31	<0.10	<0.10	12.7
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	10.1	9.8	<2.0	<2.0	4.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	10.1	9.8	<2.0	<2.0	4.3
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.044	0.043	<0.020	<0.020	0.068
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.093	0.111	<0.050	<0.050	0.066
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	0.0068
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.61	2.60	<0.50	<0.50	1.47
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.91	1.84	<0.50	<0.50	1.16
	Total Organic Carbon (mg/L)	1.85	1.86	<0.50	<0.50	1.26
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.525
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00053
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	3.41	3.45	<0.10	<0.10	1.74
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0021
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	0.745
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.95	0.96	<0.10	<0.10	0.77
	Manganese (Mn)-Total (mg/L)	0.00080	0.00084	<0.00030	<0.00030	0.0109
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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		Sample ID				
		Description	L820698-26			
		Sampled Date	13-SEP-09			
		Sampled Time				
		Client ID	DUP-2			
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	29.1				
	Hardness (as CaCO3) (mg/L)	12.1				
	pH (pH)	7.12				
	Total Suspended Solids (mg/L)	<1.0				
	Total Dissolved Solids (mg/L)	<10				
	Turbidity (NTU)	0.32				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	9.8				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0				
	Alkalinity, Total (as CaCO3) (mg/L)	9.8				
	Ammonia as N (mg/L)	<0.020				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	0.044				
	Nitrate (as N) (mg/L)	<0.0050				
	Nitrite (as N) (mg/L)	<0.0010				
	Total Kjeldahl Nitrogen (mg/L)	0.084				
	Ortho Phosphate as P (mg/L)	<0.0010				
	Total Phosphate as P (mg/L)	<0.0020				
	Silicate (as SiO2) (mg/L)	<1.0				
	Sulfate (SO4) (mg/L)	2.57				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.81				
	Total Organic Carbon (mg/L)	1.84				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	<0.00050				
	Barium (Ba)-Total (mg/L)	<0.020				
	Beryllium (Be)-Total (mg/L)	<0.0010				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	<0.000017				
	Calcium (Ca)-Total (mg/L)	3.33				
	Chromium (Cr)-Total (mg/L)	<0.0010				
	Cobalt (Co)-Total (mg/L)	<0.00030				
	Copper (Cu)-Total (mg/L)	<0.0010				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	<0.00050				
	Lithium (Li)-Total (mg/L)	<0.0050				
	Magnesium (Mg)-Total (mg/L)	0.94				
	Manganese (Mn)-Total (mg/L)	0.00099				
	Mercury (Hg)-Total (mg/L)	<0.000020				

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L820698-1	L820698-2	L820698-3	L820698-4	L820698-5
		Description					
		Sampled Date	11-SEP-09	11-SEP-09	11-SEP-09	11-SEP-09	11-SEP-09
		Sampled Time	14:00	13:30	12:35	17:45	17:00
		Client ID	TPE-8-S	TPE-9-S	TPE-10-S	TPN-8-S	TPN-9-S
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Total (mg/L)	0.0016	0.0015	0.0065	<0.0010	<0.0010	
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Total (mg/L)	0.025	0.020	0.021	<0.010	<0.010	
	Uranium (U)-Total (mg/L)	0.00028	0.00023	0.00025	<0.00020	<0.00020	
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020	
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	
	Calcium (Ca)-Dissolved (mg/L)	1.42	1.40	1.41	1.20	1.19	
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030	
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
	Magnesium (Mg)-Dissolved (mg/L)	0.57	0.61	0.61	0.50	0.51	
	Manganese (Mn)-Dissolved (mg/L)	0.00117	0.00099	0.00103	<0.00030	<0.00030	
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	

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Sample ID Description Sampled Date Sampled Time Client ID		L820698-6	L820698-7	L820698-8	L820698-9	L820698-10
		11-SEP-09 17:30 TPN-10-S	11-SEP-09 14:45 TPS-5-S	11-SEP-09 15:30 TPS-6-S	11-SEP-09 16:00 TPS-7-S	12-SEP-09 15:45 TEFF-5-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.20	1.18	1.18	1.48	1.22
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.50	0.50	0.50	0.50	0.46
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	0.00041
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-11	L820698-12	L820698-13	L820698-14	L820698-15
		12-SEP-09 15:15 TEFF-6-S	12-SEP-09 14:50 TEFF-7-S	12-SEP-09 18:15 TE-8-S	12-SEP-09 18:15 TE-8-INT	12-SEP-09 18:15 TE-8-D
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	0.000023	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.18	1.15	1.80	1.85	2.28
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.46	0.45	0.61	0.61	0.60
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	0.00031	<0.00030	0.00049	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	0.0082	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-16	L820698-17	L820698-18	L820698-19	L820698-20
Grouping Analyte						
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.67	1.69	1.66	2.29	3.35
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.57	0.57	0.58	0.61	0.94
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	0.00035	<0.00030	0.00032	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-21	L820698-22	L820698-23	L820698-24	L820698-25
Grouping Analyte						
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0016
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	0.024
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	0.00028
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	3.40	3.43	0.10	<0.10	1.43
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.97	0.96	<0.10	<0.10	0.56
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	0.00119
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010				
	Nickel (Ni)-Total (mg/L)	<0.0010				
	Potassium (K)-Total (mg/L)	<2.0				
	Selenium (Se)-Total (mg/L)	<0.0010				
	Silver (Ag)-Total (mg/L)	<0.000020				
	Sodium (Na)-Total (mg/L)	<2.0				
	Thallium (Tl)-Total (mg/L)	<0.00020				
	Tin (Sn)-Total (mg/L)	<0.00050				
	Titanium (Ti)-Total (mg/L)	<0.010				
	Uranium (U)-Total (mg/L)	<0.00020				
	Vanadium (V)-Total (mg/L)	<0.0010				
	Zinc (Zn)-Total (mg/L)	<0.0050				
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	3.30				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	0.034				
	Lead (Pb)-Dissolved (mg/L)	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	0.94				
	Manganese (Mn)-Dissolved (mg/L)	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000020				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010				
	Silver (Ag)-Dissolved (mg/L)	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	<2.0				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00050				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	<0.00020				
	Vanadium (V)-Dissolved (mg/L)	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	<0.0050				

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Sample ID Description Sampled Date Sampled Time Client ID		L820698-1	L820698-2	L820698-3	L820698-4	L820698-5
		11-SEP-09	11-SEP-09	11-SEP-09	11-SEP-09	11-SEP-09
		14:00	13:30	12:35	17:45	17:00
		TPE-8-S	TPE-9-S	TPE-10-S	TPN-8-S	TPN-9-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.495	0.162	0.195	0.147	0.286

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L820698-6 11-SEP-09 17:30 TPN-10-S	L820698-7 11-SEP-09 14:45 TPS-5-S	L820698-8 11-SEP-09 15:30 TPS-6-S	L820698-9 11-SEP-09 16:00 TPS-7-S	L820698-10 12-SEP-09 15:45 TEFF-5-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.362	0.264	0.322	0.265	0.144

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-11	L820698-12	L820698-13	L820698-14	L820698-15
		12-SEP-09	12-SEP-09	12-SEP-09	12-SEP-09	12-SEP-09
		15:15	14:50	18:15	18:15	18:15
		TEFF-6-S	TEFF-7-S	TE-8-S	TE-8-INT	TE-8-D
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.158	0.170	0.320	0.378	0.281

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L820698-16 12-SEP-09 17:30 TE-9-S	L820698-17 12-SEP-09 17:30 TE-9-INT	L820698-18 12-SEP-09 17:30 TE-9-D	L820698-19 12-SEP-09 17:00 TE-10-S	L820698-20 09-SEP-09 14:30 WAL-5-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.278	0.291	0.294	0.022	0.325

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L820698-21	L820698-22	L820698-23	L820698-24	L820698-25
		09-SEP-09	09-SEP-09	09-SEP-09	14-SEP-09	09-SEP-09
		13:30	14:00			
		WAL-6-S	WAL-7-S	EB-1	EB-2	DUP-1
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.326	0.439			

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L820698-26 13-SEP-09 DUP-2				
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)	0.589					

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

ALK-SCR-VA

Water

Alkalinity by colour or titration

EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA

Water

Bromide by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA

Water

Chloride by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA

Water

Fluoride by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA

Water

Nitrite by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA

Water

Nitrate by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA

Water

Sulfate by Ion Chromatography

APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DOC-VA

Water

Dissolved organic carbon by combustion

APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA

Water

Dissolved organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA

Water

Total organic carbon by combustion

APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.**

The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING CORPORATION
Environmental Division



Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____ Page 1 of 3

Report to:		Report Format / Distribution				Service Requested:			
Company:	Azimuth Consulting Group Inc.	☒ Standard	☐ Other	☒ PDF	☒ Excel	☐ Fax	☒ Regular Service (Default)	☐ Rush Service (2-3 Days)	☐ Priority Service (1 Day or ASAP)
Contact:	Randy Baker, Ryan VanEngen (AEM)	Email 1: rbaker@azimuthgroup.ca, rvanengen@agnico-eagle.com				Emergency Service (<1 Day / Weekend) - Contact ALS			
Address:	Vancouver	Email 2: gmann@azimuthgroup.ca, mmccornell@azimuthgroup.ca							
Phone:	604-730-1220	Fax:							
Invoice To:	☒ Same as Report					Analysis Request			
Company:									
Contact:									
Address:									
Sample									
Phone:	Fax:								
Lab Work Order # (lab use only)		ALS Contact:		Nalasha MM		Sampler (initials):		RV	
Sample #	Sample Identification (This description will appear on the report)		Date		Time		Sample Type		
			dd-mm-yy		hh:mm		(Select from drop-down list)		
	TPE-8-S		11-Sep-09		14:00		Water		X
	TPE-9-S		11-Sep-09		13:30		Water		X
	TPE-10-S		11-Sep-09		12:35		Water		X
	TPN-8-S		11-Sep-09		17:45		Water		X
	TPN-9-S		11-Sep-09		17:00		Water		X
	TPN-10-S		11-Sep-09		17:30		Water		X
	TPS-5-S		11-Sep-09		14:45		Water		X
	TPS-6-S		11-Sep-09		15:30		Water		X
	TPS-7-S		11-Sep-09		16:00		Water		X
Guidelines / Regulations									
Special Instructions / Hazardous Details									
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.									
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.									
Relinquished		Date & Time		Received		Date & Time		Temperature	Sample Condition (lab use only)
By:				By:					
Relinquished		Date & Time		Received		Date & Time			Samples Received in Good Condition? Y / N (if no provided details)
By:				By:					

Report to:				Report Format / Distribution				Service Requested:					
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)					
Contact: Randy Baker, Ryan VanEngen (AEM)				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)					
Address: Vancouver				Email 1: rbaker@azimuthgroup.ca, rvanengen@agnico-eagle.com				☐ Priority Service (1 Day or ASAP)					
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca, mmccconnell@azimuthgroup.ca				☐ Emergency Service (<1 Day / Wkend) - Contact ALS					
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) -->				Analysis Request					
Company:				Client / Project Information:									
Contact:				Job #: Meadowbank Mine AEMP									
Address:				PO/AFE:									
Sample				Legal Site Description:									
Phone:				Quote #: ALSEQ09-077									
Lab Work Order # (lab use only)				ALS Contact: Natasha MM		Sampler (initials): RV							
Sample #		Sample Identification (This description will appear on the report)		Date		Time		Sample Type					
				dd-mm-yy		hh:mm		(Select from drop-down list)					
WAL-5-S				09-Sep-09		14:30		Water		☒ T-Metals (CCME)			
WAL-6-S				09-Sep-09		13:30		Water		☒ D-Metals (CCME)			
WAL-7-S				09-Sep-09		14:00		Water		☒ TOC, DOC			
EB-1				09-Sep-09				Water		☒ TKN, Ammonia			
EB-2				14-Sep-09				Water		☒ TDS, TSS-low			
DUP-1				09-Sep-09				Water		☒ Alk (SPECIATED)			
DUP-2				13-Sep-09				Water		☒ Anion Scan, Si, pH, EC			
										☒ T-PO4, ortho-PO4			
										☒ Chlorophyll-a			
										☒ Turbidity			
										☐ Hazardous?			
										☐ Highly Contaminated?			
										☒ Number of Containers			
Guidelines / Regulations													
Special Instructions / Hazardous Details													
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.													
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.													
Relinquished		Date & Time:		Received		Date & Time:		Temperature					
By:				By:				Samples Received in Good Condition? Y / N (if no provided details)					
Relinquished		Date & Time:		Received		Date & Time:							
By:				By:									



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 13-OCT-09 20:40 (MT)

Version: FINAL

Lab Work Order #: L823671

Date Received: 26-SEP-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers: 08-031400

Other Information:

Comments:



Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L823671-1	L823671-2	L823671-3	L823671-4	L823671-5
		19-SEP-09 14:30 BAP-5-S	19-SEP-09 15:30 BAP-6-S	19-SEP-09 15:00 BAP-7-S	19-SEP-09 12:30 BBD-5-S	19-SEP-09 13:00 BBD-6-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	283	281	287	69.0	101
	Hardness (as CaCO3) (mg/L)	35.9	34.0	34.7	15.3	17.3
	pH (pH)	7.53	7.37	7.30	6.94	7.05
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	1.1	<1.0
	Total Dissolved Solids (mg/L)	146	142	154	43	59
	Turbidity (NTU)	0.39	0.67	0.66	0.62	0.63
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	9.4	9.4	9.5	8.8	9.2
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	9.4	9.4	9.5	8.8	9.2
	Ammonia as N (mg/L)	0.031	0.079	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	0.255	0.251	0.256	0.051	0.081
	Chloride (Cl) (mg/L)	71.3	70.1	71.4	13.1	21.8
	Fluoride (F) (mg/L)	0.041	0.041	0.042	0.037	0.038
	Nitrate (as N) (mg/L)	0.0132	0.0118	0.0125	<0.0050	0.0062
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.176	0.187	0.199	0.152	0.150
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0024	0.0029	0.0026	0.0026	0.0027
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	9.82	9.69	9.85	1.99	3.13
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.99	2.89	3.00	2.99	3.04
	Total Organic Carbon (mg/L)	3.02	2.96	3.10	2.96	3.19
Total Metals	Aluminum (Al)-Total (mg/L)	0.0076	0.0125	0.0150	0.0191	0.0267
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	4.14	3.98	3.99	2.83	3.03
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	6.33	5.74	5.85	2.03	2.56
	Manganese (Mn)-Total (mg/L)	0.00166	0.00184	0.00181	0.00186	0.00199
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L823671-6	L823671-7	L823671-8	L823671-9	L823671-10
		19-SEP-09 13:30 BBD-7-S	19-SEP-09 09:15 BPJ-5-S	19-SEP-09 10:30 BPJ-6-S	19-SEP-09 10:00 BPJ-7-S	19-SEP-09 DUP-4
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	88.4	204	135	146	200
	Hardness (as CaCO3) (mg/L)	16.2	27.8	20.9	22.0	27.9
	pH (pH)	7.08	7.11	7.14	7.13	7.14
	Total Suspended Solids (mg/L)	<1.0	1.3	1.3	1.1	1.7
	Total Dissolved Solids (mg/L)	58	106	75	73	103
	Turbidity (NTU)	0.77	1.38	1.50	1.20	1.35
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	8.8	8.8	9.2	9.2	9.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	8.8	8.8	9.2	9.2	9.3
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	0.072	0.186	0.119	0.124	0.174
	Chloride (Cl) (mg/L)	18.1	48.7	30.2	33.6	48.4
	Fluoride (F) (mg/L)	0.037	0.040	0.038	0.039	0.040
	Nitrate (as N) (mg/L)	<0.0050	0.0108	0.0110	0.0157	0.0106
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.176	0.175	0.176	0.159	0.137
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0025	0.0038	0.0034	0.0032	0.0034
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.65	6.75	4.26	4.71	6.69
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	3.02	2.99	3.04	3.08	2.97
	Total Organic Carbon (mg/L)	3.13	3.15	3.07	3.06	2.99
Total Metals	Aluminum (Al)-Total (mg/L)	0.0269	0.0274	0.0337	0.0295	0.0304
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	0.020	0.021	0.020	0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.87	3.60	3.20	3.32	3.59
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	2.15	4.57	3.16	3.58	4.52
	Manganese (Mn)-Total (mg/L)	0.00194	0.00254	0.00225	0.00234	0.00262
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L823671-11	L823671-12	L823671-13		
		19-SEP-09 16:30 EB-4	20-SEP-09 TRAVEL BLANK 1	20-SEP-09 TRAVEL BLANK 2		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	<2.0	<2.0		
	Hardness (as CaCO3) (mg/L)	2.4	<1.1	<1.1		
	pH (pH)	5.67	5.63	5.54		
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0		
	Total Dissolved Solids (mg/L)	<10	<10	<10		
	Turbidity (NTU)	0.24	<0.10	<0.10		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020		
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50		
	Fluoride (F) (mg/L)	<0.020	<0.020	<0.020		
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	<0.050	<0.050	<0.050		
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020		
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0		
	Sulfate (SO4) (mg/L)	<0.50	<0.50	<0.50		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	<0.50	<0.50	<0.50		
	Total Organic Carbon (mg/L)	<0.50	<0.50	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)	<0.10	<0.10	<0.10		
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030		
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)	<0.10	<0.10	<0.10		
	Manganese (Mn)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L823671-1	L823671-2	L823671-3	L823671-4	L823671-5
		19-SEP-09 14:30 BAP-5-S	19-SEP-09 15:30 BAP-6-S	19-SEP-09 15:00 BAP-7-S	19-SEP-09 12:30 BBD-5-S	19-SEP-09 13:00 BBD-6-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	2.1	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	42.2	37.6	38.0	8.0	12.3
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	4.09	4.00	4.01	2.81	2.97
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	6.23	5.84	5.99	2.00	2.41
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	0.00033	0.00033
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	41.2	38.4	39.8	7.8	11.1
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L823671-6	L823671-7	L823671-8	L823671-9	L823671-10
		19-SEP-09 13:30 BBD-7-S	19-SEP-09 09:15 BPJ-5-S	19-SEP-09 10:30 BPJ-6-S	19-SEP-09 10:00 BPJ-7-S	19-SEP-09 DUP-4
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	8.9	28.5	17.1	20.4	27.9
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	0.021	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.92	3.59	3.18	3.26	3.62
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	2.15	4.57	3.15	3.36	4.58
	Manganese (Mn)-Dissolved (mg/L)	0.00035	0.00049	0.00040	0.00042	0.00049
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	9.1	28.2	17.0	18.9	28.6
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L823671-11	L823671-12	L823671-13		
		19-SEP-09 16:30 EB-4	20-SEP-09 TRAVEL BLANK 1	20-SEP-09 TRAVEL BLANK 2		
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0		
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020		
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0		
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020		
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Dissolved (mg/L)	0.35	<0.10	<0.10		
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030		
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Dissolved (mg/L)	0.36	<0.10	<0.10		
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030		
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0		
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020		
	Sodium (Na)-Dissolved (mg/L)	2.2	<2.0	<2.0		
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050		

