GroupeHemispheres

Aquatic Survey - Howse Pit Study Area

HML
Howse Minerals Limited

Technical Report

Our file: PR185-18-13

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PROJECT TEAM

GROUPE HÉMISPHÈRES

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Elissa Dickoum	Geographer, Master (France), Geomatic and Field

(Refer also to the list of personal communications in the References section)

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1 INTRODUCTION

This technical report presents the baseline survey of the aquatic environment in the sectors directly or indirectly affected by the Howse Project in conformity with the provisions of Sub-sections 36(5)(a) to (e) of the Fisheries Act and Appendix 2 of the Metal Mining Effluent Regulations. The objective of the study was to collect the information required to characterize and quantify fish habitat. The survey includes a biophysical description of the selected water bodies and water courses as well as the results of experimental fishing.

1.1 Mandate and Objectives

HML mandated Groupe Hémisphères to carry out, among other tasks, biological surveys on the Howse Project site, including the aquatic survey. The surveys undertaken in 2008 by the sub-contractor AMEC Earth & Environmental dealt with some of the water bodies potentially affected by the Howse Project. The general objective of this study is to conduct a baseline study for the Howse Projects concerning the limnology and the aquatic fauna of the various waterbodies in and around the footprints of the Project.

The specific objectives of this study are:

- To record historical data about the sector;
- To collect baseline water quality parameters;
- To collect laboratory data on water and sediment quality and on benthos;
- To collect baseline data on fish habitat, such as absence/presence;
- To identify the fish species present;
- To classify the watercourses in terms of fish habitat;
- To quantify each water course and water body in terms of fish habitat; and
- To cover the whole sector potentially affected by the Howse Project.

In order to better understand the distribution and quality of fish habitat throughout the Project area, this report incorporates the results of the study entitled Fish and Fish Habitat Investigation for the Direct-Shipping Ore Project, New Millennium Capital Corp. (AMEC 2009).

1.2 Biophysical Description of the Local Study Area

This section briefly describes the biophysical environment of the study area surveyed during this study. Figure 1 shows the drainage basins in the study area, which lies northeast of the large Howell River drainage basin. The description of the terrestrial ecosystems and the geomorphology were taken from an ecological mapping study and floristic survey of the entire Project area (Groupe Hémisphères *In Progess*). The geology throughout the study area is of sedimentary origin and comprises relatively old rock composed of Ruth shale or cherty Sokoman sandstone (Envir-Eau 2009).

The Howse Project is located south of the 55th parallel in Newfoundland-Labrador (Figure 1). It is proximate to the Timmins pits formerly mined by the Iron Ore Company of Canada (IOC) and currently exploited through TSMC's DSO3 project. This explains the presence of large areas that have been disturbed and numerous sites where the infrastructure footprint is visible. Undisturbed areas display predominantly a High Subarctic Tundra ecosystem, dominated by low Alpine shrubs and subxeric lichen. Several small areas of mesic Glandular birch scrublands are also present, as well as a large section of xeric rock outcrops with Crowberry. Closer to the Howells River, which flows through a wide, open valley, the change in elevation is accompanied by a transition towards a Mid Subarctic Forest ecosystem dominated by Black spruce and White spruce, Labrador tea and Feathermoss. This study area is characterized by a generally flat terrain

with rolling to undulating plains. Surficial deposits generally originate from ground moraine made up of silt, sand and boulders. There is also a large wetland complex west of the Howse deposit.

1.3 Quality Control

The surveys and related analyses were conducted using standard operating procedures (SOP) that are part of the quality control system of Groupe Hémisphères. A number of these SOP consist in using various field forms throughout the survey. They involve the following activities:

- Water and sediment sampling;
- Measurement of waterbody temperature and oxygen profiles;
- Bathymetry;
- Reconnaissance of fish and macroinvertebrate habitat;
- Electrofishing;
- Management and transmission of GPS field data;
- Data entry and analysis;
- Report writing.

The procedures are based on best practices in the field, as well as on the accumulated experience of the firms' specialists. The purpose of the SOP is to ensure that the work is carried out according to the highest standards. The SOP are available upon request. The data on the field forms were entered into the computer at the end of each day. These steps made it possible to identify deficiencies and to avoid any confusion that might arise during the survey. In addition to the field forms, another SOP consisted in checking the field forms against the data entered into the computer once the teams returned from the field. As for the laboratory analyses, chains of responsibility forms were filled out to document sampling dates and conservation, delivery and reception methods. The accredited laboratory was responsible for a part of this procedure. All the compiled and analyzed data were reviewed by a competent third party and the technical report was meticulously reviewed by the project managers and directors.

1.4 Nomenclature

The official names of lakes and watercourses were taken from the 1/50 000 scale maps in Natural Resources Canada's National Topographic Database (NTDB). Unnamed hydrographic features surveyed were given a topological code in the office indicating their relationship with a known lake or parent watercourse. Some unknown lakes were named after a characteristic feature.

Georeferencing and Topographic Database

All sampling points were georeferenced using a portable GPS device (Wgs84). All GPS devices had wide area augmentation system (WAAS) correction capability to ensure positional accuracy of down to 3 m in this region. The bathymetric data have the same horizontal accuracy. The 5 m contour lines were provided by the terrain model generated from the 1/10 000 scale aerial photographs taken in 2008. The hydrography was adjusted using these photographs and validated following the field survey.

615000 630000

6105000 6090000 6075000

55°10'N 55°N 54°50'N

67°20'W 67°W

DSO 4
Leroy 1
Goodwood
Sunny 3
Kivivic 1C
Kivivic 2
Kivivic 5
Sunny 2
Kivivic 3N
Kivivic 4
Sunny 1
Kivivic 3S

DSO 3
Barney 1
Barney 2
Timmins 4
Timmins 6
Timmins 8
Timmins 7
Elross 2
Sawmill 1
Timmins 1
Snow Lake 2
Snow Lake 1
Fleming 9
Timmins 3N
Fleming 7N
Aurora
Timmins 3S
Fleming 7X

DSO 2
Fleming 6
Lance Ridge 1
Star Creek 3
Star Creek 2
Ferriman 4

DSO 1
Gill (Ruth 1)
James (Ruth 10)
Knob Lake 1
Bean Lake
Redmond 5

LabMag

QUEBEC

NEWFOUNDLAND AND LABRADOR

Kawawachikamach
Lac John
Matimekush
Schefferville

LABRADOR SEA

LEGEND

Infrastructure And Mining Components

- DSO - Deposit
- LIM Project
- TSMC Project
- Proposed Howse Pit
- Proposed Low Grade/Overburden Stockpile
- Proposed Crushing/Screening Facility
- Proposed Waste Rock Dump

- DSO Howse Local study area
- DSO - Other Site
- Taconite - LabMag

Basemap

- Town
- Railroad
- Road
- Watercourse
- Waterbody
- Provincial Boundary

Figure 1

Location

Howse Minerals Limited

0 2,5 5 7,5 10

Kilometers

SCALE:
1:150 000

UTM 19N Nad 83

FILE, VERSION, DATE, AUTHOR:
GH-0466, 03, 2014-02-25, E.D., J.T.

SOURCES:

Map base
Government of Canada, NTDB, 1:50,000, 1979
SNC Lavalin, Groupe Hémisphères, Hydrology update, 2013.

Infrastructure and Mining Components
New Millennium Capital Corp., Mining sites and roads
TATA Steel Minerals Canada Limited/ MET-CHEM, Howse Deposit Design for General Layout., 2013

GroupeHemispheres

2 METHODOLOGY

2.1 Survey Methodology

Groupe Hémisphères reconnoitered the watercourses and waterbodies in and around the planned mine sites for fish habitat. It then conducted experimental fishing in the water bodies that contained water at the time of the visit. This survey was carried out in two phase. The first phase was conducted between August 28th and September 2nd, 2013, and a total of 8.3 km of watercourse and two (2) waterbodies was visited. The second phase was conducted on the July 4th and 6th, 2014 and one (1) waterbody was visited.

The methods used for experimental fishing were based on Portt *et al.* (2006), whereas the method used for characterization of habitats in waterbodies was based on Bradbury *et al.* (2001) and that for watercourses on Sooley *et al.* (1998).

The experimental licenses obtained from DFO is presented in Appendix I.

2.2 Waterbodies

Where the presence of fish was confirmed, the team established bathymetric and *in situ* physicochemical profiles, characterized the fish habitat, and sometimes evaluated water and sediment quality. Figure 2 shows the distribution of the sampling activities. Analysis of the above parameters served to quantify the fish habitat. Further details on sampling techniques are given below.

2.2.1 Bathymetrie

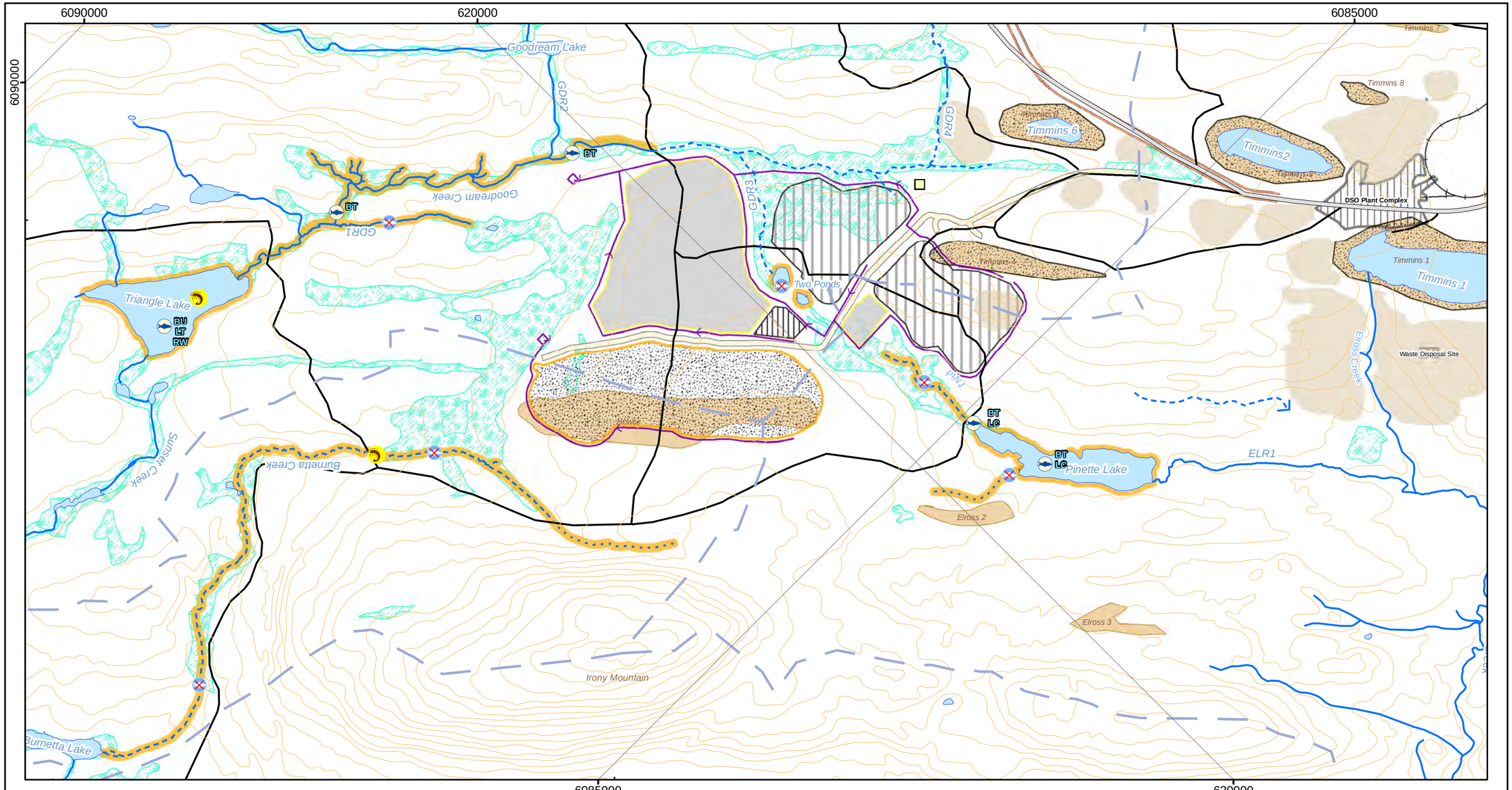
Bathymetric mapping was carried out using a small boat equipped with a Garmin GPSmap 420s sonar. Depth measurements were recorded every 10 m along transects covering the entire lake. The horizontal accuracy of the device was about 3 m and the vertical accuracy around 0.1 m. The water bodies' bathymetric profil was mapped, their deepest points identified, and aquatic habitats quantified. The data were mapped with ArcGIS 9.3.1 software, which was also used for the morphometric and volumetric analyses. Further calculations generated a biophysical description of the water bodies, including total area of the littoral and non-littoral zones, volume, maximum depth and elevation.

2.2.2 Water Quality

All water samples were taken 30 cm below the water surface at the deepest part of the lake—the most representative point in terms of the physicochemical characteristics of the waterbody as a whole—so that data could be compared over time and between waterbodies (MDDEP and CRE Laurentides 2009).

Water samples for physicochemical analysis were taken in Triangle Lake and sent to the Maxxam laboratory, accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL). The parameters analyzed were compared with the CCME water quality guidelines (protection of aquatic life) (CCME 1999). Duplicates were also sent to the laboratory for repeatability tests. If the recommendation were exceeded, the values were underlined in the tables.

In situ measurements were made in Triangle and Pinette lakes. The pH, temperature, conductivity were measured at 30 cm below the water surface and dissolved oxygen and temperature were measured over the entire water column over the deepest point of the lake using a Hanna portable probe (HI-9828060-1). Transparency was measured with a Secchi disk. Water samples were taken to measure turbidity with a portable LaMotte 2020e turbidimeter.



LEGEND

Surveys

Fish habitat

- Fish
- No fish

Fish species

- BT : Brook trout
- LT : Lake trout
- RW : Round whitefish
- BU : Burbot
- LG : Lake chub

- Benthos
- Lake And Stream Segments Surveyed

Basemap

- Permanent watercourse
- Intermittent watercourse
- Storm run-off
- Disappearing strem
- Artesian spring
- Waterbody
- Contour line (50 pi)
- Main access road
- Existing road
- Provincial Border
- Wetland
- Watershed Boundary

*Hydronyms are oriented along the direction of water flow

Infrastructure And Mining Components

- Potential Road to DSO Area 4
- Proposed Railroad
- Elross Lake Area Iron Ore Mine (ELAIOM) Plant Infrastructure footprint
- Existing Dump
- Deposit
- Other Pit
- Timmins 4 Sedimentation Pond-3
- Proposed Ditch
- Proposed Howse Pit
- Proposed Topsoil/ Overburden Stockpile
- Proposed Crushing/ Screening Facility
- Proposed Waste Rock Dump
- Proposed Sedimentation Pond
- Mine Haul Road

FILE, VERSION, DATE, AUTHOR:
GH-0470-02, 2014-10-01, E.D.

0 — 1 500

SCALE: 1:21 000 Meters UTM 19N NAD 83

SOURCES:

Basemap
Government of Canada, NTDB, 1:50,000, 1979
Government of NL and government of Quebec, Boundary used for claims,
Groupe Hémisphères, Hydrology and Wetland update, 2013

Infrastructure and Mining Components
New Millennium Capital Corp., Mining sites and roads
TATA Steel Minerals Canada Limited/
MET-CHEM, Howse Deposit Design for General Layout, 2013

Surveys
AMEC Earth and Environmental. (2009).
Fish and Fish Habitat Investigation for the Direct-Shipping Ore Project, New Millennium Capital Corp. Report TF8165902.
Prepared for Groupe Hémisphères, 39 pages and 3 appendices

Groupe Hémisphères (2013) Baseline Aquatic Fauna Characterization: Elross Lake Area Iron Ore Mine (ELAIOM) Environmental Effects Monitoring (EEM).
Field Report Submitted to TSMC, 12 pages and 2 appendices.

Fish And Fish Habitat

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Figure 2

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2.2.3 Sediment

Sediment was sampled in Triangle Lake using a Ponar sampler with a sampling area of 0.023 m² and a volume of 0.0024 m³ and a 500 µm mesh. Three grab were taken and combined, and the composite was used to fill the laboratory supplied containers. All instruments were cleaned with Alconox and rinsed thoroughly in water from the water body being sampled between each station. The samples were kept cold and sent to the MAXXAM laboratory for total extractible metals, total organic carbon and particle size analysis.

The parameters analyzed were compared with the CCME water quality guidelines (protection of aquatic life) (CCME 1999). Duplicates were also sent to the laboratory for repeatability tests. Thus the parameters can vary between stations. If the recommendation were exceeded, the values were underlined in the tables.

2.2.4 Benthos

The benthos was sampled in Triangle Lake using a Ponar sampler with a sampling area of 0.023 m² and a volume of 0.0024 m³ and a 500 µm mesh. The method consisted screening the complete content of a grab with a 500 µm sieve. The content of the sieve was then transferred to a watertight plastic jar containing 70% alcohol for subsequent identification. The procedure was repeated at three different places. All the benthos samples were sent to a laboratory for identification at the family level. Diversity indices were then estimated using standard methods: taxonomic richness (T), the Shannon-Wiener diversity index (H'), and the evenness (J'). Methods for calculation of those indices come from Krebs (1999). A family variation of the Hilsenhoff biotic index (FBI) was also calculated to provide an indication of the habitat quality.

2.2.5 Experimental Fishing

Minnow traps and gillnets standardized for Brook trout were used to determine the presence of fish in the waterbodies. The Minnow traps, baited with dog food, were installed in locations suitable for small fish. The gillnets, composed of multifilament (multi-41 model), were 22.86 m long by 1.83 m high and had six panels of 25.4 mm, 31.75 mm, 38.1 mm, 50.8 mm, 63.5 mm, and 76.2 mm mesh, respectively. The nets were installed perpendicular to the shore and distributed over the entire waterbody. They were strategically placed in order to sample the various environments suitable for fish in different habitats and at various depths to increase the chances of capturing a maximum number of species. The times at which the traps were installed and withdrawn were recorded in order to obtain the exact duration of sampling. The objective was to obtain a fishing effort equivalent to an overnight set of an 18 to 24 hour fishing period including the period between 6:00 p.m. and 9:00 a.m. the next morning. This is a standardized, comparative method of obtaining the catch per unit effort (CPUE) (Portt *et al.* 2006). For all the waterbodies in this survey in 2013, four minnow traps and three gillnets were installed overnight. As for Two Ponds, fished in 2014, one gillnet and five minnow traps were installed overnight.

The dead captured fish were kept on ice for subsequent examination. The number of individuals, as well as the species, length, weight, sex and stomach contents of all specimens were evaluated. Scales were collected from the first ten specimens of salmonids from each net to estimate the age of the fish populations, as necessary. The live fish captured in the minnow traps and gillnets were counted, identified, measured and weighted in the field and immediately returned to the water.

2.2.6 Characterization, Classification and Quantification of Fish Habitat

Fish habitat was characterized, classified and quantified in the waterbodies where experimental fishing had confirmed the presence of fish. The method prescribed in Bradbury *et al.* (2001) was used along with a habitat characterization field form developed by Groupe Hémisphères.

A DFO-generated spreadsheet was used for habitat quantification; this calculation file was used in conjunction with the habitat and species data collected in the field.

2.3 Watercourses

The method prescribed in Sooley *et al*. (1998) was used. A series of watercourses was selected using a map updated with photo-interpretation and field observations. The watercourses were divided into designated reaches based on flow topology. A reach could contain one or more homogeneous segments. One cross section per homogeneous segments served as a sampling location for analyzing, profiling and mapping. A watercourse habitat characterization field form developed by Groupe Hémisphères was used. Further details on sampling techniques are given below.

2.3.1 Water Quality

Surface water samples for physic-chemical analysis were taken in Burnetta Creek (Burnetta.d) and were treated in the same way as the surface water samples taken in the water bodies.

Water samples for physicochemical analyses were taken downstream from Burnetta Creek (Burnett.d) at mid-depth. *In situ* parameters, including temperature, pH and conductivity were measured using portable Hanna probe (HI 98129). Water samples were also taken to measure turbidity at the end of the day with a portable LaMotte 2020e turbidimeter.

2.3.2 Sediment Quality

Sediment was sampled in Burnetta Creek (Burnetta.d) using a trowel. Sediments from three sites within this homogeneous segment were mixed to provide a composite sample. This sample was treated in the same way as the sediment samples taken in the water bodies.

2.3.3 Benthos

The benthos was sampled in Burnetta Creek using a Mini-Surber benthos net with a sampling area of 0.023 m² and a 500 µm mesh collecting net. Sampling was conducted in segment Burnetta.d. The method consisted in cleaning the first 5 cm of substrate inside the sampling area with a soft brush or by hand for a period of five minutes. The content of the net was then transferred to a watertight plastic jar containing 70% alcohol for subsequent identification. The procedure was repeated at three different places, each time a little farther upstream to ensure that the sampling area had not been disturbed. The benthos samples were treated in the same way as the ones taken in the water bodies.

2.3.4 Index Electrofishing

The electrofishing techniques used were based on those of Scruton and Gibson (1995). For practical reasons and because the goal was essentially to identify the species present in the streams it was decided to opt semi-quantitative approach based on a length-frequency sampling using fixed electrofishing effort. We aimed for a fishing effort of about 300 seconds per 1,000 meters of stream length in order to ensure proportionality. At least one electrofishing session was carried out per habitat type in each watercourse. The fishing effort covered the entire stream. Sampling was done with an electrofishing device, and fish nets were held downstream to recover the fish. The team started sampling at the downstream end of a homogeneous segment and slowly moved upstream covering the entire width of the streambed. The electric current was turned on intermittently to avoid repelling the fish (Scruton and Gibson 1995). All the fish caught were kept in a pail containing water from the stream until the end of the sampling session. The length of the site, the number and species caught and the duration of the fishing session in electroseconds were recorded. All specimens were measured and weighed.

2.3.5 Characterization, Classification and Quantification of Fish Habitat

Fish habitat was characterized, classified and quantified in the watercourses. The method prescribed in Sooley *et al.* (1998) was used along with a habitat characterization field form developed by Groupe Hémisphères. Since the only species fished in all streams was the Brook Trout, it was decided to use solely the Beak (1980) classification system which is specifically designed to classify salmonid macro-habitats. Table 1 describes the categories of this classification.

Table 1. Characteristics of the Four Habitat Classification Types Identified by Beak (1980)

TYPE I	Good salmonid spawning and rearing habitat; often with some feeding pools for larger age classes: **flows**: moderate riffles **current**: 0.1 - 0.3 m/s **depth**: relatively shallow, 0.3 - 1 m **substrate**: gravel to small cobble size rock, some larger rocks or boulders **general habitat types**: primarily riffle, pool
TYPE II	Good salmonid rearing habitat with limited spawning, usually only in isolated gravel pockets, good feeding and holding areas for larger fish in deeper pools, pockets or backwater eddies: **flows**: heavier riffles to light rapids **current**: 0.3-lm/s **depth**: variable from 0.3 - 1.5 m **substrate**: larger cobble/rubble size rock to boulders and bedrock, some gravel pockets between larger rocks **general habitat types**: run, riffle, pocketwater, pool
TYPE III	Poor rearing habitat with no spawning capabilities, used for migratory purposes: **flows**: very fast, turbulent, heavy rapids, chutes, small waterfalls **current**: 1 m/s or greater **depth**: variable, 0.3 - 1.5 m **substrate**: large rock and boulders, bedrock **general habitat types**: run, pocketwater, cascades
TYPE IV	Poor juvenile salmonid rearing habitat with no spawning capability, provides shelter and feeding habitat for larger, older salmonid (especially brook trout): **flows**: sluggish **current**: 0.15 m/s **depth**: variable but often 1 m **substrate**: soft sediment or sand, occasionally large boulders or bedrock, aquatic macrophytes present in many locations **general habitat types**: flat, pool, glide

3 RESULTS

Photographs of the habitats surveyed can be seen in Appendix II and raw data can be consulted in Appendix III.

3.1 Water bodies

Both water bodies surveyed in 2013 are permanent lakes with tributaries and emissaries. The presence of fish was confirmed in both lakes. On the contrary, Two Ponds is composed of two isolated wetland ponds sheltering no fish. Therefore, only the lakes surveyed in 2013 have been characterised, classified and quantified for fish habitat.

3.1.1 Characterization, Classification and Quantification of Fish Habitat

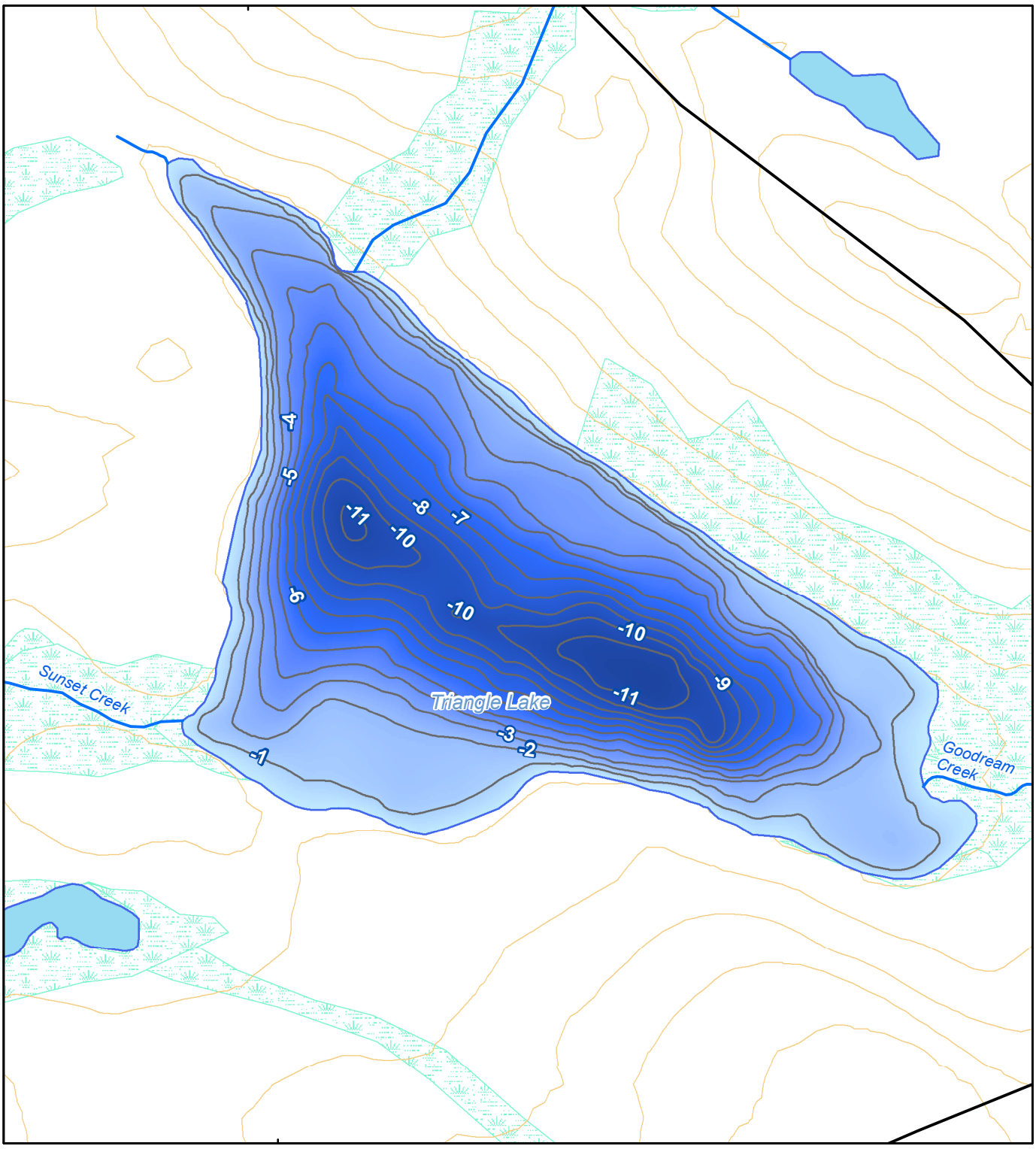
Triangle Lake

Triangle Lake is a natural lake with a few tributaries; the main one being Goodream Creek. The emissary is named for Sunset Creek. The lake has a total area of 20.8 ha with a maximum water depth of 11.9 m. The substrate composition consists mainly of silt with considerable proportions of cobbles, rubbles in the 0-1 m depth zone and blocs in the 1-2 m depth zone. Figure 3 presents the bathymetric profile. The littoral zone of Triangle Lake was homogeneous on its entire periphery and only one homogeneous segment was delimited. The littoral zone, going from 0 to 2 m water depth, circled the lake but was divided in two rings since coarser substrate was present in the 0 to 1 m water depth section.

Since Lake Trout is by far the most valuable species both in terms of social and economic value, the total habitat equivalent units (HEU) have been calculated for that species. In any case, this species presents the highest HEU of all the species present in that lake. Total HEU is therefore estimated at 12.6 ha and broken down as follows:

- 0.5 ha of Littoral Coarse, No Vegetation;
- 1.3 ha of Littoral Medium, No Vegetation;
- 1.7 ha of Littoral Fine, No Vegetation;
- 0.06 ha of Littoral Coarse, Vegetation;
- 0.4 ha of Littoral Fine, Vegetation;
- 0.1 ha of Pelagic Coarse; and
- 8.5 ha of Pelagic Fine;

Print screens of the DFO spreadsheet used can be seen in Appendix IV.



LEGEND

Basemap

- Bathymetric contour
- Permanent watercourse
- Intermittent watercourse
- Storm run-off
- Disappearing strem
- Artesian spring
- Waterbody
- Wetland
- Existing road
- Contour line (5m)

Figure 3

Bathymetric Map of Triangle Lake

Howse Minerals Limited

GroupeHemispheres

FILE, VERSION, DATE, AUTHOR:
GH-0514-02, 2014-11-13, E.D., J.T.

N

0 125 250

Meters

SCALE: 1:5 000

UTM 19N NAD 83

SOURCES:

Basemap
Government of Canada, NTDB, 1:50,000, 1979
Government of NL and government of Quebec,
Boundary used for claims,
Groupe Hémisphères, Hydrology and Wetland update, 2013

Infrastructure and Mining Components
New Millennium Capital Corp., Mining sites and roads
TATA Steel Minerals Canada Limited/
MET-CHEM, Howse Deposit Design for General Layout, 2013

Surveys
AMEC Earth and Environmental. (2009).
Fish and Fish Habitat Investigation for the Direct-Shipping Ore Project,
New Millennium Capital Corp. Report TF8165902.
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Groupe Hémisphères (2013) Baseline Aquatic Fauna Characterization:
Elross Lake Area Iron Ore Mine (ELAIOM) Environmental Effects
Monitoring (EEM).
Field Report Submitted to TSMC, 12 pages and 2 appendices.

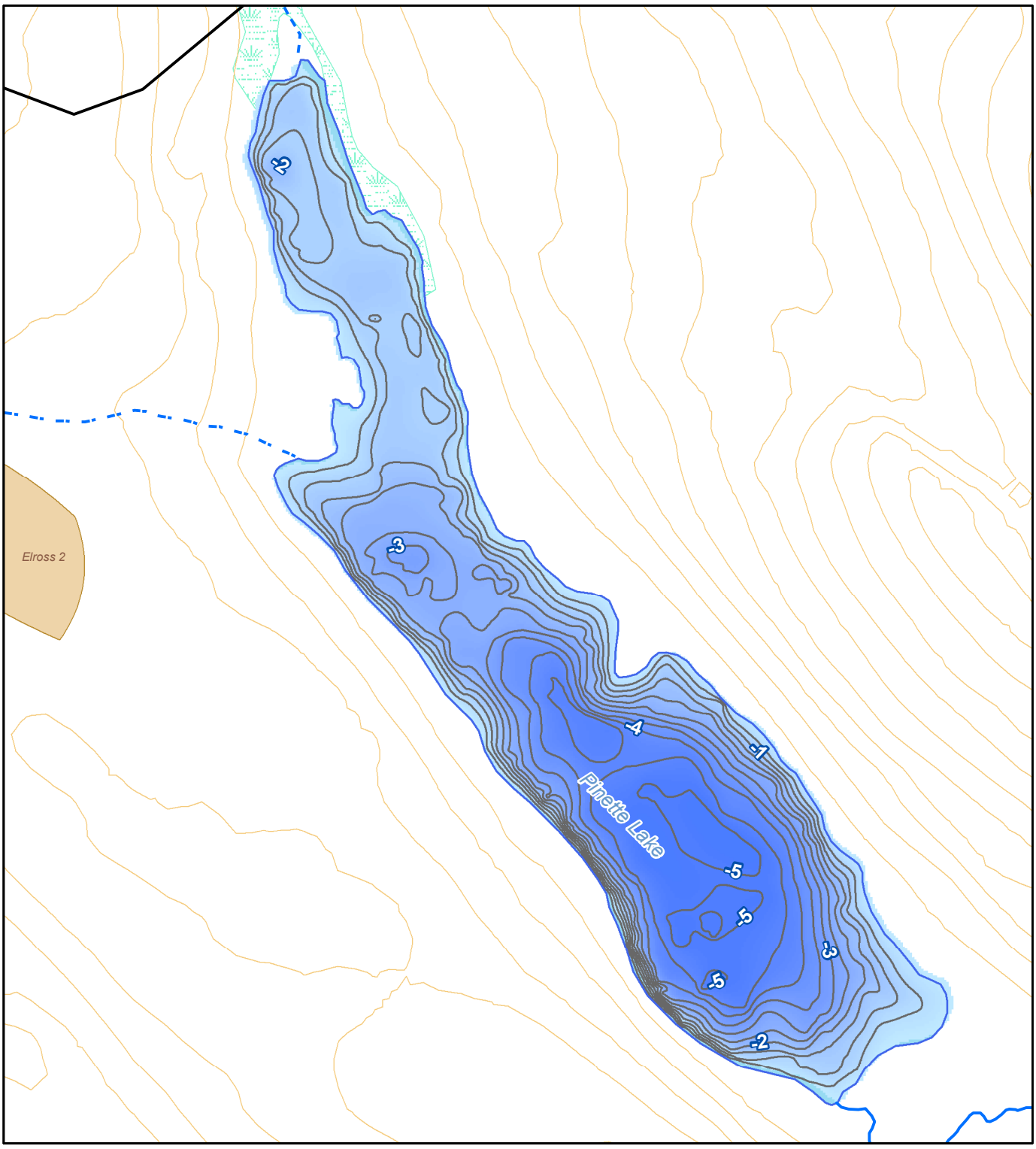
Pinette Lake

Pinette Lake, also known as Meneikshakikawiss by the First Nations, is a natural lake that is sometime used for recreation and fishing by local people. This lake has one identified tributary (PIN1) and an emissary named ELR1 jointing with Elross Creek downstream. The lake has a total area of 15.0 ha with a maximum water depth of 5.2 m. The substrate composition consists mainly of silt with variable amounts of cobbles, rubbles and boulders in the littoral zone. Figure 3 presents the bathymetric profile. The littoral zone of Pinette Lake was divided into six homogeneous segments homogeneous differentiated according to proportion of their different substrate classes and their vegetation cover.

Since Brook Trout is by far the most valuable species both in terms of social and economic value, the total habitat equivalent units (HEU) have been calculated for that species. In any case, this species presents the highest HEU of all the species present in that lake. Total HEU is therefore estimated at 9.3 ha and broken down as follows:

- 1.4 ha of Littoral Coarse, No Vegetation;
- 1.2 ha of Littoral Medium, No Vegetation;
- 1.7 ha of Littoral Fine, No Vegetation;
- 0.02 ha of Littoral Coarse, Vegetation;
- 0.04 ha of Littoral Medium, Vegetation
- 0.09 ha of Littoral Fine, Vegetation;
- 0.1 ha of Pelagic Coarse; and
- 4.8 ha of Pelagic Fine;

Print screens of the DFO spreadsheet used can be seen in Appendix IV.



LEGEND

Basemap

- Bathymetric contour
- Permanent watercourse
- Intermittent watercourse
- Storm run-off
- Disappearing strem
- Artesian spring
- Waterbody
- Existing road
- Contour line (5m)

*Hydronyms are oriented along the direction of water flow

Figure 4

Bathymetric Profile of Pinette Lake

Howse Minerals Limited

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FILE, VERSION, DATE, AUTHOR:
GH-0514-01, 2014-02-28, E.D., J.T.

N

0 125 250

Meters

SCALE: 1:5 000

UTM 19N NAD 83

SOURCES:

Basemap
Government of Canada, NTDB, 1:50,000, 1979
Government of NL and government of Quebec, Boundary used for claims,
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AMEC Earth and Environmental. (2009).
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Field Report Submitted to TSMC, 12 pages and 2 appendices.

3.1.2 Water Quality

In situ water quality measurements were made in Triangle and Pinette Lakes. These values are presented in Table 2, and the temperature and dissolved oxygen profile results are shown in Appendix III. Values are typical of the region with waters slightly acidic and very low to low conductivity.

Table 2. *In situ* Water Quality of Water Body

WATERBODY	SURVEY DATE	TEMPERATURE (°C)	PH	CONDUCTIVITY (µS/cm)	SECCHI (m)	DO (mg/L)
Pinette Lake	August 30 to 31, 2013	12.67	6.75	4	4.25	10.38
Triangle Lake	September 1 to 2, 2013	8.81	6.33	34	4.70	12.46

Both lakes showed no stratification and no major shift in parameters from surface to bottom, which is also typical of the region and the season of the survey.

Surface water samples were taken for laboratory analysis in Triangle Lake and the results are presented in Table 3. Most of the metals analyzed for in the laboratory were not detected. The only parameters that exceed the CCME guidelines were pH and aluminum, the former being the reason why the second exceeds. Indeed, when the pH is below 6.5, the guideline changes from 100 µg/L to 5 µg/L, making it difficult to respect. In any case, concentrations of aluminum are naturally high in the region (Groupe Hémisphères 2014a, Groupe Hémisphères and Groupe Synergis 2010, AMEC 2009). Due to the extremely low water hardness value, the criteria and recommendations based on them are extremely low, but they are nonetheless in compliance. The laboratory certificate is found in Appendix V.

Table 3. Laboratory Analysis Results for Surface Water Quality in Triangle Lake

PARAMETER	UNITS	RDL[1]	CCME[2]	RESULT
Conventional				
Acidity (CaCO3)	mg/L	10	-	10
Ammonia (N-NH3)	mg/L	0.02	32.4	0.02
Bicarbonates (HCO3 as CaCO3)	mg/L	1	-	15
Chloride (Cl)	mg/L	0.05	120	0.22
Conductivity	µS/cm	0.001	-	0.037
Fluoride (F)	mg/L	0.1	0.120	<0.1
Nitrate (N) and Nitrite (N)	mg/L	0.02	-	0.11
pH	pH	N/A	<6.5 or >9	6.33
Sulphate (SO4)	mg/L	0.5	-	2.2
Total Alkalinity (CaCO3) pH 4.5	mg/L	1	-	15
Total Phosphorus (TP)	µg/L	10	-	<10
Total Suspended Solids (TSS)	mg/L	2	-	3
Metal (total / dissolved)				
Aluminum (Al)	µg/L	10	5	18
Arsenic (As)	µg/L	1.0	5	<1.0
Cadmium (Cd)	µg/L	0.20	0.09	<0.20
Calcium (Ca)	µg/L	500	-	2700
Copper (Cu)	µg/L	1.0	2	<1.0
Total Hardness (CaCO3)	µg/L	1,000	-	16,000
Iron (Fe)	µg/L	60	300	75
Magnesium (Mg)	µg/L	100	-	2,300
Manganese (Mn)	µg/L	1.0	-	6,5
Molybdenum (Mo)	µg/L	1.0	73	<1.0
Mercury (Hg)	µg/L	0.10	0.026	<0.10
Nickel (Ni)	µg/L	2.0	25	<2.0
Lead (Pb)	µg/L	0.50	1	<0.50
Potassium (K)	µq/L	500	-	<500
Selenium (Se)	µg/L	3.0	1	<3.0
Sodium (Na)	µg/L	500	-	580
Uranium (U)	µg/L	1	15	<1.0
Zinc (Zn)	µg/L	7.0	30	<7.0

[1] RDL, Reported Detection Limit

[2] CCME (1999) Water Quality Guidelines for the Protection of Aquatic Life, when available

N/A = not applicable

3.1.3 Sediment Quality

Sediment quality analyses were also conducted on sediments from Triangle Lake. The results are presented in Table 4. Results were compared to the CCME Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. Two determining standard guidelines for sediment quality were identified on the basis of risk analysis studies done by the CCME:

- the interim sediment quality guideline (ISQG): when the concentration is exceeded without exceeding the threshold concentration producing the PEL. Within this range, adverse biological effects on biota are sometimes observed (25-50% of cases);
- the probable effect level (PEL): in this range, adverse biological effects on biota are frequently observed (more than 50% of cases).

The first ascertainment is that no parameter exceeds the PEL guidelines. Arsenic, cadmium and zinc concentrations exceed the ISQG, but those elements are naturally high in this region. Indeed, according to MDDEFP (1999), background values for those elements in the Labrador Trough geological province are 10, 1.5 and 230 mg/kg respectively for arsenic, cadmium and zinc. Taking that into account, only arsenic still surpasses the background value. Nevertheless, since this lake has not been impacted yet, this concentration represents the normal value for sediment in this water body.

Table 4. Laboratory Analysis Results for Sediment Quality in Triangle Lake

PARAMETER	UNITS	RDL[1]	CCME[2]		RESULT
			ISQG	PEL	
Conventional					
Total Organic Carbon (TOC)	% g/g	5	-	-	2.9
Metal (total / dissolved)					
Aluminum (Al)	mg/kg	20	-	-	12,000
Arsenic (As)	mg/kg	2	5.9	17	15
Cadmium (Cd)	mg/kg	0,2	0.6	3.5	0,8
Calcium (Ca)	mg/kg	30	-	-	1,200
Copper (Cu)	mg/kg	1	35.7	197.0	27
Iron (Fe)	mg/kg	10	-	-	95,000
Magnesium (Mg)	mg/kg	10	-	-	4,000
Manganese (Mn)	mg/kg	2	-	-	3,400
Molybdenum (Mo)	mg/kg	2	-	-	<2
Mercury (Hg)	mg/kg	0.05	0.170	0.486	0.13
Nickel (Ni)	mg/kg	1	-	-	31
Lead (Pb)	mg/kg	5	35.0	91.3	16
Potassium (K)	mg/kg	20	-	-	980
Selenium (Se)	mg/kg	10	-	-	<10
Sodium (Na)	mg/kg	10	-	-	41
Zinc (Zn)	mg/kg	5	123	315	150

[1] RDL, Reported Detection Limit

[2] CCME (1999) Sediment Quality Guidelines for the Protection of Aquatic Life, when available

Particle size analysis was also conducted on the sediment sample and the result is summarised at Figure 5.

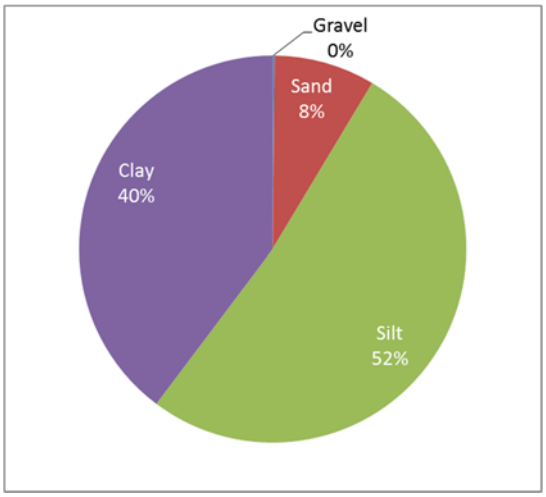

Figure 5. Particle Size Distribution of the Sediment in Triangle Lake

3.1.4 Benthos

Benthos was collected in Triangle Lake. Only three individuals where identified in the triplicate and they were all bivalves from the same family, namely the *Sphaeriidae*. Therefore, no statistics could be calculated for that site. Details of the identification can be seen in Appendix VI.

3.1.5 Experimental Fishing

Fishing effort figures are presented in Table 5. Five (5) species of fish were captured in the lakes of the study area, i.e., Burbot (*Lota lota*), Lake Trout (*Salvelinus namaycush*), Round Whitefish (*Prosopium cylindraceum*), Lake Chub (*Couesius plumbeus*) and Brook Trout (*Salvelinus fontinalis*). Triangle Lake is deeper and is populated by Lake Trout, Whitefish and Burbot, while Pinette Lake is shallower and sits at a higher elevation and is populated by Brook Trout and Lake Chub.

Table 5. Fishing Effort by Waterbodies

WATERBODY	AREA (m²)	ENGINE	NB OF ENGINE	SPECIES	NB OF INDIVIDUALS	CPUE (catch/engine*night)
Triangle Lake	208,374	Minnow Trap	4	Burbot	1	0.25
		Gillnet	3	Lake Trout Round Whitefish	17 13	5.67 4.33
Pinette Lake	150,181	Minnow Trap	4	Lake Chub	14	3.50
		Gillnet	3	Brook Trout Lake Chub	20 34	6.67 11.33
Two Ponds	8,549 +3,251	Minnow Trap	5	-	0	0
		Gillnet	1			

3.2 Watercourses

Four (4) watercourses were surveyed in the study area: PIN1, Goodream Creek, GDR1 and Burnetta Creek. Goodream Creek is a permanent streams downstream of the access road between GDR2 and GDR3 junctions, but is intermittent upstream from that crossing. The three other watercourses are intermittent, with their surface flow disappearing underground in many sections, even though the flow is surficial in other sections (Groupe Hémisphères 2014b). This is common in this sector where soil permeability is known to be very important. Fish was caught only in Goodream Creek, but some fishes were seen at the mouth of PIN1. Photos and raw data can be consulted in Appendix II and III respectively.

3.2.1 Characterization, Classification and Quantification of Fish Habitat

PIN1

PIN1 is the only tributary to Pinette Lake and has an intermittent water flow. It's about 550 m long and is mostly flat in its downstream section (first 130 m) and alternates between riffles and runs in its upstream section before it disappears completely underground. Its channel width is around 0.5 m except for a pool about 20 m wide. **The first 185 m (PIN1.a) are considered as Type IV** habitat according to Beak (1980), but **the intermittent upstream sections are not considered fish habitat** (Table 10). Its substrate is a mix of sand, gravel, cobble and rubble at its mouth, but muck and silt dominate the substrate in the other segments. Riparian vegetation cover is important and there are some aquatic plants in the pool. The downstream segment is braided and could represent an obstacle to fish passage in dryer times and the stream completely disappears in a wetland at about 220 m from Pinette Lake, representing a permanent obstacle to fish passage.

Based on the substrate and water velocity data collected, the total HEU was calculated to be of 185 m² of Type IV habitat in segment PIN1.a.

Details of the calculation can be seen in Appendix VII.

Goodream Creek

Goodream Creek is the major stream of the study area. It is about 4.5 km in length and has a permanent water flow for most of its length except for the last upstream 2 km showing intermittent water flow. Only the permanent downstream first 2.5 km have been characterized in 2013 since the intermittent upstream section was already characterized and fished in previous aquatic surveys (AMEC 2009, Groupe Hémisphères 2014a, 2013a, 2013b, 2010). **The first 560 m (Goodream.a, b and c) are considered as Type II** habitats and are mostly rapids with some running sections and a little flat section at the mouth of the stream. The substrate is dominated by medium sized substrates with some blocks and some boulders in the rapids. Vegetation cover is unimportant. **The next 240 m (Goodream.d) are considered as Type IV habitats**. This segment is heavily braided and is considered a seasonal obstacle to fish passage. It is mostly flat with a few riffles and its substrate is dominated by silt with some blocs and rubbles. It is flowing in a wetland area and the riparian vegetation covers about 40% of the watercourse. **The next 1,300 m (Goodream.e) are considered as Type II habitats**. It consists mainly of riffles and runs with medium to coarse substrate with a considerable amount of organic matter originating from the riparian wetland. Riparian vegetation covers between 10 to 20% of the watercourse. **The next 590 m (Goodream.f and g) are considered as Type IV habitats**. It is a flat sluggish area created by the presence of beaver dams at its downstream end. It is wide for the first 300 m and retracts to about 1.5 m width in its upstream end. The substrate is a mix of sand and silt with variable amounts of medium substrate. **The last 220 m characterised (Goodream.h) are considered as Type II habitats**. The wet width is of about 2.5 m and the substrate is dominated by cobbles and rubbles. Riparian vegetation covers about 10% of the watercourse. The stream then crosses an access road and is considered intermittent in its upstream section not characterized in 2013. Fish was caught in different segments of this stream.

Based on the substrate and water velocity data collected, the total HEU was calculated to be of 10,593 m² broken down as:

- 7,735 m² of Type II habitat; and
- 2,858 m² of Type IV habitat.

Details of the calculation can be seen in Appendix VII.

GDR1

GDR1 is an intermittent tributary to Goodream Creek. It is originating in a wetland area. Its flow is braided and disappears underground in places, which represents a seasonal obstacle to fish passage. It's about 707 m long and alternates between riffles and flats. **It is not considered as fish habitat.** The braided channels are between 0.5 to 1 m wide throughout a width of 20 to 50 m and present a substrate dominated by fine particles accompanied by considerable amounts of cobbles and rubbles in its upstream half. Riparian vegetation covers from 50 to 100% of the watercourse.

Since this stream is not considered fish habitat, no HEU was calculated.

Burnetta Creek

Burneta Creek is a tributary to Burnetta Lake that circumvents the north side of Irony Mountain. Its flow is intermittent at mid-course over most of its 4,100 m. **The first 1,200 m (Burnetta.a and b) are not considered fish habitat.** Indeed, it is both intermittent en highly braided and is considered an obstacle to the passage of fish. As a matter of fact, a proper channel could not even be found in some areas and the water flow is believed to be subterranean in those areas. The second part of the stream (2,900 m; Burnetta.c and d) could be considered as Type II habitat with it medium to coarse substrate and is riffle type flow but the low water depth (<10cm) is limiting. Since segments a and b are considered an obstacle to fish passage and since no fish habitat exists upstream, **this section is also not considered fish habitat**. The fishing results corroborate this affirmation (Table 10). After segment d, the channel disappears.

Since this stream is not considered fish habitat, no HEU was calculated.

3.2.2 Water Quality

In situ water quality measurements were taken in all watercourses visited. These values are presented in Table 6. Values are typical of the region with waters slightly acidic with low conductivity and turbidity.

In August 2013, the significantly lower temperature in Goodream Creek and GDR1, a tributary, is probably due to the fact that they are largely fed by groundwater resurgences in the surrounding wetland. Higher conductivity values observed in Goodream Creek and GDR1 seems to confirm this hypothesis since groundwater is generally known to be more conductive. It is also notable that all the pH values are acidic.

A great variation of the pH is also notable in PIN1 and Goodream Creek, but no correlation with other parameters is evident.

Table 6. *In situ* Water Quality of Watercourses

WATERCOURSE	SURVEY DATE	TEMPERATURE (°C)	PH	CONDUCTIVITY (µS/cm)	TURBIDITY (NTU)	DO (mg/L)
PIN1	June 9, 2013	-	6.38	-	-	-
	August 14, 2013	6.3	6.38	4	1.3	-
	August 28, 2013	9.0	5.90	7	0.31	10.38
	October 9, 2013	-	6.35	5	0.9	-
	June 10, 2014	8.2	5.94	4	1.1	-
	July 14, 2014	13.0	6.82	14	0.7	-
	August 20, 2014	-	5.85	4	0.7	-
	September 29, 2014	-	6.39	5	0.9	-
Goodream Creek	June 10, 2013	-	7.25	-	-	-
	August 14, 2013	6.3	5.87	3	1.5	-
	August 28-29, 2013	3.8	5.69	41	-	13.12
	October 9, 2013	-	7.15	25	0.4	-
	June 10, 2014	6.1	5.84	3	0.7	8.93
	July 14, 2014	10.3	6.41	9	0.3	5.26
	September 29, 2014	-	5.82	5	2.5	-
GDR1	August 29, 2013	3.8	5.69	41	-	13.12
Burnetta Creek	August 29, 2013	6.4	5.39	6	0.45	10.59

Surface water samples were also taken for laboratory analysis in many of the watercourses and results are presented in Table 7. Most metals analyzed for in the laboratory were not detected. The main parameters that did not respect the CCME guidelines were pH and aluminum, the former modifying the second as discussed earlier in the water bodies section. The laboratory certificate is found in Appendix V. There was also an exceedance of iron in Goodream Creek in September 2014, but by only 3.3% and the occurrence seems to be unique.

Table 7. Laboratory Analysis Mean Results for Surface Water Quality in Watercourses

PARAMETER	UNITS	CCME[1]	BURNETTA CREEK	PIN1							GOODREAM CREEK					
			Aug 29 2013	Sep 29 2014	Aug 20 2014	Jul 14 2014	Jun 10 2014	Oct 9 2013	Aug 14 2013	Jun 9 2013	Sep 29 2014	Jul 14 2014	Jun 10 2014	Oct 9 2013	Aug 14 2013	Jun 10 2013
Conventional																
Acidity (CaCO3)	mg/L	-	<10	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia (N-NH3)	mg/L	32.4	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	-	<0.02	0,02	<0.02	<0.02	<0.02	<0.02
Bicarbonates (HCO3 as CaCO3)	mg/L	-	2	2	<1	6	2	2	2	2	<1	4	1	8	<1	1
Chloride (Cl)	mg/L	120	0.11	0.13	0.06	0.06	0.10	0.11	0.08	0.07	0.27	<0.05	0,07	0,11	<0.05	<0.05
Conductivity	µS/cm	-	5	5	4	14	4	5	4	-	5	9	3	25	3	-
Fluoride (F)	mg/L	0.120	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (N) and Nitrite (N)	mg/L	-	<0.02	0.03	-	0.02	0.02	0.19	<0.02	<0.02	<0.02	<0.02	<0.02	0,10	<0.02	<0.02
pH	pH	<6.5 or >9	5.39	6.39	5.85	6.82	5.94	6.35	6.38	6.38	5.82	6.41	5.84	7.15	5.87	7.25
Sulphate (SO4)	mg/L	-	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.9	0.9	<0.5
Total Alkalinity (CaCO3) pH 4.5	mg/L	-	23	2	<1	6	2	2	2	2	<1	4	1	8	<1	1
Total Phosphorus (TP)	µg/L	-	<10	<10	21	<10	20.00	120	<10		<10	<10	<10	<10	<10	-
Total Suspended Solids (TSS)	mg/L	-	5	<2	<2	<2	<2		3	<2	<2	<2	<2		7	2
Metal (total / dissolved)																
Aluminum (Al)	µg/L	5-100	130	17	13	12	17	17	32	17	120	38	75	<10	76	53
Arsenic (As)	µg/L	5	<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 (Cd)	µg/L	0.09	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Calcium (Ca)	µg/L	-	<500	<500	<500	<500	<300	<500	<500	<300	<500	<500	450	2300	<500	<300
Copper (Cu)	µg/L	2	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	1.9	<0.50	<1.0	<1.0	<0.50	<1.0	1.0	<0.50
Total Hardness (CaCO3)	µg/L	-	1.200	1800	1300	1400	1500	1700	<1000		1800	2100	1800	11000	<1000	-
Iron (Fe)	µg/L	300	220	<60	84	62	<100	200	140	140	310	66	<100	<60	160	<100
Magnesium (Mg)	µg/L	-	290	210	190	200	180	220	220	200	210	220	180	1300	<100	170
Manganese (Mn)	µg/L	-	23	3.6	3.0	2.3	6.5	12.0	8.0	22.0	18.0	1.9	4.2	3.2	33.0	4.7
Molybdenum (Mo)	µg/L	73	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50	<1.0	<1.0	<0.50
Mercury (Hg)	µg/L	0.026	<0.10	<0.01	<0.01	<0.10	<0.10	<0.10	<0.10	-	<0.01	<0.10	<0.10	<0.10	<0.10	-
Nickel (Ni)	µg/L	25	<2.0	<2.0	<2.0	<2.0	<1.0	<2.0	<2.0	<1.0	<2.0	<2.0	1,2	<2.0	3,5	<1.0
Lead (Pb)	µg/L	1	<0.50	<0.50	<0.50	<0.50	<0.10	<0.50	<0.50	<0.10	<0.50	<0.50	<0.10	<0.50	<0.50	<0.10
Potassium (K)	µg/L	-	<500	<500	<500	<500	<100	<500	<500	<100	<500	<500	<100	<500	<500	<100
Selenium (Se)	µg/L	1	<3.0	<3.0	<3.0	<3.0	<1.0	<3.0	<3.0	<1.0	<3.0	<3.0	<1.0	<3.0	<3.0	<1.0
Sodium (Na)	µg/L	-	<500	700	<500	<500	410	720	540	390	840	<500	490	<500	<500	390
Uranium (U)	µg/L	15	<1.0	<1.0	<1.0	<1.0	<1.0	24	-	-	<1.0	<1.0	<1.0	<10	-	-
Zinc (Zn)	µg/L	30	<7.0	<7.0	11	<7.0	<5.0	<7.0	<7.0	<5.0	7.3	<7.0	25	11	<7.0	<5.0

[1] CCME (1999) Water Quality Guidelines for the Protection of Aquatic Life, when available

N/A = not applicable

3.2.3 Sediment Quality

Sediment quality analyses were also conducted on sediments from Burnetta Creek. The results are presented in Table 8 and were treated in the same manner as those from the water bodies.

The first ascertainment is that no parameter exceeds the PEL guidelines. Arsenic concentrations exceed the ISQG, but this element is naturally high in this region. Indeed, according to MDDEFP (1999), background values for this element in the Labrador Trough geological province is 10 mg/kg. Still, arsenic also surpasses the background value. Nevertheless, since this stream has not been impacted by anything but path fording, this concentration represents the normal value for this watercourse.

Table 8. Laboratory Analysis Results for Sediment Quality in Burnetta Creek

PARAMETER	UNITS	RDL[1]	CCME[2]		RESULT
			ISQG	PEL	
Conventional					
Total Organic Carbon (TOC)	% g/g	5	-	-	1
Metal (total / dissolved)					
Aluminum (Al)	mg/kg	20	-	-	9,100
Arsenic (As)	mg/kg	2	5.9	17	15
Cadmium (Cd)	mg/kg	0,2	0.6	3.5	0.3
Calcium (Ca)	mg/kg	30	-	-	350
Copper (Cu)	mg/kg	1	35.7	197.0	22
Iron (Fe)	mg/kg	10	-	-	91,000
Magnesium (Mg)	mg/kg	10	-	-	4,200
Manganese (Mn)	mg/kg	2	-	-	1,700
Molybdenum (Mo)	mg/kg	2	-	-	3
Mercury (Hg)	mg/kg	0.05	0.170	0.486	0.06
Nickel (Ni)	mg/kg	1	-	-	23
Lead (Pb)	mg/kg	5	35.0	91.3	14
Potassium (K)	mg/kg	20	-	-	630
Selenium (Se)	mg/kg	10	-	-	<10
Sodium (Na)	mg/kg	10	-	-	28
Zinc (Zn)	mg/kg	5	123	315	69

[1] RDL, Reported Detection Limit

[2] CCME (1999) Sediment Quality Guidelines for the Protection of Aquatic Life, when available

Particle size analysis was also conducted on the sediment sample and the result is summarised at Figure 6.

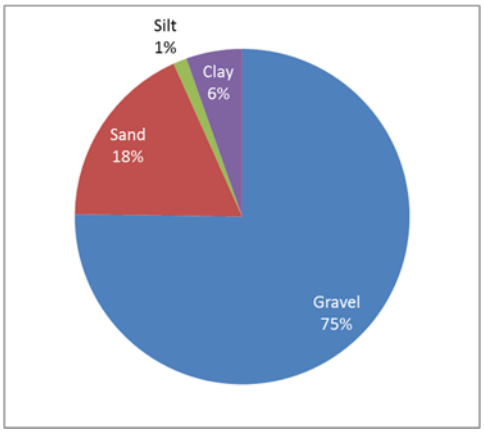

Figure 6. Particle Size Distribution of the Sediment in Burnetta Creek

3.2.4 Benthos

Benthos was collected in Burnetta Creek. Table 9 shows the statistics calculated from the identification of the organisms sampled Details of the identification can be seen in Appendix VI.

Table 9. Benthos Statistics for Burnetta Greek

STATISTIC	TRIPLICATE			MEAN	SRD. DEV.
	A	B	C		
Number of organisms (N)	11	11	4	8,67	4,04
Taxonomic richness (T)	4	3	3	3,33	0,58
Shannon-Weiner diversity index (H')	1,79	1,10	1,50	1,46	0,35
Equitability (J')	0,89	0,69	0,95	0,84	0,13
Hilsenhoff index – family level (FBI)	5,55	7,82	7,00	6,79	1,15

The FBI value is somewhat elevated and would correspond to a very substantial organic pollution, but the intermittent nature of the stream could also explain this value by selecting species more tolerant to drought. Indeed, apart from some TSS generated by fording in one place upstream, no evident pollution sources exist yet in this stream's watershed.

3.2.5 Index Electrofishing

Fishing effort figures are presented in Table 10. Brook Trout was the only species captured by electrofishing and they were all caught in Goodream Creek.

Table 10. Electrofishing Effort in Watercourses of the Study Area

WATERBODY	SEGMENT FISHED	DURATION (ES*)	SETINGS	SPECIES	NB OF INDIVIDUALS	CPUE (catch/300 ES)
PIN1	a, b, c	146	500V, DC	-	0	0
Goodream	b	104	500V, DC	Brook Trout	4	11.54
GDR1	Not fished, no habitat					
Burnetta Creek	c, d	121	500V, DC	-	0	0

* ES = Electroseconds or the amount of time, in seconds, that a current is actually being applied to the water

All individuals captured were below 10 cm in length and suggests that the stream is mainly used as a rearing habitat since not adult fishes where caught, even though it was the spawning season. Results from Groupe Hémisphères (2013a) corroborate this interpretation.

4 CONCLUSION

The only two water bodies studied are Pinette Lake and Triangle Lake. They respectively represent 9.3 ha and 12.6 ha of HEU. Fishes caught in Triangle Lake are Lake Trout, Round Whitefish and Burbot, whereas Brook Trout and Lake Chub were captured in Pinette Lake. These types of lakes are common in the region and do not represent unique habitats but they are nonetheless good fish habitat and will have to be taken into account for impact assessment.

Four streams were characterised and fished. Of the lot, only Goodream Creek and the downstream end of PIN1 are considered fish habitats. They respectively represent 10,593 and 185 m² of HEU. Goodream Stream, because of its proximity to the projected infrastructures and because of the large area of habitat it represents is definitely the most sensible element of the aquatic environment to take into account for impact assessment.

5 REFERENCES

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APPENDICES

Appendix I

Experimental Licence

Fisheries and Oceans | Pêches et Océans

2013

EXPERIMENTAL LICENCE

NL-1659-13
Amendment 2

Groupe Hemispheres
1453, rue Beaubien est, Bureau 301
Montreal, Quebec H2G 3C6

Contact: Simon Barrette 514-509-6573 #23

Pursuant to Section to Section 52 of the Fishery (General) Regulations, permission is hereby granted to **Groupe Hemispheres**, or their designate(s), to conduct fish monitoring under the following conditions:

1. This licence is effective from **August 19, 2013** to **September 6, 2013.**

2. **Areas to be fished:** DSO mining complex north of Schefferville (See attached map).

3. **Designates:** Simon Barrette, Elissa Dickoum

4. **Species:** The following species are permitted to be caught and released alive, in the waters from which they were caught: 500 Brook Trout, 100 Lake Trout, 100 White Suckers, 100 Longnose Suckers, 100 Lake Whitefish, 50 Round Whitefish, 40 Mottled Sculpin, 40 Burbot, and 100 Lake Chub.

5. **Sampling:** Scale sampling will be conducted on the first 10 salmonids over 10 cm in length per stream station or per gillnet.

6. **Gear to be Used:** Electrofisher, 4 gillnets and minnow traps.

   Electrofishing methodology should be adopted from the following reference: Scruton, D.A. and R.J. Gibson. 1995, Quantitative Electrofishing in Newfoundland and Labrador. Results of Workshops to Review Current Methods and Recommended Standarization of Techniques. Can. Manuscr. Rep. Fish. Fish Aquat. Sci. 2308: vii + 145 pp.

   Electrofishing may only be conducted in streams between July 24, 2012, and September 15, 2012 and at water temperatures 18°C or less.

7. Fish caught under the authority of this licence cannot be traded, sold or bartered.

8. If there are any unusual mortalities or diseases identified, please notify Dr. John Brattey, Fish Health Protection Officer, Fisheries & Oceans Canada, PO Box 5667, St. John's, NL A1C 5X1.

9. An electronic report of catch information is to be sent to Carole Grant, Fisheries & Oceans Canada, PO Box 5667, St. John's, NL A1C 5X1. This report shall reference licence # NL- 1645-13 and shall include the date fished, water body fished, species identified, and numbers caught and shall be submitted within 90 days of the licence end date.

10. Prior to activities taking place, the Field Supervisor, Conservation and Protection, Fisheries & Oceans Canada shall be notified verbally of your activities (**Goose Bay (709) 896-6153).**

Canada

2013

EXPERIMENTAL LICENCE

NL-1659-13
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1453, rue Beaubien est, Bureau 301
Montreal, Quebec H2G 3C6

Contact: Simon Barrette 514-509-6573 #23

11. Request for amendments to this licence (i.e. Changes or additions to species, quantities, gear, etc.) must be made in writing to Licencing Services, Fisheries & Oceans Canada, PO Box 5667, St. John's, NL A1C 5X1. Phone 772-3687, Fax 772-5133, Email experimentallicenses@dfo-mpo.gc.ca

12. This licence must be carried at all times and must be produced for inspection upon the request of a Fishery Officer.

Fisheries and Oceans | Pêches et Océans

2013

EXPERIMENTAL LICENCE

NL-1659-13
Amendment 2

Groupe Hemispheres
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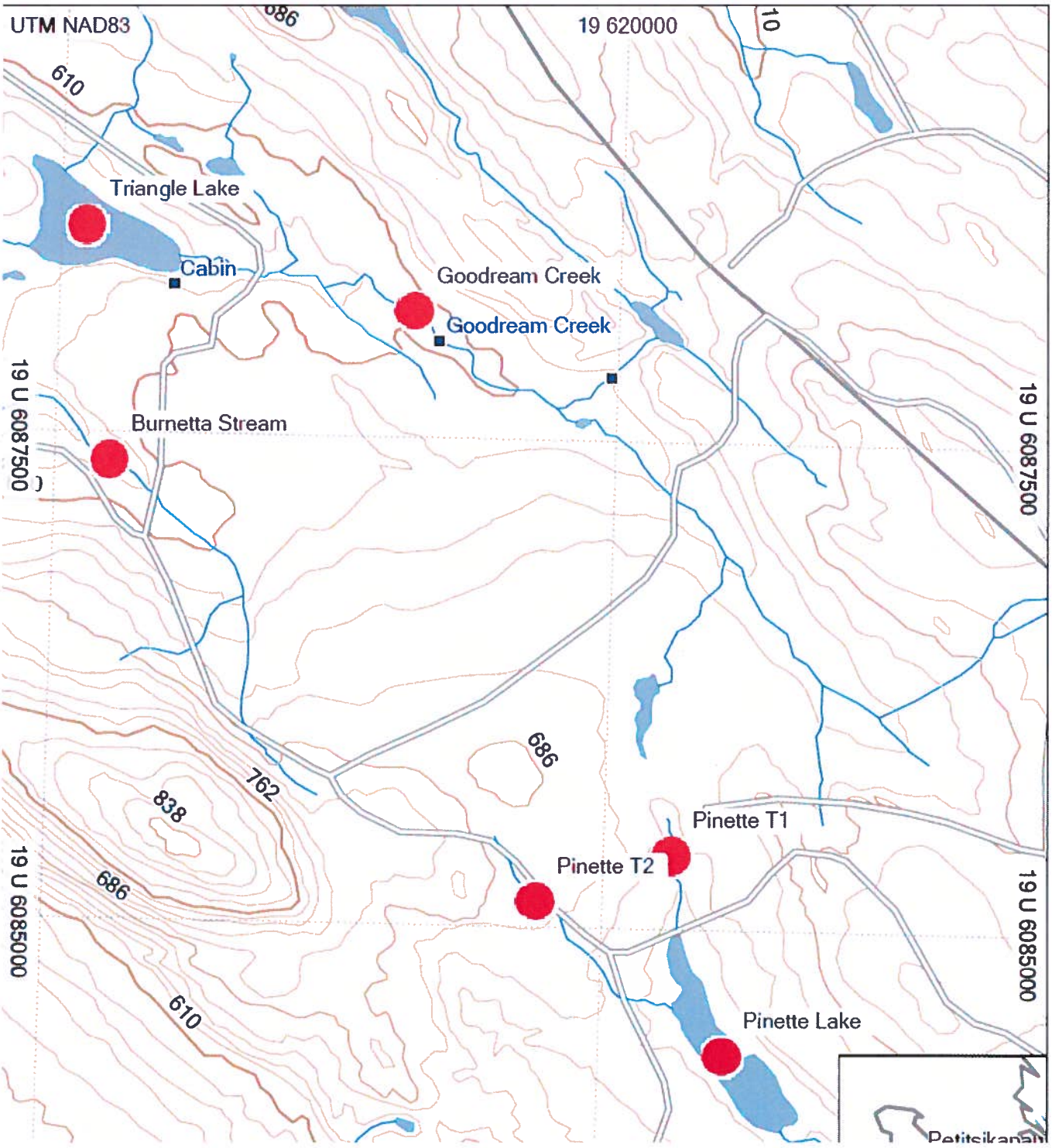
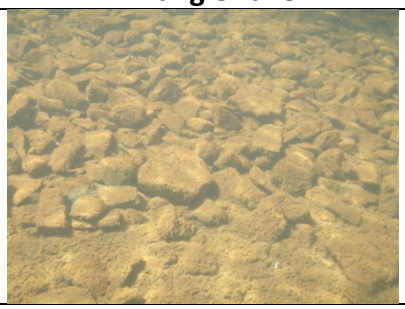
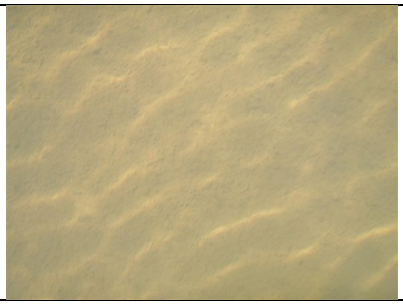
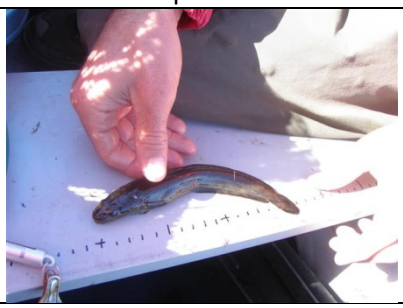
Montreal, Quebec H2G 3C6

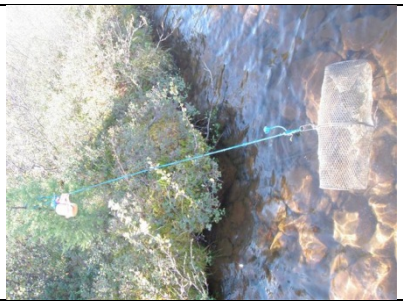
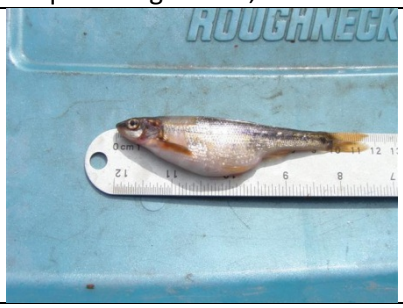
Contact: Simon Barrette 514-509-6573 #23

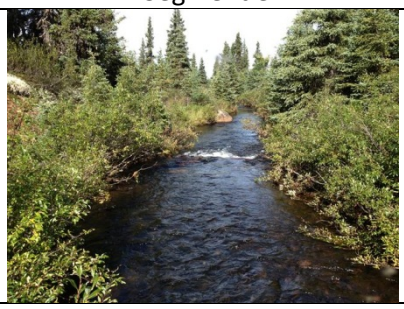


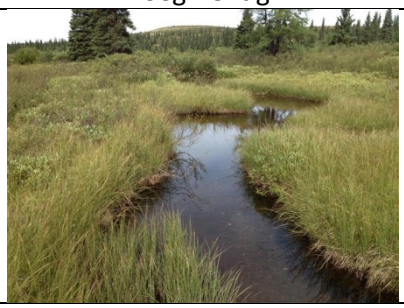
Appendix II

Photographs

Triangle Lake		
		
Riparian vegetation	0-1m depth substrate	1-2m depth substrate
		
Lake Trout	Round Whitefish	Burbot

Pinette Lake		
		
General view	Riparian vegetation	Aquatic vegetation, north end
		
Minnow trap installed	Brook Trout	Lake Chub

Goodream Creek		
Upstream	**Downstream**	**Substrate**
Segment a		
		
Segment b		
		
Segment c		
		
Segment e		
		

Segment f		
		
Segment g		
		
Segment h		
		

GDR1		
Upstream	**Downstream**	**Substrate**
Segment b		
		
Segment c		
		
Segment d		
		
Segment e		
		

PIN1		
Upstream	**Downstream**	**Substrate**
Segment a		
		
Segment b		
		
Segment c		
		
Segment d		
		
Segment e		



Segment f



Burnetta Creek		
Upstream	**Downstream**	**Substrate**
Segment a		
		
Segment b		
		
Segment c		
		
Segment d		
		

Appendix III

Raw Data:

Watercourse characterization

Lake Characterization

Lake Experimental Fisheries

#	Project	Team	Date	Meteo				Reach	Segment	GPS			Photo	Water Color	Commentary
				General	T°C	Cloud				Start	Cut	End			
1	HOWSE	SB, ED	2013-08-28	BEAU	13	0	/8	PIN1	A	391	392	394	IPHONE	CLAIRE	ANASTOMOSÉ; 20E D'OMBLE OBSERVÉS
2	HOWSE	SB, ED	2013-08-28	BEAU	13	0	/8	PIN1	B	394		395	IPHONE	CLAIRE	PAS DE POISSON
3	HOWSE	SB, ED	2013-08-28	BEAU	13	0	/8	PIN1	C	395	396	397	IPHONE	CLAIRE	PÊCHE DANS A, B, C : 146s, 500V, DC – PAS DE POISSON
	HOWSE	SB, ED	2013-08-28	BEAU	13	0	/8	PIN1	D	397	398	399	IPHONE	CLAIRE	MILIEU HUMIDE
4	HOWSE	SB, ED	2013-08-28	BEAU	13	0	/8	PIN1	E	399	400	401	IPHONE	CLAIRE	
5	HOWSE	SB, ED	2013-08-28	BEAU	13	0	/8	PIN1	F	401	402	403	IPHONE	CLAIRE	
							/8				404		IPHONE	CLAIRE	NAISSANCE DU COURS = RÉSURGENCE
6	HOWSE	SB, ED	2013-08-28	BEAU	15	0	/8	GOODREAM	A	407	406	408	IPHONE	CLAIRE	
7	HOWSE	SB, ED	2013-08-28	BEAU	15	0	/8	GOODREAM	B	408	409	410	IPHONE	CLAIRE	
8	HOWSE	SB, ED	2013-08-28	BEAU	15	0	/8	GOODREAM	C	410	412	411	IPHONE	CLAIRE	
9	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GOODREAM	D	411		421	IPHONE	CLAIRE	ANASTOMOSÉ
10	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GDR1	A	413		415	-	PEU TURBIDE	
11	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GDR1	B	415		414	IPHONE	PEU TURBIDE	ANASTOMOSÉ
12	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GDR1	C	414	416	417	IPHONE	PEU TURBIDE	
13	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GDR1	D	417		418	IPHONE	PEU TURBIDE	
14	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GDR1	E	418	419	420	IPHONE	PEU TURBIDE	ANASTOMOSÉ
15	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GOODREAM	E	421	422		IPHONE	CLAIRE	
16	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GOODREAM	E		423		IPHONE	CLAIRE	
17	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GOODREAM	E		424		IPHONE	CLAIRE	
18	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GOODREAM	E		425	426	IPHONE	CLAIRE	
19	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GOODREAM	F	426		427	IPHONE	CLAIRE	ÉTANG DE CASTOR
20	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GOODREAM	G	427	428	429	IPHONE	CLAIRE	ANASTOMOSÉ
21	HOWSE	SB, ED	2013-08-29	BEAU	10	2	/8	GOODREAM	H	429	430	431	IPHONE	PEU TURBIDE	SUBSTRAT SEMI-COLMATÉ
22	HOWSE	SB, ED	2013-08-29	NUAGEUX	16	7	/8	Burnetta Creek	A	432	433				ANASTOMOSÉ
23	HOWSE	SB, ED	2013-08-29	NUAGEUX	16	7	/8	Burnetta Creek	B		435				ANASTOMOSÉ
24	HOWSE	SB, ED	2013-08-29	NUAGEUX	16	7	/8	Burnetta Creek	C		436				BASSIN DE 8M; EF:49s à 500V, DC - PAS DE POISSON
25	HOWSE	SB, ED	2013-08-29	NUAGEUX	16	7	/8	Burnetta Creek	D		437				EF: 72s à 500V, DC - PAS DE POISSON
26	HOWSE	SB, ED	2013-08-29	NUAGEUX	16	7	/8	Burnetta Creek			438				PAS DE LIT D'ÉCOULEMENT
27	HOWSE	SB, ED	2013-08-29	NUAGEUX	16	7	/8	Burnetta Creek			439				INFILTRATION SOUS LA ROUTE

#	Hydrology										Flow Type				Phisico-chemestry						Habitat Type (%)							Substrate (%)								Stream Cover (%)						% Unstable Bank	Obstacle				Critical Habitat (%)		
	HWM (m)	HWM height (m)	Wet Width (m)	1/3 depth (cm)	1/3 flow (m/s)	1/2 depth (cm)	1/2 flow (m/s)	2/3 depth (cm)	2/3 flow (m/s)	Slope (%)	Interm. Spacial	Interm. Tempor.	Permanent	Drainage	pH	D.O. (mg/L)	Water T° (°C)	Air T° (°C)	Cond. (µs/cm)	Turbidity (NTU)	Pocketwater	Pool	Flat	Riffle	Run	Rapid	Cascade/Fall	R	Bo (>500)	Bl (250-500)	R (80-250)	C (40-80)	Gr (5-40)	Sa (0,125-5)	Si (<0,125)	OM	Overhang	Ile stte	Canopy	Riparian veg.	Aquatic Emerging	Aquatic Submerged		Seasonal	Permanent	GPS	Photo	Spawning	Resurgence	Other
1	40,0	0,9								2			X										100								35	35	15	15										X		392				
2	30,0	0,9	20,0			100				1			X										100												50	50					10	30	20							
3	10,0	0,6	0,5			15				3			X		5,90	10,38	9,0	7,0	7	0,31				50	50					25	25			25	25		10		80		3							
											pas de chenal																																										
4	6,8	0,7	0,5			13				4			X											50	50					15	15				70		3		80										
5	20,0					30				1			X										100							20					80				50				X		402				
																																															x		
6	4,8		4,8	28	0,64	30	0,90	28	0,82	1,5			X										100							20	30	30	20			3		5								x		
7	2,6		2,6	32	0,94	27	0,12	39	0,98	4,5			X		5,69	13,1	3,8	5,0	41						100			10	20	30	30	10				3	3	5										
8	4,9		4,9	51	1,17	27	1,05	16	0,81	3			X												100				20	30	40	10						5										
9										1			X										90	10						10	10			80		10		40										
10	20,0		0,2			10				2	X													100										20	80		15	100				X						
11	50,0									1			X										100											50	50			10	15	15								
12	0,5	0,2	0,5			17				4			X											100						5	20	20		35	20	10	3	80		1								
13		0,3	1,5			30	<,01			1			X										100							5	20	20		30	25													
14		0,1	0,2			10				4			X											100							20	20			50	10		50		50								
15	PI		6,5			25	1,11			3			X											100					5	30	30	15				20	5	5		10								
16			4,5			30	0,63			3			X											50	50					5	30	35				30	3			10								
17	2,5		2,5			30	0,86			3			X											70	30					3	30	35				32	3			20				X		426				
18																																																
19																																																
20			1,5			100																	100								30	10	50		10	10												
21			2,5	10		13	0,07	15		1,5			X											20	80					10	40	40			10	2	3		10									
22										1	X												100										50	50		3			20			X						
23			2	PAR CANAL			<,01			4	X				5,87	11,5	6,0	5,0	5	0,45			100							5	20	20		45	10	3	3	20				X						
24			0,6			15				4			X											100					50	50						15		80										
25	4,6		1,8	6	<,01	8	0,09	3	0,12	4			X		4,19	9,7	6,8	5,0	6					100						10	30	35	15		10			2		5	1								
26																																																
27											X	X																																X						

GroupeHemispheres

GroupeHemispheres

POISSON - HABITAT, PLAN D'EAU

PROJET	HOWSE GPN	DATE	11/09/13
ÉQUIPE	SB & ED	HEURE	12:30

ID		MÉTÉO	
LOCALISATION	LAC Triangle / H	MÉTÉO	Soleil + peu de nuage
		TEMPÉRATURE	10 °C
NOM DU PLAN D'EAU	LAC TRIANGLE	NÉBULOSITÉ	2 /8

HYDROLOGIE		PHYSICO-CHIMIE			
HAUTEUR (LNHE - SURFACE)	m	TEPÉRATURE	°C	COULEUR	
HAUTEUR (SEUIL - SURFACE)	m	pH		SECCHI	4.70 m
PROFONDEUR (ZMAX)	11.9 m	CONDUCTIVITÉ	µS/cm	DO	mg/L
		TURBIDITÉ	NTU		

DESCRIPTION DES SEGMENTS

0-1m

SEGMENT 1

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE InSitu	PHOTOS
	456			40			30	25	5		[illegible]		1	193

BERGE ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL	COMMENTAIRES
	F		20			0-1m: (194) photos (Unique SEGMENT)

1-2m

SEGMENT 2

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE InSitu	PHOTOS
	456			90					10		15			photos

BERGE ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL	COMMENTAIRES
						(195-196) Resurgence : GPS 455 // Photos : 197

SEGMENT (1)

Fosse : GPS 458 (11.9m prof.)