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L823671-1	L823671-2	L823671-3	L823671-4	L823671-5
		19-SEP-09	19-SEP-09	19-SEP-09	19-SEP-09	19-SEP-09
		14:30	15:30	15:00	12:30	13:00
		BAP-5-S	BAP-6-S	BAP-7-S	BBD-5-S	BBD-6-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	1.09	1.19	1.38	1.05	1.35

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID	L823671-6	L823671-7	L823671-8	L823671-9	L823671-10
		Description					
		Sampled Date	19-SEP-09	19-SEP-09	19-SEP-09	19-SEP-09	19-SEP-09
		Sampled Time	13:30	09:15	10:30	10:00	
		Client ID	BBD-7-S	BPJ-5-S	BPJ-6-S	BPJ-7-S	DUP-4
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)	0.985	1.13	1.41	1.42	1.26	

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Sample ID Description Sampled Date Sampled Time Client ID		L823671-11 19-SEP-09 16:30 EB-4	L823671-12 20-SEP-09 TRAVEL BLANK 1	L823671-13 20-SEP-09 TRAVEL BLANK 2		
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)					

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

ALK-SCR-VA Water Alkalinity by colour or titration EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA Water Bromide by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA Water Chloride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA Water Fluoride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA Water Nitrite by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA Water Nitrate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:**

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location

VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Report to:				Report Format / Distribution				Service Requested:				
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)				
Contact: Randy Baker, Ryan VanEngen (AEM)				☒ PDF ☒ Excel ☐ Fax				☐ Rush Service (2-3 Days)				
Address: Vancouver				Email 1: rbaker@azimuthgroup.ca, rvanengen@agnico-eagle.com				☐ Priority Service (1 Day or ASAP)				
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca, mmccormell@azimuthgroup.ca				☐ Emergency Service (<1 Day / Weekend) - Contact ALS				
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) →								
Company:				Client / Project Information:								
Contact:				Job #: Meadowbank Mine AEMP								
Address:				PO/A/E:								
Sample:				Legal Site Description:								
Phone:				Quote #: ALSEQ09-077								
Fax:				ALS Contact: Natasha MM								
Lab Work Order # (lab use only) 1828671				ALS Contact:				Sampler (initials) RV				
Sample #		Sample Identification (This description will appear on the report)		Date dd-mm-yy		Time hh:mm		Sample Type (Select from drop-down list)		Analysis Request		
BBD-5-S				19-Sep-09		14:30		Water		T-Metals (CCME)		
BBD-6-S				19-Sep-09		15:30		Water		D-Metals (CCME)		
BBD-7-S				19-Sep-09		15:00		Water		TOC, DOC		
BPJ-5-S				19-Sep-09		12:30		Water		TKN, Ammonia		
BPJ-6-S				19-Sep-09		13:00		Water		TDS, TSS-low		
BPJ-7-S				19-Sep-09		9:15		Water		AIK (SPECIATED)		
BAP-5-S				19-Sep-09		10:30		Water		Anion Scan, Si, pH, EC		
BAP-6-S				19-Sep-09		10:00		Water		T-PO4, ortho-PO4		
BAP-7-S				19-Sep-09				Water		Chlorophyll-a		
DUP-4				19-Sep-09				Water		Turbidity		
Guidelines / Regulations										Hazardous?		
										Highly Contaminated?		
										Number of Containers		
Special Instructions / Hazardous Details												
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.												
By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.												
Reinquired By:		Date & Time		Received By:		Date & Time		Temperature		Sample Condition (lab use only)		
Reinquired By:		Date & Time		Received By:		Date & Time				Samples Received in Good Condition? Y / N (if no provided details)		

[illegible]



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: RANDY BAKER

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 14-OCT-09 18:06 (MT)

Version: FINAL

Lab Work Order #: L824564

Date Received: 29-SEP-09

Project P.O. #:

Job Reference: MEADOWBANK MINE AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:



Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L824564-1	L824564-2	L824564-3	L824564-4	L824564-5
		14-SEP-09 09:00 PDL-5-S	14-SEP-09 10:00 PDL-6-S	14-SEP-09 10:00 PDL-7-S	15-SEP-09 14:15 SP-8-S	15-SEP-09 14:30 SP-9-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	20.9	20.1	20.2	22.9	22.9
	Hardness (as CaCO3) (mg/L)	8.2	8.2	8.2	9.3	9.3
	pH (pH)	8.66	7.29	6.91	6.86	6.85
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	1.3	<1.0
	Total Dissolved Solids (mg/L)	19	12	24	17	16
	Turbidity (NTU)	0.26	0.29	0.26	2.15	2.39
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	14.0	6.5	6.3	6.7	7.4
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	14.0	6.5	6.3	6.7	7.4
	Ammonia as N (mg/L)	0.026	<0.020	<0.020	<0.020	0.048
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.57	0.66	0.59	<0.50	<0.50
	Fluoride (F) (mg/L)	0.032	0.033	0.033	0.055	0.055
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.098	0.080	0.082	0.122	0.096
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.48	1.66	1.50	2.12	2.13
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.63	1.62	1.48	1.51	1.64
	Total Organic Carbon (mg/L)	1.54	1.53	1.58	1.60	1.63
Total Metals	Aluminum (Al)-Total (mg/L)	0.0066	<0.0050	0.0052	0.0648	0.0713
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.04	2.06	2.05	2.31	2.34
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	0.091	0.096
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.73	0.75	0.74	0.80	0.82
	Manganese (Mn)-Total (mg/L)	0.00077	0.00066	0.00067	0.00221	0.00229
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L824564-6	L824564-7	L824564-8	L824564-9	L824564-10
		15-SEP-09 15:00 SP10-S	16-SEP-09 11:00 INUG-8-S	16-SEP-09 11:00 INUG-8-INT	16-SEP-09 11:00 INUG-8-D	16-SEP-09 09:00 INUG-10-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	22.8	14.3	14.3	14.3	14.3
	Hardness (as CaCO3) (mg/L)	9.3	5.2	5.2	5.2	5.2
	pH (pH)	6.84	6.84	6.83	6.90	6.85
	Total Suspended Solids (mg/L)	1.1	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	<10	<10	<10	16
	Turbidity (NTU)	2.57	0.46	0.52	0.49	0.45
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.2	4.1	4.1	4.2	4.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.2	4.1	4.1	4.2	4.1
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	0.079
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.69	0.67	0.67	0.67
	Fluoride (F) (mg/L)	0.055	0.052	0.052	0.052	0.052
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.096	0.107	0.110	0.564	0.095
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.11	0.86	0.81	0.82	0.82
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.59	1.85	1.75	1.78	1.85
	Total Organic Carbon (mg/L)	1.73	1.96	1.83	1.87	2.01
Total Metals	Aluminum (Al)-Total (mg/L)	0.0759	0.0101	0.0125	0.0083	0.0073
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	0.000029	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.31	1.02	0.99	1.03	1.02
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.107	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.82	0.65	0.63	0.65	0.65
	Manganese (Mn)-Total (mg/L)	0.00237	0.00135	0.00174	0.00135	0.00127
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L824564-11	L824564-12	L824564-13	L824564-14	L824564-15
		16-SEP-09 10:00 INUG-9-S	16-SEP-09 10:00 INUG-9-D	16-SEP-09 10:00 INUG-9-INT	15-SEP-09 DUP-3	16-SEP-09 EB-3
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	14.3	14.4	14.4	22.8	<2.0
	Hardness (as CaCO3) (mg/L)	5.2	5.2	5.2	9.4	<1.1
	pH (pH)	6.89	6.99	6.84	6.78	5.71
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	1.3	<1.0
	Total Dissolved Solids (mg/L)	<10	29	<10	14	<10
	Turbidity (NTU)	0.47	0.55	0.58	2.60	0.17
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.2	3.2	4.4	7.2	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.2	3.2	4.4	7.2	<2.0
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	0.032	0.035
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.68	0.68	0.68	<0.50	<0.50
	Fluoride (F) (mg/L)	0.052	0.052	0.051	0.055	<0.020
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.106	0.090	0.094	0.086	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	<0.0020	0.0024	0.0030	<0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.84	0.84	0.84	2.10	<0.50
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.84	2.13	1.72	1.43	<0.50
	Total Organic Carbon (mg/L)	1.98	1.95	1.84	1.54	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0090	0.0083	0.0100	0.0813	<0.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	0.000022
	Calcium (Ca)-Total (mg/L)	1.02	1.03	1.03	2.35	<0.10
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	0.112	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.65	0.65	0.66	0.82	<0.10
	Manganese (Mn)-Total (mg/L)	0.00130	0.00133	0.00131	0.00243	<0.00030
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L824564-1	L824564-2	L824564-3	L824564-4	L824564-5
		14-SEP-09 09:00 PDL-5-S	14-SEP-09 10:00 PDL-6-S	14-SEP-09 10:00 PDL-7-S	15-SEP-09 14:15 SP-8-S	15-SEP-09 14:30 SP-9-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000040	<0.000020	0.000028	<0.000030	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	0.0057	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.06	2.05	2.07	2.40	2.41
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.74	0.74	0.75	0.81	0.81
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L824564-6	L824564-7	L824564-8	L824564-9	L824564-10
		15-SEP-09	16-SEP-09	16-SEP-09	16-SEP-09	16-SEP-09
		15:00	11:00	11:00	11:00	09:00
		SP10-S	INUG-8-S	INUG-8-INT	INUG-8-D	INUG-10-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	0.000030	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.38	1.01	1.03	1.02	1.01
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.80	0.65	0.65	0.64	0.65
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L824564-11	L824564-12	L824564-13	L824564-14	L824564-15
		16-SEP-09 10:00 INUG-9-S	16-SEP-09 10:00 INUG-9-D	16-SEP-09 10:00 INUG-9-INT	15-SEP-09 DUP-3	16-SEP-09 EB-3
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	0.000026	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.02	1.02	1.03	2.44	<0.10
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.64	0.65	0.64	0.80	<0.10
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L824564-1 14-SEP-09 09:00 PDL-5-S	L824564-2 14-SEP-09 10:00 PDL-6-S	L824564-3 14-SEP-09 10:00 PDL-7-S	L824564-4 15-SEP-09 14:15 SP-8-S	L824564-5 15-SEP-09 14:30 SP-9-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.463	0.544	0.467	0.523	0.437

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L824564-6	L824564-7	L824564-8	L824564-9	L824564-10
		15-SEP-09	16-SEP-09	16-SEP-09	16-SEP-09	16-SEP-09
		15:00	11:00	11:00	11:00	09:00
		SP10-S	INUG-8-S	INUG-8-INT	INUG-8-D	INUG-10-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.725	0.521	0.486	0.475	0.535
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ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L824564-11 16-SEP-09 10:00 INUG-9-S	L824564-12 16-SEP-09 10:00 INUG-9-D	L824564-13 16-SEP-09 10:00 INUG-9-INT	L824564-14 15-SEP-09 DUP-3	L824564-15 16-SEP-09 EB-3
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)		0.593	0.628	0.493	0.512	

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

ALK-PCT-VA Water Alkalinity by Auto. Titration APHA 2320 "Alkalinity"

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-PCT-VA Water Alkalinity by Auto. Titration APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ALK-SCR-VA Water Alkalinity by colour or titration EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA Water Bromide by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA Water Chloride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA Water Fluoride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA Water Nitrite by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA Water Nitrate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueuos acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorecence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorecence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

the molybdsilicate-heteropoly blue colourimetric method.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies.**

The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA		

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

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Temperature 14	Samples Received in Good Condition? Y / N (if no provided details)



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: GARY MANN

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 21-DEC-09 15:12 (MT)

Version: FINAL

Lab Work Order #: L846573

Date Received: 07-DEC-09

Project P.O. #:

Job Reference: MEADOWBANK MINE WATER AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments: Please note that there were no Chlorophyll a filters received for samples EB-1 and EB-2 so the analysis could not be carried out.

Please note that there was an extra sample received that was not listed on the chain of custody. Sample "TRAVEL BLANK" was analyzed as per the client's request.