SEGMENT 3

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE InSitu	PHOTOS
456														

BERGE ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL	COMMENTAIRES

SEGMENT 4

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE InSitu	PHOTOS

BERGE ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL	COMMENTAIRES

SEGMENT 5

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE InSitu	PHOTOS

BERGE ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL	COMMENTAIRES

SEGMENT 6

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE InSitu	PHOTOS

BERGE ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL	COMMENTAIRES

GroupeHemispheres

POISSON - HABITAT, PLAN D'EAU

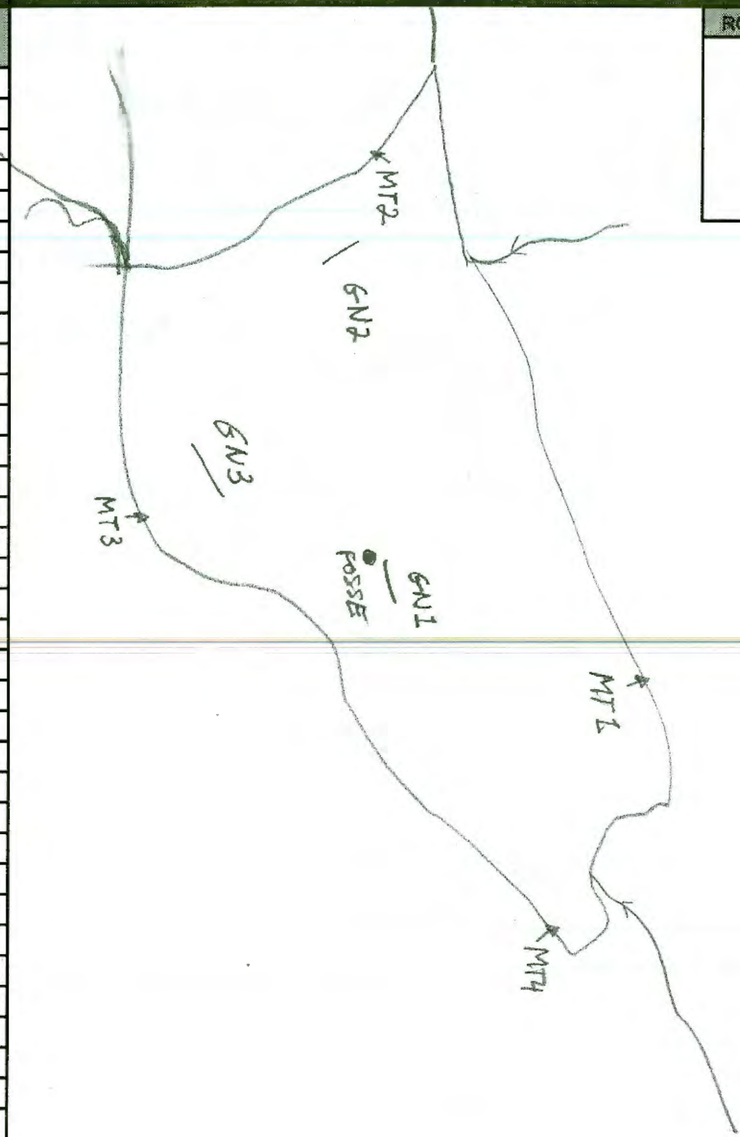
2/2

PROJET	HONISE ([illegible] lac)	DATE	11/09/13
ÉQUIPE	SB & ED	HEURE	13h54

PROFIL

Mém.	PARAMÈTRES				AUTRES	
PROF.	T°C	pH	DO	COND.		
SURFACE 0,5	8.81	6.33	12.46	34		
1,5	8.7	6.03	12.1	35		
2,5	8.67	5.94	11.83	35		
3,5	8.62	5.9	11.67	35		
4,5	8.6	5.85	11.9	35		
5,5	8.56	5.85	11.9	35		
6,5	8.35	5.85	12.27	35		
7,5	7.69	5.88	12.52	35		
8,5	7.44	5.89	12.69	36		
9,5	7.36	5.91	12.4	35		

CROQUIS



RODE DES VENTS

N ↑

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POISSON - SPECIFICATIONS DES PECHES

PROJET: HOWSE PIT | MÉTÉO: Soleil 99 nuage
ÉQUIPE: SB dED | TEMPÉRATURE: 10 °C

NOM DU PLAN D'EAU: TRIANGLE LAKE | TYPE: ☒ LAC ☐ COURS D'EAU ☐ MILIEU HUMIDE
NOM DE TRONCON: | # PERMIS:

SITE/MÉTHODE

# SITE	GPS	MTD/#	PHYSICO-CHIMIE TEMP.	COND.	TURB.	COMMENTAIRES
TRIANGLE	459 Photo 198	GN1				
TRIANGLE	460 Photo — Ø	GN2				
TRIANGLE	461 — Ø	GN3				
TRIANGLE	462 Photo 199	MT1				
TRIANGLE	463 — Ø	MT2				
TRIANGLE	464 — Ø	MT3				
TRIANGLE	465	MT4				

SPÉCIFICATION DES ENGINS

Photo 198

# SITE	MTD/#	PAS	POSE DATE	POSE HEURE	LEVÉE DATE	LEVÉE HEURE	TYPE	LONG.	PROF.	GRAND. MAILLES	EMPLACE.	HABIT.
TRIANGLE	GN1	1	1/09/13	14h40	02/09/13	8h09			11.5			
TRIANGE	GN2	1	1/09/13	14h56	02/09/13	8h40			4.5			
TRIANGE	GN3	1	1/09/13	15h09	02/09/13	9h26			2.5			
TRIANGLE	MT1	1	1/09/13	15:26	02/09/13	10:20						
TRIANGLE	MT2	1	1/09/13	15:34	02/09/13	10:06						
TRIANGLE	MT3	1	1/09/13	15h41	02/09/13	10:13						
TRIANGLE	MT4	1	1/09/13	15h47	02/09/13	10:25						

PÊCHE ÉLECTRIQUE

# SITE	MTD/#	PAS	H. DÉBUT	H. FIN	TEMPS SEC	LONG.	LARG.	OUVERT.	VOLT.	FREQ.	PULS.	MARQUE	MODEL

RÉSUMÉ POISSON

# SITE	MTD/#	PAS	ESPÈCES	STAGE	ÂGE	# TOTAL	LONG. MAX	LONG. MIN	ACTIVITÉ	COMMENTAIRES

COMMENTAIRE

Version du 23 mars 2012

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POISSON - DESCRIPTEURS BIOLOGIQUES

PROJET HOWST **DATE** 210913
EQUIPE SB a+D **HEURE** 8h09

#	MTD/#	PAS	ESPÈCE	LONG.	POIDS	SEX	MAT	AGE STRUCT.	AGE #	AGE	ENVEL.#	GÉNÉTIQUE STRUCT.	GÉNÉTIQUE #	COMMENTAIRES	PHOTO
1	GN1	1	SANA	25	120			ecaille	1						
2	GN1	1	PRCY	27.5	170			~~ecaille~~							
3	GN2	1	SANA	59	>600			ecaille	2						200
4	GN2		SANA	57	>600			ecaille	3.						
5	GN2		PRCY	31	250			ecaille	4						
6	GN2		SANA	47	>600			ecaille	5						
7	GN2		SANA	52	>600										
8	GN2		PRCY	29.	200										204
9	GN2		SANA	32	235			écaille	6						
10	GN2		—	46	>600			—	7						
11	GN2		—	65	>600			—	8						205
12	GN3		—	54	>600			—	9						
13	GN3		—	48	>600			—	10						
14	/		—	47	>600			—	11						
15	GN3		PRCY	24	100										
16	GN3		SANA	51	>600			—	12						
17	GN3		PRCY	25.5	130										
18	GN3		SANA	66	>600			—	13						
19	GN3		SANA	40.5	515			—	14						
20	MT4		LOLO	19	35										206
21	GN3		PRCY	30	210	M	M							mangé des plantes	
22	GN3		SANA	48.5	>600	F	i	écaille	15					mangé isopode (crevette)	
23	GN3		PRCY	18.3	40	M	i								
24	GN3		PRCY	17.6	36	M	i								
25	GN3		PRCY	15.2	25	M	i								
26	GN1		SANA	23.4	110	M	i	ecaille	16					mangé poisson & invertebré	
27	GN2		PRCY	21.1	130	F	i								
28	GN2		PRCY	28	160	F	M								
29	GN2		PRCY	27.6	130	F	i								
30	GN2		SANA	33	260	i	i	ecaille	17					mangé poisson & invertebré	
31	GN2		PRCY	18.9	46	M	i	~~ecaille~~							

203? 204 -

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POISSON - HABITAT, PLAN D'EAU

PROJET: Haubert Pit | DATE: 30/08/13
ÉQUIPE: Simon B & Elissa D | HEURE: pm

ID
LOCALISATION:
NOM DU PLAN D'EAU: Lac Pinette

MÉTÉO
MÉTÉO: Soleil quelques nuages
TEMPÉRATURE: ~10 °C
NÉBULOSITÉ: 3 /8

HYDROLOGIE
HAUTEUR (LNHE - SURFACE): m
HAUTEUR (SEUIL - SURFACE): m
PROFONDEUR (ZMAX): 5.7 m

PHYSICO-CHIMIE
TEPÉRATURE: °C
pH:
CONDUCTIVITÉ: µS/cm
TURBIDITÉ: NTU
COULEUR:
SECCHI: 4.25 m
DO: mg/L

DESCRIPTION DES SEGMENTS

SEGMENT 1

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE *InSitu*	PHOTOS
454	448			73			10	15	3		5	1	1	187

BERGE

ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL
-	F	9	9		1.5

COMMENTAIRES: Île à la baie

SEGMENT 2

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE *InSitu*	PHOTOS
448	449			30			10	15	40		9		1	188

BERGE

ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL
	F	9	9		1.6

COMMENTAIRES:

SEGMENT 3

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE *InSitu*	PHOTOS
449	450			10			15	15	60					189

BERGE

ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL
	M				2 m

COMMENTAIRES:

SEGMENT 4

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE *InSitu*	PHOTOS
451	452			73			10	15	3		5	1	1	

BERGE

ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL
	F	2	2		~1.6

COMMENTAIRES:

SEGMENT 5

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE *InSitu*	PHOTOS
452	453	45		50					5		5		3	190

BERGE

ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL
	F				

COMMENTAIRES:

SEGMENT 6

LITTORAL

GPS DÉBUT	GPS FIN	O	A	Si	Sa	Gr	Ca	Ga	B	RM	VÉGÉTATION SUB.	VÉGÉTATION EMER.	AUTRE *InSitu*	PHOTOS
453	454			100							60	40		191

BERGE

ÉROS.	PENTE	VÉGÉTATION SURP.	VÉGÉTATION CANO.	AUTRE SURP.	PROFONDEUR NON LITTORAL
	F				

COMMENTAIRES:

(GB;446) pour le profil.

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POISSON - HABITAT, PLAN D'EAU

2/2

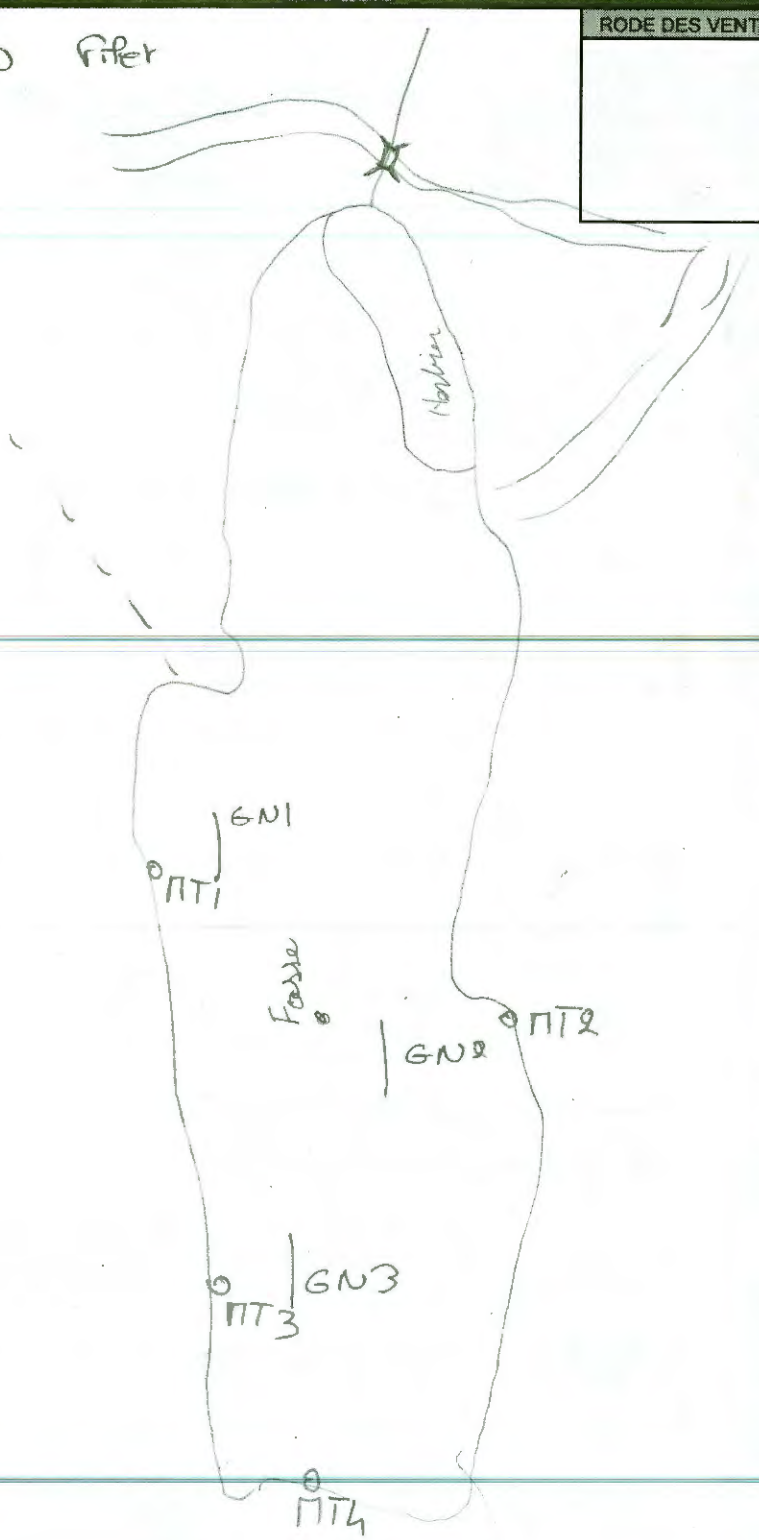
PROJET	HOWARD PTT	DATE	30/08/13
ÉQUIPE	Simon B. & Elissa D.	HEURE	PM

PROFIL

PROF.	PARAMÈTRES T°C	pH	DO	COND.	AUTRES	
0	12.67	6.75	10.38	4		
1	12.67	6.39	10.45	4		
2	12.67	6.14	10.35	4		
3	12.58	6.10	10.38	4		
4	12.63	6.23	10.40	4		

CROQUIS

RODE DES VENTS



Version du 23 mars 2012

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POISSON - SPECIFICATIONS DES PECHES

PROJET: HOWSE | MÉTÉO: Soleil quelques nuages

ÉQUIPE: SG & ED | TEMPÉRATURE: ± 10 °C

NOM DU PLAN D'EAU: PINETTE LAKE | TYPE: ☒ LAC ☐ COURS D'EAU ☐ MILIEU HUMIDE

NOM DE TRONÇON: | # PERMIS:

SITE/MÉTHODE

# SITE	GPS	MTD/#	PHYSICO-CHIMIE TEMP.	COND.	TURB.	COMMENTAIRES
HOWSE	440	GN1				
HOWSE	447	MT1				
HOWSE	441	GN2				
HOWSE	449	MT2				
HOWSE	443	GN3				
HOWSE	444	MT3				
HOWSE	445	MT4				

SPÉCIFICATION DES ENGINS

# SITE	MTD/#	PAS	POSE DATE	POSE HEURE	LEVÉE DATE	LEVÉE HEURE	TYPE	LONG.	PROF.	GRAND. MAILLES	EMPLACE.	HABIT.
HOWSE	GN1	1	30/08/13	15:04	31/08/13	9:00			3m			
HOWSE	MT1	1	30/08/13	15:20	31/08/13	11:39			~~5m~~			
HOWSE	GN2	1	30/08/13	15:19	31/08/13	10:10			5m			
HOWSE	MT2	1	30/08/13	15:29	31/08/13	11:18						
HOWSE	GN3	1	30/08/13	15:36	31/08/13	10:45			4m			
HOWSE	MT3	1	30/08/13	15:39	31/08/13	11:29						
HOWSE	MT4	1	30/08/13	15:47	31/08/13	11:10						

PÊCHE ÉLECTRIQUE

# SITE	MTD/#	PAS	H. DÉBUT	H. FIN	TEMPS SEC	LONG.	LARG.	OUVERT.	VOLT.	FREQ.	PULS.	MARQUE	MODEL

RÉSUMÉ POISSON

# SITE	MTD/#	PAS	ESPÈCES	STAGE	AGE	# TOTAL	LONG. MAX	LONG. MIN	ACTIVITÉ	COMMENTAIRES
HOWSE	MT2		COPL			11	10 cm	6 cm		40 (Poids) g
HOWSE	GN1		COPL			17	17 cm	11 cm		320 g (Poids)

COMMENTAIRE

Version du 23 mars 2012

GroupeHemispheres

POISSON - DESCRIPTEURS BIOLOGIQUES

PROJET: MOUSE PIT | DATE: 30/08/13
EQUIPE: GD & ED | HEURE:

#	MTD#	PAS	ESPÈCE	LONG.	POIDS	SEX	MAT	AGE STRUCT	AGE #	AGE	ENVEL.#	GÉNÉTIQUE STRUCT	GÉNÉTIQUE #	COMMENTAIRES	PHOTO
1	GN1		Méné	13	17	/	/								
2	|		Méné	12.5	10										
3	|		Méné	12	13										
4	|			11.5	9										
5	|			12.5	15										
6	|		Méné	12	12										
7	|			15.5	31										
8	GN2		SAFO	17	50	I	M	écaille	1						
9	GN2		MÉNÉ	11	13	-	-								
10	|		COPL	13	18	-	-								
11	|		COPL	12	10	-	-								
12	GN3		COPL	12	14	/	/								
13	GN3		COPL	12	14	/	/								
14	MT4		COPL	10	10	/	/								
~~15~~	~~MT3~~		~~Méné~~												
15	MT3		Méné	11.4	16										
16	MT3		COPL	8.6	5										
17	GN3		SAFO	20	65	F	i	écaille	2					manger invertébré	185
18	GN3		SAFO	21.8	86	i	i	écaille	3					manger invertébré	
19	GN3		SAFO	27.7	200	F	M	écaille	4					—	
20	GN3		SAFO	15.5	28	F	i	écaille	5					—	
21	GN3		COPL	11.6	15										186
22	GN2		COPL	12.6	18										
23	GN2		COPL	12.9	18										
24	GN2		SAFO	19.7	57	i	i	écaille	6					manger invertébré — estomac vide	
25	GN2		SAFO	17.8	41	F	i	écaille	7						
26	GN2		COPL	10.7	11										
27	GN2		SAFO	14.9	27	F	i	écaille	8						
28	GN2		COPL	11.9	14										
29	GN1		SAFO	23.7	130	M	M	écaille	9					— estomac vide	
30	GN1		SAFO	20	78	F	M	écaille	10					— estomac vide	
31	GN1		SAFO	25	140	F	M	écaille	11					manger invertébré	
32	GN1		SAFO	20	61	F	i	écaille	12						
33	GN1		SAFO	17.8	42	i	i	écaille	13					— estomac vide.	
34	GN1		SAFO	14.6	23	F	i	écaille	14					— estomac trop plein	
35	GN1		SAFO	25	170	M	M	écaille	15					estomac avec un autre poisson	
36	GN1		SAFO	16.8	37	F	i	écaille	16					— estomac vide	
37	GN1		SAFO	17.2	48	F	i	écaille	17					— estomac vide	
38	GN1		SAFO	18.2	49	F	M	écaille	18						
39	GN1		SAFO	19.4	56	M	i	écaille	19						
40	GN1		SAFO	13.2	18			écaille	20						

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POISSON - SPECIFICATIONS DES PECHES

PROJET: HOWSE | MÉTÉO: NUAGEUX
ÉQUIPE: SB + GT | TEMPÉRATURE: 15 °C

NOM DU PLAN D'EAU: TWO PONDS | TYPE: ☐ LAC ☐ COURS D'EAU ☐ MILIEU HUMIDE

NOM DE TRONÇON: | # PERMIS:

SITE/MÉTHODE

# SITE	GPS	MTD/#	PHYSICO-CHIMIE TEMP.	COND.	TURB.	COMMENTAIRES
TWO PONDS	TWO PONDS	GN1				
	296	MT1				
	297	MT2				
	298	MT3				
	299	MT4				
	300	MT5				

SPÉCIFICATION DES ENGINS

# SITE	MTD/#	PAS	POSE DATE	POSE HEURE	LEVÉE DATE	LEVÉE HEURE	TYPE	LONG.	PROF.	GRAND. MAILLES	EMPLACE.	HABIT.
TWO PONDS	GT1	1	05/07	14h30	06/07	8h10			2m		Centre	
	MT1	1	05/07	14h45		8h43			32m		Rive	
	MT2	1	05/07	14h47		8h47			↓		↓	
	MT3	1	05/07	14h50		8h52						
	MT4	1	05/07	14h55		8h56						
	MT5	1	05/07	14h59	↓	8h58			↓		↓	

PÊCHE ÉLECTRIQUE

# SITE	MTD/#	PAS	H. DÉBUT	H. FIN	TEMPS SEC	LONG.	LARG.	OUVERT.	VOLT.	FREQ.	PULS.	MARQUE	MODEL

RÉSUMÉ POISSON

# SITE	MTD/#	PAS	ESPÈCES	STAGE	ÂGE	# TOTAL	LONG. MAX	LONG. MIN	ACTIVITÉ	COMMENTAIRES

COMMENTAIRE

GroupeHemispheres

POISSON - DESCRIPTEURS BIOLOGIQUES

PROJET		DATE	
EQUIPE		HEURE	

#	MTD/#	PAS	ESPÈCE	LONG.	POIDS	SEX	MAT	AGE			ENVEL.#	GÉNÉTIQUE		COMMENTAIRES	PHOTO
								STRUCT.	#	AGE		STRUCT.	#		

Appendix IV

Habitat Suitability Index and Habitat Equivalent Unit Calculation for Lakes

	Enter Lake name:	Triangle			
Part 1 Entering Lake depth(s):					
IF Lake Depth is less than or equal to 10 m:			**IF Lake Depth is greater than 10 m:**		
Path 1		**OR**	**Path 2**		
A Enter Depth of Littoral Zone:	**0**		**A-1 Enter mean depth of Non-Littoral Zone**	**6**	
B Enter Mean Depth of Lake:	**0**		**B-1 Enter depth of Benthic Zone:**	**12**	

Path 2 (Continued…)			
IF Lake Depth is greater than 10 m:	**Mean depth of Non-Littoral Zone:**	6	*(Reduced Value)*
	Depth of the Benthic Zone:	12	*(Reduced Value)*
	Benthic Pelagic ratio:		11,9:5,89

Part 2 Enter the values for the estimated bottom surface area:

Littoral Zone (No vegetation):

Substrate:	**Coarse**	m^2	**Medium**	m^2	**Fine**	m^2
	Bedrock:	**0,00**	Rubble:	**5 994,00**	Sand:	**0,00**
	Boulder:	**4 500,00**	Cobble:	**7 192,00**	Silt:	**39 299,00**
			Gravel:	**0,00**	Muck:	**0,00**
					Clay:	**0,00**
	SubTotals:	4 500		13 186		39 299

Littoral Zone (Vegetation)

Substrate:	**Coarse**	m^2	**Medium**	m^2	**Fine**	m^2
	Bedrock:	**0,00**	Rubble:	**0,00**	Sand:	**0,00**
	Boulder:	**583,00**	Cobble:	**0,00**	Silt:	**5 243,00**
			Gravel:	**0,00**	Muck:	**0,00**
					Clay:	**0,00**
	SubTotals:	583		0		5 243

Non-Littoral Zone

Substrate:	**Coarse**	m^2	**Medium**	m^2	**Fine**	m^2
	Bedrock:	**0,00**	Rubble:	**0,00**	Sand:	**0,00**
	Boulder:	**1 456,00**	Cobble:	**0,00**	Silt:	**0,00**
			Gravel:	**0,00**	Muck:	**144 109,00**
					Clay:	**0,00**
	SubTotals:	1 456		0		144 109

Part 3 Summary Table for Bottom Surface Area Totals:

Habitat Types	**Bottom Surface area (m^2)**
Littoral Coarse/No vegetation	4 500
Littoral Medium/No vegetation	13 186
Littoral Fine/No vegetation	39 299
subtotal Littoral/No vegetation	**56 985**
Littoral Coarse/Vegetation	583
Littoral Medium/Vegetation	0
Littoral Fine/Vegetation	5 243
Subtotal Littoral/Vegetation	**5 826**
Subtotal Littoral	**62 811**
Non-littoral Coarse/Pelagic	1 456
Non-littoral Medium/Pelagic	0
Non-littoral Fine/Pelagic	144 109
Subtotal nonlittoral	**145 565**
Total Available Habitat	**208 376**

	Species	Life Stage	Littoral Zone						Non-Littoral Zone		
			Coarse/No Vegetation	Medium/No Vegetation	Fine/No Vegetation	Coarse/Vegetation	Medium/Vegetation	Fine/Vegetation	Coarse/Pelagic	Medium/Pelagic	Fine/Pelagic
		Spawning	0,00	0,84	0,00	0,00	NA	0,00	0,00	NA	0,00
		YOY	1,00	1,00	0,00	0,89	NA	0,00	1,00	NA	0,17
		Juvenile	1,00	1,00	0,00	0,89	NA	0,00	1,00	NA	0,00
1	Burbot	Adult	0,00	0,00	0,00	0,00	NA	0,00	0,67	NA	0,00
		Spawning	1,00	1,00	0,00	1,00	NA	0,00	1,00	NA	0,00
		YOY	0,76	0,67	0,00	0,84	NA	0,00	1,00	NA	0,00
		Juvenile	0,76	0,67	0,00	0,84	NA	0,00	1,00	NA	0,00
2	Lake Trout	Adult	0,42	0,00	0,42	0,84	NA	0,84	0,84	NA	0,59
		Spawning	0,59	0,84	0,59	0,44	NA	0,44	0,33	NA	0,00
		YOY	0,67	1,00	0,00	0,67	NA	0,00	0,00	NA	0,00
		Juvenile	0,67	1,00	0,00	0,67	NA	0,00	0,67	NA	0,50
3	Round whitefish	Adult	0,67	1,00	0,00	0,67	NA	0,00	0,67	NA	0,50

	Species	Littoral Zone						Non-Littoral Zone			
		Coarse/No Vegetation	Medium/No Vegetation	Fine/No Vegetation	Coarse/Vegetation	Medium/Vegetation	Fine/Vegetation	Coarse/Pelagic	Medium/Pelagic	Fine/Pelagic	Total Available Habitat
☐ 1	Burbot	4500	13186	0	519	0	0	1456	0	24499	44159,9
☑ 2	Lake Trout	4500	13186	16506	583	0	4404	1456	0	85024	125659,0
☐ 3	Round whitefish	3015	13186	23186	391	0	2307	976	0	72055	115115,1

	Enter Lake name:	Pinette		

Part 1 Entering Lake depth(s):

IF Lake Depth is less than or equal to 10 m: — **OR** — **IF Lake Depth is greater than 10 m:**

Path 1			**Path 2**	
A Enter Depth of Littoral Zone:	**2**		**A-1 Enter mean depth of Non-Littoral Zone**	**0**
B Enter Mean Depth of Lake:	**2**		**B-1 Enter depth of Benthic Zone:**	**0**

Path 2 (Continued...)

IF Lake Depth is greater than 10 m:

Mean depth of Non-Littoral Zone:		*(Reduced Value)*
Depth of the Benthic Zone:		*(Reduced Value)*
Benthic Pelagic ratio:		

Part 2 Enter the values for the estimated bottom surface area:

Littoral Zone (No vegetation):

Substrate:	**Coarse**	m^2	**Medium**	m^2	**Fine**	m^2
	Bedrock:	**0,00**	Rubble:	**6 467,00**	Sand:	**0,00**
	Boulder:	**13 844,00**	Cobble:	**5 412,00**	Silt:	**24 994,00**
			Gravel:	**0,00**	Muck:	**0,00**
					Clay:	**0,00**
	SubTotals:	13 844		11 879		24 994

Littoral Zone (Vegetation)

Substrate:	**Coarse**	m^2	**Medium**	m^2	**Fine**	m^2
	Bedrock:	**0,00**	Rubble:	**249,00**	Sand:	**0,00**
	Boulder:	**227,00**	Cobble:	**181,00**	Silt:	**1 156,00**
			Gravel:	**0,00**	Muck:	**0,00**
					Clay:	**0,00**
	SubTotals:	227		430		1 156

Non-Littoral Zone

Substrate:	**Coarse**	m^2	**Medium**	m^2	**Fine**	m^2
	Bedrock:	**0,00**	Rubble:	**0,00**	Sand:	**0,00**
	Boulder:	**977,00**	Cobble:	**0,00**	Silt:	**96 677,00**
			Gravel:	**0,00**	Muck:	**0,00**
					Clay:	**0,00**
	SubTotals:	977		0		96 677

Part 3 Summary Table for Bottom Surface Area Totals:

Habitat Types	**Bottom Surface area (m^2)**
Littoral Coarse/No vegetation	13 844
Littoral Medium/No vegetation	11 879
Littoral Fine/No vegetation	24 994
subtotal Littoral/No vegetation	**50 717**
Littoral Coarse/Vegetation	227
Littoral Medium/Vegetation	430
Littoral Fine/Vegetation	1 156
Subtotal Littoral/Vegetation	**1 813**
Subtotal Littoral	**52 530**
Non-littoral Coarse/Pelagic	977
Non-littoral Medium/Pelagic	0
Non-littoral Fine/Pelagic	96 677
Subtotal nonlittoral	**97 654**
Total Available Habitat	**150 184**

	Species	Life Stage	Littoral Zone						Non-Littoral Zone		
			Coarse/No Vegetation	Medium/No Vegetation	Fine/No Vegetation	Coarse/Vegetation	Medium/Vegetation	Fine/Vegetation	Coarse/Pelagic	Medium/Pelagic	Fine/Pelagic
1	Lake Chub	Spawning	0,00	1,00	0,84	0,00	1,00	0,84	0,00	NA	0,00
		YOY	0,00	1,00	0,84	0,00	1,00	0,84	0,00	NA	0,00
		Juvenile	0,00	0,00	0,00	0,00	0,00	0,00	0,00	NA	0,00
		Adult	1,00	0,00	0,00	1,00	0,00	0,00	1,00	NA	0,00
2	Brook Trout (freshwater resident)	Spawning	0,00	0,76	0,67	0,00	0,76	0,67	0,00	NA	0,17
		YOY	1,00	1,00	0,00	1,00	1,00	0,00	1,00	NA	0,00
		Juvenile	1,00	1,00	0,00	1,00	1,00	0,00	1,00	NA	0,17
		Adult	0,00	0,50	0,67	0,00	0,50	0,78	0,00	NA	0,50

	Species	Littoral Zone						Non-Littoral Zone			
		Coarse/No Vegetation	Medium/No Vegetation	Fine/No Vegetation	Coarse/Vegetation	Medium/Vegetation	Fine/Vegetation	Coarse/Pelagic	Medium/Pelagic	Fine/Pelagic	Total Available Habitat
☐ 1	Lake Chub	13844	11879	20995	227	430	971	977	0	0	49323,0
☑ 2	Brook Trout (freshwater resident)	13844	11879	16746	227	430	902	977	0	48339	93344,0

Appendix V

Laboratory Certificates

Attention: Simon Barette
GROUPE HÉMISPHÈRES INC.
13,rue St. Louis
bureau 201
Lévis, PQ
CANADA G6V4E2

Votre # de commande: 93874
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # Bordereau: c#938740, c#93874-01-01

Date du rapport: 2013/09/27
 # Rapport: NM-456078

Ce rapport a préséance sur tous les rapports précédents pour le même numéro de dossier Maxxam

CERTIFICAT D'ANALYSES

 # DE DOSSIER MAXXAM: B355654
Reçu: 2013/09/09, 14:50

Matrice: SÉDIMENT
Nombre d'échantillons reçus: 2

Analyses	Quantité	Date de l' extraction	Date Analysé	Méthode de laboratoire	Référence primaire
Métaux extractibles totaux	2	2013/09/13	2013/09/14	STL SOP-00006	MA.200- Mét 1.2
Granulométrie et sédimentométrie (1)	2	N/A	N/A		
Carbone organique total	2	2013/09/16	2013/09/17	STL SOP-00068	MA.310–CS 1.0, Rév2

Matrice: EAU
Nombre d'échantillons reçus: 2

Analyses	Quantité	Date de l' extraction	Date Analysé	Méthode de laboratoire	Référence primaire
Métaux extractibles totaux(basse limite)	2	2013/09/11	2013/09/12	STL SOP-00006	MA.200- Mét 1.2

Matrice: EAU DE SURFACE
Nombre d'échantillons reçus: 2

Analyses	Quantité	Date de l' extraction	Date Analysé	Méthode de laboratoire	Référence primaire
Acidite	2	N/A	2013/09/11	STL SOP-00057	MA.315 Alc-Aci 1.0
Alcalinité totale (pH final 4.5)	2	N/A	2013/09/12	STL SOP-00038	SM 2320B
Anions	2	N/A	2013/09/14	STL SOP-00014	MA. 300 - Ions 1.3
Conductivité	2	N/A	2013/09/12	STL SOP-00038	SM 2510
Fluorures	2	N/A	2013/09/12	STL SOP-00038	SM 4500-F- C.
Matières en suspension	2	2013/09/10	2013/09/10	STL SOP-00015	MA. 104 - S.S. 1.1
Métaux extractibles totaux(basse limite)	2	2013/09/11	2013/09/12	STL SOP-00006	MA.200- Mét 1.2
Azote ammoniacal	2	N/A	2013/09/11	STL SOP-00040	MA. 300 - N 1.1

* Les données brutes sont utilisées pour le calcul du RPD (% d'écart relatif). L'arrondissement des résultats finaux peut expliquer la variation apparente.