Lindsay Jones
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L846573-1	L846573-2	L846573-3	L846573-4	L846573-5
		25-NOV-09 11:00 SP-11-S	25-NOV-09 11:20 SP-12-S	25-NOV-09 10:00 SP-13-S	27-NOV-09 10:30 TPE-11-S	27-NOV-09 11:00 TPE-12-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	27.1	23.4	24.0	16.8	18.6
	Hardness (as CaCO3) (mg/L)	10.6	10.0	10.3	6.4	7.0
	pH (pH)	6.91	6.81	6.80	7.18	7.03
	Total Suspended Solids (mg/L)	<1.0	<1.0	1.1	1.9	1.7
	Total Dissolved Solids (mg/L)	24	23	18	15	14
	Turbidity (NTU)	0.73	0.79	0.78	3.83	4.08
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.9	7.5	7.4	4.9	5.6
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.9	7.5	7.4	4.9	5.6
	Ammonia as N (mg/L)	0.093	<0.020	0.030	0.039	0.023
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.60	0.53	0.52	0.50	0.56
	Fluoride (F) (mg/L)	0.056	0.054	0.056	0.059	0.064
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	0.0123	0.0147
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.125	0.153	0.089	0.081	0.092
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0021	0.0021	<0.0020	0.0030	0.0036
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.48	2.28	2.31	1.52	1.70
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.93	1.80	1.98	1.29	1.41
	Total Organic Carbon (mg/L)	1.80	1.72	1.64	1.16	1.29
Total Metals	Aluminum (Al)-Total (mg/L)	0.0320	0.0326	0.0320	0.164	0.204
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.69	2.51	2.61	1.49	1.65
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.039	0.036	0.032	0.187	0.216
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.90	0.86	0.90	0.69	0.77
	Manganese (Mn)-Total (mg/L)	0.00118	0.00115	0.00121	0.00302	0.00345
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L846573-6	L846573-7	L846573-8	L846573-9	L846573-10
		27-NOV-09 12:30 TPE-13-S	29-NOV-09 11:30 TPN-11-S	29-NOV-09 11:00 TPN-12-S	29-NOV-09 12:30 TPN-13-S	25-NOV-09 18:00 EB-1
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	16.7	15.4	16.9	15.5	<2.0
	Hardness (as CaCO3) (mg/L)	6.5	5.4	6.1	5.8	<1.1
	pH (pH)	6.92	6.86	6.84	6.73	5.61
	Total Suspended Solids (mg/L)	1.7	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	14	14	13	13	<10
	Turbidity (NTU)	3.94	0.27	0.26	0.26	<0.10
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.8	4.6	4.9	4.3	<2.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.8	4.6	4.9	4.3	<2.0
	Ammonia as N (mg/L)	0.035	0.029	0.035	0.043	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.50	0.50	0.52	0.50	<0.50
	Fluoride (F) (mg/L)	0.060	0.054	0.056	0.055	<0.020
	Nitrate (as N) (mg/L)	0.0140	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.079	0.091	0.087	0.089	<0.050
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0032	<0.0020	<0.0020	0.0066	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	1.52	1.51	1.57	1.55	<0.50
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.32	1.66	2.03	1.63	0.87
	Total Organic Carbon (mg/L)	1.27	1.71	1.72	1.69	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.169	0.0103	0.0088	0.0090	<0.0050
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	0.000021	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.52	1.28	1.36	1.30	<0.10
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.169	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00054
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.71	0.60	0.63	0.60	<0.10
	Manganese (Mn)-Total (mg/L)	0.00305	0.00045	0.00051	0.00057	<0.00030
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L846573-11	L846573-12	L846573-13	L846573-14	L846573-15
		29-NOV-09 18:00 EB-2	29-NOV-09 14:30 DUP-1	29-NOV-09 DUP-2	26-NOV-09 TEH-11-S	26-NOV-09 11:00 TEH-11-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	5.8	21.0	15.6	22.6	21.3
	Hardness (as CaCO3) (mg/L)	<1.1	7.7	5.8	9.2	8.5
	pH (pH)	5.52	6.68	6.67	6.73	6.73
	Total Suspended Solids (mg/L)	<1.0	1.1	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<10	17	12	14	16
	Turbidity (NTU)	<0.10	0.43	0.26	0.63	0.53
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<2.0	5.9	4.2	6.5	6.6
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	<2.0	5.9	4.2	6.5	6.6
	Ammonia as N (mg/L)	<0.020	<0.020	0.029	0.051	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	0.58	<0.50	0.54	0.52
	Fluoride (F) (mg/L)	<0.020	0.056	0.053	0.055	0.055
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.124	0.126	0.097	0.087
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0018
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	<0.0020	0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	<0.50	2.17	1.51	2.24	2.12
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	0.78	1.79	1.74	2.26	1.85
	Total Organic Carbon (mg/L)	0.62	1.83	1.89	1.91	2.08
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	0.0135	0.0065	0.0278	0.0235
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	<0.10	2.13	1.32	2.33	2.22
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00052	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	<0.10	0.76	0.61	0.83	0.78
	Manganese (Mn)-Total (mg/L)	<0.00030	0.00089	0.00048	0.00100	0.00107
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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Sample ID Description Sampled Date Sampled Time Client ID		L846573-16	L846573-17	L846573-18	L846573-19	L846573-20
		26-NOV-09 11:00 TEH-11-INT	26-NOV-09 11:00 TEH-12-S	26-NOV-09 12:00 TEH-12-D	26-NOV-09 12:00 TEH-12-INT	26-NOV-09 12:00 TEH-13-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	21.8	20.4	19.6	19.3	20.8
	Hardness (as CaCO3) (mg/L)	8.8	8.0	7.9	7.6	7.9
	pH (pH)	6.73	6.67	6.74	6.75	6.70
	Total Suspended Solids (mg/L)	1.2	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	20	19	19	17	17
	Turbidity (NTU)	0.67	0.38	0.44	0.44	0.41
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	6.6	5.9	6.0	6.0	6.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	6.6	5.9	6.0	6.0	6.3
	Ammonia as N (mg/L)	0.029	<0.020	0.021	0.022	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.55	0.58	0.51	0.52	0.58
	Fluoride (F) (mg/L)	0.055	0.055	0.053	0.054	0.055
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.117	0.096	0.115	0.086	0.080
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0022	<0.0020	<0.0020	0.0028	0.0021
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.18	2.15	1.97	1.98	2.20
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.88	1.71	1.92	1.52	1.59
	Total Organic Carbon (mg/L)	1.91	1.73	1.60	1.59	1.69
Total Metals	Aluminum (Al)-Total (mg/L)	0.0236	0.0161	0.0197	0.0153	0.0133
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.21	1.91	1.97	1.92	2.07
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.79	0.73	0.72	0.72	0.77
	Manganese (Mn)-Total (mg/L)	0.00106	0.00082	0.00113	0.00085	0.00080
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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Sample ID Description Sampled Date Sampled Time Client ID		L846573-21	L846573-22	L846573-23	L846573-24	L846573-25
		26-NOV-09 13:30 INUG-11-S	28-NOV-09 10:30 INUG-11-D	28-NOV-09 10:30 INUG-11-INT	28-NOV-09 10:30 INUG-12-S	28-NOV-09 13:30 INUG-12-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	15.0	15.1	16.2	17.5	18.1
	Hardness (as CaCO3) (mg/L)	5.6	5.6	5.9	5.3	6.2
	pH (pH)	6.75	6.69	6.77	6.79	6.74
	Total Suspended Solids (mg/L)	<1.0	<1.0	1.0	1.0	<1.0
	Total Dissolved Solids (mg/L)	14	14	16	17	17
	Turbidity (NTU)	0.29	0.31	0.32	0.29	0.31
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	4.7	4.8	4.9	4.6	5.1
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	4.7	4.8	4.9	4.6	5.1
	Ammonia as N (mg/L)	0.021	0.031	0.030	0.026	<0.020
	Bromide (Br) (mg/L)	0.062	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	0.70	0.70	0.79	0.69	0.77
	Fluoride (F) (mg/L)	0.052	0.052	0.055	0.052	0.053
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.097	0.096	0.109	0.094	0.101
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0023	0.0025	0.0032	0.0023	0.0021
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	0.86	0.85	0.91	0.83	0.97
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.74	2.14	3.33	1.53	2.00
	Total Organic Carbon (mg/L)	2.85	2.22	2.21	2.13	1.92
Total Metals	Aluminum (Al)-Total (mg/L)	0.0087	0.0068	0.0102	0.0076	0.0062
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	1.09	1.10	1.35	1.06	1.23
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.68	0.69	0.74	0.66	0.76
	Manganese (Mn)-Total (mg/L)	0.00115	0.00101	0.00107	0.00096	0.00106
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

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Sample ID Description Sampled Date Sampled Time Client ID		L846573-26	L846573-27	L846573-28		
		28-NOV-09 13:30 INUG-12-INT	28-NOV-09 13:30 INUG-13-S	28-NOV-09 11:30 TRAVEL BLANK		
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	21.3	14.8	<2.0		
	Hardness (as CaCO3) (mg/L)	5.7	5.3	<1.1		
	pH (pH)	6.90	6.72	5.56		
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0		
	Total Dissolved Solids (mg/L)	15	15	<10		
	Turbidity (NTU)	0.30	0.29	<0.10		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	5.3	4.8	<2.0		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0		
	Alkalinity, Total (as CaCO3) (mg/L)	5.3	4.8	<2.0		
	Ammonia as N (mg/L)	0.070	0.026			
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050		
	Chloride (Cl) (mg/L)	0.73	0.68	<0.50		
	Fluoride (F) (mg/L)	0.051	0.051	<0.020		
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050		
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Kjeldahl Nitrogen (mg/L)	0.097	0.090			
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010		
	Total Phosphate as P (mg/L)	<0.0020	0.0063	<0.0020		
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0		
	Sulfate (SO4) (mg/L)	0.90	0.82	<0.50		
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.32	2.27			
	Total Organic Carbon (mg/L)	2.19	2.14	<0.50		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0071	0.0083	<0.0050		
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020		
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10		
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017		
	Calcium (Ca)-Total (mg/L)	1.14	1.03	<0.10		
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030		
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010		
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030		
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050		
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050		
	Magnesium (Mg)-Total (mg/L)	0.71	0.65	<0.10		
	Manganese (Mn)-Total (mg/L)	0.00101	0.00131	<0.00030		
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020		

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Sample ID Description Sampled Date Sampled Time Client ID		L846573-1	L846573-2	L846573-3	L846573-4	L846573-5
		25-NOV-09 11:00 SP-11-S	25-NOV-09 11:20 SP-12-S	25-NOV-09 10:00 SP-13-S	27-NOV-09 10:30 TPE-11-S	27-NOV-09 11:00 TPE-12-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	0.0061	0.0066
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	0.000018
	Calcium (Ca)-Dissolved (mg/L)	2.72	2.56	2.63	1.50	1.63
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.91	0.87	0.90	0.65	0.71
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	0.00038	0.00042
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L846573-6	L846573-7	L846573-8	L846573-9	L846573-10
		27-NOV-09 12:30 TPE-13-S	29-NOV-09 11:30 TPN-11-S	29-NOV-09 11:00 TPN-12-S	29-NOV-09 12:30 TPN-13-S	25-NOV-09 18:00 EB-1
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0068	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	0.000018	0.000021	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.52	1.22	1.39	1.31	<0.10
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.66	0.56	0.64	0.60	<0.10
	Manganese (Mn)-Dissolved (mg/L)	0.00039	<0.00030	0.00040	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L846573-11	L846573-12	L846573-13	L846573-14	L846573-15
		29-NOV-09 18:00 EB-2	29-NOV-09 14:30 DUP-1	29-NOV-09 DUP-2	26-NOV-09 TEH-11-S	26-NOV-09 11:00 TEH-11-D
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	<0.10	1.91	1.33	2.32	2.16
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	<0.10	0.72	0.61	0.82	0.77
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L846573-16	L846573-17	L846573-18	L846573-19	L846573-20
		26-NOV-09 11:00 TEH-11-INT	26-NOV-09 11:00 TEH-12-S	26-NOV-09 12:00 TEH-12-D	26-NOV-09 12:00 TEH-12-INT	26-NOV-09 12:00 TEH-13-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.24	2.02	2.01	1.88	1.96
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.78	0.73	0.70	0.70	0.73
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L846573-21	L846573-22	L846573-23	L846573-24	L846573-25
		26-NOV-09 13:30 INUG-11-S	28-NOV-09 10:30 INUG-11-D	28-NOV-09 10:30 INUG-11-INT	28-NOV-09 10:30 INUG-12-S	28-NOV-09 13:30 INUG-12-D
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	0.0051	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	1.10	1.11	1.15	1.04	1.23
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.69	0.70	0.72	0.65	0.75
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L846573-26 28-NOV-09 13:30 INUG-12-INT	L846573-27 28-NOV-09 13:30 INUG-13-S	L846573-28 28-NOV-09 11:30 TRAVEL BLANK		
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050				
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010				
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017				
	Calcium (Ca)-Dissolved (mg/L)	1.12	1.05				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030				
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010				
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030				
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050				
	Magnesium (Mg)-Dissolved (mg/L)	0.70	0.66				
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030				
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020				
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010				
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010				
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0				
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010				
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050				
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010				
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020				
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010				
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050				