(1) Cette analyse a été effectuée par Maxxam Analytics - Bedford

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Attention: Simon Barette
GROUPE HÉMISPHÈRES INC.
13,rue St. Louis
bureau 201
Lévis, PQ
CANADA G6V4E2

Votre # de commande: 93874
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # Bordereau: c#938740, c#93874-01-01

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 # Rapport: NM-456078

Ce rapport a préséance sur tous les rapports précédents pour le même numéro de dossier Maxxam

CERTIFICAT D'ANALYSES

-2-

clé de cryptage

Veuillez adresser toute question concernant ce certificat d'analyse à votre chargé(e) de projets

Séverine Planté,
Email: SPlante@maxxam.ca
Phone# (514) 448-9001

==========

Maxxam a mis en place des procédures qui protègent contre l'utilisation non autorisée de la signature électronique et emploie les "signataires" requis, conformément à la section 5.10.2 de la norme ISO/CEI 17025:2005(E). Veuillez vous référer à la page des signatures de validation pour obtenir les détails des validations pour chaque division.

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Dossier Maxxam: B355654
Date du rapport: 2013/09/27

GROUPE HÉMISPHÈRES INC.
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # de commande: 93874
Initiales du préleveur: SB

MÉTAUX EXTRACTIBLES TOTAUX (SÉDIMENT)

Identification Maxxam					V82011	V82011	V82011		
Date d'échantillonnage					2013/09/02 13:52	2013/09/02 13:52	2013/09/02 13:52		
# Bordereau					c#93874-01-01	c#93874-01-01	c#93874-01-01		
	UNITÉS	**A**	**B**	**C**	**TRIANGLE**	**TRIANGLE Dup. de Lab.**	**TRIANGLE Dup. de Lab. 2**	**LDR**	**Lot CQ**
MÉTAUX									
Aluminium (Al)	mg/kg	**-**	-	-	12000	12000	12000	20	1205756
Arsenic (As)	mg/kg	**10**	30	50	**15**	**15**	**15**	2	1205756
Cadmium (Cd)	mg/kg	**1.5**	5	20	0.8	0.8	0.8	0.2	1205756
Calcium (Ca)	mg/kg	**-**	-	-	1200	1200	1200	30	1205756
Cuivre (Cu)	mg/kg	**100**	100	500	27	27	28	1	1205756
Fer (Fe)	mg/kg	**-**	-	-	95000	93000	95000	10	1205756
Magnésium (Mg)	mg/kg	**-**	-	-	4000	3800	3900	10	1205756
Manganèse (Mn)	mg/kg	**1000**	1000	2200	3400	3300	3400	2	1205756
Molybdène (Mo)	mg/kg	**6**	10	40	<2	<2	<2	2	1205756
Nickel (Ni)	mg/kg	**100**	100	500	31	31	32	1	1205756
Mercure (Hg)	mg/kg	**0.3**	2	10	0.13	0.13	0.14	0.05	1205756
Potassium (K)	mg/kg	**-**	-	-	980	960	990	20	1205756
Plomb (Pb)	mg/kg	**30**	500	1000	16	16	17	5	1205756
Sélénium (Se)	mg/kg	**1**	3	10	<10	<10	<10	10	1205756
Sodium (Na)	mg/kg	**-**	-	-	41	39	42	10	1205756
Zinc (Zn)	mg/kg	**230**	500	1500	150	140	150	5	1205756

LDR = Limite de détection rapportée
Lot CQ = Lot Contrôle Qualité

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Dossier Maxxam: B355654
Date du rapport: 2013/09/27

GROUPE HÉMISPHÈRES INC.
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # de commande: 93874
Initiales du préleveur: SB

MÉTAUX EXTRACTIBLES TOTAUX (SÉDIMENT)

Identification Maxxam					V82013		
Date d'échantillonnage					2013/09/03 13:30		
# Bordereau					c#93874-01-01		
	UNITÉS	**A**	**B**	**C**	**BURNETTA**	**LDR**	**Lot CQ**
MÉTAUX							
Aluminium (Al)	mg/kg	**-**	-	-	9100	20	1205756
Arsenic (As)	mg/kg	**10**	30	50	**15**	2	1205756
Cadmium (Cd)	mg/kg	**1.5**	5	20	0.3	0.2	1205756
Calcium (Ca)	mg/kg	**-**	-	-	350	30	1205756
Cuivre (Cu)	mg/kg	**100**	100	500	22	1	1205756
Fer (Fe)	mg/kg	**-**	-	-	91000	10	1205756
Magnésium (Mg)	mg/kg	**-**	-	-	4200	10	1205756
Manganèse (Mn)	mg/kg	**1000**	1000	2200	1700	2	1205756
Molybdène (Mo)	mg/kg	**6**	10	40	3	2	1205756
Nickel (Ni)	mg/kg	**100**	100	500	23	1	1205756
Mercure (Hg)	mg/kg	**0.3**	2	10	0.06	0.05	1205756
Potassium (K)	mg/kg	**-**	-	-	630	20	1205756
Plomb (Pb)	mg/kg	**30**	500	1000	14	5	1205756
Sélénium (Se)	mg/kg	**1**	3	10	<10	10	1205756
Sodium (Na)	mg/kg	**-**	-	-	28	10	1205756
Zinc (Zn)	mg/kg	**230**	500	1500	69	5	1205756

LDR = Limite de détection rapportée
Lot CQ = Lot Contrôle Qualité

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Dossier Maxxam: B355654
Date du rapport: 2013/09/27

GROUPE HÉMISPHÈRES INC.
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # de commande: 93874
Initiales du préleveur: SB

PARAMÈTRES CONVENTIONNELS (SÉDIMENT)

Identification Maxxam		V82011	V82013		
Date d'échantillonnage		2013/09/02 13:52	2013/09/03 13:30		
# Bordereau		c#93874-01-01	c#93874-01-01		
	UNITÉS	**TRIANGLE**	**BURNETTA**	**LDR**	**Lot CQ**
CONVENTIONNELS					
Carbone organique total	% g/g	2.9	1.0	0.5	1206627

LDR = Limite de détection rapportée
Lot CQ = Lot Contrôle Qualité

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Dossier Maxxam: B355654
Date du rapport: 2013/09/27

GROUPE HÉMISPHÈRES INC.
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # de commande: 93874
Initiales du préleveur: SB

MÉTAUX EXTRACTIBLES TOTAUX (EAU)

Identification Maxxam		V82014	V82015		
Date d'échantillonnage		2013/09/03	2013/09/03		
# Bordereau		c#93874-01-01	c#93874-01-01		
	UNITÉS	**BLANC TRANSPORT LOT:13JN27-B**	**BLANC TERRAIN LOT:13JN27-B**	**LDR**	**Lot CQ**
MÉTAUX ICP-MS					
Aluminium (Al)	ug/L	<10	<10	10	1204469
Arsenic (As)	ug/L	<1.0	<1.0	1.0	1204469
Cadmium (Cd)	ug/L	<0.20	<0.20	0.20	1204469
Calcium (Ca)	ug/L	<500	<500	500	1204469
Cuivre (Cu)	ug/L	<1.0	<1.0	1.0	1204469
Fer (Fe)	ug/L	<60	<60	60	1204469
Magnésium (Mg)	ug/L	<100	<100	100	1204469
Manganèse (Mn)	ug/L	<1.0	<1.0	1.0	1204469
Molybdène (Mo)	ug/L	<1.0	<1.0	1.0	1204469
Nickel (Ni)	ug/L	<2.0	<2.0	2.0	1204469
Plomb (Pb)	ug/L	<0.50	<0.50	0.50	1204469
Potassium (K)	ug/L	<500	<500	500	1204469
Sélénium (Se)	ug/L	<3.0	<3.0	3.0	1204469
Sodium (Na)	ug/L	<500	<500	500	1204469
Zinc (Zn)	ug/L	<7.0	<7.0	7.0	1204469

LDR = Limite de détection rapportée
Lot CQ = Lot Contrôle Qualité

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Dossier Maxxam: B355654
Date du rapport: 2013/09/27

GROUPE HÉMISPHÈRES INC.
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # de commande: 93874
Initiales du préleveur: SB

MÉTAUX EXTRACTIBLES TOTAUX (EAU DE SURFACE)

Identification Maxxam		V82010	V82012		
Date d'échantillonnage		2013/09/02 13:52	2013/09/03 13:30		
# Bordereau		c#93874-01-01	c#93874-01-01		
	UNITÉS	**TRIANGLE**	**BURNETTA**	**LDR**	**Lot CQ**
MÉTAUX ICP-MS					
Aluminium (Al)	ug/L	18	130	10	1204469
Arsenic (As)	ug/L	<1.0	<1.0	1.0	1204469
Cadmium (Cd)	ug/L	<0.20	<0.20	0.20	1204469
Calcium (Ca)	ug/L	2700	<500	500	1204469
Cuivre (Cu)	ug/L	<1.0	<1.0	1.0	1204469
Dureté totale (CaCO3)	ug/L	16000	1200	1000	1204469
Fer (Fe)	ug/L	75	220	60	1204469
Magnésium (Mg)	ug/L	2300	290	100	1204469
Manganèse (Mn)	ug/L	6.5	23	1.0	1204469
Molybdène (Mo)	ug/L	<1.0	<1.0	1.0	1204469
Mercure (Hg)	ug/L	<0.10	<0.10	0.10	1204469
Nickel (Ni)	ug/L	<2.0	<2.0	2.0	1204469
Phosphore total	ug/L	<10	<10	10	1204469
Plomb (Pb)	ug/L	<0.50	<0.50	0.50	1204469
Potassium (K)	ug/L	<500	<500	500	1204469
Sélénium (Se)	ug/L	<3.0	<3.0	3.0	1204469
Sodium (Na)	ug/L	580	<500	500	1204469
Uranium (U)	ug/L	<1.0	<1.0	1.0	1204469
Zinc (Zn)	ug/L	<7.0	<7.0	7.0	1204469

LDR = Limite de détection rapportée
Lot CQ = Lot Contrôle Qualité

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Dossier Maxxam: B355654
Date du rapport: 2013/09/27

GROUPE HÉMISPHÈRES INC.
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # de commande: 93874
Initiales du préleveur: SB

PARAMÈTRES CONVENTIONNELS (EAU DE SURFACE)

Identification Maxxam		V82010	V82012		
Date d'échantillonnage		2013/09/02 13:52	2013/09/03 13:30		
# Bordereau		c#93874-01-01	c#93874-01-01		
	UNITÉS	**TRIANGLE**	**BURNETTA**	**LDR**	**Lot CQ**
CONVENTIONNELS					
Acidité en CaCO3	mg/L	10	<10	10	1204450
Azote ammoniacal (N-NH3)	mg/L	0.02	<0.02	0.02	1204007
Conductivité	mS/cm	0.037	0.005	0.001	1204014
Fluorure (F)	mg/L	<0.1	<0.1	0.1	1204016
Alcalinité Totale (en CaCO3) pH 4.5	mg/L	15	2	1	1204009
Bicarbonates (HCO3 comme CaCO3)	mg/L	15	2	1	1204009
Chlorures (Cl)	mg/L	0.22	0.11	0.05	1205296
Nitrate(N) et Nitrite(N)	mg/L	0.11	<0.02	0.02	1205296
Sulfates (SO4)	mg/L	2.2	<0.5	0.5	1205296
Matières en suspension (MES)	mg/L	3	5	2	1203807

LDR = Limite de détection rapportée
Lot CQ = Lot Contrôle Qualité

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Dossier Maxxam: B355654
Date du rapport: 2013/09/27

GROUPE HÉMISPHÈRES INC.
Votre # du projet: PR185-HOWSE
Adresse du site: HOWSE
Votre # de commande: 93874
Initiales du préleveur: SB

REMARQUES GÉNÉRALES

État des échantillons à l'arrivée: BON excepté pour
Métaux extractibles totaux: Afin de respecter le délai de conservation, l'échantillon a été congelé dès sa réception: V82011, V82013
Carbone organique total: Afin de respecter le délai de conservation, l'échantillon a été congelé dès sa réception: V82011, V82013

Tous les résultats sont calculés sur une base sèche excepté lorsque non-applicable.

A,B,C: Selon l'Annexe 2 du "Politique de protection des sols et de réhabilitation des terrains contaminés" intitulée "Les critères génériques pour les sols et pour les eaux souterraines (eau de surface et égouts)". Pour toutes les analyses organiques, le critère A désigne toute concentration inférieure à la valeur indiquée. Pour toutes les analyses de métaux dans les sols, le Critère A désigne la " Teneur de fond Secteur Fosse du Labrador ".

A,B-eau souterraine: A=Critère pour fin de consommation; B=Critère pour la résurgence dans les eaux de surface ou infiltration dans les égouts.

Ces références ne sont rapportées qu'à titre indicatif et ne doivent pas être interprétées dans aucun autre contexte.
- = Ce composé ne fait pas parti de la réglementation.

PARAMÈTRES CONVENTIONNELS (SÉDIMENT)

Veuillez noter que les résultats n'ont pas été corrigés ni pour la récupération des échantillons de contrôle qualité, ni pour le blanc de méthode.Veuillez noter que le résultat de TOC inclut le carbone graphitique.

MÉTAUX EXTRACTIBLES TOTAUX (EAU)

Veuillez noter que les résultats n'ont pas été corrigés ni pour la récupération des échantillons de contrôle qualité, ni pour le blanc de méthode.

MÉTAUX EXTRACTIBLES TOTAUX (EAU DE SURFACE)

Veuillez noter que les résultats n'ont pas été corrigés ni pour la récupération des échantillons de contrôle qualité, ni pour le blanc de méthode.

PARAMÈTRES CONVENTIONNELS (EAU DE SURFACE)

Veuillez noter que les résultats n'ont pas été corrigés ni pour la récupération des échantillons de contrôle qualité, ni pour le blanc de méthode.

Les résultats ne se rapportent qu'aux échantillons soumis pour analyse

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

GROUPE HÉMISPHÈRES INC.
Attention: Simon Barette
Votre # du projet: PR185-HOWSE
P.O. #: 93874
Adresse du site: HOWSE

Rapport Assurance Qualité

Dossier Maxxam: B355654

Lot Num	Lot Init	Type CQ	Groupe	Date Analysé aaaa/mm/jj	Valeur	Réc	UNITÉS
1203807	FSI	Blanc fortifié	Matières en suspension (MES)	2013/09/10		95	%
		Blanc fortifié DUP	Matières en suspension (MES)	2013/09/10		97	%
		Blanc de méthode	Matières en suspension (MES)	2013/09/10	<2		mg/L
1204007	DKH	MRC	Azote ammoniacal (N-NH3)	2013/09/11		92	%
		Blanc fortifié	Azote ammoniacal (N-NH3)	2013/09/11		100	%
		Blanc de méthode	Azote ammoniacal (N-NH3)	2013/09/11	<0.02		mg/L
1204009	MR4	Blanc fortifié	Alcalinité Totale (en CaCO3) pH 4.5	2013/09/12		101	%
		Blanc de méthode	Alcalinité Totale (en CaCO3) pH 4.5	2013/09/12	<1		mg/L
			Bicarbonates (HCO3 comme CaCO3)	2013/09/12	<1		mg/L
1204014	MR4	Blanc fortifié	Conductivité	2013/09/12		102	%
		Blanc de méthode	Conductivité	2013/09/12	<0.001		mS/cm
1204016	MR4	Blanc fortifié	Fluorure (F)	2013/09/12		96	%
		Blanc de méthode	Fluorure (F)	2013/09/12	<0.1		mg/L
1204450	JE1	Vérification étalonnage	Acidité en CaCO3	2013/09/11		100	%
		MRC	Acidité en CaCO3	2013/09/11		99	%
		Blanc fortifié	Acidité en CaCO3	2013/09/11		99	%
1204469	JF1	MRC	Aluminium (Al)	2013/09/12		105	%
			Arsenic (As)	2013/09/12		105	%
			Cadmium (Cd)	2013/09/12		102	%
			Cuivre (Cu)	2013/09/12		100	%
			Fer (Fe)	2013/09/12		112	%
			Manganèse (Mn)	2013/09/12		105	%
			Molybdène (Mo)	2013/09/12		106	%
			Nickel (Ni)	2013/09/12		102	%
			Plomb (Pb)	2013/09/12		101	%
			Sélénium (Se)	2013/09/12		101	%
			Zinc (Zn)	2013/09/12		101	%
		Blanc fortifié	Aluminium (Al)	2013/09/12		91	%
			Arsenic (As)	2013/09/12		107	%
			Cadmium (Cd)	2013/09/12		95	%
			Calcium (Ca)	2013/09/12		91	%
			Cuivre (Cu)	2013/09/12		100	%
			Fer (Fe)	2013/09/12		105	%
			Magnésium (Mg)	2013/09/12		104	%
			Manganèse (Mn)	2013/09/12		108	%
			Molybdène (Mo)	2013/09/12		100	%
			Mercure (Hg)	2013/09/12		117	%
			Nickel (Ni)	2013/09/12		101	%
			Phosphore total	2013/09/12		101	%
			Plomb (Pb)	2013/09/12		93	%
			Potassium (K)	2013/09/12		103	%
			Sélénium (Se)	2013/09/12		98	%
			Sodium (Na)	2013/09/12		108	%
			Uranium (U)	2013/09/12		94	%
			Zinc (Zn)	2013/09/12		99	%
		Blanc de méthode	Aluminium (Al)	2013/09/12	<10		ug/L
			Arsenic (As)	2013/09/12	1.0, LDR=1.0		ug/L
			Cadmium (Cd)	2013/09/12	<0.20		ug/L
			Calcium (Ca)	2013/09/12	<500		ug/L
			Cuivre (Cu)	2013/09/12	<1.0		ug/L
			Dureté totale (CaCO3)	2013/09/12	<1000		ug/L
			Fer (Fe)	2013/09/12	<60		ug/L
			Magnésium (Mg)	2013/09/12	<100		ug/L
			Manganèse (Mn)	2013/09/12	<1.0		ug/L

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

GROUPE HÉMISPHÈRES INC.
Attention: Simon Barette
Votre # du projet: PR185-HOWSE
P.O. #: 93874
Adresse du site: HOWSE

Rapport Assurance Qualité (Suite)

Dossier Maxxam: B355654

Lot Num Init	Type CQ	Groupe	Date Analysé aaaa/mm/jj	Valeur	Réc	UNITÉS
1204469 JF1	Blanc de méthode	Molybdène (Mo)	2013/09/12	<1.0		ug/L
		Mercure (Hg)	2013/09/12	<0.10		ug/L
		Nickel (Ni)	2013/09/12	<2.0		ug/L
		Phosphore total	2013/09/12	<10		ug/L
		Plomb (Pb)	2013/09/12	<0.50		ug/L
		Potassium (K)	2013/09/12	<500		ug/L
		Sélénium (Se)	2013/09/12	<3.0		ug/L
		Sodium (Na)	2013/09/12	<500		ug/L
		Uranium (U)	2013/09/12	<1.0		ug/L
		Zinc (Zn)	2013/09/12	<7.0		ug/L
1205296 MR4	Blanc fortifié	Chlorures (Cl)	2013/09/14		102	%
		Nitrate(N) et Nitrite(N)	2013/09/14		104	%
		Sulfates (SO4)	2013/09/14		105	%
	Blanc de méthode	Chlorures (Cl)	2013/09/14	<0.05		mg/L
		Nitrate(N) et Nitrite(N)	2013/09/14	<0.02		mg/L
		Sulfates (SO4)	2013/09/14	<0.5		mg/L
1205756 AL5	Échantillon fortifié [V82011-01]	Aluminium (Al)	2013/09/14		NC	%
		Arsenic (As)	2013/09/14		102	%
		Cadmium (Cd)	2013/09/14		96	%
		Calcium (Ca)	2013/09/14		NC	%
		Cuivre (Cu)	2013/09/14		NC	%
		Fer (Fe)	2013/09/14		NC	%
		Magnésium (Mg)	2013/09/14		NC	%
		Manganèse (Mn)	2013/09/14		NC	%
		Molybdène (Mo)	2013/09/14		100	%
		Nickel (Ni)	2013/09/14		NC	%
		Mercure (Hg)	2013/09/14		97	%
		Potassium (K)	2013/09/14		NC	%
		Plomb (Pb)	2013/09/14		105	%
		Sélénium (Se)	2013/09/14		103	%
		Sodium (Na)	2013/09/14		104	%
		Zinc (Zn)	2013/09/14		NC	%
	MRC	Arsenic (As)	2013/09/14		117	%
		Cadmium (Cd)	2013/09/14		106	%
		Cuivre (Cu)	2013/09/14		91	%
		Fer (Fe)	2013/09/14		101	%
		Manganèse (Mn)	2013/09/14		99	%
		Molybdène (Mo)	2013/09/14		82	%
		Nickel (Ni)	2013/09/14		115	%
		Mercure (Hg)	2013/09/14		109	%
		Plomb (Pb)	2013/09/14		105	%
		Zinc (Zn)	2013/09/14		98	%
	Blanc fortifié	Aluminium (Al)	2013/09/14		99	%
		Arsenic (As)	2013/09/14		105	%
		Cadmium (Cd)	2013/09/14		98	%
		Calcium (Ca)	2013/09/14		103	%
		Cuivre (Cu)	2013/09/14		100	%
		Fer (Fe)	2013/09/14		108	%
		Magnésium (Mg)	2013/09/14		99	%
		Manganèse (Mn)	2013/09/14		102	%
		Molybdène (Mo)	2013/09/14		102	%
		Nickel (Ni)	2013/09/14		108	%
		Mercure (Hg)	2013/09/14		94	%
		Potassium (K)	2013/09/14		101	%

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GROUPE HÉMISPHÈRES INC.
Attention: Simon Barette
Votre # du projet: PR185-HOWSE
P.O. #: 93874
Adresse du site: HOWSE

Rapport Assurance Qualité (Suite)

Dossier Maxxam: B355654

Lot Num Init	Lot Type CQ	Groupe	Date Analysé aaaa/mm/jj	Valeur	Réc	UNITÉS
1205756 AL5	Blanc fortifié	Plomb (Pb)	2013/09/14		103	%
		Sélénium (Se)	2013/09/14		102	%
		Sodium (Na)	2013/09/14		105	%
		Zinc (Zn)	2013/09/14		107	%
	Blanc de méthode	Aluminium (Al)	2013/09/14	<20		mg/kg
		Arsenic (As)	2013/09/14	<2		mg/kg
		Cadmium (Cd)	2013/09/14	<0.2		mg/kg
		Calcium (Ca)	2013/09/14	<30		mg/kg
		Cuivre (Cu)	2013/09/14	<1		mg/kg
		Fer (Fe)	2013/09/14	<10		mg/kg
		Magnésium (Mg)	2013/09/14	<10		mg/kg
		Manganèse (Mn)	2013/09/14	<2		mg/kg
		Molybdène (Mo)	2013/09/14	<2		mg/kg
		Nickel (Ni)	2013/09/14	<1		mg/kg
		Mercure (Hg)	2013/09/14	<0.05		mg/kg
		Potassium (K)	2013/09/14	<20		mg/kg
		Plomb (Pb)	2013/09/14	<5		mg/kg
		Sélénium (Se)	2013/09/14	<10		mg/kg
		Sodium (Na)	2013/09/14	<10		mg/kg
		Zinc (Zn)	2013/09/14	<5		mg/kg
1206627 VB	MRC	Carbone organique total	2013/09/17		96	%
	Blanc de méthode	Carbone organique total	2013/09/17	<0.5		% g/g

Vérification d'étalonnage: Sert à confimer que l'étalonnage est en contrôle tout au long de la séquence instrumentale.
Échantillon fortifié: Échantillon auquel a été ajouté une quantité connue d'un ou de plusieurs composés chimiques d'intérêt. Sert à évaluer les interférences dues à la matrice.
MRC: Un échantillon de concentration connue préparé dans des conditions rigoureuses par un organisme externe. Utilisé pour vérifier la justesse de la méthode.
Blanc fortifié: Un blanc, d'une matrice exempte de contaminants, auquel a été ajouté une quantité connue d'analyte provenant généralement d'une deuxième source. Utilisé pour évaluer la précision de la méthode.
Blanc de méthode: Une partie aliquote de matrice pure soumise au même processus analytique que les échantillons, du prétraitement au dosage. Sert à évaluer toutes contaminations du laboratoire.
NC (Matrice d'échantillon fortifié) : Le pourcentage de récupération de l'échantillon fortifié n'a pas pu être calculé. La différence entre la concentration de l'ajout dosé et de la concentration initiale de l'échantillon n'était pas suffisamment élevée pour permettre un calcul fiable
LDR = Limite de détection rapportée
Réc = Récupération

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Page des signatures de validation

Dossier Maxxam: B355654

Les résultats analytiques ainsi que les données de contrôle-qualité contenus dans ce rapport furent vérifiés et validés par les personnes suivantes:

<Original signed by>

Delia Barbul, B.Sc., Chimiste

<Original signed by>

Kathie Quevillon, B.Sc., Chimiste

<Original signed by>

Miryam Assayag

<Original signed by>

Madina Hamrouni, B.Sc., Chimiste

<Original signed by>

Steliana Calestru, B.Sc. Chimiste

<Original signed by>

Veronic Beausejour, B.Sc., Chimiste, Superviseur

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Maxxam — Maxxam Analytics International Corporation o/a Maxxam Analytique
889, montée de Liesse, Saint-Laurent, Quebec Canada H4T 1P5 Téléphone:(514) 448-9001 Ligne sans frais:1-877-462-9926 Télécopieur:(514)-448-9199 www.maxxam.ca

BORDEREAU D[...] — Page 1 de 2

9-Sep-13 14:50
Séverine Planté
B355654
SBA MTL-0075

INFORMATION FACTURATION:		INFORMATION RAPPORT (si différente de facturation):		INFORMATION PROJET:	
Compagnie:	#3990 GROUPE HÉMISPHÈRES INC.	Compagnie:	#1953 GROUPE HÉMISPHÈRES INC.	Nº de cotation:	B20511
Attention de:	COMPTES PAYABLES	Attention de:	Simon BARETTE	Nº de commande:	93874
Adresse:	13,rue St. Louis bureau 201, Lévis PQ G6V4E2	Adresse:	1453, RUE BEAUBIEN EST BUREAU 301, MONTRÉAL PQ H2G 3C6	Nº de projet:	PR185-Howse
				Nom du projet:	HOWSE
Téléphone:	(418)903-9678 Téléc.: (418)838-1855	Téléphone:	(514)509-6572 Téléc.: (514)509-6573	# de site:	
Courriel:	cybel@hemis.ca;info@hemis.ca	Courriel:	sbarrette@hemis.ca	Échantillonneur:	SIMON BARRETTE

[...]re seulement:
COMMANDE BOUTEILLES: 93874
CHARGÉ(E) DE PROJETS: Lorena Di Benedetto
C#93874-01-01

CRITÈRES ET RÈGLEMENTS: ☐ Politique ☐ RDS ☐ RMD ☐ REIMR — Essai de pompage: ☐ 24h (Art. 6.1&6.2) ☐ 48h (Art. 6.2) ☐ 72h (Art. 6.1&6.2) — Règ. CUM: ☐ Égout sanitaire Art.10 ☐ Égout pluvial Art.11 — Qualité Eau Potable: ☐ Municipal ☐ Non-municipal — ☐ Règ. Pâtes & Papiers (Art.104) ☐ Règ. Pâtes & Papiers (Art.112) — Autre (spécifier): REMM

INSTRUCTIONS SPÉCIALES: Métaux extractible total.

Remarque: Pour les échantillons d'eau potable soumis à la réglementation - S.V.P utiliser le formulaire client rattaché à l'eau potable

CONSERVER LES ÉCHANTILLONS EN MILIEU FROID (< 10 OC) DE L'ÉCHANTILLONNAGE À LA LIVRAISON CHEZ MAXXAM

ANALYSES REQUISES (S.V.P soyez précis):

	Étiquette Codebar	Identification de l'échantillon	Date Prélevé	Heure	Matrice	Eau potable réglementée ? (O/N)	métaux à filtrer au labo ? (O/N)	Métaux (As,Cu,Pb,Ni,Zn,Al,Cd,Fe,Mn,	Mo,Se,Ca,Mg,K,Na)	Mercure par ICP-MS	Uranium par ICP-MS	Dureté	Matières en suspension	Azote ammoniacal	Anions (NO2+NO3)	Phosphore total	Anions (Cl, SO4, NO2+NO3)	# de Contenants	Commentaires
1		TRIANGLE	02/09 2013	13h52	SURF	N	N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7	
2		TRIANGLE	02/09 2013	13h52	SED ~~SURF~~			✓	✓	✓								3	SÉDIMENT
3		BURNETTA	03/09 2013	13h30	SURF	N	N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7	
4		BURNETTA	03/09 2013	13h30	SED			✓	✓	✓								3	SÉDIMENT
5																			
6																			
7																			
8																			
9																			ICE-YES
10																			SEAL NO

DÉLAIS REQUIS:
S.V.P NOTIFIER À L'AVANCE EN CAS DE PROJET URGENT

Délai Régulier: ☐
(Sera applicable si le délai de l'urgence n'est pas précisé):
Délai Régulier = 5 Jours ouvrables pour la plupart des analyses.
S.V.P Veuillez noter que le délai pour certaines analyses telles que la DBO5 et les Dioxines/Furannes est > 5 jours - Contactez votre chargé de projets pour les détails.

Délai rapide (Si applicable à tous les échantillons) ☐
Date Requis: Heure requise:
Veuillez noter que tout échantillon reçu après 15H00, sera considéré comme reçu le lendemain (jour ouvrable) à 9H00.

Maxxam
FREEZE

*DÉSSAISI PAR: (Signature)	Date: (AAAA/MM/JJ)	Heure:	REÇU PAR: (Signature)	Date: (AAAA/MM/JJ)	Heure:	# de pots utilisés et non retournés	Court Délai de Conservation	Temperature (°C) de Reception	Sceau légal intact sur la glacière
[signature]	2013/09/09	14h45	[signature]	2013/09/09	14:50		☐	10 10 10	☐ Oui ☑ Non

À l'usage du laboratoire seulement

* IL EST DE LA RESPONSABILITÉ DE LA PERSONNE RAPPORTANT L'ÉCHANTILLON DE S'ASSURER DE L'EXACTITUDE DU BORDEREAU DE TRANSMISSION. UN MANQUEMENT À CETTE PROCÉDURE PEUT SE TRADUIRE PAR UN RETARD DANS LE DÉLAI ANALYTIQUE.

Blanc: Maxxam Jaune: Client

Maxxam Analytics International Corporation o/a Maxxam Analytique

Maxxam

Maxxam Analytics International Corporation o/a Maxxam Analytique
889, montée de Liesse, Saint-Laurent, Quebec Canada H4T 1P5 Téléphone:(514) 448-9001 Ligne sans frais:1-877-462-9926 Télécopieur:(514)-448-9199 www.maxxam.ca

BORDEREAU DE TRANSMISSION D'ÉCHANTILLONS

INFORMATION FACTURATION:		INFORMATION RAPPORT (si différente de facturation):		INFORMATION PROJET:		À l'usage du laboratoire seulement:	
Compagnie:	#3990 GROUPE HÉMISPHÈRES INC.	Compagnie:	#1953 GROUPE HÉMISPHÈRES INC.	N° de cotation:	B20511	# DOSSIER MAXXAM:	# COMMANDE BOUTEILLES: 93874
Attention de:	COMPTES PAYABLES	Attention de:	Simon BARETTE	N° de commande:	93874		
Adresse:	13,rue St. Louis bureau 201	Adresse:	1453, RUE BEAUBIEN EST BUREAU 301	N° de projet:	PR185-Howse	# CHAINE DE RESPONSABILITÉ: C#93874-01-02	CHARGÉ(E) DE PROJETS: Lorena Di Benedetto
	Lévis PQ G6V4E2		MONTRÉAL PQ H2G 3C6	Nom du projet:	HOWSE		
Téléphone:	(418)903-9678 Téléc.: (418)838-1855	Téléphone:	(514)509-6572 Téléc.: (514)509-6573	# de site:			
Courriel:	cybel@hemis.ca;info@hemis.ca	Courriel:	sbarrette@hemis.ca	Échantillonneur:	SIMON BARRETTE		

CRITÈRES ET RÉGLEMENTS:

☐ Politique ☐ RDS ☐ RMD ☐ REIMR

Essai de pompage: ☐ 24h (Art. 6.1&6.2) ☐ 48h (Art. 6.2) ☐ 72h (Art. 6.1&6.2)

Rég. CUM: ☐ Égout sanitaire Art.10 ☐ Égout pluvial Art.11

Rég. Pâtes & Papiers (Art.104) ☐ Rég. Pates & Papiers (Art.112)

Qualité Eau Potable: ☐ Municipal ☐ Non-municipal

Autre (spécifier) _____

INSTRUCTIONS SPÉCIALES

Remarque: Pour les échantillons d'eau potable soumis à la réglementation - S.V.P utiliser le formulaire client rattaché à l'eau potable

CONSERVER LES ÉCHANTILLONS EN MILIEU FROID (< 10 OC) DE L'ÉCHANTILLONNAGE À LA LIVRAISON CHEZ MAXXAM

DÉLAIS REQUIS:

S.V.P NOTIFIER À L'AVANCE EN CAS DE PROJET URGENT

Délai Régulier:

(Sera applicable si le délai de l'urgence n'est pas précisé) ☐

Délai Régulier = 5 Jours ouvrables pour la plupart des analyses.

S.V.P Veuillez noter que le délai pour certaines analyses telles que la DBO5 et les Dioxines/Furannes est > 5 jours - Contactez votre chargé de projets pour les détails.

Délai rapide (Si applicable à tous les échantillons)

Date Requis: _____ Heure requise: _____ ☐

Veuillez noter que tout échantillon reçu après 15H00, sera considéré comme reçu le lendemain (jour ouvrable) à 9H00.

	Étiquette Codebar	Identification de l'échantillon	Date Prélevé	Heure	Matrice	Eau potable réglementée ? (O / N)	métaux à filtrer au labo ? (O / N)	Conductivité	Alcalinité totale (pH final 4.5)	Acidité	Fluorures	Granulométrie	Carbone organique total					# de Contenants	Commentaires
1		TRIANGLE	02/09 2013	13h52	SURF	N	N	✓	✓	✓	✓							7	
2		TRIANGLE	02/09 2013	13h52	SED ~~SURF~~							✓	✓					3	SÉDIMENT
3		BURNETTA	03/09 2013	13h30	SURF	N	N	✓	✓	✓	✓							7	
4		BURNETTA	03/09 2013	13h30	SED							✓	✓					3	SÉDIMENT
5																			
6																		1	
7																			
8																			
9																			ICE - YES
10																			SEAL - NO

*DÉSSAISI PAR: (Signature)	Date: (AAAA/MM/JJ)	Heure:	REÇU PAR: (Signature)	Date: (AAAA/MM/JJ)	Heure:	# de pots utilisés et non retournés	À l'usage du laboratoire seulement		
							Court Délai de Conservation ☐	Temperature (°C) de Reception	Sceau légal intact sur la glacière
Jenna Bett.	2013/09/09	14h45		2013/09/09	14:50			10.10.10	☐ Oui ☒ Non

Blanc: Maxxam Jaune: Client

* IL EST DE LA RESPONSABILITÉ DE LA PERSONNE RAPPORTANT L'ÉCHANTILLON DE S'ASSURER DE L'EXACTITUDE DU BORDEREAU DE TRANSMISSION. UN MANQUEMENT À CETTE PROCÉDURE PEUT SE TRADUIRE PAR UN RETARD DANS LE DÉLAI ANALYTIQUE.

Your Project #: B355654
Your C.O.C. #: N/A

Attention: Severine Plante
Maxxam Analytique
Saint Laurent PQ to Bedford
889 Montee de Liesse
Saint Laurent, QC
H4T 1P5

Report Date: 2013/09/23

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B3F2794
Received: 2013/09/12, 10:19

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Particle size in solids (pipette&sieve) (1)	2	N/A	2013/09/21	ATL SOP 00012	based on MSAMS-1978
Particle size retained (Calculated) (1)	2	N/A	2013/09/22	ATL SOP 00012	based on MSAMS-1978

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Note: Graphical representation of larger fractions (PHI-4, PHI -3 and PHI -2) not applicable unless these optional parameters are specifically requested.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Katie Cohoon, Bedford Client Services
Email: KCohoon@maxxam.ca
Phone# (902) 420-0203 Ext:226

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B3F2794
Report Date: 2013/09/23

Maxxam Analytique
Client Project #: B355654

RESULTS OF ANALYSES OF SOIL

Maxxam ID		TA2799	TA2800		
Sampling Date		2013/09/02 13:52	2013/09/03 13:30		
COC Number		N/A	N/A		
	Units	**V82011-03R \ TRIANGLE**	**V82013-03R \ BURNETTA**	**RDL**	**QC Batch**
< -1 Phi (2 mm)	%	100	25 (1)	0.10	3354225
< 0 Phi (1 mm)	%	100	12	0.10	3354225
< +1 Phi (0.5 mm)	%	99	8.4	0.10	3354225
< +2 Phi (0.25 mm)	%	98	7.1	0.10	3354225
< +3 Phi (0.12 mm)	%	97	6.8	0.10	3354225
< +4 Phi (0.062 mm)	%	91	6.7	0.10	3354225
< +5 Phi (0.031 mm)	%	88	6.6	0.10	3354225
< +6 Phi (0.016 mm)	%	73	6.4	0.10	3354225
< +7 Phi (0.0078 mm)	%	47	5.8	0.10	3354225
< +8 Phi (0.0039 mm)	%	40	5.4	0.10	3354225
< +9 Phi (0.0020 mm)	%	27	4.2	0.10	3354225
Gravel	%	0.15	75	0.10	3354225
Sand	%	8.5	18	0.10	3354225
Silt	%	52	1.3	0.10	3354225
Clay	%	40	5.4	0.10	3354225

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Sample observsation comment: fraction contained many rocks

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Maxxam Job #: B3F2794
Report Date: 2013/09/23

Maxxam Analytique
Client Project #: B355654

CALCULATED PARAMETERS (SOIL)

Maxxam ID		TA2799	TA2800		
Sampling Date		2013/09/02 13:52	2013/09/03 13:30		
COC Number		N/A	N/A		
	Units	**V82011-03R \ TRIANGLE**	**V82013-03R \ BURNETTA**	**RDL**	**QC Batch**
2-4 mm	%	0.15	75	0.10	3346832
1-2 mm	%	0.23	13	0.10	3346832
0.5-1 mm	%	0.83	3.8	0.10	3346832
0.25-0.5 mm	%	0.79	1.3	0.10	3346832
0.125-0.25 mm	%	1.4	0.26	0.10	3346832
0.0625-0.125 mm	%	5.2	0.13	0.10	3346832
0.031-0.062 mm	%	3.2	<0.10	0.10	3346832
0.016-0.031 mm	%	15	0.26	0.10	3346832
0.0078-0.016 mm	%	26	0.62	0.10	3346832
0.0039-0.0078 mm	%	7.8	0.36	0.10	3346832
0.0020-0.0039 mm	%	13	1.2	0.10	3346832

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B3F2794
Report Date: 2013/09/23

Maxxam Analytique
Client Project #: B355654

Package 1	3.7°C

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Analytique
Attention: Severine Plante
Client Project #: B355654
P.O. #:
Site Location:

Quality Assurance Report

Maxxam Job Number: DB3F2794

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3354225	KLA	RPD	Gravel	2013/09/21	6.6		%	35
			Sand	2013/09/21	5.0		%	35
			Silt	2013/09/21	3.5		%	35
			Clay	2013/09/21	2.0		%	35

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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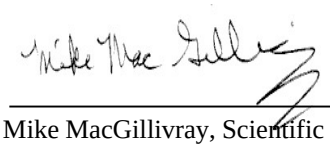
Validation Signature Page

Maxxam Job #: B3F2794

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Mike MacGillivray, Scientific Specialist (Inorganics)

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Attention: LOIC DIDILLON

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Your P.O. #: 2200000001
Your Project #: QUARTERLY SURFACE WATER
Site Location: DSO-TIMM
Your C.O.C. #: c#792760, c#79276-04-01

Report Date: 2013/06/18

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B332609
Received: 2013/06/11, 14:00

Sample Matrix: WATER
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary reference
Total Alkalinity (pH end point 4.5)	6	N/A	2013/06/12	STL SOP-00038	SM 2320B
Anions	6	N/A	2013/06/14	STL SOP-00014	MA. 300 - Ions 1.3
Real Color	6	N/A	2013/06/11	STL SOP-00046	MA. 103 - Col. 2.0
Total Suspended Solids	6	2013/06/13	2013/06/13	STL SOP-00015	MA. 104 - S.S. 1.1
Acid Soluble Metals by ICP-MS	2	2013/06/17	2013/06/17	STL SOP-00006	MA.200- Mét 1.2
Dissolved Metals by ICP-MS (Low Level)	4	2013/06/14	2013/06/14	STL SOP-00006	MA.200- Mét 1.2
Ammonia Nitrogen	6	N/A	2013/06/14	STL SOP-00040	MA. 300 - N 1.1
pH	6	N/A	2013/06/12	STL SOP-00038	MA.100- pH1.1
Sulfides (S2-)	6	2013/06/17	2013/06/17	STL SOP-00005	MA. 300-S 1.1
Total Petroleum Hydrocarbons	2	2013/06/13	2013/06/14	STL SOP-00125	MA. 408 - IdePet 1.0

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Lorena Di Benedetto, B.Sc., Chemist, Project Manager Supervisor
Email: LDibenedetto@maxxam.ca
Phone# (514) 448-9001 Ext:4262

==========

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Maxxam Job #: B332609
Report Date: 2013/06/18

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY SURFACE WATER
Site Location: DSO-TIMM
Your P.O. #: 2200000001

HYDROCARBONS BY GCFID (WATER)

Maxxam ID		U77062	U77063		
Sampling Date		2013/06/09	2013/06/09		
COC Number		c#79276-04-01	c#79276-04-01		
	Units	**COA-SW3**	**COA-SW10**	**RDL**	**QC Batch**
PETROLEUM HYDROCARBONS					
Tot Petroleum Hydrocarbons(C6-C36)	ug/L	<100	<100	100	1164083

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B332609
Report Date: 2013/06/18

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY SURFACE WATER
Site Location: DSO-TIMM
Your P.O. #: 2200000001

DISSOLVED METALS (WATER)

Maxxam ID		U77061	U77061	U77062	U77064	U77066		
Sampling Date		2013/06/09	2013/06/09	2013/06/09	2013/06/09	2013/06/09		
COC Number		c#79276-04-01	c#79276-04-01	c#79276-04-01	c#79276-04-01	c#79276-04-01		
	Units	**COA-SW4**	**COA-SW4 Lab-Dup**	**COA-SW3**	**COA-SW9**	**COA-SW13**	**RDL**	**QC Batch**
METALS ICP-MS								
Aluminum (Al)	ug/L	<10	39	36	75	17	10	1164247
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1164247
Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	1164247
Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1164247
Barium (Ba)	ug/L	<2.0	<2.0	7.0	<2.0	<2.0	2.0	1164247
Beryllium (Be)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	1164247
Bismuth (Bi)	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25	0.25	1164247
Boron (B)	ug/L	<20	<20	<20	<20	<20	20	1164247
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	1164247
Calcium (Ca)	ug/L	1800	1700	1700	<300	<300	300	1164247
Chromium (Cr)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	1164247
Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	1164247
Copper (Cu)	ug/L	1.5	<0.50	<0.50	<0.50	<0.50	0.50	1164247
Tin (Sn)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1164247
Iron (Fe)	ug/L	<100	<100	<100	130	140	100	1164247
Magnesium (Mg)	ug/L	1200	1200	1300	<100	200	100	1164247
Manganese (Mn)	ug/L	12	12	15	20	22	0.40	1164247
Molybdenum (Mo)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	1164247
Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1164247
Lead (Pb)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	1164247
Potassium (K)	ug/L	<100	<100	300	<100	<100	100	1164247
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1164247
Strontium (Sr)	ug/L	6.2	6.1	5.5	<2.0	2.1	2.0	1164247
Sodium (Na)	ug/L	750	740	490	<100	390	100	1164247
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1164247
Titanium (Ti)	ug/L	<10	<10	<10	<10	<10	10	1164247
Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1164247
Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	1164247

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B332609
Report Date: 2013/06/18

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY SURFACE WATER
Site Location: DSO-TIMM
Your P.O. #: 2200000001

ACID SOLUBLE METALS (WATER)

Maxxam ID		U77063	U77065		
Sampling Date		2013/06/09	2013/06/09		
COC Number		c#79276-04-01	c#79276-04-01		
	Units	**COA-SW10**	**COA-SW11**	**RDL**	**QC Batch**
METALS					
Antimony (Sb)	ug/L	<1.0	<1.0	1.0	1164916
Arsenic (As)	ug/L	<1.0	<1.0	1.0	1164916
Barium (Ba)	ug/L	15	10	2.0	1164916
Boron (B)	ug/L	<20	<20	20	1164916
Cadmium (Cd)	ug/L	<0.20	<0.20	0.20	1164916
Chromium (Cr)	ug/L	1.3	<0.50	0.50	1164916
Copper (Cu)	ug/L	3.7	0.55	0.50	1164916
Iron (Fe)	ug/L	770	<100	100	1164916
Lead (Pb)	ug/L	1.3	0.14	0.10	1164916
Selenium (Se)	ug/L	<1.0	<1.0	1.0	1164916

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B332609
Report Date: 2013/06/18

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY SURFACE WATER
Site Location: DSO-TIMM
Your P.O. #: 2200000001

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		U77061	U77062		U77063		U77064		
Sampling Date		2013/06/09	2013/06/09		2013/06/09		2013/06/09		
COC Number		c#79276-04-01	c#79276-04-01		c#79276-04-01		c#79276-04-01		
	Units	**COA-SW4**	**COA-SW3**	**RDL**	**COA-SW10**	**RDL**	**COA-SW9**	**RDL**	**QC Batch**
CONVENTIONALS									
Nitrogen ammonia (N-NH3)	mg/L	<0.02	<0.02	0.02	0.04	0.02	0.02	0.02	1164241
pH	pH	6.56	6.85	N/A	6.13	N/A	5.75	N/A	1162363
Real Color	UCV	4	8	2	330	10	20	2	1162353
Sulfides (S2-)	mg/L	<0.02	<0.02	0.02	<0.1	0.1	<0.02	0.02	1164966
Alkalinity Total (as CaCO3) pH 4.5	mg/L	5	8	1	1	1	<1	1	1162367
Bicarbonates (HCO3 as CaCO3)	mg/L	5	8	1	1	1	<1	1	1162367
Carbonate (CO3 as CaCO3)	mg/L	<1	<1	1	<1	1	<1	1	1162367
Chloride (Cl)	mg/L	1.1	0.32	0.05	0.17	0.05	0.06	0.05	1164313
Nitrate (N) and Nitrite(N)	mg/L	0.84	0.21	0.02	0.09	0.02	<0.02	0.02	1164313
Sulfates (SO4)	mg/L	1.3	1.6	0.5	0.7	0.5	<0.5	0.5	1164313
Total suspended solids (TSS)	mg/L	3	<2	2	23	10	2	2	1163781

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B332609
Report Date: 2013/06/18

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY SURFACE WATER
Site Location: DSO-TIMM
Your P.O. #: 2200000001

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		U77064	U77065	U77066		
Sampling Date		2013/06/09	2013/06/09	2013/06/09		
COC Number		c#79276-04-01	c#79276-04-01	c#79276-04-01		
	Units	**COA-SW9 Lab-Dup**	**COA-SW11**	**COA-SW13**	**RDL**	**QC Batch**
CONVENTIONALS						
Nitrogen ammonia (N-NH3)	mg/L	N/A	<0.02	<0.02	0.02	1164241
pH	pH	N/A	6.89	6.38	N/A	1162363
Real Color	UCV	N/A	8	6	2	1162353
Sulfides (S2-)	mg/L	<0.02	<0.02	<0.02	0.02	1164966
Alkalinity Total (as CaCO3) pH 4.5	mg/L	N/A	7	2	1	1162367
Bicarbonates (HCO3 as CaCO3)	mg/L	N/A	7	2	1	1162367
Carbonate (CO3 as CaCO3)	mg/L	N/A	<1	<1	1	1162367
Chloride (Cl)	mg/L	N/A	0.39	0.07	0.05	1164313
Nitrate (N) and Nitrite(N)	mg/L	N/A	0.25	<0.02	0.02	1164313
Sulfates (SO4)	mg/L	N/A	2.1	<0.5	0.5	1164313
Total suspended solids (TSS)	mg/L	N/A	18	<2	2	1163781

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B332609
Report Date: 2013/06/18

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY SURFACE WATER
Site Location: DSO-TIMM
Your P.O. #: 2200000001

Qualitative Interpretation for
Tot Petroleum Hydrocarbons(C6-C36)

Sample	Qualitative Interpretation
COA-SW3	No chromatographic hydrocarbon profile is present.
COA-SW10	No chromatographic hydrocarbon profile is present.

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Maxxam Job #: B332609
Report Date: 2013/06/18

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY SURFACE WATER
Site Location: DSO-TIMM
Your P.O. #: 2200000001

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD except for the following:
pH: Holding time already past.: U77061, U77062, U77063, U77064, U77065, U77066

HYDROCARBONS BY GCFID (WATER)

Please note that the results have not been corrected for QC recoveries (spiked blank). Please note that the results have been corrected for the instrument blank.

DISSOLVED METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

ACID SOLUBLE METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.
Holding time not respected for pH analysis.
Reported detection limits are multiplied by dilution factors used for sample analysis.

Results relate only to the items tested.

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TATA STEEL MINERALS CANADA
Attention: LOIC DIDILLON
Client Project #: QUARTERLY SURFACE WATER
P.O. #: 2200000001
Site Location: DSO-TIMM

Quality Assurance Report

Maxxam Job Number: B332609

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1162353	VK1	QC Standard	Real Color	2013/06/11		106	%
		Method Blank	Real Color	2013/06/11	<2		UCV
1162363	AL8	Spiked Blank	pH	2013/06/12		102	%
1162367	AL8	Spiked Blank	Alkalinity Total (as CaCO3) pH 4.5	2013/06/12		99	%
		Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2013/06/12	<1		mg/L
			Bicarbonates (HCO3 as CaCO3)	2013/06/12	<1		mg/L
			Carbonate (CO3 as CaCO3)	2013/06/12	<1		mg/L
1163781	RD2	Spiked Blank	Total suspended solids (TSS)	2013/06/13		96	%
		Spiked Blank DUP	Total suspended solids (TSS)	2013/06/13		95	%
		Method Blank	Total suspended solids (TSS)	2013/06/13	<2		mg/L
1164083	AS2	Spiked Blank	Tot Petroleum Hydrocarbons(C6-C36)	2013/06/14		92	%
		Method Blank	Tot Petroleum Hydrocarbons(C6-C36)	2013/06/14	<100		ug/L
1164241	DKH	Spiked Blank	Nitrogen ammonia (N-NH3)	2013/06/14		104	%
		Method Blank	Nitrogen ammonia (N-NH3)	2013/06/14	<0.02		mg/L
1164247	KQ	Spiked Blank	Aluminum (Al)	2013/06/14		105	%
			Antimony (Sb)	2013/06/14		110	%
			Silver (Ag)	2013/06/14		97	%
			Arsenic (As)	2013/06/14		100	%
			Barium (Ba)	2013/06/14		98	%
			Beryllium (Be)	2013/06/14		92	%
			Bismuth (Bi)	2013/06/14		101	%
			Boron (B)	2013/06/14		94	%
			Cadmium (Cd)	2013/06/14		101	%
			Calcium (Ca)	2013/06/14		98	%
			Chromium (Cr)	2013/06/14		95	%
			Cobalt (Co)	2013/06/14		93	%
			Copper (Cu)	2013/06/14		96	%
			Tin (Sn)	2013/06/14		109	%
			Iron (Fe)	2013/06/14		99	%
			Magnesium (Mg)	2013/06/14		98	%
			Manganese (Mn)	2013/06/14		99	%
			Molybdenum (Mo)	2013/06/14		102	%
			Nickel (Ni)	2013/06/14		95	%
			Lead (Pb)	2013/06/14		99	%
			Potassium (K)	2013/06/14		97	%
			Selenium (Se)	2013/06/14		95	%
			Strontium (Sr)	2013/06/14		100	%
			Sodium (Na)	2013/06/14		98	%
			Thallium (Tl)	2013/06/14		101	%
			Titanium (Ti)	2013/06/14		97	%
			Vanadium (V)	2013/06/14		94	%
			Zinc (Zn)	2013/06/14		97	%
		Method Blank	Aluminum (Al)	2013/06/14	<10		ug/L
			Antimony (Sb)	2013/06/14	<1.0		ug/L
			Silver (Ag)	2013/06/14	0.19, RDL=0.10		ug/L
			Arsenic (As)	2013/06/14	<1.0		ug/L
			Barium (Ba)	2013/06/14	<2.0		ug/L
			Beryllium (Be)	2013/06/14	<0.50		ug/L
			Bismuth (Bi)	2013/06/14	<0.25		ug/L
			Boron (B)	2013/06/14	<20		ug/L
			Cadmium (Cd)	2013/06/14	<0.20		ug/L
			Calcium (Ca)	2013/06/14	<300		ug/L
			Chromium (Cr)	2013/06/14	<0.50		ug/L
			Cobalt (Co)	2013/06/14	<0.50		ug/L
			Copper (Cu)	2013/06/14	<0.50		ug/L

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TATA STEEL MINERALS CANADA
Attention: LOIC DIDILLON
Client Project #: QUARTERLY SURFACE WATER
P.O. #: 2200000001
Site Location: DSO-TIMM

Quality Assurance Report (Continued)

Maxxam Job Number: B332609

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1164247	KQ	Method Blank	Tin (Sn)	2013/06/14	<1.0		ug/L
			Iron (Fe)	2013/06/14	<100		ug/L
			Magnesium (Mg)	2013/06/14	<100		ug/L
			Manganese (Mn)	2013/06/14	<0.40		ug/L
			Molybdenum (Mo)	2013/06/14	<0.50		ug/L
			Nickel (Ni)	2013/06/14	<1.0		ug/L
			Lead (Pb)	2013/06/14	<0.10		ug/L
			Potassium (K)	2013/06/14	<100		ug/L
			Selenium (Se)	2013/06/14	<1.0		ug/L
			Strontium (Sr)	2013/06/14	<2.0		ug/L
			Sodium (Na)	2013/06/14	<100		ug/L
			Thallium (Tl)	2013/06/14	<2.0		ug/L
			Titanium (Ti)	2013/06/14	<10		ug/L
			Vanadium (V)	2013/06/14	<2.0		ug/L
			Zinc (Zn)	2013/06/14	<5.0		ug/L
1164313	AL8	Spiked Blank	Chloride (Cl)	2013/06/14		99	%
			Nitrate (N) and Nitrite(N)	2013/06/14		98	%
			Sulfates (SO4)	2013/06/14		98	%
		Method Blank	Chloride (Cl)	2013/06/14	<0.05		mg/L
			Nitrate (N) and Nitrite(N)	2013/06/14	<0.02		mg/L
			Sulfates (SO4)	2013/06/14	<0.5		mg/L
1164916	MCA	Spiked Blank	Antimony (Sb)	2013/06/17		110	%
			Arsenic (As)	2013/06/17		102	%
			Barium (Ba)	2013/06/17		98	%
			Boron (B)	2013/06/17		99	%
			Cadmium (Cd)	2013/06/17		102	%
			Chromium (Cr)	2013/06/17		100	%
			Copper (Cu)	2013/06/17		98	%
			Iron (Fe)	2013/06/17		104	%
			Lead (Pb)	2013/06/17		103	%
			Selenium (Se)	2013/06/17		102	%
		Method Blank	Antimony (Sb)	2013/06/17	<1.0		ug/L
			Arsenic (As)	2013/06/17	<1.0		ug/L
			Barium (Ba)	2013/06/17	<2.0		ug/L
			Boron (B)	2013/06/17	<20		ug/L
			Cadmium (Cd)	2013/06/17	<0.20		ug/L
			Chromium (Cr)	2013/06/17	<0.50		ug/L
			Copper (Cu)	2013/06/17	<0.50		ug/L
			Iron (Fe)	2013/06/17	<100		ug/L
			Lead (Pb)	2013/06/17	<0.10		ug/L
			Selenium (Se)	2013/06/17	<1.0		ug/L
1164966	LI	Spiked Blank	Sulfides (S2-)	2013/06/17		99	%
		Method Blank	Sulfides (S2-)	2013/06/17	<0.02		mg/L

RDL = Reportable Detection Limit
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Validation Signature Page

Maxxam Job #: B332609

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Abdeslam Siaida, Analyst II

<Original signed by>

Delia Barbul, B.Sc., Chemist

<Original signed by>

Kathie Quevillon, B.Sc., Chemist

<Original signed by>

Madina Hamrouni, B.Sc., Chemist

<Original signed by>

Veronic Beausejour, B.Sc., Chemist, Supervisor

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Attention: Natasha Poole

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Your P.O. #: 2100-00-0001
Your Project #: Quarterly Surface Water
Site#: DSO-TIMMINS
Site Location: TSMC
Your C.O.C. #: C#792760, C#79276-04-02

Report Date: 2013/06/19

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B332981
Received: 2013/06/12, 14:00

Sample Matrix: SURFACE WATER
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary reference
Total Alkalinity (pH end point 4.5)	1	N/A	2013/06/13	STL SOP-00038	SM 2320B
Anions	1	N/A	2013/06/12	STL SOP-00014	MA. 300 - Ions 1.3
Real Color	1	N/A	2013/06/12	STL SOP-00046	MA. 103 - Col. 2.0
Total Suspended Solids	1	2013/06/17	2013/06/17	STL SOP-00015	MA. 104 - S.S. 1.1
Dissolved Metals by ICP-MS (Low Level)	1	2013/06/17	2013/06/18	STL SOP-00006	MA.200- Mét 1.2
Ammonia Nitrogen	1	N/A	2013/06/14	STL SOP-00040	MA. 300 - N 1.1
Nitrate and/or Nitrite	1	N/A	2013/06/12	STL SOP-00014	MA. 300 - Ions 1.3
Dissolved Oxygen	1	N/A	2013/06/13	STL SOP-00008	MA. 315 - DBO 1.1
pH	1	N/A	2013/06/12	STL SOP-00038	MA.100- pH1.1
Sulfides (S2-)	1	2013/06/17	2013/06/17	STL SOP-00005	MA. 300-S 1.1

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Lorena Di Benedetto, B.Sc., Chemist, Project Manager Supervisor
Email: LDibenedetto@maxxam.ca
Phone# (514) 448-9001 Ext:4262

==========

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Maxxam Job #: B332981
Report Date: 2013/06/19

TATA STEEL MINERALS CANADA
Client Project #: Quarterly Surface Water
Site Location: TSMC
Your P.O. #: 2100-00-0001
Sampler Initials: AM

DISSOLVED METALS (SURFACE WATER)

Maxxam ID		U78780		
Sampling Date		2013/06/10		
COC Number		C#79276-04-02		
	Units	**COA-SW8**	**RDL**	**QC Batch**
METALS ICP-MS				
Aluminum (Al)	ug/L	53	10	1165192
Antimony (Sb)	ug/L	<1.0	1.0	1165192
Silver (Ag)	ug/L	<0.10	0.10	1165192
Arsenic (As)	ug/L	<1.0	1.0	1165192
Barium (Ba)	ug/L	<2.0	2.0	1165192
Beryllium (Be)	ug/L	<0.50	0.50	1165192
Bismuth (Bi)	ug/L	<0.25	0.25	1165192
Boron (B)	ug/L	<20	20	1165192
Cadmium (Cd)	ug/L	<0.20	0.20	1165192
Calcium (Ca)	ug/L	<300	300	1165192
Chromium (Cr)	ug/L	0.63	0.50	1165192
Cobalt (Co)	ug/L	<0.50	0.50	1165192
Copper (Cu)	ug/L	<0.50	0.50	1165192
Tin (Sn)	ug/L	<1.0	1.0	1165192
Iron (Fe)	ug/L	<100	100	1165192
Magnesium (Mg)	ug/L	170	100	1165192
Manganese (Mn)	ug/L	4.7	0.40	1165192
Molybdenum (Mo)	ug/L	<0.50	0.50	1165192
Nickel (Ni)	ug/L	<1.0	1.0	1165192
Lead (Pb)	ug/L	<0.10	0.10	1165192
Potassium (K)	ug/L	<100	100	1165192
Selenium (Se)	ug/L	<1.0	1.0	1165192
Strontium (Sr)	ug/L	<2.0	2.0	1165192
Sodium (Na)	ug/L	390	100	1165192
Thallium (Tl)	ug/L	<2.0	2.0	1165192
Titanium (Ti)	ug/L	<10	10	1165192
Vanadium (V)	ug/L	<2.0	2.0	1165192
Zinc (Zn)	ug/L	<5.0	5.0	1165192

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B332981
Report Date: 2013/06/19

TATA STEEL MINERALS CANADA
Client Project #: Quarterly Surface Water
Site Location: TSMC
Your P.O. #: 2100-00-0001
Sampler Initials: AM

CONVENTIONAL PARAMETERS (SURFACE WATER)

Maxxam ID		U78780		
Sampling Date		2013/06/10		
COC Number		C#79276-04-02		
	Units	**COA-SW8**	**RDL**	**QC Batch**
CONVENTIONALS				
Dissolved oxygen	mg/L	9.6	1.0	1163944
Nitrate (N) and Nitrite(N)	mg/L	<0.02	0.02	1163058
Nitrates (N-NO3-)	mg/L	<0.02	0.02	1163058
Nitrites (N-NO2-)	mg/L	<0.02	0.02	1163058
Nitrogen ammonia (N-NH3)	mg/L	<0.02	0.02	1164250
pH	pH	7.25	N/A	1163061
Real Color	UCV	15	2	1163069
Sulfides (S2-)	mg/L	<0.02	0.02	1165314
Alkalinity Total (as CaCO3) pH 4.5	mg/L	1	1	1163354
Bicarbonates (HCO3 as CaCO3)	mg/L	1	1	1163354
Carbonate (CO3 as CaCO3)	mg/L	<1	1	1163354
Chloride (Cl)	mg/L	<0.05	0.05	1163059
Sulfates (SO4)	mg/L	<0.5	0.5	1163059
Total suspended solids (TSS)	mg/L	2	2	1164872

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B332981
Report Date: 2013/06/19

TATA STEEL MINERALS CANADA
Client Project #: Quarterly Surface Water
Site Location: TSMC
Your P.O. #: 2100-00-0001
Sampler Initials: AM

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD except for the following:
pH: Holding time already past.: U78780

DISSOLVED METALS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.
Holding time not respected for pH analysis.

Results relate only to the items tested.

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TATA STEEL MINERALS CANADA
Attention: Natasha Poole
Client Project #: Quarterly Surface Water
P.O. #: 2100-00-0001
Site Location: TSMC

Quality Assurance Report

Maxxam Job Number: B332981

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1163058	AL8	Spiked Blank	Nitrate (N) and Nitrite(N)	2013/06/12		104	%
			Nitrates (N-NO3-)	2013/06/12		107	%
			Nitrites (N-NO2-)	2013/06/12		100	%
		Method Blank	Nitrate (N) and Nitrite(N)	2013/06/12	<0.02		mg/L
			Nitrates (N-NO3-)	2013/06/12	<0.02		mg/L
			Nitrites (N-NO2-)	2013/06/12	<0.02		mg/L
1163059	AL8	Spiked Blank	Chloride (Cl)	2013/06/12		104	%
			Sulfates (SO4)	2013/06/12		105	%
		Method Blank	Chloride (Cl)	2013/06/12	<0.05		mg/L
			Sulfates (SO4)	2013/06/12	<0.5		mg/L
1163061	AL8	Spiked Blank	pH	2013/06/12		102	%
1163069	LI	QC Standard	Real Color	2013/06/12		103	%
		Method Blank	Real Color	2013/06/12	<2		UCV
1163354	MR4	Spiked Blank	Alkalinity Total (as CaCO3) pH 4.5	2013/06/13		99	%
		Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2013/06/13	<1		mg/L
			Bicarbonates (HCO3 as CaCO3)	2013/06/13	<1		mg/L
			Carbonate (CO3 as CaCO3)	2013/06/13	<1		mg/L
1164250	DKH	Spiked Blank	Nitrogen ammonia (N-NH3)	2013/06/14		100	%
		Method Blank	Nitrogen ammonia (N-NH3)	2013/06/14	<0.02		mg/L
1164872	RD2	Spiked Blank	Total suspended solids (TSS)	2013/06/17		95	%
		Spiked Blank DUP	Total suspended solids (TSS)	2013/06/17		95	%
		Method Blank	Total suspended solids (TSS)	2013/06/17	<2		mg/L
1165192	MCA	Spiked Blank	Aluminum (Al)	2013/06/18		105	%
			Antimony (Sb)	2013/06/18		110	%
			Silver (Ag)	2013/06/18		97	%
			Arsenic (As)	2013/06/18		103	%
			Barium (Ba)	2013/06/18		104	%
			Beryllium (Be)	2013/06/18		99	%
			Bismuth (Bi)	2013/06/18		104	%
			Boron (B)	2013/06/18		106	%
			Cadmium (Cd)	2013/06/18		102	%
			Calcium (Ca)	2013/06/18		105	%
			Chromium (Cr)	2013/06/18		103	%
			Cobalt (Co)	2013/06/18		101	%
			Copper (Cu)	2013/06/18		99	%
			Tin (Sn)	2013/06/18		111	%
			Iron (Fe)	2013/06/18		105	%
			Magnesium (Mg)	2013/06/18		108	%
			Manganese (Mn)	2013/06/18		106	%
			Molybdenum (Mo)	2013/06/18		106	%
			Nickel (Ni)	2013/06/18		99	%
			Lead (Pb)	2013/06/18		103	%
			Potassium (K)	2013/06/18		107	%
			Selenium (Se)	2013/06/18		101	%
			Strontium (Sr)	2013/06/18		103	%
			Sodium (Na)	2013/06/18		112	%
			Thallium (Tl)	2013/06/18		104	%
			Titanium (Ti)	2013/06/18		104	%
			Vanadium (V)	2013/06/18		104	%
			Zinc (Zn)	2013/06/18		100	%
		Method Blank	Aluminum (Al)	2013/06/18	<10		ug/L
			Antimony (Sb)	2013/06/18	<1.0		ug/L
			Silver (Ag)	2013/06/18	<0.10		ug/L
			Arsenic (As)	2013/06/18	<1.0		ug/L
			Barium (Ba)	2013/06/18	<2.0		ug/L

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TATA STEEL MINERALS CANADA
Attention: Natasha Poole
Client Project #: Quarterly Surface Water
P.O. #: 2100-00-0001
Site Location: TSMC

Quality Assurance Report (Continued)

Maxxam Job Number: B332981

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1165192	MCA	Method Blank	Beryllium (Be)	2013/06/18	<0.50		ug/L
			Bismuth (Bi)	2013/06/18	<0.25		ug/L
			Boron (B)	2013/06/18	<20		ug/L
			Cadmium (Cd)	2013/06/18	<0.20		ug/L
			Calcium (Ca)	2013/06/18	<300		ug/L
			Chromium (Cr)	2013/06/18	<0.50		ug/L
			Cobalt (Co)	2013/06/18	<0.50		ug/L
			Copper (Cu)	2013/06/18	<0.50		ug/L
			Tin (Sn)	2013/06/18	<1.0		ug/L
			Iron (Fe)	2013/06/18	<100		ug/L
			Magnesium (Mg)	2013/06/18	<100		ug/L
			Manganese (Mn)	2013/06/18	<0.40		ug/L
			Molybdenum (Mo)	2013/06/18	<0.50		ug/L
			Nickel (Ni)	2013/06/18	<1.0		ug/L
			Lead (Pb)	2013/06/18	<0.10		ug/L
			Potassium (K)	2013/06/18	<100		ug/L
			Selenium (Se)	2013/06/18	<1.0		ug/L
			Strontium (Sr)	2013/06/18	<2.0		ug/L
			Sodium (Na)	2013/06/18	<100		ug/L
			Thallium (Tl)	2013/06/18	<2.0		ug/L
			Titanium (Ti)	2013/06/18	<10		ug/L
			Vanadium (V)	2013/06/18	<2.0		ug/L
			Zinc (Zn)	2013/06/18	<5.0		ug/L
1165314	LI	Spiked Blank	Sulfides (S2-)	2013/06/17		98	%
		Method Blank	Sulfides (S2-)	2013/06/17	<0.02		mg/L

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

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Validation Signature Page

Maxxam Job #: B332981

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Delia Barbul, B.Sc., Chemist

<Original signed by>

Faouzi Sarsi, B.Sc. Chemist

<Original signed by>

Maria Chrifi Alaoui, B.Sc., Chemist

<Original signed by>

Veronic Beausejour, B.Sc., Chemist, Supervisor

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Attention: LOIC DIDILLON

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Your P.O. #: 2200000001
Your Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your C.O.C. #: C#948050, C#94805-01-01

Report Date: 2013/09/17

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B349869
Received: 2013/08/16, 13:40

Sample Matrix: WATER
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary reference
Total Alkalinity (pH end point 4.5)	8	N/A	2013/08/16	STL SOP-00038	SM 2320B
Anions	8	N/A	2013/08/19	STL SOP-00014	MA. 300 - Ions 1.3
Real Color	8	N/A	2013/08/16	STL SOP-00046	MA. 103 - Col. 2.0
Conductivity	8	N/A	2013/08/16	STL SOP-00038	SM 2510
Dissolved Organic Carbon	3	2013/08/16	2013/08/16	STL SOP-00243	SM 5310B
Total Suspended Solids	8	2013/08/21	2013/08/21	STL SOP-00015	MA. 104 - S.S. 1.1
Total Extractable Metals (Low Level)	8	2013/08/21	2013/08/21	STL SOP-00006	MA.200- Mét 1.2
Ammonia Nitrogen	8	N/A	2013/08/19	STL SOP-00040	MA. 300 - N 1.1
Nitrate and/or Nitrite	8	N/A	2013/08/19	STL SOP-00014	MA. 300 - Ions 1.3
Dissolved Oxygen	8	N/A	2013/08/19	STL SOP-00008	MA. 315 - DBO 1.1
pH	8	N/A	2013/08/16	STL SOP-00038	MA.100- pH1.1
Total Phenols by 4-AAP	8	2013/08/19	2013/08/19	STL SOP-00033	MA.404-I.Phé 2.2
Ortho Phosphate	8	N/A	2013/08/16	STL SOP-00003	SM 4500-P E
Radium 226 (1)	1	N/A	N/A		
Sulfides (S2-)	5	2013/08/21	2013/08/21	STL SOP-00005	MA. 300-S 1.1
Reactive Silica (SiO2) (2)	8	N/A	2013/08/20	QUE SOP-00132	HACH, Method 8186
Total Dissolved Solids	8	2013/08/21	2013/08/21	STL SOP-00050	MA. 103 - S.T. 1.0
Turbidity	8	N/A	2013/08/16	STL SOP-00022	MA. 103 - Tur. 1.0

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Multilab Val d'Or
(2) This test was performed by Maxxam - Québec

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Your P.O. #: 2200000001
Your Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your C.O.C. #: C#948050, C#94805-01-01

Attention: LOIC DIDILLON

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2013/09/17

CERTIFICATE OF ANALYSIS

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Lorena Di Benedetto, B.Sc., Chemist, Project Manager Supervisor
Email: LDibenedetto@maxxam.ca
Phone# (514) 448-9001 Ext:4262

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889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B349869
Report Date: 2013/09/17

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your P.O. #: 2200000001
Sampler Initials: JFD

TOTAL EXTRACTABLE METALS (WATER)

Maxxam ID		V54732	V54733	V54734	V54735	V54736		
Sampling Date		2013/08/14	2013/08/14	2013/08/14	2013/08/14	2013/08/14		
COC Number		C#94805-01-01	C#94805-01-01	C#94805-01-01	C#94805-01-01	C#94805-01-01		
	Units	**COA-SW3**	**COA-SW4**	**COA-SW7**	**COA-SW8**	**COA-SW9**	**RDL**	**QC Batch**
METALS ICP-MS								
Aluminum (Al)	ug/L	62	140	95	92	76	10	1194265
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1194265
Silver (Ag)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1194265
Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1194265
Barium (Ba)	ug/L	8.2	4.1	8.3	2.6	2.7	2.0	1194265
Beryllium (Be)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1194265
Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1194265
Boron (B)	ug/L	<50	<50	<50	<50	<50	50	1194265
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	1194265
Calcium (Ca)	ug/L	1700	1800	1700	<500	<500	500	1194265
Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	1194265
Cobalt (Co)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1194265
Copper (Cu)	ug/L	<1.0	1.3	<1.0	<1.0	1.0	1.0	1194265
Total Hardness (CaCO3)	ug/L	9600	9900	9500	<1000	<1000	1000	1194265
Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1194265
Iron (Fe)	ug/L	160	510	390	220	160	60	1194265
Magnesium (Mg)	ug/L	1300	1300	1300	200	<100	100	1194265
Manganese (Mn)	ug/L	21	30	26	15	33	1.0	1194265
Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1194265
Mercury (Hg)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	1194265
Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	3.5	2.0	1194265
Total phosphorous	ug/L	<10	<10	<10	<10	<10	10	1194265
Lead (Pb)	ug/L	<0.50	<0.50	<0.50	4.3	<0.50	0.50	1194265
Potassium (K)	ug/L	<500	<500	<500	<500	<500	500	1194265
Selenium (Se)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	1194265
Sodium (Na)	ug/L	610	860	660	<500	<500	500	1194265
Strontium (Sr)	ug/L	5.3	6.6	5.7	2.6	<2.0	2.0	1194265
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1194265
Titanium (Ti)	ug/L	<10	<10	<10	<10	<10	10	1194265
Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1194265
Zinc (Zn)	ug/L	<7.0	<7.0	<7.0	<7.0	<7.0	7.0	1194265

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B349869
Report Date: 2013/09/17

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your P.O. #: 2200000001
Sampler Initials: JFD

TOTAL EXTRACTABLE METALS (WATER)

Maxxam ID		V54737	V54738	V54739		
Sampling Date		2013/08/14	2013/08/15	2013/08/14		
COC Number		C#94805-01-01	C#94805-01-01	C#94805-01-01		
	Units	**COA-SW10**	**COA-SW11**	**COA-SW13**	**RDL**	**QC Batch**
METALS ICP-MS						
Aluminum (Al)	ug/L	7900	3200	32	10	1194265
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	1.0	1194265
Silver (Ag)	ug/L	<1.0	<1.0	<1.0	1.0	1194265
Arsenic (As)	ug/L	7.1	3.3	<1.0	1.0	1194265
Barium (Ba)	ug/L	45	24	<2.0	2.0	1194265
Beryllium (Be)	ug/L	<2.0	<2.0	<2.0	2.0	1194265
Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	1.0	1194265
Boron (B)	ug/L	<50	<50	<50	50	1194265
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	0.20	1194265
Calcium (Ca)	ug/L	1800	1500	<500	500	1194265
Chromium (Cr)	ug/L	18	6.2	<5.0	5.0	1194265
Cobalt (Co)	ug/L	5.3	2.0	<1.0	1.0	1194265
Copper (Cu)	ug/L	16	4.7	1.9	1.0	1194265
Total Hardness (CaCO3)	ug/L	16000	9700	<1000	1000	1194265
Tin (Sn)	ug/L	<2.0	<2.0	<2.0	2.0	1194265
Iron (Fe)	ug/L	25000	11000	140	60	1194265
Magnesium (Mg)	ug/L	2900	1400	220	100	1194265
Manganese (Mn)	ug/L	450	210	8.0	1.0	1194265
Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	1.0	1194265
Mercury (Hg)	ug/L	0.12	<0.10	<0.10	0.10	1194265
Nickel (Ni)	ug/L	13	3.8	<2.0	2.0	1194265
Total phosphorous	ug/L	200	55	<10	10	1194265
Lead (Pb)	ug/L	4.8	1.5	<0.50	0.50	1194265
Potassium (K)	ug/L	2200	1300	<500	500	1194265
Selenium (Se)	ug/L	<3.0	<3.0	<3.0	3.0	1194265
Sodium (Na)	ug/L	840	1100	540	500	1194265
Strontium (Sr)	ug/L	10	7.8	2.1	2.0	1194265
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	2.0	1194265
Titanium (Ti)	ug/L	240	85	<10	10	1194265
Vanadium (V)	ug/L	17	7.6	2.3	2.0	1194265
Zinc (Zn)	ug/L	38	43	<7.0	7.0	1194265

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B349869
Report Date: 2013/09/17

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your P.O. #: 2200000001
Sampler Initials: JFD

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		V54732	V54732		V54733		
Sampling Date		2013/08/14	2013/08/14		2013/08/14		
COC Number		C#94805-01-01	C#94805-01-01		C#94805-01-01		
	Units	**COA-SW3**	**COA-SW3 Lab-Dup**	**QC Batch**	**COA-SW4**	**RDL**	**QC Batch**
CONVENTIONALS							
Conductivity	mS/cm	0.023	N/A	1192820	0.025	0.001	1192820
Dissolved organic carbon	mg/L	0.7	N/A	1192816	N/A	0.2	N/A
Dissolved oxygen	mg/L	7.1	N/A	1193091	7.1	1.0	1193091
Nitrate (N) and Nitrite(N)	mg/L	0.22	N/A	1192737	0.89	0.02	1192737
Nitrates (N-NO3-)	mg/L	0.22	N/A	1192737	0.89	0.02	1192737
Nitrites (N-NO2-)	mg/L	<0.02	N/A	1192737	<0.02	0.02	1192737
Nitrogen ammonia (N-NH3)	mg/L	<0.02	<0.02	1193071	<0.02	0.02	1193071
Orthophosphate (P)	mg/L	<0.05	N/A	1192815	<0.05	0.05	1192815
pH	pH	7.95	N/A	1192819	7.27	N/A	1192819
Phenols-4AAP	mg/L	<0.002	<0.002	1192992	<0.002	0.002	1192992
Reactive silica (SiO2)	mg/L	2.5	N/A	1193945	3.7	0.1	1193945
Real Color	UCV	7	N/A	1192826	12	2	1192826
Sulfides (S2-)	mg/L	<0.02	N/A	1194576	<0.02	0.02	1194576
Turbidity	NTU	20	N/A	1192828	56	0.1	1192734
Alkalinity Total (as CaCO3) pH 4.5	mg/L	12	N/A	1192821	6	1	1192821
Bicarbonates (HCO3 as CaCO3)	mg/L	12	N/A	1192821	6	1	1192821
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	1192821	<1	1	1192821
Chloride (Cl)	mg/L	0.32	N/A	1192745	1.1	0.05	1192745
Sulfates (SO4)	mg/L	1.7	N/A	1192745	1.3	0.5	1192745
Total Dissolved Solids	mg/L	<10	N/A	1194361	12	10	1194361
Total suspended solids (TSS)	mg/L	9	N/A	1194351	15	2	1194351