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L846573-1	L846573-2	L846573-3	L846573-4	L846573-5
		25-NOV-09	25-NOV-09	25-NOV-09	27-NOV-09	27-NOV-09
		11:00	11:20	10:00	10:30	11:00
		SP-11-S	SP-12-S	SP-13-S	TPE-11-S	TPE-12-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.556	0.740	0.916	0.651	0.298

Sample ID Description Sampled Date Sampled Time Client ID		L846573-6	L846573-7	L846573-8	L846573-9	L846573-10
		27-NOV-09	29-NOV-09	29-NOV-09	29-NOV-09	25-NOV-09
		12:30	11:30	11:00	12:30	18:00
		TPE-13-S	TPN-11-S	TPN-12-S	TPN-13-S	EB-1
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.508	0.555	0.289	0.624	

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L846573-11	L846573-12	L846573-13	L846573-14	L846573-15
		29-NOV-09	29-NOV-09	29-NOV-09	26-NOV-09	26-NOV-09
		18:00	14:30			11:00
		EB-2	DUP-1	DUP-2	TEH-11-S	TEH-11-D
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)		0.696	0.521	0.086	0.390

Sample ID Description Sampled Date Sampled Time Client ID		L846573-16	L846573-17	L846573-18	L846573-19	L846573-20
		26-NOV-09	26-NOV-09	26-NOV-09	26-NOV-09	26-NOV-09
		11:00	11:00	12:00	12:00	12:00
		TEH-11-INT	TEH-12-S	TEH-12-D	TEH-12-INT	TEH-13-S
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug)	0.462	0.571	0.433	0.634	0.647

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L846573-21 26-NOV-09 13:30 INUG-11-S	L846573-22 28-NOV-09 10:30 INUG-11-D	L846573-23 28-NOV-09 10:30 INUG-11-INT	L846573-24 28-NOV-09 10:30 INUG-12-S	L846573-25 28-NOV-09 13:30 INUG-12-D
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)		0.834	0.719	0.671	0.442	0.617

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L846573-26 28-NOV-09 13:30 INUG-12-INT	L846573-27 28-NOV-09 13:30 INUG-13-S	L846573-28 28-NOV-09 11:30 TRAVEL BLANK		
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug)		0.607	0.313			

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

ALK-SCR-VA Water Alkalinity by colour or titration EPA 310.2 OR APHA 2320

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

OR

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

ANIONS-BR-IC-VA Water Bromide by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-CL-IC-VA Water Chloride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-F-IC-VA Water Fluoride by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-NO2-IC-VA Water Nitrite by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.

ANIONS-NO3-IC-VA Water Nitrate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.

ANIONS-SO4-IC-VA Water Sulfate by Ion Chromatography APHA 4110 B.

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 "TOTAL ORGANIC CARBON (TOC)"

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:**

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location

VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Rush Processing



COC #

Page 1 of 3

Report to:						Report Format / Distribution							Service Requested:																					
Company: Azimuth Consulting Group Inc.						☒ Standard ☐ Other							☒ Regular Service (Default)																					
Contact: Gary Mann / Maggie McConnell						☒ PDF ☒ Excel Fax							Rush Service (2-3 Days)																					
Address: Vancouver						Email 1: rvanengen@agnico-eagle.com Email 2: gmann@azimuthgroup.ca , mmcconnell@azimuthgroup.ca							Priority Service (1 Day or ASAP) Emergency Service (<1 Day / Wkend) - Contact ALS																					
Phone: 604-730-1220 Fax:																																		
Invoice To: [x] Same as Report						Indicate Bottles: Filtered / Preserved (F/P) -->																												
Company:						Client / Project Information:																												
Contact:						Job #: Meadowbank Mine Winter AEMP																												
Address:						PO/AFE:																												
Sample						Legal Site Description:																												
Phone:						Quote #: ALSE009-077																												
Lab Work Order # (lab use only)						ALS Contact: Natasha MM																												
Sample #		Sample Identification (This description will appear on the report)				Date dd-mm-yy		Time hh:mm		Sampler (initials)		Sample Type (Select from drop-down list)		T-Metals (CCME)																				
		SP-11-S				25/11/09		11:00		Water				X	X	X	X	X	X	X	X													
		SP-12-S				25/11/09		11:20		Water				X	X	X	X	X	X	X	X													
		SP-13-S				25/11/09		10:00		Water				X	X	X	X	X	X	X	X													
		TPE-11-S				27/11/09		10:30		Water				X	X	X	X	X	X	X	X													
		TPE-12-S				27/11/09		11:00		Water				X	X	X	X	X	X	X	X													
		TPE-13-S				27/11/09		12:30		Water				X	X	X	X	X	X	X	X													
		TPN-11-S				29/11/09		11:30		Water				X	X	X	X	X	X	X	X													
		TPN-12-S				29/11/09		11:00		Water				X	X	X	X	X	X	X	X													
		TPN-13-S				29/11/09		12:30		Water				X	X	X	X	X	X	X	X													
		EB-1				25/11/09		18:00		Water				X	X	X	X	X	X	X	X													
Guidelines / Regulations																									Special Instructions / Hazardous Details									
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.																																		
Relinquished RV		Date & Time: Nov 30/09 7:30	Received By:		Date & Time:	Temperature		Sample Condition (lab use only)																										
Relinquished By:		Date & Time:	Received By:		Date & Time:	Condition? Y/N (if no provided details)																												

Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other ☒ PDF ☒ Excel ☐ Fax				☒ Regular Service (Default) ☐ Rush Service (2-3 Days) ☐ Priority Service (1 Day or ASAP) ☐ Emergency Service (<1 Day / Weekend) - Contact ALS			
Contact: Gary Mann / Maggie McConnell				Email 1: rmanngen@azimco-eagle.com							
Address: Vancouver				Email 2: gmann@azimuthgroup.ca, mmcconnell@azimuthgroup.ca							
Phone: 604-730-1220 Fax:											
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) --							
Company:				Client / Project Information:							
Contact:				Job #:				Meadowbank Mine Winter AEMP			
Address:				PO/A/E:							
Sample:				Legal Site Description:							
Phone:				Quote #: ALSEQ09-077							
Lab Work Order # (lab use only)				ALS Contact: Natasha MM				Sampler (Initials):			
Sample #		Sample Identification (This description will appear on the report)		Date	Time	Sample Type (Select from drop-down list)					
		INUG-11-S		28/11/09	10:30	Water	X	X	X	X	X
		INUG-11-D		28/11/09	10:30	Water	X	X	X	X	X
		INUG-11-INT		28/11/09	10:30	Water	X	X	X	X	X
		INUG-12-S		28/11/09	13:30	Water	X	X	X	X	X
		INUG-12-D		28/11/09	13:30	Water	X	X	X	X	X
		INUG-12-INT		28/11/09	13:30	Water	X	X	X	X	X
		INUG-13-S		28/11/09	11:30	Water	X	X	X	X	X
						Water					
						Water					
						Water					
Guidelines / Regulations											
Special Instructions / Hazardous Details											
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Relinquished By:	RV	Date & Time:	Nov 30/09 7:30	Received By:		Date & Time:	9/12/09	Temperature	4	Sample Condition (lab use only)	Sample Received in Good Condition? ☒ (if no provided details)
Relinquished By:		Date & Time:		Received By:		Date & Time:	12/09				

34,4,3



Environmental Division

Certificate of Analysis

AZIMUTH CONSULTING GROUP INC.

ATTN: GARY MANN

218 - 2902 WEST BROADWAY

VANCOUVER BC V6K 2G8

Report Date: 28-JAN-10 17:08 (MT)

Version: FINAL

Lab Work Order #: L853861

Date Received: 12-JAN-10

Project P.O. #: NOT SUBMITTED

Job Reference: MEADOWBANK MINE WINTER AEMP

Legal Site Desc:

CofC Numbers:

Other Information:

Comments:



Natasha Markovic-Mirovic
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L853861-1	L853861-2	L853861-3	L853861-4	L853861-5
		18-DEC-09 13:40 SP-14-S	19-DEC-09 13:00 TPN-14-S	19-DEC-09 12:10 TE-14-S	21-DEC-09 12:20 TE-14-INT	21-DEC-09 12:15 TE-14-D
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	23.0	17.7	29.6	29.7	28.8
	Hardness (as CaCO3) (mg/L)	10.0	6.1	8.8	9.5	9.4
	pH (pH)	7.89	6.76	6.94	6.90	6.87
	Total Suspended Solids (mg/L)	1.0	<1.0	3.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	11	<10	16	12	<10
	Turbidity (NTU)	0.74	0.26	0.59	0.41	0.42
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.9	5.1	7.2	6.8	7.3
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO3) (mg/L)	7.9	5.1	7.2	6.8	7.3
	Ammonia as N (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	0.54	0.52	0.52
	Fluoride (F) (mg/L)	0.053	0.054	0.056	0.054	0.053
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	0.124	0.111	0.080	0.080	0.078
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Phosphate as P (mg/L)	0.0023	<0.0020	0.0031	0.0020	<0.0020
	Silicate (as SiO2) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO4) (mg/L)	2.22	1.56	2.29	2.23	2.22
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.00	1.73	1.73	1.72	1.75
	Total Organic Carbon (mg/L)	1.79	1.72	1.77	1.78	1.69
Total Metals	Aluminum (Al)-Total (mg/L)	0.0428	0.0094	0.0339	0.0260	0.0208
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	2.49	1.37	2.34	2.32	2.33
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	0.050	<0.030	0.034	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	0.87	0.63	0.84	0.84	0.83
	Manganese (Mn)-Total (mg/L)	0.00142	0.00058	0.00101	0.00137	0.00143
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L853861-6	L853861-7	L853861-8	L853861-9	L853861-10
		TRAVELING BLANKS	TPS-8-S	TPS-8-INT	TPS-8-D	TPE-14-S
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	14.7	14.3	14.2	18.9
	Hardness (as CaCO ₃) (mg/L)	<1.1	5.7	5.4	5.4	7.9
	pH (pH)	5.65	6.72	6.69	6.69	6.77
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	1.6
	Total Dissolved Solids (mg/L)	<10	<10	<10	<10	<10
	Turbidity (NTU)	<0.10	0.23	0.30	0.22	3.26
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO ₃) (mg/L)	<2.0	4.6	4.2	4.4	6.1
	Alkalinity, Carbonate (as CaCO ₃) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Hydroxide (as CaCO ₃) (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Alkalinity, Total (as CaCO ₃) (mg/L)	<2.0	4.6	4.2	4.4	6.1
	Ammonia as N (mg/L)	<0.020	0.050	<0.020	<0.020	<0.020
	Bromide (Br) (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	0.58
	Fluoride (F) (mg/L)	<0.020	0.051	0.052	0.051	0.067
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0166
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Total Kjeldahl Nitrogen (mg/L)	<0.050	0.127	0.125	0.122	0.131
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0010
	Total Phosphate as P (mg/L)	<0.0020	<0.0020	0.0024	<0.0020	0.0034
	Silicate (as SiO ₂) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Sulfate (SO ₄) (mg/L)	<0.50	1.41	1.39	1.37	1.79
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	<0.50	1.16	1.18	1.12	1.23
	Total Organic Carbon (mg/L)	<0.50	1.22	1.26	1.13	1.20
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0050	0.0090	0.0132	0.0073	0.181
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Total (mg/L)	<0.10	1.24	1.21	1.21	1.83
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	0.190
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Total (mg/L)	<0.10	0.58	0.56	0.56	0.84
	Manganese (Mn)-Total (mg/L)	<0.00030	0.00048	0.00064	0.00050	0.00326
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID				
		Description				
		Sampled Date				
		Sampled Time				
		Client ID				
		L853861-11	L853861-12			
		DEC DUP1	DEC EB1			
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	19.3	<2.0			
	Hardness (as CaCO3) (mg/L)	8.0	<1.1			
	pH (pH)	6.70	5.58			
	Total Suspended Solids (mg/L)	1.0	<1.0			
	Total Dissolved Solids (mg/L)	13	<10			
	Turbidity (NTU)	3.22	<0.10			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	6.1	<2.0			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<2.0	<2.0			
	Alkalinity, Total (as CaCO3) (mg/L)	6.1	<2.0			
	Ammonia as N (mg/L)	<0.020	<0.020			
	Bromide (Br) (mg/L)	<0.050	<0.050			
	Chloride (Cl) (mg/L)	0.57	<0.50			
	Fluoride (F) (mg/L)	0.065	<0.020			
	Nitrate (as N) (mg/L)	0.0122	<0.0050			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Total Kjeldahl Nitrogen (mg/L)	0.134	<0.050			
	Ortho Phosphate as P (mg/L)	<0.0010	<0.0010			
	Total Phosphate as P (mg/L)	0.0035	<0.0020			
	Silicate (as SiO2) (mg/L)	<1.0	<1.0			
	Sulfate (SO4) (mg/L)	1.77	<0.50			
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.49	<0.50			
	Total Organic Carbon (mg/L)	1.60	<0.50			
Total Metals	Aluminum (Al)-Total (mg/L)	0.177	<0.0050			
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)	<0.00050	<0.00050			
	Barium (Ba)-Total (mg/L)	<0.020	<0.020			
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010			
	Boron (B)-Total (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)	<0.000017	<0.000017			
	Calcium (Ca)-Total (mg/L)	1.78	<0.10			
	Chromium (Cr)-Total (mg/L)	<0.0010	<0.0010			
	Cobalt (Co)-Total (mg/L)	<0.00030	<0.00030			
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0010			
	Iron (Fe)-Total (mg/L)	0.185	<0.030			
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050			
	Lithium (Li)-Total (mg/L)	<0.0050	<0.0050			
	Magnesium (Mg)-Total (mg/L)	0.82	<0.10			
	Manganese (Mn)-Total (mg/L)	0.00318	<0.00030			
	Mercury (Hg)-Total (mg/L)	<0.000020	<0.000020			

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L853861-1	L853861-2	L853861-3	L853861-4	L853861-5
		18-DEC-09 13:40 SP-14-S	19-DEC-09 13:00 TPN-14-S	19-DEC-09 12:10 TE-14-S	21-DEC-09 12:20 TE-14-INT	21-DEC-09 12:15 TE-14-D
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)	2.56	1.41	2.21	2.41	2.38
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)	0.87	0.63	0.79	0.84	0.83
	Manganese (Mn)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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Sample ID Description Sampled Date Sampled Time Client ID		L853861-6	L853861-7	L853861-8	L853861-9	L853861-10
		TRAVELING BLANKS	TPS-8-S	TPS-8-INT	TPS-8-D	TPE-14-S
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	0.0185
	Antimony (Sb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050
	Barium (Ba)-Dissolved (mg/L)		<0.020	<0.020	<0.020	<0.020
	Beryllium (Be)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Dissolved (mg/L)		<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)		<0.000017	<0.000017	<0.000017	<0.000017
	Calcium (Ca)-Dissolved (mg/L)		1.31	1.25	1.22	1.86
	Chromium (Cr)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030
	Copper (Cu)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Dissolved (mg/L)		<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050
	Magnesium (Mg)-Dissolved (mg/L)		0.60	0.56	0.56	0.79
	Manganese (Mn)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	0.00057
	Mercury (Hg)-Dissolved (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020
	Molybdenum (Mo)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010
	Nickel (Ni)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010
	Potassium (K)-Dissolved (mg/L)		<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010
	Silver (Ag)-Dissolved (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)		<2.0	<2.0	<2.0	<2.0
	Thallium (Tl)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)		<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020
	Vanadium (V)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L853861-11 DEC DUP1	L853861-12 DEC EB1		
Grouping	Analyte					
WATER						
Total Metals	Molybdenum (Mo)-Total (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Total (mg/L)	<0.0010	<0.0010			
	Potassium (K)-Total (mg/L)	<2.0	<2.0			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010			
	Silver (Ag)-Total (mg/L)	<0.000020	<0.000020			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0			
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020			
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050			
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010			
	Uranium (U)-Total (mg/L)	<0.00020	<0.00020			
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Total (mg/L)	<0.0050	<0.0050			
Dissolved Metals	Aluminum (Al)-Dissolved (mg/L)	0.0122	<0.0050			
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Dissolved (mg/L)	<0.00050	<0.00050			
	Barium (Ba)-Dissolved (mg/L)	<0.020	<0.020			
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010			
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Dissolved (mg/L)	<0.000017	0.000024			
	Calcium (Ca)-Dissolved (mg/L)	1.90	<0.10			
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010			
	Cobalt (Co)-Dissolved (mg/L)	<0.00030	<0.00030			
	Copper (Cu)-Dissolved (mg/L)	<0.0010	<0.0010			
	Iron (Fe)-Dissolved (mg/L)	<0.030	<0.030			
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050			
	Lithium (Li)-Dissolved (mg/L)	<0.0050	<0.0050			
	Magnesium (Mg)-Dissolved (mg/L)	0.80	<0.10			
	Manganese (Mn)-Dissolved (mg/L)	0.00049	<0.00030			
	Mercury (Hg)-Dissolved (mg/L)	<0.000020	<0.000020			
	Molybdenum (Mo)-Dissolved (mg/L)	<0.0010	<0.0010			
	Nickel (Ni)-Dissolved (mg/L)	<0.0010	<0.0010			
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0			
	Selenium (Se)-Dissolved (mg/L)	<0.0010	<0.0010			
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020			
	Sodium (Na)-Dissolved (mg/L)	<2.0	<2.0			
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020			
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050			
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010			
	Uranium (U)-Dissolved (mg/L)	<0.00020	<0.00020			
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050			