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B349869
Report Date: 2013/09/17

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your P.O. #: 2200000001
Sampler Initials: JFD

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		V54734		V54735	V54736	V54736		
Sampling Date		2013/08/14		2013/08/14	2013/08/14	2013/08/14		
COC Number		C#94805-01-01		C#94805-01-01	C#94805-01-01	C#94805-01-01		
	Units	**COA-SW7**	**RDL**	**COA-SW8**	**COA-SW9**	**COA-SW9 Lab-Dup**	**RDL**	**QC Batch**
CONVENTIONALS								
Conductivity	mS/cm	0.022	0.001	0.004	0.003	N/A	0.001	1192820
Dissolved organic carbon	mg/L	0.8	0.2	6	N/A	N/A	1	1192816
Dissolved oxygen	mg/L	6.4	1.0	6.7	6.3	N/A	1.0	1193091
Nitrate (N) and Nitrite(N)	mg/L	0.25	0.02	<0.02	<0.02	N/A	0.02	1192737
Nitrates (N-NO3-)	mg/L	0.25	0.02	<0.02	<0.02	N/A	0.02	1192737
Nitrites (N-NO2-)	mg/L	<0.02	0.02	<0.02	<0.02	N/A	0.02	1192737
Nitrogen ammonia (N-NH3)	mg/L	<0.02	0.02	<0.02	<0.02	<0.02	0.02	1193071
Orthophosphate (P)	mg/L	<0.05	0.05	<0.05	<0.05	N/A	0.05	1192815
pH	pH	7.11	N/A	6.25	5.87	N/A	N/A	1192819
Phenols-4AAP	mg/L	<0.002	0.002	<0.002	<0.002	N/A	0.002	1192992
Reactive silica (SiO2)	mg/L	2.7	0.1	2.7	0.7	N/A	0.1	1193945
Real Color	UCV	8	2	27	12	N/A	2	1192826
Sulfides (S2-)	mg/L	<0.02	0.02	<0.02	N/A	N/A	0.02	1194425
Turbidity	NTU	23	0.1	3.6	1.5	N/A	0.1	1192828
Alkalinity Total (as CaCO3) pH 4.5	mg/L	13	1	2	<1	N/A	1	1192821
Bicarbonates (HCO3 as CaCO3)	mg/L	13	1	2	<1	N/A	1	1192821
Carbonate (CO3 as CaCO3)	mg/L	<1	1	<1	<1	N/A	1	1192821
Chloride (Cl)	mg/L	0.36	0.05	0.10	<0.05	N/A	0.05	1192745
Sulfates (SO4)	mg/L	1.7	0.5	<0.5	0.9	N/A	0.5	1192745
Total Dissolved Solids	mg/L	<10	10	15	<10	N/A	10	1194361
Total suspended solids (TSS)	mg/L	26	2	5	7	N/A	2	1194351

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B349869
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TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your P.O. #: 2200000001
Sampler Initials: JFD

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		V54737			V54738		
Sampling Date		2013/08/14			2013/08/15		
COC Number		C#94805-01-01			C#94805-01-01		
	Units	**COA-SW10**	**RDL**	**QC Batch**	**COA-SW11**	**RDL**	**QC Batch**
CONVENTIONALS							
Conductivity	mS/cm	0.018	0.001	1192820	0.020	0.001	1192820
Dissolved oxygen	mg/L	5.9	1.0	1193091	6.9	1.0	1193091
Nitrate (N) and Nitrite(N)	mg/L	0.50	0.02	1192737	0.64	0.02	1192737
Nitrates (N-NO3-)	mg/L	0.50	0.02	1192737	0.64	0.02	1192737
Nitrites (N-NO2-)	mg/L	<0.02	0.02	1192737	<0.02	0.02	1192737
Nitrogen ammonia (N-NH3)	mg/L	0.04	0.02	1193071	0.02	0.02	1193071
Orthophosphate (P)	mg/L	<0.05	0.05	1192815	<0.05	0.05	1192815
pH	pH	6.66	N/A	1192819	6.83	N/A	1192819
Phenols-4AAP	mg/L	<0.002	0.002	1192992	<0.002	0.002	1192992
Reactive silica (SiO2)	mg/L	4.8	0.1	1193945	4.8	0.1	1193945
Real Color	UCV	240	2	1192826	120	10	1192826
Sulfides (S2-)	mg/L	<0.02	0.02	1194576	N/A	N/A	N/A
Turbidity	NTU	1200	0.1	1192828	510	0.1	1192734
Alkalinity Total (as CaCO3) pH 4.5	mg/L	5	1	1192821	6	1	1192821
Bicarbonates (HCO3 as CaCO3)	mg/L	5	1	1192821	6	1	1192821
Carbonate (CO3 as CaCO3)	mg/L	<1	1	1192821	<1	1	1192821
Chloride (Cl)	mg/L	0.17	0.05	1192745	0.60	0.05	1192745
Sulfates (SO4)	mg/L	1.3	0.5	1192745	1.0	0.5	1192745
Total Dissolved Solids	mg/L	310	10	1194361	76	10	1194361
Total suspended solids (TSS)	mg/L	51	2	1194351	30	2	1194351

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B349869
Report Date: 2013/09/17

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your P.O. #: 2200000001
Sampler Initials: JFD

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		V54739	V54739		
Sampling Date		2013/08/14	2013/08/14		
COC Number		C#94805-01-01	C#94805-01-01		
	Units	**COA-SW13**	**COA-SW13 Lab-Dup**	**RDL**	**QC Batch**
CONVENTIONALS					
Conductivity	mS/cm	0.004	N/A	0.001	1192820
Dissolved oxygen	mg/L	6.3	N/A	1.0	1193091
Nitrate (N) and Nitrite(N)	mg/L	<0.02	N/A	0.02	1192737
Nitrates (N-NO3-)	mg/L	<0.02	N/A	0.02	1192737
Nitrites (N-NO2-)	mg/L	<0.02	N/A	0.02	1192737
Nitrogen ammonia (N-NH3)	mg/L	<0.02	N/A	0.02	1193071
Orthophosphate (P)	mg/L	<0.05	N/A	0.05	1192815
pH	pH	6.38	N/A	N/A	1192819
Phenols-4AAP	mg/L	<0.002	N/A	0.002	1192992
Reactive silica (SiO2)	mg/L	2.4	N/A	0.1	1193945
Real Color	UCV	11	N/A	2	1192826
Turbidity	NTU	1.3	N/A	0.1	1192828
Alkalinity Total (as CaCO3) pH 4.5	mg/L	2	N/A	1	1192821
Bicarbonates (HCO3 as CaCO3)	mg/L	2	N/A	1	1192821
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	1	1192821
Chloride (Cl)	mg/L	0.08	N/A	0.05	1192745
Sulfates (SO4)	mg/L	<0.5	N/A	0.5	1192745
Total Dissolved Solids	mg/L	11	<10	10	1194361
Total suspended solids (TSS)	mg/L	3	3	2	1194351

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Maxxam Job #: B349869
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TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: DSO-TIMMINS
Your P.O. #: 2200000001
Sampler Initials: JFD

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD except for the following:
Dissolved Oxygen: Holding time already past.: V54732, V54733, V54734, V54735, V54736, V54737, V54739
pH: Holding time already past.: V54732, V54733, V54734, V54735, V54736, V54737, V54739

TOTAL EXTRACTABLE METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.
Holding time not respected for pH analysis.
Reported detection limits are multiplied by dilution factors used for sample analysis.

Results relate only to the items tested.

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

TATA STEEL MINERALS CANADA
Attention: LOIC DIDILLON
Client Project #: QUATERLY SURFACE WATER
P.O. #: 2200000001
Site Location: DSO-TIMMINS

Quality Assurance Report

Maxxam Job Number: B349869

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1192734	WO1	QC Standard	Turbidity	2013/08/16		99	%
		Method Blank	Turbidity	2013/08/16	0.1, RDL=0.1		NTU
1192737	AL8	Spiked Blank	Nitrate (N) and Nitrite(N)	2013/08/16		99	%
			Nitrates (N-NO3-)	2013/08/16		104	%
			Nitrites (N-NO2-)	2013/08/16		94	%
		Method Blank	Nitrate (N) and Nitrite(N)	2013/08/16	<0.02		mg/L
			Nitrates (N-NO3-)	2013/08/16	<0.02		mg/L
			Nitrites (N-NO2-)	2013/08/16	<0.02		mg/L
1192745	AL8	Spiked Blank	Chloride (Cl)	2013/08/16		97	%
			Sulfates (SO4)	2013/08/16		101	%
		Method Blank	Chloride (Cl)	2013/08/16	<0.05		mg/L
			Sulfates (SO4)	2013/08/16	<0.5		mg/L
1192815	AL8	Spiked Blank	Orthophosphate (P)	2013/08/16		100	%
		Method Blank	Orthophosphate (P)	2013/08/16	<0.05		mg/L
1192816	AL8	QC Standard	Dissolved organic carbon	2013/08/16		106	%
		Spiked Blank	Dissolved organic carbon	2013/08/16		106	%
		Method Blank	Dissolved organic carbon	2013/08/16	<0.2		mg/L
1192819	AL8	Spiked Blank	pH	2013/08/16		102	%
1192820	AL8	Spiked Blank	Conductivity	2013/08/16		101	%
		Method Blank	Conductivity	2013/08/16	<0.001		mS/cm
1192821	AL8	Spiked Blank	Alkalinity Total (as CaCO3) pH 4.5	2013/08/16		103	%
		Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2013/08/16	<1		mg/L
			Bicarbonates (HCO3 as CaCO3)	2013/08/16	<1		mg/L
			Carbonate (CO3 as CaCO3)	2013/08/16	<1		mg/L
1192826	JE1	QC Standard	Real Color	2013/08/16		104	%
		Method Blank	Real Color	2013/08/16	<2		UCV
1192828	LI	QC Standard	Turbidity	2013/08/16		100	%
		Method Blank	Turbidity	2013/08/16	<0.1		NTU
1192992	CC6	QC Standard	Phenols-4AAP	2013/08/19		86	%
		Spiked Blank	Phenols-4AAP	2013/08/19		98	%
		Method Blank	Phenols-4AAP	2013/08/19	<0.002		mg/L
1193071	DKH	Spiked Blank	Nitrogen ammonia (N-NH3)	2013/08/19		108	%
		Method Blank	Nitrogen ammonia (N-NH3)	2013/08/19	<0.02		mg/L
1193945	MT9	QC Standard	Reactive silica (SiO2)	2013/08/20		94	%
		Method Blank	Reactive silica (SiO2)	2013/08/20	<0.1		mg/L
1194265	JF1	Spiked Blank	Aluminum (Al)	2013/08/21		98	%
			Antimony (Sb)	2013/08/21		105	%
			Silver (Ag)	2013/08/21		96	%
			Arsenic (As)	2013/08/21		99	%
			Barium (Ba)	2013/08/21		97	%
			Beryllium (Be)	2013/08/21		100	%
			Bismuth (Bi)	2013/08/21		97	%
			Boron (B)	2013/08/21		105	%
			Cadmium (Cd)	2013/08/21		96	%
			Calcium (Ca)	2013/08/21		97	%
			Chromium (Cr)	2013/08/21		95	%
			Cobalt (Co)	2013/08/21		91	%
			Copper (Cu)	2013/08/21		90	%
			Tin (Sn)	2013/08/21		103	%
			Iron (Fe)	2013/08/21		98	%
			Magnesium (Mg)	2013/08/21		99	%
			Manganese (Mn)	2013/08/21		100	%
			Molybdenum (Mo)	2013/08/21		102	%
			Mercury (Hg)	2013/08/21		111	%
			Nickel (Ni)	2013/08/21		91	%

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TATA STEEL MINERALS CANADA
Attention: LOIC DIDILLON
Client Project #: QUATERLY SURFACE WATER
P.O. #: 2200000001
Site Location: DSO-TIMMINS

Quality Assurance Report (Continued)

Maxxam Job Number: B349869

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1194265	JF1	Spiked Blank	Total phosphorous	2013/08/21		97	%
			Lead (Pb)	2013/08/21		96	%
			Potassium (K)	2013/08/21		99	%
			Selenium (Se)	2013/08/21		96	%
			Sodium (Na)	2013/08/21		106	%
			Strontium (Sr)	2013/08/21		98	%
			Thallium (Tl)	2013/08/21		96	%
			Titanium (Ti)	2013/08/21		99	%
			Vanadium (V)	2013/08/21		98	%
			Zinc (Zn)	2013/08/21		94	%
		Method Blank	Aluminum (Al)	2013/08/21	<10		ug/L
			Antimony (Sb)	2013/08/21	<1.0		ug/L
			Silver (Ag)	2013/08/21	<1.0		ug/L
			Arsenic (As)	2013/08/21	<1.0		ug/L
			Barium (Ba)	2013/08/21	<2.0		ug/L
			Beryllium (Be)	2013/08/21	<2.0		ug/L
			Bismuth (Bi)	2013/08/21	<1.0		ug/L
			Boron (B)	2013/08/21	<50		ug/L
			Cadmium (Cd)	2013/08/21	<0.20		ug/L
			Calcium (Ca)	2013/08/21	<500		ug/L
			Chromium (Cr)	2013/08/21	<5.0		ug/L
			Cobalt (Co)	2013/08/21	<1.0		ug/L
			Copper (Cu)	2013/08/21	<1.0		ug/L
			Total Hardness (CaCO3)	2013/08/21	<1000		ug/L
			Tin (Sn)	2013/08/21	<2.0		ug/L
			Iron (Fe)	2013/08/21	<60		ug/L
			Magnesium (Mg)	2013/08/21	<100		ug/L
			Manganese (Mn)	2013/08/21	<1.0		ug/L
			Molybdenum (Mo)	2013/08/21	<1.0		ug/L
			Mercury (Hg)	2013/08/21	<0.10		ug/L
			Nickel (Ni)	2013/08/21	<2.0		ug/L
			Total phosphorous	2013/08/21	<10		ug/L
			Lead (Pb)	2013/08/21	<0.50		ug/L
			Potassium (K)	2013/08/21	<500		ug/L
			Selenium (Se)	2013/08/21	<3.0		ug/L
			Sodium (Na)	2013/08/21	<500		ug/L
			Strontium (Sr)	2013/08/21	<2.0		ug/L
			Thallium (Tl)	2013/08/21	<2.0		ug/L
			Titanium (Ti)	2013/08/21	<10		ug/L
			Vanadium (V)	2013/08/21	2.3, RDL=2.0		ug/L
			Zinc (Zn)	2013/08/21	<7.0		ug/L
1194351	FSI	Spiked Blank	Total suspended solids (TSS)	2013/08/21		100	%
		Spiked Blank DUP	Total suspended solids (TSS)	2013/08/21		98	%
		Method Blank	Total suspended solids (TSS)	2013/08/21	<2		mg/L
1194361	FSI	Spiked Blank	Total Dissolved Solids	2013/08/21		99	%
		Spiked Blank DUP	Total Dissolved Solids	2013/08/21		99	%
		Method Blank	Total Dissolved Solids	2013/08/21	<10		mg/L
1194425	RC6	Spiked Blank	Sulfides (S2-)	2013/08/21		90	%
		Method Blank	Sulfides (S2-)	2013/08/21	<0.02		mg/L
1194576	RC6	Spiked Blank	Sulfides (S2-)	2013/08/21		91	%
		Method Blank	Sulfides (S2-)	2013/08/21	<0.02		mg/L

RDL = Reportable Detection Limit
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to

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TATA STEEL MINERALS CANADA
Attention: LOIC DIDILLON
Client Project #: QUATERLY SURFACE WATER
P.O. #: 2200000001
Site Location: DSO-TIMMINS

Quality Assurance Report (Continued)

Maxxam Job Number: B349869

evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

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Validation Signature Page

Maxxam Job #: B349869

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Delia Barbul, B.Sc., Chemist

<Original signed by>

Kathie Quevillon, B.Sc., Chemist

<Original signed by>

Miryam Assayag

<Original signed by>

Madina Hamrouni, B.Sc., Chemist

<Original signed by>

Mathieu Letourneau, B.Sc., chimist

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Le succès par la science®

Attention: Natasha Poole

TATA STEEL MINERALS CANADA
Schefferville
85 Atlantic Street
Schefferville , PQ
CANADA G0G2T0

Your P.O. #: 2200000001
Your Project #: QUATERLY SURFACE WATER
Site#: DSO-TIMMINS
Site Location: TSMC
Your C.O.C. #: C#972130, C#97213-01-01

Report Date: 2013/10/18

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B364381
Received: 2013/10/10, 13:20

Sample Matrix: SURFACE WATER
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary Reference
Total Alkalinity (pH end point 4.5)	7	N/A	2013/10/11	STL SOP-00038	SM 2320B
Anions	7	N/A	2013/10/11	STL SOP-00014	MA. 300 - Ions 1.3
Real Color	7	N/A	2013/10/10	STL SOP-00046	MA. 103 - Col. 2.0
Conductivity	7	N/A	2013/10/11	STL SOP-00038	SM 2510
Dissolved Organic Carbon (2)	3	2013/10/10	2013/10/11	STL SOP-00243	SM 5310B
Dissolved Organic Carbon (2)	4	2013/10/11	2013/10/11	STL SOP-00243	SM 5310B
Total Extractable Metals (Low Level)	5	2013/10/15	2013/10/16	STL SOP-00006	MA.200- Mét 1.2
Total Extractable Metals (Low Level)	2	2013/10/17	2013/10/18	STL SOP-00006	MA.200- Mét 1.2
Ammonia Nitrogen	7	N/A	2013/10/15	STL SOP-00040	MA. 300 – N 2.0
Nitrate and/or Nitrite	7	N/A	2013/10/11	STL SOP-00014	MA. 300 - Ions 1.3
pH	7	N/A	2013/10/10	STL SOP-00038	MA.100- pH1.1
Total Phenols by 4-AAP	7	2013/10/16	2013/10/17	STL SOP-00033	MA.404-I.Phé 2.2
Ortho Phosphate	7	N/A	2013/10/10	STL SOP-00003	SM 4500-P E
Sulfides (S2-)	7	2013/10/12	2013/10/12	STL SOP-00005	MA. 300-S 1.1
Reactive Silica (SiO2) (1)	7	N/A	2013/10/15	QUE SOP-00132	HACH, Method 8186
Total Dissolved Solids	7	2013/10/15	2013/10/15	STL SOP-00050	MA. 103 - S.T. 1.0
Turbidity	7	N/A	2013/10/10	STL SOP-00022	MA. 103 - Tur. 1.0

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam - Québec
(2) DOC present in the sample should be considered as non-purgeable DOC

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Séverine Planté,
Email: SPlante@maxxam.ca
Phone# (514) 448-9001

Attention: Natasha Poole

TATA STEEL MINERALS CANADA
Schefferville
85 Atlantic Street
Schefferville , PQ
CANADA G0G2T0

Your P.O. #: 2200000001
Your Project #: QUATERLY SURFACE WATER
Site#: DSO-TIMMINS
Site Location: TSMC
Your C.O.C. #: C#972130, C#97213-01-01

Report Date: 2013/10/18

CERTIFICATE OF ANALYSIS

-2-

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Maxxam Job #: B364381
Report Date: 2013/10/18

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: TSMC
Your P.O. #: 2200000001
Sampler Initials: NP

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Maxxam ID		W25727		W25728	W25729		W25730		
Sampling Date		2013/10/08		2013/10/08	2013/10/08		2013/10/09		
COC Number		C#97213-01-01		C#97213-01-01	C#97213-01-01		C#97213-01-01		
	Units	**COA-SW7**	**QC Batch**	**COA-SW3**	**COA-SW9**	**QC Batch**	**COA-SW13**	**RDL**	**QC Batch**
METALS ICP-MS									
Aluminum (Al)	ug/L	48	1221871	150	54	1220330	17	10	1221871
Antimony (Sb)	ug/L	<1.0	1221871	<1.0	<1.0	1220330	<1.0	1.0	1221871
Silver (Ag)	ug/L	<1.0	1221871	<1.0	<1.0	1220330	<1.0	1.0	1221871
Arsenic (As)	ug/L	<1.0	1221871	<1.0	<1.0	1220330	<1.0	1.0	1221871
Barium (Ba)	ug/L	5.5	1221871	9.8	2.3	1220330	<2.0	2.0	1221871
Beryllium (Be)	ug/L	<2.0	1221871	<2.0	<2.0	1220330	<2.0	2.0	1221871
Bismuth (Bi)	ug/L	<1.0	1221871	<1.0	<1.0	1220330	<1.0	1.0	1221871
Boron (B)	ug/L	<50	1221871	<50	<50	1220330	<50	50	1221871
Cadmium (Cd)	ug/L	<0.20	1221871	<0.20	<0.20	1220330	<0.20	0.20	1221871
Calcium (Ca)	ug/L	1600	1221871	1800	<500	1220330	<500	500	1221871
Chromium (Cr)	ug/L	<5.0	1221871	<5.0	<5.0	1220330	<5.0	5.0	1221871
Cobalt (Co)	ug/L	<1.0	1221871	<1.0	<1.0	1220330	<1.0	1.0	1221871
Copper (Cu)	ug/L	<1.0	1221871	<1.0	<1.0	1220330	<1.0	1.0	1221871
Total Hardness (CaCO3)	ug/L	8800	1221871	10000	<1000	1220330	1700	1000	1221871
Tin (Sn)	ug/L	<2.0	1221871	<2.0	<2.0	1220330	<2.0	2.0	1221871
Iron (Fe)	ug/L	110	1221871	600	330	1220330	200	60	1221871
Magnesium (Mg)	ug/L	1200	1221871	1500	<100	1220330	220	100	1221871
Manganese (Mn)	ug/L	15	1221871	55	22	1220330	12	1.0	1221871
Molybdenum (Mo)	ug/L	<1.0	1221871	<1.0	<1.0	1220330	<1.0	1.0	1221871
Mercury (Hg)	ug/L	<0.10	1221871	0.12	<0.10	1220330	<0.10	0.10	1221871
Nickel (Ni)	ug/L	2.4	1221871	<2.0	<2.0	1220330	<2.0	2.0	1221871
Total phosphorous	ug/L	<10	1221871	22	25	1220330	12	10	1221871
Lead (Pb)	ug/L	<0.50	1221871	<0.50	<0.50	1220330	<0.50	0.50	1221871
Potassium (K)	ug/L	<500	1221871	500	<500	1220330	<500	500	1221871
Selenium (Se)	ug/L	<3.0	1221871	<3.0	<3.0	1220330	<3.0	3.0	1221871
Sodium (Na)	ug/L	840	1221871	650	<500	1220330	720	500	1221871
Strontium (Sr)	ug/L	5.8	1221871	6.0	2.0	1220330	<2.0	2.0	1221871
Thallium (Tl)	ug/L	<2.0	1221871	<2.0	<2.0	1220330	<2.0	2.0	1221871
Titanium (Ti)	ug/L	21	1221871	<10	<10	1220330	24	10	1221871
Uranium (U)	ug/L	<1.0	1221871	<1.0	<1.0	1220330	<1.0	1.0	1221871
Vanadium (V)	ug/L	<2.0	1221871	<2.0	<2.0	1220330	<2.0	2.0	1221871
Zinc (Zn)	ug/L	<7.0	1221871	<7.0	<7.0	1220330	<7.0	7.0	1221871

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B364381
Report Date: 2013/10/18

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: TSMC
Your P.O. #: 2200000001
Sampler Initials: NP

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Maxxam ID		W25731	W25732	W25733	W25733		
Sampling Date		2013/10/09	2013/10/09	2013/10/09	2013/10/09		
COC Number		C#97213-01-01	C#97213-01-01	C#97213-01-01	C#97213-01-01		
	Units	**COA-SW8**	**COA-SW4**	**COA-SW10**	**COA-SW10 Lab-Dup**	**RDL**	**QC Batch**
METALS ICP-MS							
Aluminum (Al)	ug/L	<10	34	2400	2900	10	1220330
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	1220330
Silver (Ag)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	1220330
Arsenic (As)	ug/L	<1.0	<1.0	2.6	2.9	1.0	1220330
Barium (Ba)	ug/L	<2.0	3.9	28	29	2.0	1220330
Beryllium (Be)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	1220330
Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	1220330
Boron (B)	ug/L	<50	<50	<50	<50	50	1220330
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	1220330
Calcium (Ca)	ug/L	2300	1800	3000	3100	500	1220330
Chromium (Cr)	ug/L	<5.0	<5.0	5.8	7.7	5.0	1220330
Cobalt (Co)	ug/L	<1.0	<1.0	2.2	2.5	1.0	1220330
Copper (Cu)	ug/L	<1.0	<1.0	6.8	7.5	1.0	1220330
Total Hardness (CaCO3)	ug/L	11000	10000	17000	18000	1000	1220330
Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	1220330
Iron (Fe)	ug/L	<60	<60	7700	9100	60	1220330
Magnesium (Mg)	ug/L	1300	1300	2400	2500	100	1220330
Manganese (Mn)	ug/L	3.2	23	210	230	1.0	1220330
Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	1220330
Mercury (Hg)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	1220330
Nickel (Ni)	ug/L	<2.0	<2.0	4.7	5.3	2.0	1220330
Total phosphorous	ug/L	<10	17	100	120	10	1220330
Lead (Pb)	ug/L	<0.50	<0.50	2.0	2.1	0.50	1220330
Potassium (K)	ug/L	<500	<500	1100	1200	500	1220330
Selenium (Se)	ug/L	<3.0	<3.0	<3.0	<3.0	3.0	1220330
Sodium (Na)	ug/L	<500	880	1200	1200	500	1220330
Strontium (Sr)	ug/L	4.4	7.1	12	12	2.0	1220330
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	1220330
Titanium (Ti)	ug/L	<10	<10	77	90	10	1220330
Uranium (U)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	1220330
Vanadium (V)	ug/L	<2.0	<2.0	5.2	6.0	2.0	1220330

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B364381
Report Date: 2013/10/18

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: TSMC
Your P.O. #: 2200000001
Sampler Initials: NP

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Maxxam ID		W25731	W25732	W25733	W25733		
Sampling Date		2013/10/09	2013/10/09	2013/10/09	2013/10/09		
COC Number		C#97213-01-01	C#97213-01-01	C#97213-01-01	C#97213-01-01		
	Units	**COA-SW8**	**COA-SW4**	**COA-SW10**	**COA-SW10 Lab-Dup**	**RDL**	**QC Batch**
Zinc (Zn)	ug/L	11	<7.0	22	25	7.0	1220330

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B364381
Report Date: 2013/10/18

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: TSMC
Your P.O. #: 2200000001
Sampler Initials: NP

CONVENTIONAL PARAMETERS (SURFACE WATER)

Maxxam ID		W25727	W25728	W25729		W25730		
Sampling Date		2013/10/08	2013/10/08	2013/10/08		2013/10/09		
COC Number		C#97213-01-01	C#97213-01-01	C#97213-01-01		C#97213-01-01		
	Units	**COA-SW7**	**COA-SW3**	**COA-SW9**	**QC Batch**	**COA-SW13**	**RDL**	**QC Batch**
CONVENTIONALS								
Conductivity	mS/cm	0.020	0.024	0.003	1219042	0.005	0.001	1219042
Dissolved organic carbon	mg/L	0.9	0.4	1.2	1219111	1.7	0.2	1219223
Nitrate (N) and Nitrite(N)	mg/L	0.26	0.29	0.04	1219027	0.19	0.02	1219027
Nitrates (N-NO3-)	mg/L	0.26	0.29	0.04	1219027	0.19	0.02	1219027
Nitrites (N-NO2-)	mg/L	<0.02	<0.02	<0.02	1219027	<0.02	0.02	1219027
Nitrogen ammonia (N-NH3)	mg/L	<0.02	<0.02	<0.02	1219485	<0.02	0.02	1219485
Orthophosphate (P)	mg/L	<0.05	<0.05	<0.05	1219146	<0.05	0.05	1219146
pH	pH	6.87	7.12	5.62	1219050	6.35	N/A	1219050
Phenols-4AAP	mg/L	<0.002	<0.002	<0.002	1220997	<0.002	0.002	1220997
Reactive silica (SiO2)	mg/L	3.2	3.0	0.1	1220481	1.9	0.1	1220481
Real Color	UCV	7	8	6	1219043	4	2	1219043
Sulfides (S2-)	mg/L	<0.02	<0.02	<0.02	1219988	<0.02	0.02	1219988
Turbidity	NTU	13	75	2.7	1219141	0.9	0.1	1219141
Alkalinity Total (as CaCO3) pH 4.5	mg/L	6	8	<1	1219040	2	1	1219040
Bicarbonates (HCO3 as CaCO3)	mg/L	6	8	<1	1219040	2	1	1219040
Carbonate (CO3 as CaCO3)	mg/L	<1	<1	<1	1219040	<1	1	1219040
Chloride (Cl)	mg/L	0.46	0.37	0.09	1219033	0.11	0.05	1219033
Sulfates (SO4)	mg/L	1.9	1.8	0.8	1219033	<0.5	0.5	1219033
Total Dissolved Solids	mg/L	<10	<10	11	1220241	<10	10	1220241

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B364381
Report Date: 2013/10/18

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: TSMC
Your P.O. #: 2200000001
Sampler Initials: NP

CONVENTIONAL PARAMETERS (SURFACE WATER)

Maxxam ID		W25731	W25731		W25732		W25733		
Sampling Date		2013/10/09	2013/10/09		2013/10/09		2013/10/09		
COC Number		C#97213-01-01	C#97213-01-01		C#97213-01-01		C#97213-01-01		
	Units	**COA-SW8**	**COA-SW8 Lab-Dup**	**QC Batch**	**COA-SW4**	**RDL**	**COA-SW10**	**RDL**	**QC Batch**
CONVENTIONALS									
Conductivity	mS/cm	0.025	N/A	1219042	0.027	0.001	0.034	0.001	1219042
Dissolved organic carbon	mg/L	1.4	N/A	1219223	0.2	0.2	1.0	0.4	1219223
Nitrate (N) and Nitrite(N)	mg/L	0.10	N/A	1219027	0.98	0.02	0.46	0.02	1219027
Nitrates (N-NO3-)	mg/L	0.10	N/A	1219027	0.98	0.02	0.46	0.02	1219027
Nitrites (N-NO2-)	mg/L	<0.02	N/A	1219027	<0.02	0.02	<0.02	0.02	1219027
Nitrogen ammonia (N-NH3)	mg/L	<0.02	<0.02	1219485	<0.02	0.02	<0.02	0.02	1219485
Orthophosphate (P)	mg/L	<0.05	N/A	1219146	<0.05	0.05	<0.05	0.05	1219146
pH	pH	7.15	N/A	1219050	6.91	N/A	7.32	N/A	1219050
Phenols-4AAP	mg/L	<0.002	N/A	1220997	<0.002	0.002	<0.002	0.002	1220997
Reactive silica (SiO2)	mg/L	1.1	N/A	1220481	5.5	0.1	5.9	0.1	1220481
Real Color	UCV	<2	N/A	1219043	3	2	120	2	1219043
Sulfides (S2-)	mg/L	<0.02	N/A	1219988	<0.02	0.02	<0.02	0.02	1220032
Turbidity	NTU	0.4	N/A	1219141	39	0.1	360	0.1	1219141
Alkalinity Total (as CaCO3) pH 4.5	mg/L	8	N/A	1219040	6	1	12	1	1219040
Bicarbonates (HCO3 as CaCO3)	mg/L	8	N/A	1219040	6	1	12	1	1219040
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	1219040	<1	1	<1	1	1219040
Chloride (Cl)	mg/L	0.11	N/A	1219033	1.1	0.05	0.26	0.05	1219033
Sulfates (SO4)	mg/L	2.9	N/A	1219033	1.6	0.5	2.2	0.5	1219033
Total Dissolved Solids	mg/L	10	N/A	1220241	13	10	78	10	1220241

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		W25733		
Sampling Date		2013/10/09		
COC Number		C#97213-01-01		
	Units	**COA-SW10 Lab-Dup**	**RDL**	**QC Batch**
CONVENTIONALS				
Total Dissolved Solids	mg/L	77	10	1220241

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Maxxam Job #: B364381
Report Date: 2013/10/18

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY SURFACE WATER
Site Location: TSMC
Your P.O. #: 2200000001
Sampler Initials: NP

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD except for the following:
pH: Holding time already past.: W25727, W25728, W25729

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.
Reported detection limits are multiplied by dilution factors used for sample analysis.

Results relate only to the items tested.

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

TATA STEEL MINERALS CANADA
Attention: Natasha Poole
Client Project #: QUATERLY SURFACE WATER
P.O. #: 2200000001
Site Location: TSMC

Quality Assurance Report

Maxxam Job Number: B364381

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1219027	AL8	Spiked Blank	Nitrate (N) and Nitrite(N)	2013/10/11		100	%
			Nitrates (N-NO3-)	2013/10/11		104	%
			Nitrites (N-NO2-)	2013/10/11		96	%
		Method Blank	Nitrate (N) and Nitrite(N)	2013/10/11	<0.02		mg/L
			Nitrates (N-NO3-)	2013/10/11	<0.02		mg/L
			Nitrites (N-NO2-)	2013/10/11	<0.02		mg/L
1219033	AL8	Spiked Blank	Chloride (Cl)	2013/10/11		97	%
			Sulfates (SO4)	2013/10/11		103	%
		Method Blank	Chloride (Cl)	2013/10/11	<0.05		mg/L
			Sulfates (SO4)	2013/10/11	<0.5		mg/L
1219040	MR4	Spiked Blank	Alkalinity Total (as CaCO3) pH 4.5	2013/10/11		101	%
		Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2013/10/11	<1		mg/L
			Bicarbonates (HCO3 as CaCO3)	2013/10/11	<1		mg/L
			Carbonate (CO3 as CaCO3)	2013/10/11	<1		mg/L
1219042	MR4	Spiked Blank	Conductivity	2013/10/11		103	%
		Method Blank	Conductivity	2013/10/11	<0.001		mS/cm
1219043	WO1	QC Standard	Real Color	2013/10/10		103	%
		Method Blank	Real Color	2013/10/10	<2		UCV
1219050	AL8	Spiked Blank	pH	2013/10/10		101	%
1219111	AL8	QC Standard	Dissolved organic carbon	2013/10/11		105	%
		Spiked Blank	Dissolved organic carbon	2013/10/11		100	%
		Method Blank	Dissolved organic carbon	2013/10/11	<0.2		mg/L
1219141	RC6	QC Standard	Turbidity	2013/10/10		98	%
		Method Blank	Turbidity	2013/10/10	0.1, RDL=0.1		NTU
1219146	AL8	Spiked Blank	Orthophosphate (P)	2013/10/10		102	%
		Method Blank	Orthophosphate (P)	2013/10/10	<0.05		mg/L
1219223	AL8	QC Standard	Dissolved organic carbon	2013/10/11		105	%
		Spiked Blank	Dissolved organic carbon	2013/10/11		98	%
		Method Blank	Dissolved organic carbon	2013/10/11	0.4, RDL=0.2		mg/L
1219485	DKH	QC Standard	Nitrogen ammonia (N-NH3)	2013/10/15		91	%
		Spiked Blank	Nitrogen ammonia (N-NH3)	2013/10/15		91	%
		Method Blank	Nitrogen ammonia (N-NH3)	2013/10/15	<0.02		mg/L
1219988	JE1	Spiked Blank	Sulfides (S2-)	2013/10/12		93	%
		Method Blank	Sulfides (S2-)	2013/10/12	<0.02		mg/L
1220032	JE1	Spiked Blank	Sulfides (S2-)	2013/10/12		93	%
		Method Blank	Sulfides (S2-)	2013/10/12	<0.02		mg/L
1220241	FSI	Spiked Blank	Total Dissolved Solids	2013/10/15		98	%
		Spiked Blank DUP	Total Dissolved Solids	2013/10/15		101	%
		Method Blank	Total Dissolved Solids	2013/10/15	<10		mg/L
1220330	JS2	Spiked Blank	Aluminum (Al)	2013/10/15		104	%
			Antimony (Sb)	2013/10/15		103	%
			Silver (Ag)	2013/10/15		99	%
			Arsenic (As)	2013/10/15		103	%
			Barium (Ba)	2013/10/15		104	%
			Beryllium (Be)	2013/10/15		107	%
			Bismuth (Bi)	2013/10/15		101	%
			Boron (B)	2013/10/15		107	%
			Cadmium (Cd)	2013/10/15		102	%
			Calcium (Ca)	2013/10/15		102	%
			Chromium (Cr)	2013/10/15		102	%
			Cobalt (Co)	2013/10/15		97	%
			Copper (Cu)	2013/10/15		97	%
			Tin (Sn)	2013/10/15		105	%
			Iron (Fe)	2013/10/15		101	%
			Magnesium (Mg)	2013/10/15		103	%

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TATA STEEL MINERALS CANADA
Attention: Natasha Poole
Client Project #: QUATERLY SURFACE WATER
P.O. #: 2200000001
Site Location: TSMC

Quality Assurance Report (Continued)