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L853861-1 18-DEC-09 13:40 SP-14-S	L853861-2 19-DEC-09 13:00 TPN-14-S	L853861-3 19-DEC-09 12:10 TE-14-S	L853861-4 21-DEC-09 12:20 TE-14-INT	L853861-5 21-DEC-09 12:15 TE-14-D
Grouping	Analyte					
WATER						
Plant Pigments	Chlorophyll a (ug/L)	0.389	0.323	0.353	0.235	0.176

ALS LABORATORY GROUP ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L853861-6 TRAVELING BLANKS	L853861-7 22-DEC-09 TPS-8-S	L853861-8 22-DEC-09 TPS-8-INT	L853861-9 22-DEC-09 TPS-8-D	L853861-10 22-DEC-09 TPE-14-S
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug/L)			0.228	0.203	0.188	0.279

		Sample ID Description Sampled Date Sampled Time Client ID	L853861-11 DEC DUP1	L853861-12 DEC EB1			
Grouping	Analyte						
WATER							
Plant Pigments	Chlorophyll a (ug/L)	0.310					

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comments
Methods Listed (if applicable):			
ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
ALK-SCR-VA	Water	Alkalinity by colour or titration	EPA 310.2 OR APHA 2320
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method. OR This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-BR-IC-VA	Water	Bromide by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrite detection is by UV absorbance and not conductivity.			
ANIONS-NO3-IC-VA	Water	Nitrate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Specifically, the nitrate detection is by UV absorbance and not conductivity.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 "TOTAL ORGANIC CARBON (TOC)"
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
CHLOROA-VA	Water	Chlorophyll a by Fluorometer	EPA 445.0
Chlorophyll and Pheopigments by Fluorometry analysis is carried out using procedures adapted from USEPA Method 445.0. The sample is filtered using either a glass fiber filter or a 0.45 micron Membrane filter. The pigments are extracted from the filter with 90% aqueous acetone. For chlorophyll-a analysis the extract is read using a fluorometer. For pheopigments the extract is first acidified then read. This method is not subject to interferences from chlorophyll b.			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.			
HG-DIS-CCME-CVAFS-VA	Water	Diss. Mercury in Water by CVAFS (CCME)	EPA 3005A/245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
HG-TOT-CCME-CVAFS-VA	Water	Total Mercury in Water by CVAFS (CCME)	EPA 245.7
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).			
MET-DIS-CCME-ICP-VA	Water	Diss. Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-DIS-CCME-MS-VA	Water	Diss. Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
MET-TOT-CCME-ICP-VA	Water	Total Metals in Water by ICPOES (CCME)	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-CCME-MS-VA	Water	Total Metals in Water by ICPMS (CCME)	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
NH3-SIE-VA	Water	Ammonia by SIE	APHA 4500 D. - NH3 NITROGEN (AMMONIA)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)
This analysis is carried out, on sulphuric acid preserved samples, using procedures adapted from APHA Method 4500-NH3 "Nitrogen (Ammonia)". Ammonia is determined using an ammonia selective electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-DO-COL-VA	Water	Dissolved ortho Phosphate by Colour	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P "Phosphorous"
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
PO4-T-COL-VA	Water	Total Phosphate P by Color	APHA 4500-P Phosphorous
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". All forms of phosphate are determined by the ascorbic acid colourimetric method. Dissolved ortho-phosphate (dissolved reactive phosphorous) is determined by direct measurement. Total phosphate (total phosphorous) is determined after persulphate digestion of a sample. Total dissolved phosphate (total dissolved phosphorous) is determined by filtering a sample through a 0.45 micron membrane filter followed by persulfate digestion of the filtrate.			
SILICATE-COL-VA	Water	Silicate by Colourimetric analysis	APHA 4500-SiO2 D.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 D. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-SIE-VA	Water	Total Kjeldahl Nitrogen by SIE	APHA 4500-Norg (TKN)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Analytical Method Reference(Based On)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total kjeldahl nitrogen is determined by sample digestion at 367 celcius with analysis using an ammonia selective electrode.

TSS-LOW-VA	Water	Total Suspended Solids by Grav. (1 mg/L)	APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

**** Laboratory Methods employed follow in-house procedures, which are generally based on nationally or internationally accepted methodologies. The last two letters of the above ALS Test Code column indicate the laboratory that performed analytical analysis for that test. Refer to the list below:**

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location

VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

GLOSSARY OF REPORT TERMS

Surr - A surrogate is an organic compound that is similar to the target analyte(s) in chemical composition and behavior but not normally detected in enviromental samples. Prior to sample processing, samples are fortified with one or more surrogate compounds.

The reported surrogate recovery value provides a measure of method efficiency.

mg/kg (units) - unit of concentration based on mass, parts per million

mg/L (units) - unit of concentration based on volume, parts per million

N/A - Result not available. Refer to qualifier code and definition for explanation

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Although test results are generated under strict QA/QC protocols, any unsigned test reports, faxes, or emails are considered preliminary.

ALS Laboratory Group has an extensive QA/QC program where all analytical data reported is analyzed using approved referenced procedures followed by checks and reviews by senior managers and quality assurance personnel. However, since the results are obtained from chemical measurements and thus cannot be guaranteed, ALS Laboratory Group assumes no liability for the use or interpretation of the results.

Rush Processing



COC#

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Report to:				Report Format / Distribution				Service Requested:			
Company: Azimuth Consulting Group Inc.				☒ Standard ☐ Other				☒ Regular Service (Default)			
Contact: Gary Mann / Maggie McConnell				☒ PDF ☐ Excel ☐ Fax				☐ Rush Service (2-3 Days)			
Address: Vancouver				Email 1: rvanengien@agnico-eagle.com				☐ Priority Service (1 Day or ASAP)			
Phone: 604-730-1220 Fax:				Email 2: gmann@azimuthgroup.ca				☐ Emergency Service (<1 Day / Weekend) - Contact ALS			
Invoice To: ☒ Same as Report				Indicate Bottles: Filtered / Preserved (F/P) →				Analysis Request			
Company:				Client / Project Information:							
Contact:				Job #:				Meadowbank Mine Winter AEMP			
Address:				PO/A/E:							
Sample				Legal Site Description:							
Phone:				Quote #: ALSEQ09-077							
Fax:											
Lab Work Order # (lab use only)				ALS Contact:				Sampler (Initials):			
Sample #				Sample Identification (This description will appear on the report)				Date			
								Time			
								Sample Type (Select from drop-down list)			
SP-14-S				18-12-2009				13:40			
TPS-14-S				19-12-2009				11:40			
TPN-14-S				19-12-2009				13:00			
TE-14-S				21-12-2009				12:10			
TE-14-INT				21-12-2009				12:20			
TE-14-D				21-12-2009				12:15			
TPS-14-S				22-12-2009				11:05			
TPS-14-INT				22-12-2009				11:15			
TPS-14-D				22-12-2009				11:10			
Traveling Blanks								Water			
Guidelines / Regulations								Special Instructions / Hazardous Details			
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the adjacent worksheet.											
Relinquished By:		Date & Time:		Received By:		Date & Time:		Temperature:		Sample Condition (lab use only)	
Relinquished By:		Date & Time:		Received By:		Date & Time:		Temperature:		Samples Received in Good Condition? Y / N (if no provided details)	

[illegible]