Maxxam Job Number: B364381

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1220330 JS2	Spiked Blank	Manganese (Mn)	2013/10/15		103	%
		Molybdenum (Mo)	2013/10/15		102	%
		Mercury (Hg)	2013/10/15		94	%
		Nickel (Ni)	2013/10/15		97	%
		Total phosphorous	2013/10/15		102	%
		Lead (Pb)	2013/10/15		101	%
		Potassium (K)	2013/10/15		105	%
		Selenium (Se)	2013/10/15		100	%
		Sodium (Na)	2013/10/15		105	%
		Strontium (Sr)	2013/10/15		101	%
		Thallium (Tl)	2013/10/15		102	%
		Titanium (Ti)	2013/10/15		105	%
		Uranium (U)	2013/10/15		98	%
		Vanadium (V)	2013/10/15		103	%
		Zinc (Zn)	2013/10/15		98	%
	Method Blank	Aluminum (Al)	2013/10/15	<10		ug/L
		Antimony (Sb)	2013/10/15	<1.0		ug/L
		Silver (Ag)	2013/10/15	<1.0		ug/L
		Arsenic (As)	2013/10/15	<1.0		ug/L
		Barium (Ba)	2013/10/15	<2.0		ug/L
		Beryllium (Be)	2013/10/15	<2.0		ug/L
		Bismuth (Bi)	2013/10/15	<1.0		ug/L
		Boron (B)	2013/10/15	<50		ug/L
		Cadmium (Cd)	2013/10/15	<0.20		ug/L
		Calcium (Ca)	2013/10/15	<500		ug/L
		Chromium (Cr)	2013/10/15	<5.0		ug/L
		Cobalt (Co)	2013/10/15	<1.0		ug/L
		Copper (Cu)	2013/10/15	<1.0		ug/L
		Total Hardness (CaCO3)	2013/10/15	<1000		ug/L
		Tin (Sn)	2013/10/15	<2.0		ug/L
		Iron (Fe)	2013/10/15	<60		ug/L
		Magnesium (Mg)	2013/10/15	<100		ug/L
		Manganese (Mn)	2013/10/15	<1.0		ug/L
		Molybdenum (Mo)	2013/10/15	<1.0		ug/L
		Mercury (Hg)	2013/10/15	<0.10		ug/L
		Nickel (Ni)	2013/10/15	<2.0		ug/L
		Total phosphorous	2013/10/15	<10		ug/L
		Lead (Pb)	2013/10/15	<0.50		ug/L
		Potassium (K)	2013/10/15	<500		ug/L
		Selenium (Se)	2013/10/15	<3.0		ug/L
		Sodium (Na)	2013/10/15	<500		ug/L
		Strontium (Sr)	2013/10/15	<2.0		ug/L
		Thallium (Tl)	2013/10/15	<2.0		ug/L
		Titanium (Ti)	2013/10/15	<10		ug/L
		Uranium (U)	2013/10/15	<1.0		ug/L
		Vanadium (V)	2013/10/15	<2.0		ug/L
		Zinc (Zn)	2013/10/15	<7.0		ug/L
1220481 CG0	QC Standard	Reactive silica (SiO2)	2013/10/15		99	%
	Method Blank	Reactive silica (SiO2)	2013/10/15	<0.1		mg/L
1220997 MH1	QC Standard	Phenols-4AAP	2013/10/17		94	%
	Spiked Blank	Phenols-4AAP	2013/10/17		99	%
	Method Blank	Phenols-4AAP	2013/10/17	<0.002		mg/L
1221871 JS2	Spiked Blank	Aluminum (Al)	2013/10/18		106	%
		Antimony (Sb)	2013/10/18		106	%
		Silver (Ag)	2013/10/18		104	%

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

TATA STEEL MINERALS CANADA
Attention: Natasha Poole
Client Project #: QUATERLY SURFACE WATER
P.O. #: 2200000001
Site Location: TSMC

Quality Assurance Report (Continued)

Maxxam Job Number: B364381

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1221871	JS2	Spiked Blank	Arsenic (As)	2013/10/18		103	%
			Barium (Ba)	2013/10/18		97	%
			Beryllium (Be)	2013/10/18		101	%
			Bismuth (Bi)	2013/10/18		99	%
			Boron (B)	2013/10/18		104	%
			Cadmium (Cd)	2013/10/18		100	%
			Calcium (Ca)	2013/10/18		100	%
			Chromium (Cr)	2013/10/18		98	%
			Cobalt (Co)	2013/10/18		94	%
			Copper (Cu)	2013/10/18		94	%
			Tin (Sn)	2013/10/18		107	%
			Iron (Fe)	2013/10/18		102	%
			Magnesium (Mg)	2013/10/18		102	%
			Manganese (Mn)	2013/10/18		102	%
			Molybdenum (Mo)	2013/10/18		107	%
			Mercury (Hg)	2013/10/18		96	%
			Nickel (Ni)	2013/10/18		98	%
			Total phosphorous	2013/10/18		101	%
			Lead (Pb)	2013/10/18		98	%
			Potassium (K)	2013/10/18		101	%
			Selenium (Se)	2013/10/18		97	%
			Sodium (Na)	2013/10/18		104	%
			Strontium (Sr)	2013/10/18		100	%
			Thallium (Tl)	2013/10/18		100	%
			Titanium (Ti)	2013/10/18		110	%
			Uranium (U)	2013/10/18		102	%
			Vanadium (V)	2013/10/18		104	%
			Zinc (Zn)	2013/10/18		96	%
		Method Blank	Aluminum (Al)	2013/10/18	<10		ug/L
			Antimony (Sb)	2013/10/18	<1.0		ug/L
			Silver (Ag)	2013/10/18	<1.0		ug/L
			Arsenic (As)	2013/10/18	<1.0		ug/L
			Barium (Ba)	2013/10/18	<2.0		ug/L
			Beryllium (Be)	2013/10/18	<2.0		ug/L
			Bismuth (Bi)	2013/10/18	<1.0		ug/L
			Boron (B)	2013/10/18	<50		ug/L
			Cadmium (Cd)	2013/10/18	<0.20		ug/L
			Calcium (Ca)	2013/10/18	<500		ug/L
			Chromium (Cr)	2013/10/18	<5.0		ug/L
			Cobalt (Co)	2013/10/18	<1.0		ug/L
			Copper (Cu)	2013/10/18	<1.0		ug/L
			Total Hardness (CaCO3)	2013/10/18	<1000		ug/L
			Tin (Sn)	2013/10/18	<2.0		ug/L
			Iron (Fe)	2013/10/18	<60		ug/L
			Magnesium (Mg)	2013/10/18	<100		ug/L
			Manganese (Mn)	2013/10/18	1.3, RDL=1.0		ug/L
			Molybdenum (Mo)	2013/10/18	<1.0		ug/L
			Mercury (Hg)	2013/10/18	<0.10		ug/L
			Nickel (Ni)	2013/10/18	<2.0		ug/L
			Total phosphorous	2013/10/18	<10		ug/L
			Lead (Pb)	2013/10/18	<0.50		ug/L
			Potassium (K)	2013/10/18	<500		ug/L
			Selenium (Se)	2013/10/18	<3.0		ug/L
			Sodium (Na)	2013/10/18	<500		ug/L
			Strontium (Sr)	2013/10/18	<2.0		ug/L

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TATA STEEL MINERALS CANADA
Attention: Natasha Poole
Client Project #: QUATERLY SURFACE WATER
P.O. #: 2200000001
Site Location: TSMC

Quality Assurance Report (Continued)

Maxxam Job Number: B364381

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units
1221871	JS2	Method Blank	Thallium (Tl)	2013/10/18	<2.0		ug/L
			Titanium (Ti)	2013/10/18	17, RDL=10		ug/L
			Uranium (U)	2013/10/18	<1.0		ug/L
			Vanadium (V)	2013/10/18	2.1, RDL=2.0		ug/L
			Zinc (Zn)	2013/10/18	<7.0		ug/L

RDL = Reportable Detection Limit
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tél. : (514) 448-9001 Télécopieur : (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Validation Signature Page

Maxxam Job #: B364381

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Delia Barbul, B.Sc., Chemist

<Original signed by>

Jonathan Pauvel, B.Sc, Chimiste, Analyste II

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Miryam Assayag

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Mathieu Letourneau, B.Sc., chimist

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your P.O. #: 2200000001
Your Project #: QUARTERLY MONITORING
Site#: DSO TIMMINS
Site Location: TSMC
Your C.O.C. #: C#9720602

TATA STEEL MINERALS CANADA
85 Atlantic Street
Schefferville , PQ
CANADA G0G2T0

Report Date: 2014/06/19
Report #: R1881192
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B433794
Received: 2014/06/12, 13:45

Sample Matrix: WATER
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary Reference
Total Alkalinity (pH end point 4.5)***	8	N/A	2014/06/12	STL SOP-00038	MA. 315 – Alc.-Aci 1
Anions*	8	N/A	2014/06/19	STL SOP-00014	MA. 300 - Ions 1.3
Petroleum Hydrocarbons (C10-C50)*	1	2014/06/17	2014/06/18	STL SOP-00173	MA.400 - Hyd 1.1
Real Color*	8	N/A	2014/06/12	STL SOP-00046	MA. 103 - Col. 2.0
Conductivity*	8	N/A	2014/06/12	STL SOP-00038	SM 2510
Dissolved Organic Carbon (2)***	8	2014/06/12	2014/06/17	STL SOP-00243	SM 5310B
Total Suspended Solids*	8	2014/06/13	2014/06/13	STL SOP-00015	MA. 104 - S.S. 2.0
Total Extractable Metals by ICP*	8	2014/06/19	2014/06/19	STL SOP-00006	MA.200- Mét 1.2
Dissolved Metals by ICP-MS (Low Level)*	8	2014/06/19	2014/06/19	STL SOP-00006	MA.200- Mét 1.2
Ammonia Nitrogen*	8	N/A	2014/06/16	STL SOP-00040	MA.300 – N 2.0
Nitrate and/or Nitrite*	8	N/A	2014/06/19	STL SOP-00014	MA. 300 - Ions 1.3
pH*	8	N/A	2014/06/12	STL SOP-00038	MA.100- pH1.1
Total Phenols by 4-AAP*	8	2014/06/19	2014/06/19	STL SOP-00033	MA.404-I.Phé 2.2
Ortho Phosphate*	8	N/A	2014/06/12	STL SOP-00003	SM 4500-P E
Sulfides (S2-)*	8	2014/06/18	2014/06/18	STL SOP-00005	MA. 300 – S 1.2
Reactive Silica (SiO2) (1)***	8	N/A	2014/06/16	QUE SOP-00132	HACH, Method 8186
Total Dissolved Solids*	8	2014/06/13	2014/06/13	STL SOP-00050	MA. 115 – S.D. 1.0
Turbidity*	8	N/A	2014/06/12	STL SOP-00022	MA. 103 - Tur. 1.0

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam - Québec
(2) DOC present in the sample should be considered as non-purgeable DOC

* Maxxam is accredited as per the MDDELCC program.
*** This analysis is not subject to MDDELCC accreditation.

2014/06/19 17:08

889 Montée de Liesse, Ville St-Laurent, Québec, Canada H4T 1P5 Tel: (514) 448-9001 Fax: (514) 448-9199 Ligne sans frais : 1-877-4MAXXAM (462-9926)

Your P.O. #: 2200000001
Your Project #: QUARTERLY MONITORING
Site#: DSO TIMMINS
Site Location: TSMC
Your C.O.C. #: C#9720602

TATA STEEL MINERALS CANADA
85 Atlantic Street
Schefferville , PQ
CANADA G0G2T0

Report Date: 2014/06/19
Report #: R1881192
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B433794
Received: 2014/06/12, 13:45

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Séverine Planté,
Email: SPlante@maxxam.ca
Phone# (514) 448-9001
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

HYDROCARBONS BY GCFID (WATER)

Maxxam ID		Y70731		
Sampling Date		2014/06/10		
COC Number		C#9720602		
	Units	**COA-SW10-Q1**	**RDL**	**QC Batch**
PETROLEUM HYDROCARBONS				
Petroleum Hydrocarbons (C10-C50)	ug/L	<100	100	1321178
Surrogate Recovery (%)				
1-Chlorooctadecane	%	83	N/A	1321178

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

2014/06/19 17:08

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

DISSOLVED METALS (WATER)

Maxxam ID		Y70726	Y70727	Y70728	Y70729	Y70730	Y70731		
Sampling Date		2014/06/10	2014/06/10	2014/06/10	2014/06/10	2014/06/10	2014/06/10		
COC Number		C#9720602	C#9720602	C#9720602	C#9720602	C#9720602	C#9720602		
	Units	COA-SW3-Q1	COA-SW4-Q1	COA-SW7-Q1	COA-SW8-Q1	COA-SW9-Q1	COA-SW10-Q1	RDL	QC Batch
METALS ICP-MS									
Aluminum (Al)	ug/L	50	23	26	75	39	380	10	1322588
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1322588
Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	1322588
Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1322588
Barium (Ba)	ug/L	8.6	4.0	2.7	<2.0	2.1	9.3	2.0	1322588
Beryllium (Be)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	1322588
Bismuth (Bi)	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	0.25	1322588
Boron (B)	ug/L	<20	<20	<20	<20	<20	<20	20	1322588
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	1322588
Calcium (Ca)	ug/L	1800	1800	880	450	<300	710	300	1322588
Chromium (Cr)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.96	0.50	1322588
Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.58	0.50	1322588
Copper (Cu)	ug/L	1.1	<0.50	<0.50	<0.50	1.0	2.6	0.50	1322588
Total Hardness (CaCO3)	ug/L	10000	9700	4700	1800	<1000	4000	1000	1322588
Tin (Sn)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1322588
Iron (Fe)	ug/L	<100	<100	<100	<100	120	550	100	1322588
Magnesium (Mg)	ug/L	1400	1200	620	180	<100	530	100	1322588
Manganese (Mn)	ug/L	29	20	4.3	4.2	17	67	0.40	1322588
Molybdenum (Mo)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	1322588
Mercury (Hg)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	1322588
Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	1.2	<1.0	1.1	1.0	1322588
Lead (Pb)	ug/L	0.19	0.12	<0.10	<0.10	<0.10	0.61	0.10	1322588
Potassium (K)	ug/L	400	230	200	<100	<100	360	100	1322588
Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1322588
Strontium (Sr)	ug/L	5.9	6.6	3.9	2.4	<2.0	3.8	2.0	1322588
Sodium (Na)	ug/L	590	780	490	490	200	280	100	1322588
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1322588
Uranium (U)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1322588
Titanium (Ti)	ug/L	<10	<10	<10	<10	<10	<10	10	1322588
Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.6	2.0	1322588
Zinc (Zn)	ug/L	8.5	5.8	5.0	25	<5.0	9.0	5.0	1322588

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

DISSOLVED METALS (WATER)

Maxxam ID		Y70732	Y70733		
Sampling Date		2014/06/10	2014/06/10		
COC Number		C#9720602	C#9720602		
	Units	COA-SW13-Q1	COA-GW1-Q1	RDL	QC Batch
METALS ICP-MS					
Aluminum (Al)	ug/L	17	<10	10	1322588
Antimony (Sb)	ug/L	<1.0	<1.0	1.0	1322588
Silver (Ag)	ug/L	<0.10	<0.10	0.10	1322588
Arsenic (As)	ug/L	<1.0	<1.0	1.0	1322588
Barium (Ba)	ug/L	<2.0	<2.0	2.0	1322588
Beryllium (Be)	ug/L	<0.50	<0.50	0.50	1322588
Bismuth (Bi)	ug/L	<0.25	<0.25	0.25	1322588
Boron (B)	ug/L	<20	<20	20	1322588
Cadmium (Cd)	ug/L	<0.20	<0.20	0.20	1322588
Calcium (Ca)	ug/L	<300	1000	300	1322588
Chromium (Cr)	ug/L	<0.50	<0.50	0.50	1322588
Cobalt (Co)	ug/L	<0.50	<0.50	0.50	1322588
Copper (Cu)	ug/L	<0.50	6.3	0.50	1322588
Total Hardness (CaCO3)	ug/L	1500	5200	1000	1322588
Tin (Sn)	ug/L	<1.0	<1.0	1.0	1322588
Iron (Fe)	ug/L	<100	1900	100	1322588
Magnesium (Mg)	ug/L	180	640	100	1322588
Manganese (Mn)	ug/L	6.5	50	0.40	1322588
Molybdenum (Mo)	ug/L	<0.50	<0.50	0.50	1322588
Mercury (Hg)	ug/L	<0.10	<0.10	0.10	1322588
Nickel (Ni)	ug/L	<1.0	1.9	1.0	1322588
Lead (Pb)	ug/L	<0.10	0.33	0.10	1322588
Potassium (K)	ug/L	<100	190	100	1322588
Selenium (Se)	ug/L	<1.0	<1.0	1.0	1322588
Strontium (Sr)	ug/L	2.1	5.3	2.0	1322588
Sodium (Na)	ug/L	410	980	100	1322588
Thallium (Tl)	ug/L	<2.0	<2.0	2.0	1322588
Uranium (U)	ug/L	<1.0	<1.0	1.0	1322588
Titanium (Ti)	ug/L	<10	<10	10	1322588
Vanadium (V)	ug/L	<2.0	<2.0	2.0	1322588
Zinc (Zn)	ug/L	<5.0	21	5.0	1322588

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

TOTAL EXTRACTABLE METALS (WATER)

Maxxam ID		Y70726	Y70727	Y70728	Y70729	Y70730	Y70731		
Sampling Date		2014/06/10	2014/06/10	2014/06/10	2014/06/10	2014/06/10	2014/06/10		
COC Number		C#9720602	C#9720602	C#9720602	C#9720602	C#9720602	C#9720602		
	Units	COA-SW3-Q1	COA-SW4-Q1	COA-SW7-Q1	COA-SW8-Q1	COA-SW9-Q1	COA-SW10-Q1	RDL	QC Batch
METALS									
Total phosphorous	mg/L	<0.01	0.02	0.02	<0.01	<0.01	0.12	0.01	1322584

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		Y70732	Y70733		
Sampling Date		2014/06/10	2014/06/10		
COC Number		C#9720602	C#9720602		
	Units	COA-SW13-Q1	COA-GW1-Q1	RDL	QC Batch
METALS					
Total phosphorous	mg/L	0.02	<0.01	0.01	1322584

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		Y70726	Y70727	Y70727	Y70728	Y70729	Y70730		
Sampling Date		2014/06/10	2014/06/10	2014/06/10	2014/06/10	2014/06/10	2014/06/10		
COC Number		C#9720602	C#9720602	C#9720602	C#9720602	C#9720602	C#9720602		
	Units	COA-SW3-Q1	COA-SW4-Q1	COA-SW4-Q1 Lab-Dup	COA-SW7-Q1	COA-SW8-Q1	COA-SW9-Q1	RDL	QC Batch
CONVENTIONALS									
Conductivity	mS/cm	0.024	0.026	N/A	0.012	0.003	0.003	0.001	1319609
Dissolved organic carbon	mg/L	0.9	0.9	N/A	2.0	3.8	2.8	0.2	1319658
Nitrate (N) and Nitrite(N)	mg/L	0.24	0.87	N/A	0.09	<0.02	<0.02	0.02	1319611
Nitrates (N-NO3-)	mg/L	0.24	0.87	N/A	0.09	<0.02	<0.02	0.02	1319611
Nitrites (N-NO2-)	mg/L	<0.02	<0.02	N/A	<0.02	<0.02	<0.02	0.02	1319611
Nitrogen ammonia (N-NH3)	mg/L	<0.02	<0.02	N/A	<0.02	<0.02	<0.02	0.02	1320841
Orthophosphate (P)	mg/L	<0.05	<0.05	N/A	<0.05	<0.05	<0.05	0.05	1319584
pH	pH	6.07	6.06	N/A	6.05	5.84	5.59	N/A	1319603
Phenols-4AAP	mg/L	0.005	0.003	0.005	0.004	0.004	0.004	0.002	1322607
Reactive silica (SiO2)	mg/L	4.4	5.8	N/A	3.5	3.5	0.7	0.1	1321596
Real Color	UCV	16	6	N/A	12	17	11	2	1319754
Sulfides (S2-)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	1321959
Turbidity	NTU	36	58	N/A	5.8	0.7	1.7	0.1	1319762
Alkalinity Total (as CaCO3) pH 4.5	mg/L	8	5	N/A	4	1	<1	1	1319617
Bicarbonates (HCO3 as CaCO3)	mg/L	8	5	N/A	4	1	<1	1	1319617
Carbonate (CO3 as CaCO3)	mg/L	<1	<1	N/A	<1	<1	<1	1	1319617
Chloride (Cl)	mg/L	0.36	1.1	N/A	0.21	0.07	0.12	0.05	1319645
Sulfates (SO4)	mg/L	1.9	1.4	N/A	1.3	<0.5	0.6	0.5	1319645
Total Dissolved Solids	mg/L	24	16	29	12	14	<10	10	1319960
Total suspended solids (TSS)	mg/L	7	7	N/A	5	<2	3	2	1319955

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		Y70731	Y70731		Y70732	Y70733		
Sampling Date		2014/06/10	2014/06/10		2014/06/10	2014/06/10		
COC Number		C#9720602	C#9720602		C#9720602	C#9720602		
	Units	COA-SW10-Q1	COA-SW10-Q1 Lab-Dup	QC Batch	COA-SW13-Q1	COA-GW1-Q1	RDL	QC Batch
CONVENTIONALS								
Conductivity	mS/cm	0.008	N/A	1319609	0.004	0.020	0.001	1319609
Dissolved organic carbon	mg/L	2.4	N/A	1319658	2.2	0.8	0.2	1319658
Nitrate (N) and Nitrite(N)	mg/L	0.18	N/A	1319611	0.02	1.7	0.02	1319611
Nitrates (N-NO3-)	mg/L	0.18	N/A	1319611	0.02	1.7	0.02	1319611
Nitrites (N-NO2-)	mg/L	<0.02	N/A	1319611	<0.02	<0.02	0.02	1319611
Nitrogen ammonia (N-NH3)	mg/L	0.03	N/A	1320841	<0.02	0.11	0.02	1320841
Orthophosphate (P)	mg/L	<0.05	N/A	1319584	<0.05	<0.05	0.05	1319584
pH	pH	5.90	N/A	1319603	5.94	5.81	N/A	1319603
Phenols-4AAP	mg/L	0.004	N/A	1322607	0.004	0.004	0.002	1322607
Reactive silica (SiO2)	mg/L	1.4	N/A	1321596	2.1	4.7	0.1	1321596
Real Color	UCV	210	N/A	1319754	7	11	2	1319754
Sulfides (S2-)	mg/L	<0.02	N/A	1321959	<0.02	<0.02	0.02	1321959
Turbidity	NTU	340	N/A	1319762	1.1	16	0.1	1319762
Alkalinity Total (as CaCO3) pH 4.5	mg/L	2	N/A	1319617	2	2	1	1319617
Bicarbonates (HCO3 as CaCO3)	mg/L	2	N/A	1319617	2	2	1	1319617
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	1319617	<1	<1	1	1319617
Chloride (Cl)	mg/L	0.11	N/A	1319645	0.10	0.31	0.05	1319645
Sulfates (SO4)	mg/L	<0.5	N/A	1319645	0.7	<0.5	0.5	1319645
Total Dissolved Solids	mg/L	91	N/A	1319960	21	37	10	1321229
Total suspended solids (TSS)	mg/L	11	13	1319955	<2	7	2	1321230

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B433794
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TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD except for the following:
Dissolved Metals by ICP-MS (Low Level): Due to the presence of particles, the sample was re-filtered after preservation.: Y70726, Y70727, Y70728, Y70729, Y70730, Y70731, Y70732, Y70733

HYDROCARBONS BY GCFID (WATER)

Please note that the results have not been corrected for QC recoveries (spiked blank and surrogates). Please note that the results have been corrected for the method blank.

DISSOLVED METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

TOTAL EXTRACTABLE METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.
pH-W : Holding time not respected.

Results relate only to the items tested.

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
1319584	DKH	QC Standard	Orthophosphate (P)	2014/06/12		99	%
1319584	DKH	Spiked Blank	Orthophosphate (P)	2014/06/12		98	%
1319584	DKH	Method Blank	Orthophosphate (P)	2014/06/12	<0.05		mg/L
1319603	DB2	Spiked Blank	pH	2014/06/12		102	%
1319609	DB2	Spiked Blank	Conductivity	2014/06/12		103	%
1319609	DB2	Method Blank	Conductivity	2014/06/12	<0.001		mS/cm
1319611	MMF	Spiked Blank	Nitrate (N) and Nitrite(N)	2014/06/13		100	%
			Nitrates (N-NO3-)	2014/06/13		101	%
			Nitrites (N-NO2-)	2014/06/13		100	%
1319611	MMF	Method Blank	Nitrate (N) and Nitrite(N)	2014/06/13	<0.02		mg/L
			Nitrates (N-NO3-)	2014/06/13	<0.02		mg/L
			Nitrites (N-NO2-)	2014/06/13	<0.02		mg/L
1319617	DB2	Spiked Blank	Alkalinity Total (as CaCO3) pH 4.5	2014/06/12		101	%
1319617	DB2	Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2014/06/12	<1		mg/L
			Bicarbonates (HCO3 as CaCO3)	2014/06/12	<1		mg/L
			Carbonate (CO3 as CaCO3)	2014/06/12	<1		mg/L
1319645	MMF	Spiked Blank	Chloride (Cl)	2014/06/13		98	%
			Sulfates (SO4)	2014/06/13		98	%
1319645	MMF	Method Blank	Chloride (Cl)	2014/06/13	<0.05		mg/L
			Sulfates (SO4)	2014/06/13	<0.5		mg/L
1319658	JL1	QC Standard	Dissolved organic carbon	2014/06/17		100	%
1319658	JL1	Spiked Blank	Dissolved organic carbon	2014/06/17		98	%
1319658	JL1	Method Blank	Dissolved organic carbon	2014/06/17	0.6 , RDL=0.2		mg/L
1319754	JEM	QC Standard	Real Color	2014/06/12		104	%
1319754	JEM	Method Blank	Real Color	2014/06/12	<2		UCV
1319762	NA3	QC Standard	Turbidity	2014/06/12		105	%
1319762	NA3	Method Blank	Turbidity	2014/06/12	0.1 , RDL=0.1		NTU
1319955	MA3	Spiked Blank	Total suspended solids (TSS)	2014/06/13		98	%
1319955	MA3	Spiked Blank DUP	Total suspended solids (TSS)	2014/06/13		96	%
1319955	MA3	Method Blank	Total suspended solids (TSS)	2014/06/13	<2		mg/L
1319960	MA3	Spiked Blank	Total Dissolved Solids	2014/06/13		99	%
1319960	MA3	Spiked Blank DUP	Total Dissolved Solids	2014/06/13		98	%
1319960	MA3	Method Blank	Total Dissolved Solids	2014/06/13	<10		mg/L
1320841	DKH	QC Standard	Nitrogen ammonia (N-NH3)	2014/06/16		100	%
1320841	DKH	Spiked Blank	Nitrogen ammonia (N-NH3)	2014/06/16		98	%
1320841	DKH	Method Blank	Nitrogen ammonia (N-NH3)	2014/06/16	<0.02		mg/L
1321178	CG2	Spiked Blank	1-Chlorooctadecane	2014/06/18		79	%
			Petroleum Hydrocarbons (C10-C50)	2014/06/18		84	%
1321178	CG2	Spiked Blank DUP	1-Chlorooctadecane	2014/06/18		87	%
			Petroleum Hydrocarbons (C10-C50)	2014/06/18		90	%
1321178	CG2	Method Blank	1-Chlorooctadecane	2014/06/18		84	%
			Petroleum Hydrocarbons (C10-C50)	2014/06/18	<100		ug/L
1321229	ACH	Spiked Blank	Total Dissolved Solids	2014/06/19		100	%
1321229	ACH	Spiked Blank DUP	Total Dissolved Solids	2014/06/19		100	%
1321229	ACH	Method Blank	Total Dissolved Solids	2014/06/19	<10		mg/L
1321230	ACH	Spiked Blank	Total suspended solids (TSS)	2014/06/17		95	%
1321230	ACH	Spiked Blank DUP	Total suspended solids (TSS)	2014/06/17		95	%
1321230	ACH	Method Blank	Total suspended solids (TSS)	2014/06/17	<2		mg/L

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
1321596	FTN	QC Standard	Reactive silica (SiO2)	2014/06/17		98	%
1321596	FTN	Method Blank	Reactive silica (SiO2)	2014/06/17	<0.1		mg/L
1321959	LI	Spiked Blank	Sulfides (S2-)	2014/06/18		96	%
1321959	LI	Method Blank	Sulfides (S2-)	2014/06/18	<0.02		mg/L
1322584	JS2	Spiked Blank	Total phosphorous	2014/06/19		101	%
1322584	JS2	Method Blank	Total phosphorous	2014/06/19	<0.01		mg/L
1322588	AL5	Spiked Blank	Aluminum (Al)	2014/06/19		93	%
			Antimony (Sb)	2014/06/19		104	%
			Silver (Ag)	2014/06/19		99	%
			Arsenic (As)	2014/06/19		109	%
			Barium (Ba)	2014/06/19		99	%
			Beryllium (Be)	2014/06/19		104	%
			Bismuth (Bi)	2014/06/19		97	%
			Boron (B)	2014/06/19		97	%
			Cadmium (Cd)	2014/06/19		103	%
			Calcium (Ca)	2014/06/19		96	%
			Chromium (Cr)	2014/06/19		96	%
			Cobalt (Co)	2014/06/19		97	%
			Copper (Cu)	2014/06/19		100	%
			Tin (Sn)	2014/06/19		99	%
			Iron (Fe)	2014/06/19		94	%
			Magnesium (Mg)	2014/06/19		93	%
			Manganese (Mn)	2014/06/19		100	%
			Molybdenum (Mo)	2014/06/19		100	%
			Mercury (Hg)	2014/06/19		91	%
			Nickel (Ni)	2014/06/19		100	%
			Lead (Pb)	2014/06/19		96	%
			Potassium (K)	2014/06/19		95	%
			Selenium (Se)	2014/06/19		107	%
			Strontium (Sr)	2014/06/19		98	%
			Sodium (Na)	2014/06/19		95	%
			Thallium (Tl)	2014/06/19		95	%
			Uranium (U)	2014/06/19		99	%
			Titanium (Ti)	2014/06/19		97	%
			Vanadium (V)	2014/06/19		100	%
			Zinc (Zn)	2014/06/19		106	%
1322588	AL5	Method Blank	Aluminum (Al)	2014/06/19	<10		ug/L
			Antimony (Sb)	2014/06/19	<1.0		ug/L
			Silver (Ag)	2014/06/19	0.19 , RDL=0.10		ug/L
			Arsenic (As)	2014/06/19	<1.0		ug/L
			Barium (Ba)	2014/06/19	<2.0		ug/L
			Beryllium (Be)	2014/06/19	<0.50		ug/L
			Bismuth (Bi)	2014/06/19	<0.25		ug/L
			Boron (B)	2014/06/19	<20		ug/L
			Cadmium (Cd)	2014/06/19	<0.20		ug/L
			Calcium (Ca)	2014/06/19	<300		ug/L
			Chromium (Cr)	2014/06/19	<0.50		ug/L
			Cobalt (Co)	2014/06/19	<0.50		ug/L
			Copper (Cu)	2014/06/19	<0.50		ug/L
			Total Hardness (CaCO3)	2014/06/19	<1000		ug/L

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Tin (Sn)	2014/06/19	<1.0		ug/L
			Iron (Fe)	2014/06/19	<100		ug/L
			Magnesium (Mg)	2014/06/19	<100		ug/L
			Manganese (Mn)	2014/06/19	0.58 , RDL=0.40		ug/L
			Molybdenum (Mo)	2014/06/19	<0.50		ug/L
			Mercury (Hg)	2014/06/19	<0.10		ug/L
			Nickel (Ni)	2014/06/19	<1.0		ug/L
			Lead (Pb)	2014/06/19	<0.10		ug/L
			Potassium (K)	2014/06/19	<100		ug/L
			Selenium (Se)	2014/06/19	<1.0		ug/L
			Strontium (Sr)	2014/06/19	<2.0		ug/L
			Sodium (Na)	2014/06/19	<100		ug/L
			Thallium (Tl)	2014/06/19	<2.0		ug/L
			Uranium (U)	2014/06/19	<1.0		ug/L
			Titanium (Ti)	2014/06/19	<10		ug/L
			Vanadium (V)	2014/06/19	<2.0		ug/L
			Zinc (Zn)	2014/06/19	<5.0		ug/L
1322607	CC6	QC Standard	Phenols-4AAP	2014/06/19		84	%
1322607	CC6	Spiked Blank	Phenols-4AAP	2014/06/19		102	%
1322607	CC6	Method Blank	Phenols-4AAP	2014/06/19	0.002 , RDL=0.002		mg/L

RDL = Reportable Detection Limit

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

2014/06/19 17:08

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Corina Tue, B.Sc., Chemist

<Original signed by>

Delia Barbul, B.Sc., Chemist

<Original signed by>

Dochka Koleva Hristo, B.Sc., Chemist

<Original signed by>

David Provencher, B.Sc., Chemist

<Original signed by>

Jonathan Fauvel, B.Sc, Chimiste, Analyste II

<Original signed by>

Karyn Vaucher

<Original signed by>

Madina Hamrouni, B.Sc., Chemist

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Maxxam Job #: B433794
Report Date: 2014/06/19

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

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Success Through Science®

Your P.O. #: 2200000001
Your Project #: QUATERLY MONITORING
Site#: DSO TIMMINS
Site Location: TSMC
Your C.O.C. #: 97206-01-01

Attention:Loic Didillon

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2014/07/23
Report #: R1896816
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B441557
Received: 2014/07/15, 9:00

Sample Matrix: WATER
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary Reference
Total Alkalinity (pH end point 4.5)***	8	N/A	2014/07/15	QUE SOP-00142	MA.303-TitrAuto 2.1
Anions (1)*	4	N/A	2014/07/18	STL SOP-00014	MA300-Ions 1.3 R2 m
Anions (1)*	4	N/A	2014/07/21	STL SOP-00014	MA300-Ions 1.3 R2 m
Petroleum Hydrocarbons (C10-C50)*	1	2014/07/17	2014/07/18	QUE SOP-00209	MA. 400 - Hyd. 1.1
Real Color*	8	N/A	2014/07/15	QUE SOP-00115	MA. 103 - Col. 2.0
Conductivity*	8	N/A	2014/07/15	QUE SOP-00142	MA.303-TitrAuto 2.1
Dissolved Organic Carbon (2, 3)	8	2014/07/23	2014/07/23		
Total Extractable Mercury - Cold Vapour (1)***	2	2014/07/21	2014/07/22	STL SOP-00042	MA200-Hg 1.1 R1 m
Total Suspended Solids*	8	2014/07/15	2014/07/15	QUE SOP-00111	SM 2540 D
Total Extractable Metals (Low Level)*	6	2014/07/16	2014/07/17	LCQ 05.12/ICP-MS	MA. 200 - Mét. 1.1
Total Extractable Metals (Low Level) (1)*	2	2014/07/17	2014/07/18	STL SOP-00006	MA200–Mét 1.2 R4 m
Ammonia Nitrogen (1)*	8	N/A	2014/07/17	STL SOP-00040	MA300–N 2.0 R1 m
Nitrate and/or Nitrite (1)*	4	N/A	2014/07/18	STL SOP-00014	MA300-Ions 1.3 R2 m
Nitrate and/or Nitrite (1)*	4	N/A	2014/07/21	STL SOP-00014	MA300-Ions 1.3 R2 m
pH*	8	N/A	2014/07/15	QUE SOP-00142	MA.303-TitrAuto 2.1
Total Phenols by 4-AAP (1)*	8	2014/07/18	2014/07/18	STL SOP-00033	MA404-I.Phé 2.2 R2 m
Ortho Phosphate*	8	N/A	2014/07/15	QUE SOP-00121	MA.303 - P 1.1
Sulfides (S2-)*	2	2014/07/15	2014/07/15	QUE SOP-00107	MA 300 - S 1.1
Sulfides (S2-)*	6	2014/07/16	2014/07/16	QUE SOP-00107	MA 300 - S 1.1
Reactive Silica (SiO2)***	8	N/A	2014/07/15	QUE SOP-00132	HACH, Method 8186
Total Dissolved Solids*	8	2014/07/16	2014/07/16	QUE SOP-00119	MA. 103 - S.T. 1.0
Turbidity*	8	N/A	2014/07/15	QUE SOP-00118	MA.103-TUR. 1.0

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam -Ville St. Laurent
(2) This test was performed by Sub Quebec to Exova - PC
(3) DOC present in the sample should be considered as non-purgeable DOC

* Maxxam is accredited as per the MDDELCC program.
*** This analysis is not subject to MDDELCC accreditation.

2014/07/23 17:24

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Your P.O. #: 2200000001
Your Project #: QUATERLY MONITORING
Site#: DSO TIMMINS
Site Location: TSMC
Your C.O.C. #: 97206-01-01

Attention:Loic Didillon

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2014/07/23
Report #: R1896816
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B441557
Received: 2014/07/15, 9:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Mathieu Letourneau, B.Sc., chimist, Customer Service
Email: MLetourneau@maxxam.ca
Phone# (418) 658-5784

==========

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

HYDROCARBONS BY GCFID (WATER)

Maxxam ID		Z07942		
Sampling Date		2014/07/14 09:30		
COC Number		97206-01-01		
	Units	COA-SW10-Q2	RDL	QC Batch
PETROLEUM HYDROCARBONS				
Petroleum Hydrocarbons (C10-C50)	ug/L	<100	100	1334806
Surrogate Recovery (%)				
1-Chlorooctadecane	%	95	N/A	1334806

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

2014/07/23 17:24

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

METALS (WATER)

Maxxam ID		Z07487	Z07939		
Sampling Date		2014/07/14 09:05	2014/07/14 08:40		
COC Number		97206-01-01	97206-01-01		
	Units	COA-SW3-Q2	COA-SW7-Q2	RDL	QC Batch
METALS					
Mercury (Hg)	mg/L	<0.00001	<0.00001	0.00001	1336290

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

2014/07/23 17:24

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

TOTAL EXTRACTABLE METALS (WATER)

Maxxam ID		Z07487	Z07487		Z07938		Z07939		
Sampling Date		2014/07/14 09:05	2014/07/14 09:05		2014/07/14 10:00		2014/07/14 08:40		
COC Number		97206-01-01	97206-01-01		97206-01-01		97206-01-01		
	Units	COA-SW3-Q2	COA-SW3-Q2 Lab-Dup	QC Batch	COA-SW4-Q2	QC Batch	COA-SW7-Q2	RDL	QC Batch
METALS ICP-MS									
Aluminum (Al)	ug/L	35	31	1335005	67	1334105	15	10	1335005
Antimony (Sb)	ug/L	<1.0	<1.0	1335005	<1.0	1334105	<1.0	1.0	1335005
Silver (Ag)	ug/L	<1.0	<1.0	1335005	<1.0	1334105	<1.0	1.0	1335005
Arsenic (As)	ug/L	<1.0	<1.0	1335005	<1.0	1334105	<1.0	1.0	1335005
Barium (Ba)	ug/L	7.2	7.1	1335005	3.3	1334105	<2.0	2.0	1335005
Beryllium (Be)	ug/L	<2.0	<2.0	1335005	<2.0	1334105	<2.0	2.0	1335005
Bismuth (Bi)	ug/L	<1.0	<1.0	1335005	<1.0	1334105	<1.0	1.0	1335005
Boron (B)	ug/L	<50	<50	1335005	<50	1334105	<50	50	1335005
Cadmium (Cd)	ug/L	<0.20	<0.20	1335005	<0.20	1334105	<0.20	0.20	1335005
Calcium (Ca)	ug/L	1700	1700	1335005	2500	1334105	<500	500	1335005
Chromium (Cr)	ug/L	<5.0	<5.0	1335005	<5.0	1334105	<5.0	5.0	1335005
Cobalt (Co)	ug/L	<1.0	<1.0	1335005	<1.0	1334105	<1.0	1.0	1335005
Copper (Cu)	ug/L	<1.0	<1.0	1335005	<1.0	1334105	<1.0	1.0	1335005
Total Hardness (CaCO3)	ug/L	9600	9600	1335005	12000	1334105	2200	1000	1335005
Tin (Sn)	ug/L	<2.0	<2.0	1335005	<2.0	1334105	<2.0	2.0	1335005
Iron (Fe)	ug/L	68	65	1335005	110	1334105	<60	60	1335005
Magnesium (Mg)	ug/L	1300	1300	1335005	1300	1334105	340	100	1335005
Manganese (Mn)	ug/L	11	11	1335005	17	1334105	1.6	1.0	1335005
Molybdenum (Mo)	ug/L	<1.0	<1.0	1335005	<1.0	1334105	<1.0	1.0	1335005
Mercury (Hg)	ug/L	<0.10	<0.10	1335005	<0.10	1334105	<0.10	0.10	1335005
Nickel (Ni)	ug/L	<2.0	<2.0	1335005	<2.0	1334105	<2.0	2.0	1335005
Total phosphorous	ug/L	<10	<10	1335005	<10	1334105	<10	10	1335005
Lead (Pb)	ug/L	<0.50	<0.50	1335005	<0.50	1334105	<0.50	0.50	1335005
Potassium (K)	ug/L	<500	<500	1335005	<500	1334105	<500	500	1335005
Selenium (Se)	ug/L	<3.0	<3.0	1335005	<3.0	1334105	<3.0	3.0	1335005
Sodium (Na)	ug/L	610	590	1335005	840	1334105	600	500	1335005
Strontium (Sr)	ug/L	6.7	5.7	1335005	7.4	1334105	3.0	2.0	1335005
Thallium (Tl)	ug/L	<2.0	<2.0	1335005	<2.0	1334105	<2.0	2.0	1335005
Titanium (Ti)	ug/L	<10	<10	1335005	<10	1334105	<10	10	1335005
Uranium (U)	ug/L	<1.0	<1.0	1335005	<1.0	1334105	<1.0	1.0	1335005
Vanadium (V)	ug/L	<2.0	<2.0	1335005	<2.0	1334105	<2.0	2.0	1335005
Zinc (Zn)	ug/L	<7.0	<7.0	1335005	<7.0	1334105	<7.0	7.0	1335005

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

2014/07/23 17:24

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

TOTAL EXTRACTABLE METALS (WATER)

Maxxam ID		Z07940	Z07941	Z07942	Z07943	Z07943	Z07944		
Sampling Date		2014/07/14 07:30	2014/07/14 11:20	2014/07/14 09:30	2014/07/14 08:00	2014/07/14 08:00	2014/07/14 10:45		
COC Number		97206-01-01	97206-01-01	97206-01-01	97206-01-01	97206-01-01	97206-01-01		
	Units	COA-SW8-Q2	COA-SW9-Q2	COA-SW10-Q2	COA-SW13-Q2	COA-SW13-Q2 Lab-Dup	COA-GW1-Q2	RDL	QC Batch
METALS ICP-MS									
Aluminum (Al)	ug/L	38	110	1300	12	12	<10	10	1334105
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1334105
Silver (Ag)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1334105
Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1334105
Barium (Ba)	ug/L	<2.0	3.0	13	<2.0	<2.0	<2.0	2.0	1334105
Beryllium (Be)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1334105
Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1334105
Boron (B)	ug/L	<50	<50	<50	<50	<50	<50	50	1334105
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	1334105
Calcium (Ca)	ug/L	<500	<500	1300	<500	<500	1200	500	1334105
Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	1334105
Cobalt (Co)	ug/L	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	1.0	1334105
Copper (Cu)	ug/L	<1.0	<1.0	3.2	<1.0	<1.0	5.6	1.0	1334105
Total Hardness (CaCO3)	ug/L	2100	1200	7900	1400	1400	6000	1000	1334105
Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1334105
Iron (Fe)	ug/L	66	390	2800	62	64	210	60	1334105
Magnesium (Mg)	ug/L	220	110	1200	200	200	740	100	1334105
Manganese (Mn)	ug/L	1.9	30	110	2.3	2.4	16	1.0	1334105
Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1334105
Mercury (Hg)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	1334105
Nickel (Ni)	ug/L	<2.0	<2.0	2.7	<2.0	<2.0	<2.0	2.0	1334105
Total phosphorous	ug/L	<10	12	33	<10	14	<10	10	1334105
Lead (Pb)	ug/L	<0.50	<0.50	0.99	<0.50	<0.50	1.1	0.50	1334105
Potassium (K)	ug/L	<500	<500	730	<500	<500	<500	500	1334105
Selenium (Se)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	1334105
Sodium (Na)	ug/L	<500	<500	<500	<500	<500	1000	500	1334105
Strontium (Sr)	ug/L	2.3	2.4	5.9	<2.0	<2.0	6.0	2.0	1334105
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1334105
Titanium (Ti)	ug/L	<10	<10	31	<10	<10	<10	10	1334105
Uranium (U)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1334105
Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1334105
Zinc (Zn)	ug/L	<7.0	<7.0	10	<7.0	<7.0	37	7.0	1334105

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		Z07487	Z07487	Z07938	Z07938		Z07939		
Sampling Date		2014/07/14 09:05	2014/07/14 09:05	2014/07/14 10:00	2014/07/14 10:00		2014/07/14 08:40		
COC Number		97206-01-01	97206-01-01	97206-01-01	97206-01-01		97206-01-01		
	Units	COA-SW3-Q2	COA-SW3-Q2 Lab-Dup	COA-SW4-Q2	COA-SW4-Q2 Lab-Dup	QC Batch	COA-SW7-Q2	RDL	QC Batch
CONVENTIONALS									
Conductivity	mS/cm	0.030	N/A	0.033	N/A	1333890	0.012	0.001	1333890
Nitrates (N-NO3-)	mg/L	0.22	N/A	0.85	N/A	1334626	<0.02	0.02	1334626
Nitrites (N-NO2-)	mg/L	<0.02	N/A	<0.02	N/A	1334626	<0.02	0.02	1334626
Nitrogen ammonia (N-NH3)	mg/L	0.04	N/A	0.03	N/A	1334927	0.02	0.02	1334927
Orthophosphate (P)	mg/L	<0.01	N/A	<0.01	N/A	1333884	<0.01	0.01	1333884
pH	pH	7.21	N/A	7.14	N/A	1333885	6.43	N/A	1333885
Phenols-4AAP	mg/L	<0.002	N/A	<0.002	N/A	1335550	<0.002	0.002	1335550
Reactive silica (SiO2)	mg/L	2.8	N/A	4.4	N/A	1334021	1.9	0.1	1334021
Real Color	UCV	10	N/A	8	N/A	1333962	4	2	1333962
Sulfides (S2-)	mg/L	<0.02	N/A	<0.02	N/A	1333971	<0.02	0.02	1334623
Turbidity	NTU	16	16	27	27	1333968	0.5	0.1	1333968
Alkalinity Total (as CaCO3) pH 4.5	mg/L	12	N/A	9	N/A	1333886	4	1	1333886
Bicarbonates (HCO3 as CaCO3)	mg/L	12	N/A	9	N/A	1333886	4	1	1333886
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	<1	N/A	1333886	<1	1	1333886
Chloride (Cl)	mg/L	0.32	N/A	1.1	N/A	1334636	0.08	0.05	1334636
Nitrate (N) and Nitrite(N)	mg/L	0.22	N/A	0.85	N/A	1334636	<0.02	0.02	1334636
Sulfates (SO4)	mg/L	1.8	N/A	1.4	N/A	1334636	0.5	0.5	1334636
Total Dissolved Solids	mg/L	17	N/A	21	N/A	1334157	<10	10	1334157
Total suspended solids (TSS)	mg/L	<2	N/A	4	N/A	1333852	<2	2	1333852

RDL = Reportable Detection Limit
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N/A = Not Applicable

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		Z07940	Z07940	Z07941	Z07941	Z07942	Z07942		
Sampling Date		2014/07/14 07:30	2014/07/14 07:30	2014/07/14 11:20	2014/07/14 11:20	2014/07/14 09:30	2014/07/14 09:30		
COC Number		97206-01-01	97206-01-01	97206-01-01	97206-01-01	97206-01-01	97206-01-01		
	Units	COA-SW8-Q2	COA-SW8-Q2 Lab-Dup	COA-SW9-Q2	COA-SW9-Q2 Lab-Dup	COA-SW10-Q2	COA-SW10-Q2 Lab-Dup	RDL	QC Batch
CONVENTIONALS									
Conductivity	mS/cm	0.009	N/A	0.010	N/A	0.015	N/A	0.001	1333890
Nitrates (N-NO3-)	mg/L	<0.02	N/A	0.03	N/A	0.18	N/A	0.02	1334626
Nitrites (N-NO2-)	mg/L	<0.02	N/A	<0.02	N/A	<0.02	N/A	0.02	1334626
Nitrogen ammonia (N-NH3)	mg/L	0.02	N/A	0.03	0.03	0.03	N/A	0.02	1334927
Orthophosphate (P)	mg/L	<0.01	N/A	<0.01	N/A	0.01	N/A	0.01	1333884
pH	pH	6.41	N/A	6.47	N/A	6.75	N/A	N/A	1333885
Phenols-4AAP	mg/L	<0.002	N/A	<0.002	<0.002	<0.002	N/A	0.002	1335550
Reactive silica (SiO2)	mg/L	3.2	N/A	0.1	N/A	1.4	N/A	0.1	1334021
Real Color	UCV	7	N/A	17	N/A	190	N/A	2	1333962
Sulfides (S2-)	mg/L	<0.02	N/A	<0.02	N/A	<0.02	N/A	0.02	1334623
Turbidity	NTU	0.3	0.3	1.3	N/A	200	190	0.1	1333968
Alkalinity Total (as CaCO3) pH 4.5	mg/L	4	N/A	3	N/A	6	N/A	1	1333886
Bicarbonates (HCO3 as CaCO3)	mg/L	4	N/A	3	N/A	6	N/A	1	1333886
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	<1	N/A	<1	N/A	1	1333886
Chloride (Cl)	mg/L	<0.05	N/A	0.12	N/A	0.12	N/A	0.05	1334636
Nitrate (N) and Nitrite(N)	mg/L	<0.02	N/A	0.03	N/A	0.18	N/A	0.02	1334636
Sulfates (SO4)	mg/L	<0.5	N/A	1.1	N/A	0.5	N/A	0.5	1334636
Total Dissolved Solids	mg/L	<10	N/A	<10	N/A	57	N/A	10	1334157
Total suspended solids (TSS)	mg/L	<2	N/A	<2	N/A	33	35	2	1333852

RDL = Reportable Detection Limit
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N/A = Not Applicable

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		Z07943	Z07943	Z07944		
Sampling Date		2014/07/14 08:00	2014/07/14 08:00	2014/07/14 10:45		
COC Number		97206-01-01	97206-01-01	97206-01-01		
	Units	COA-SW13-Q2	COA-SW13-Q2 Lab-Dup	COA-GW1-Q2	RDL	QC Batch
CONVENTIONALS						
Conductivity	mS/cm	0.014	N/A	0.026	0.001	1333890
Nitrates (N-NO3-)	mg/L	0.02	<0.02	1.6	0.02	1334626
Nitrites (N-NO2-)	mg/L	<0.02	<0.02	<0.02	0.02	1334626
Nitrogen ammonia (N-NH3)	mg/L	0.02	N/A	0.04	0.02	1334927
Orthophosphate (P)	mg/L	<0.01	N/A	<0.01	0.01	1333884
pH	pH	6.82	N/A	6.56	N/A	1333885
Phenols-4AAP	mg/L	<0.002	N/A	<0.002	0.002	1335550
Reactive silica (SiO2)	mg/L	1.0	N/A	3.6	0.1	1334021
Real Color	UCV	5	5	5	2	1333962
Sulfides (S2-)	mg/L	<0.02	N/A	<0.02	0.02	1334623
Turbidity	NTU	0.7	N/A	1.6	0.1	1333968
Alkalinity Total (as CaCO3) pH 4.5	mg/L	6	N/A	5	1	1333886
Bicarbonates (HCO3 as CaCO3)	mg/L	6	N/A	5	1	1333886
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	<1	1	1333886
Chloride (Cl)	mg/L	0.06	0.07	0.23	0.05	1334636
Nitrate (N) and Nitrite(N)	mg/L	0.02	<0.02	1.6	0.02	1334636
Sulfates (SO4)	mg/L	<0.5	<0.5	<0.5	0.5	1334636
Total Dissolved Solids	mg/L	<10	N/A	16	10	1334157
Total suspended solids (TSS)	mg/L	<2	N/A	<2	2	1333852

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD

HYDROCARBONS BY GCFID (WATER)

Please note that the results have not been corrected for QC recoveries (spiked blank and surrogates). Please note that the results have been corrected for the method blank.

METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

TOTAL EXTRACTABLE METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

Results relate only to the items tested.

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
1333852	MCC	Spiked Blank	Total suspended solids (TSS)	2014/07/15		92	%
1333852	MCC	Method Blank	Total suspended solids (TSS)	2014/07/15	<2		mg/L
1333884	CG0	QC Standard	Orthophosphate (P)	2014/07/15		106	%
1333884	CG0	Method Blank	Orthophosphate (P)	2014/07/15	<0.01		mg/L
1333885	CG0	QC Standard	pH	2014/07/15		99	%
1333886	CG0	QC Standard	Alkalinity Total (as CaCO3) pH 4.5	2014/07/15		99	%
1333886	CG0	Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2014/07/15	<1		mg/L
1333890	CG0	QC Standard	Conductivity	2014/07/15		100	%
1333890	CG0	Method Blank	Conductivity	2014/07/15	<0.001		mS/cm
1333962	CG0	Spiked Blank	Real Color	2014/07/15		96	%
1333962	CG0	Method Blank	Real Color	2014/07/15	<2		UCV
1333968	FTN	Spiked Blank	Turbidity	2014/07/15		98	%
1333968	FTN	Method Blank	Turbidity	2014/07/15	<0.1		NTU
1333971	BD	Spiked Blank	Sulfides (S2-)	2014/07/15		94	%
1333971	BD	Method Blank	Sulfides (S2-)	2014/07/15	<0.02		mg/L
1334021	CG0	QC Standard	Reactive silica (SiO2)	2014/07/15		96	%
1334021	CG0	Method Blank	Reactive silica (SiO2)	2014/07/15	0.1 , RDL=0.1		mg/L
1334105	JFB	QC Standard	Aluminum (Al)	2014/07/17		116	%
			Antimony (Sb)	2014/07/17		115	%
			Arsenic (As)	2014/07/17		112	%
			Barium (Ba)	2014/07/17		110	%
			Beryllium (Be)	2014/07/17		108	%
			Boron (B)	2014/07/17		103	%
			Cadmium (Cd)	2014/07/17		107	%
			Calcium (Ca)	2014/07/17		115	%
			Chromium (Cr)	2014/07/17		110	%
			Cobalt (Co)	2014/07/17		111	%
			Copper (Cu)	2014/07/17		110	%
			Iron (Fe)	2014/07/17		109	%
			Magnesium (Mg)	2014/07/17		115	%
			Manganese (Mn)	2014/07/17		112	%
			Molybdenum (Mo)	2014/07/17		104	%
			Nickel (Ni)	2014/07/17		111	%
			Total phosphorous	2014/07/17		107	%
			Lead (Pb)	2014/07/17		113	%
			Potassium (K)	2014/07/17		113	%
			Selenium (Se)	2014/07/17		108	%
			Sodium (Na)	2014/07/17		109	%
			Strontium (Sr)	2014/07/17		108	%
			Thallium (Tl)	2014/07/17		115	%
			Uranium (U)	2014/07/17		111	%
			Vanadium (V)	2014/07/17		107	%
			Zinc (Zn)	2014/07/17		113	%
1334105	JFB	Spiked Blank	Aluminum (Al)	2014/07/17		103	%
			Antimony (Sb)	2014/07/17		101	%
			Silver (Ag)	2014/07/17		98	%
			Arsenic (As)	2014/07/17		105	%
			Barium (Ba)	2014/07/17		101	%
			Beryllium (Be)	2014/07/17		103	%
			Bismuth (Bi)	2014/07/17		106	%

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TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Boron (B)	2014/07/17		105	%
			Cadmium (Cd)	2014/07/17		99	%
			Calcium (Ca)	2014/07/17		107	%
			Chromium (Cr)	2014/07/17		102	%
			Cobalt (Co)	2014/07/17		100	%
			Copper (Cu)	2014/07/17		103	%
			Tin (Sn)	2014/07/17		99	%
			Iron (Fe)	2014/07/17		102	%
			Magnesium (Mg)	2014/07/17		107	%
			Manganese (Mn)	2014/07/17		109	%
			Molybdenum (Mo)	2014/07/17		99	%
			Mercury (Hg)	2014/07/17		111	%
			Nickel (Ni)	2014/07/17		102	%
			Total phosphorous	2014/07/17		101	%
			Lead (Pb)	2014/07/17		105	%
			Potassium (K)	2014/07/17		107	%
			Selenium (Se)	2014/07/17		101	%
			Sodium (Na)	2014/07/17		103	%
			Strontium (Sr)	2014/07/17		105	%
			Thallium (Tl)	2014/07/17		104	%
			Titanium (Ti)	2014/07/17		109	%
			Uranium (U)	2014/07/17		106	%
			Vanadium (V)	2014/07/17		104	%
			Zinc (Zn)	2014/07/17		104	%
1334105	JFB	Method Blank	Aluminum (Al)	2014/07/17	14 , RDL=10		ug/L
			Antimony (Sb)	2014/07/17	<1.0		ug/L
			Silver (Ag)	2014/07/17	<1.0		ug/L
			Arsenic (As)	2014/07/17	<1.0		ug/L
			Barium (Ba)	2014/07/17	<2.0		ug/L
			Beryllium (Be)	2014/07/17	<2.0		ug/L
			Bismuth (Bi)	2014/07/17	<1.0		ug/L
			Boron (B)	2014/07/17	<50		ug/L
			Cadmium (Cd)	2014/07/17	<0.20		ug/L
			Calcium (Ca)	2014/07/17	<500		ug/L
			Chromium (Cr)	2014/07/17	<5.0		ug/L
			Cobalt (Co)	2014/07/17	<1.0		ug/L
			Copper (Cu)	2014/07/17	<1.0		ug/L
			Total Hardness (CaCO3)	2014/07/17	<1000		ug/L
			Tin (Sn)	2014/07/17	<2.0		ug/L
			Iron (Fe)	2014/07/17	<60		ug/L
			Magnesium (Mg)	2014/07/17	<100		ug/L
			Manganese (Mn)	2014/07/17	<1.0		ug/L
			Molybdenum (Mo)	2014/07/17	<1.0		ug/L
			Mercury (Hg)	2014/07/17	<0.10		ug/L
			Nickel (Ni)	2014/07/17	<2.0		ug/L
			Total phosphorous	2014/07/17	<10		ug/L
			Lead (Pb)	2014/07/17	<0.50		ug/L
			Potassium (K)	2014/07/17	<500		ug/L
			Selenium (Se)	2014/07/17	<3.0		ug/L
			Sodium (Na)	2014/07/17	<500		ug/L

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TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Strontium (Sr)	2014/07/17	<2.0		ug/L
			Thallium (Tl)	2014/07/17	<2.0		ug/L
			Titanium (Ti)	2014/07/17	<10		ug/L
			Uranium (U)	2014/07/17	<1.0		ug/L
			Vanadium (V)	2014/07/17	<2.0		ug/L
			Zinc (Zn)	2014/07/17	<7.0		ug/L
1334157	MCC	Spiked Blank	Total Dissolved Solids	2014/07/16		103	%
1334157	MCC	Method Blank	Total Dissolved Solids	2014/07/16	<10		mg/L
1334623	BD	QC Standard	Sulfides (S2-)	2014/07/16		88	%
1334623	BD	Method Blank	Sulfides (S2-)	2014/07/16	<0.02		mg/L
1334626	FS	Spiked Blank	Nitrates (N-NO3-)	2014/07/17		101	%
			Nitrites (N-NO2-)	2014/07/17		105	%
1334626	FS	Method Blank	Nitrates (N-NO3-)	2014/07/17	<0.02		mg/L
			Nitrites (N-NO2-)	2014/07/17	<0.02		mg/L
1334636	FS	Spiked Blank	Chloride (Cl)	2014/07/17		98	%
			Nitrate (N) and Nitrite(N)	2014/07/17		103	%
			Sulfates (SO4)	2014/07/17		99	%
1334636	FS	Method Blank	Chloride (Cl)	2014/07/17	<0.05		mg/L
			Nitrate (N) and Nitrite(N)	2014/07/17	<0.02		mg/L
			Sulfates (SO4)	2014/07/17	<0.5		mg/L
1334806	GM2	Spiked Blank	1-Chlorooctadecane	2014/07/18		94	%
			Petroleum Hydrocarbons (C10-C50)	2014/07/18		94	%
1334806	GM2	Method Blank	1-Chlorooctadecane	2014/07/18		87	%
			Petroleum Hydrocarbons (C10-C50)	2014/07/18	150 , RDL=100		ug/L
1334927	DKH	QC Standard	Nitrogen ammonia (N-NH3)	2014/07/17		97	%
1334927	DKH	Spiked Blank	Nitrogen ammonia (N-NH3)	2014/07/17		98	%
1334927	DKH	Method Blank	Nitrogen ammonia (N-NH3)	2014/07/17	<0.02		mg/L
1335005	JS2	QC Standard	Aluminum (Al)	2014/07/18		102	%
			Antimony (Sb)	2014/07/18		107	%
			Silver (Ag)	2014/07/18		107	%
			Arsenic (As)	2014/07/18		100	%
			Barium (Ba)	2014/07/18		103	%
			Beryllium (Be)	2014/07/18		96	%
			Boron (B)	2014/07/18		102	%
			Cadmium (Cd)	2014/07/18		99	%
			Chromium (Cr)	2014/07/18		103	%
			Cobalt (Co)	2014/07/18		102	%
			Copper (Cu)	2014/07/18		97	%
			Iron (Fe)	2014/07/18		98	%
			Manganese (Mn)	2014/07/18		106	%
			Molybdenum (Mo)	2014/07/18		108	%
			Nickel (Ni)	2014/07/18		97	%
			Lead (Pb)	2014/07/18		102	%
			Selenium (Se)	2014/07/18		96	%
			Strontium (Sr)	2014/07/18		101	%
			Thallium (Tl)	2014/07/18		106	%
			Vanadium (V)	2014/07/18		98	%
			Zinc (Zn)	2014/07/18		95	%
1335005	JS2	Spiked Blank	Aluminum (Al)	2014/07/18		101	%
			Antimony (Sb)	2014/07/18		104	%

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Silver (Ag)	2014/07/18		102	%
			Arsenic (As)	2014/07/18		101	%
			Barium (Ba)	2014/07/18		100	%
			Beryllium (Be)	2014/07/18		100	%
			Bismuth (Bi)	2014/07/18		98	%
			Boron (B)	2014/07/18		104	%
			Cadmium (Cd)	2014/07/18		101	%
			Calcium (Ca)	2014/07/18		101	%
			Chromium (Cr)	2014/07/18		98	%
			Cobalt (Co)	2014/07/18		96	%
			Copper (Cu)	2014/07/18		95	%
			Tin (Sn)	2014/07/18		104	%
			Iron (Fe)	2014/07/18		101	%
			Magnesium (Mg)	2014/07/18		102	%
			Manganese (Mn)	2014/07/18		102	%
			Molybdenum (Mo)	2014/07/18		102	%
			Mercury (Hg)	2014/07/18		97	%
			Nickel (Ni)	2014/07/18		98	%
			Total phosphorous	2014/07/18		99	%
			Lead (Pb)	2014/07/18		99	%
			Potassium (K)	2014/07/18		102	%
			Selenium (Se)	2014/07/18		97	%
			Sodium (Na)	2014/07/18		105	%
			Strontium (Sr)	2014/07/18		95	%
			Thallium (Tl)	2014/07/18		100	%
			Titanium (Ti)	2014/07/18		99	%
			Uranium (U)	2014/07/18		92	%
			Vanadium (V)	2014/07/18		98	%
			Zinc (Zn)	2014/07/18		94	%
1335005	JS2	Method Blank	Aluminum (Al)	2014/07/18	<10		ug/L
			Antimony (Sb)	2014/07/18	<1.0		ug/L
			Silver (Ag)	2014/07/18	<1.0		ug/L
			Arsenic (As)	2014/07/18	<1.0		ug/L
			Barium (Ba)	2014/07/18	<2.0		ug/L
			Beryllium (Be)	2014/07/18	<2.0		ug/L
			Bismuth (Bi)	2014/07/18	<1.0		ug/L
			Boron (B)	2014/07/18	<50		ug/L
			Cadmium (Cd)	2014/07/18	<0.20		ug/L
			Calcium (Ca)	2014/07/18	<500		ug/L
			Chromium (Cr)	2014/07/18	<5.0		ug/L
			Cobalt (Co)	2014/07/18	<1.0		ug/L
			Copper (Cu)	2014/07/18	<1.0		ug/L
			Total Hardness (CaCO3)	2014/07/18	<1000		ug/L
			Tin (Sn)	2014/07/18	<2.0		ug/L
			Iron (Fe)	2014/07/18	<60		ug/L
			Magnesium (Mg)	2014/07/18	<100		ug/L
			Manganese (Mn)	2014/07/18	<1.0		ug/L
			Molybdenum (Mo)	2014/07/18	<1.0		ug/L
			Mercury (Hg)	2014/07/18	<0.10		ug/L
			Nickel (Ni)	2014/07/18	<2.0		ug/L
			Total phosphorous	2014/07/18	<10		ug/L

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Lead (Pb)	2014/07/18	<0.50		ug/L
			Potassium (K)	2014/07/18	<500		ug/L
			Selenium (Se)	2014/07/18	<3.0		ug/L
			Sodium (Na)	2014/07/18	<500		ug/L
			Strontium (Sr)	2014/07/18	<2.0		ug/L
			Thallium (Tl)	2014/07/18	<2.0		ug/L
			Titanium (Ti)	2014/07/18	<10		ug/L
			Uranium (U)	2014/07/18	<1.0		ug/L
			Vanadium (V)	2014/07/18	<2.0		ug/L
			Zinc (Zn)	2014/07/18	<7.0		ug/L
1335550	CC6	QC Standard	Phenols-4AAP	2014/07/18		99	%
1335550	CC6	Spiked Blank	Phenols-4AAP	2014/07/18		102	%
1335550	CC6	Method Blank	Phenols-4AAP	2014/07/18	<0.002		mg/L
1336290	CC6	QC Standard	Mercury (Hg)	2014/07/22		99	%
1336290	CC6	Spiked Blank	Mercury (Hg)	2014/07/22		96	%
1336290	CC6	Method Blank	Mercury (Hg)	2014/07/22	<0.00001		mg/L

RDL = Reportable Detection Limit

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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Maxxam Job #: B441557
Report Date: 2014/07/23

TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Delia Barbul, B.Sc., Chemist

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Dochka Koleva Hristo, B.Sc., Chemist

<Original signed by>

Emmanuelle Caron, Ph.D., chimiste

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Galya Minkova, B.Sc. Chimiste, Analyste II

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Jonathan Fauvel, B.Sc, Chimiste, Analyste II

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Madina Hamrouni, B.Sc., Chemist

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Mathieu Letourneau, B.Sc., chimist, Customer Service

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TATA STEEL MINERALS CANADA
Client Project #: QUATERLY MONITORING
Site Location: TSMC
Your P.O. #: 2200000001

VALIDATION SIGNATURE PAGE(CONT'D)

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Your P.O. #: 2200000001
Your Project #: QUARTERLY MONITORING
Site#: TSMC
Your C.O.C. #: 82546-05-01

Attention:Loic Didillon

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2014/09/02
Report #: R1913633
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B451327
Received: 2014/08/21, 08:30

Sample Matrix: WATER
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary Reference
Total Alkalinity (pH end point 4.5)***	5	N/A	2014/08/21	QUE SOP-00142	MA.303-TitrAuto 2.1
Anions (1)*	5	N/A	2014/08/28	STL SOP-00014	MA300-Ions 1.3 R2 m
Petroleum Hydrocarbons (C10-C50)*	1	2014/08/25	2014/08/25	QUE SOP-00209	MA. 400 - Hyd. 1.1
Real Color*	5	N/A	2014/08/21	QUE SOP-00115	MA. 103 - Col. 2.0
Conductivity*	4	N/A	2014/08/21	QUE SOP-00142	MA.303-TitrAuto 2.1
Conductivity*	1	N/A	2014/08/28	QUE SOP-00142	MA.303-TitrAuto 2.1
Dissolved Organic Carbon (1, 2)***	5	2014/08/28	2014/08/28	STL SOP-00243	SM 21 5310-B m
Total Extractable Mercury - Cold Vapour (1)***	5	2014/08/25	2014/08/26	STL SOP-00042	MA200-Hg 1.1 R1 m
Total Suspended Solids*	5	2014/08/22	2014/08/22	QUE SOP-00111	SM 2540 D
Total Extractable Metals (Low Level) (1)*	5	2014/08/25	2014/08/25	STL SOP-00006	MA200–Mét 1.2 R4 m
Ammonia Nitrogen (1)*	5	N/A	2014/08/27	STL SOP-00040	MA300–N 2.0 R1 m
Nitrate and/or Nitrite (1)*	5	N/A	2014/08/28	STL SOP-00014	MA300-Ions 1.3 R2 m
pH*	5	N/A	2014/08/21	QUE SOP-00142	MA.303-TitrAuto 2.1
Total Phenols by 4-AAP (1)*	5	2014/08/28	2014/08/28	STL SOP-00033	MA404-I.Phé 2.2 R2 m
Ortho Phosphate*	5	N/A	2014/08/21	QUE SOP-00121	MA.303 - P 1.1
Sulfides (S2-)*	3	2014/08/25	2014/08/25	QUE SOP-00107	MA 300 - S 1.1
Sulfides (S2-)*	2	2014/08/26	2014/08/26	QUE SOP-00107	MA 300 - S 1.1
Reactive Silica (SiO2)***	5	N/A	2014/08/22	QUE SOP-00132	HACH, Method 8186
Total Dissolved Solids*	5	2014/08/22	2014/08/22	QUE SOP-00119	MA. 103 - S.T. 1.0
Total Organic Carbon (1, 3)*	5	N/A	2014/08/28	STL SOP-00243	SM 21 5310-B m
Turbidity*	5	N/A	2014/08/21	QUE SOP-00118	MA.103-TUR. 1.0

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam -Ville St. Laurent
(2) DOC present in the sample should be considered as non-purgeable DOC
(3) TOC present in the sample should be considered as non-purgeable TOC

* Maxxam is accredited as per the MDDELCC program.
*** This analysis is not subject to MDDELCC accreditation.

2014/09/02 13:59

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Your P.O. #: 2200000001
Your Project #: QUARTERLY MONITORING
Site#: TSMC
Your C.O.C. #: 82546-05-01

Attention:Loic Didillon

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2014/09/02
Report #: R1913633
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B451327
Received: 2014/08/21, 08:30

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Mathieu Letourneau, B.Sc., chimist, Customer Service
Email: MLetourneau@maxxam.ca
Phone# (418) 658-5784
==========
This report has been generated and distributed using a secure automated process.
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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

HYDROCARBONS BY GCFID (WATER)

Maxxam ID		Z54967		
Sampling Date		2014/08/20		
COC Number		82546-05-01		
	Units	**COA-SW10-Q3**	**RDL**	**QC Batch**
PETROLEUM HYDROCARBONS				
Petroleum Hydrocarbons (C10-C50)	ug/L	<100	100	1352015
Surrogate Recovery (%)				
1-Chlorooctadecane	%	102	N/A	1352015

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

2014/09/02 13:59

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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

METALS (WATER)

Maxxam ID		Z54855	Z54965	Z54966	Z54967	Z54968		
Sampling Date		2014/08/20	2014/08/20	2014/08/20	2014/08/20	2014/08/20		
COC Number		82546-05-01	82546-05-01	82546-05-01	82546-05-01	82546-05-01		
	Units	COA-SW3-Q3	COA-SW7-Q3	COA-SW9-Q3	COA-SW10-Q3	COA-SW13-Q3	RDL	QC Batch
METALS								
Mercury (Hg)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00001	1352000

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

TOTAL EXTRACTABLE METALS (WATER)

Maxxam ID		Z54855	Z54965	Z54966	Z54967	Z54968		
Sampling Date		2014/08/20	2014/08/20	2014/08/20	2014/08/20	2014/08/20		
COC Number		82546-05-01	82546-05-01	82546-05-01	82546-05-01	82546-05-01		
	Units	COA-SW3-Q3	COA-SW7-Q3	COA-SW9-Q3	COA-SW10-Q3	COA-SW13-Q3	RDL	QC Batch
METALS ICP-MS								
Aluminum (Al)	ug/L	20	13	82	840	13	10	1352155
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1352155
Silver (Ag)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1352155
Arsenic (As)	ug/L	<1.0	<1.0	<1.0	1.2	<1.0	1.0	1352155
Barium (Ba)	ug/L	5.8	<2.0	2.2	7.1	<2.0	2.0	1352155
Beryllium (Be)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1352155
Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1352155
Boron (B)	ug/L	<50	<50	<50	<50	<50	50	1352155
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	1352155
Calcium (Ca)	ug/L	1800	<500	<500	570	<500	500	1352155
Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	1352155
Cobalt (Co)	ug/L	<1.0	<1.0	<1.0	1.0	<1.0	1.0	1352155
Copper (Cu)	ug/L	<1.0	<1.0	1.1	2.6	<1.0	1.0	1352155
Total Hardness (CaCO3)	ug/L	10000	2400	<1000	3900	1300	1000	1352155
Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1352155
Iron (Fe)	ug/L	<60	<60	710	3200	84	60	1352155
Magnesium (Mg)	ug/L	1400	330	<100	600	190	100	1352155
Manganese (Mn)	ug/L	3.2	1.9	31	56	3.0	1.0	1352155
Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1352155
Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1352155
Total phosphorous	ug/L	<10	<10	25	42	21	10	1352155
Lead (Pb)	ug/L	<0.50	<0.50	<0.50	0.65	<0.50	0.50	1352155
Potassium (K)	ug/L	<500	<500	<500	550	<500	500	1352155
Selenium (Se)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	1352155
Sodium (Na)	ug/L	550	610	<500	<500	<500	500	1352155
Strontium (Sr)	ug/L	5.8	3.2	2.1	3.3	<2.0	2.0	1352155
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1352155
Titanium (Ti)	ug/L	<10	<10	<10	33	<10	10	1352155
Uranium (U)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1352155
Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1352155
Zinc (Zn)	ug/L	<7.0	8.5	27	16	11	7.0	1352155

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		Z54855		Z54855		Z54965		Z54966		
Sampling Date		2014/08/20		2014/08/20		2014/08/20		2014/08/20		
COC Number		82546-05-01		82546-05-01		82546-05-01		82546-05-01		
	Units	COA-SW3-Q3	RDL	COA-SW3-Q3 Lab-Dup	QC Batch	COA-SW7-Q3	QC Batch	COA-SW9-Q3	RDL	QC Batch
CONVENTIONALS										
Conductivity	mS/cm	0.021	0.001	N/A	1354202	0.006	1350960	0.037	0.001	1350960
Dissolved organic carbon	mg/L	0.7	0.2	N/A	1354109	1.2	1354109	2.6	0.2	1354109
Nitrates (N-NO3-)	mg/L	0.16	0.02	N/A	1353100	<0.02	1353100	<0.02	0.02	1353100
Nitrites (N-NO2-)	mg/L	<0.02	0.02	N/A	1353100	<0.02	1353100	<0.02	0.02	1353100
Nitrogen ammonia (N-NH3)	mg/L	<0.02	0.02	N/A	1353223	<0.02	1353223	0.05	0.02	1353223
Orthophosphate (P)	mg/L	<0.01	0.01	N/A	1350985	0.01	1350985	<0.01	0.01	1350985
pH	pH	3.01	N/A	2.99	1350957	5.91	1350957	6.87	N/A	1350957
Phenols-4AAP	mg/L	0.002	0.002	N/A	1353975	0.002	1353975	0.003	0.002	1353975
Reactive silica (SiO2)	mg/L	2.6	0.1	N/A	1351821	1.8	1351821	0.2	0.1	1351821
Real Color	UCV	<2	2	N/A	1350988	3	1350988	20	2	1350988
Sulfides (S2-)	mg/L	<0.02	0.02	N/A	1352364	<0.02	1352364	<0.02	0.02	1352489
Total Organic Carbon	mg/L	0.7	0.2	N/A	1354135	1.2	1354135	4.7	0.2	1354135
Turbidity	NTU	2.9	0.1	N/A	1350972	0.6	1350972	0.9	0.1	1350972
Alkalinity Total (as CaCO3) pH 4.5	mg/L	<1	1	N/A	1350959	3	1350959	6	1	1350959
Bicarbonates (HCO3 as CaCO3)	mg/L	<1	1	N/A	1350959	3	1350959	6	1	1350959
Carbonate (CO3 as CaCO3)	mg/L	<1	1	N/A	1350959	<1	1350959	<1	1	1350959
Chloride (Cl)	mg/L	0.32	0.05	N/A	1353102	0.08	1353102	0.05	0.05	1353102
Sulfates (SO4)	mg/L	1.7	0.5	N/A	1353102	<0.5	1353102	1.6	0.5	1353102
Total Dissolved Solids	mg/L	25	10	N/A	1351308	11	1351308	20	10	1351308
Total suspended solids (TSS)	mg/L	<2	2	N/A	1351233	<2	1351233	<2	2	1351233

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

CONVENTIONAL PARAMETERS (WATER)

Maxxam ID		Z54967	Z54967		Z54968	Z54968		
Sampling Date		2014/08/20	2014/08/20		2014/08/20	2014/08/20		
COC Number		82546-05-01	82546-05-01		82546-05-01	82546-05-01		
	Units	COA-SW10-Q3	COA-SW10-Q3 Lab-Dup	QC Batch	COA-SW13-Q3	COA-SW13-Q3 Lab-Dup	RDL	QC Batch
CONVENTIONALS								
Conductivity	mS/cm	0.007	N/A	1350960	0.004	N/A	0.001	1350960
Dissolved organic carbon	mg/L	1.6	N/A	1354109	1.8	N/A	0.2	1354109
Nitrates (N-NO3-)	mg/L	0.13	N/A	1353100	<0.02	<0.02	0.02	1353100
Nitrites (N-NO2-)	mg/L	<0.02	N/A	1353100	<0.02	<0.02	0.02	1353100
Nitrogen ammonia (N-NH3)	mg/L	<0.02	N/A	1353223	<0.02	N/A	0.02	1353223
Orthophosphate (P)	mg/L	0.02	N/A	1350985	<0.01	N/A	0.01	1350985
pH	pH	6.12	N/A	1350957	5.85	N/A	N/A	1350957
Phenols-4AAP	mg/L	0.002	N/A	1353975	0.002	N/A	0.002	1353975
Reactive silica (SiO2)	mg/L	0.7	N/A	1351821	0.7	N/A	0.1	1351821
Real Color	UCV	140	N/A	1350988	5	N/A	2	1350988
Sulfides (S2-)	mg/L	<0.02	N/A	1352489	<0.02	N/A	0.02	1352364
Total Organic Carbon	mg/L	3.1	N/A	1354135	1.9	N/A	0.2	1354135
Turbidity	NTU	63	63	1350972	0.7	N/A	0.1	1350972
Alkalinity Total (as CaCO3) pH 4.5	mg/L	2	N/A	1350959	<1	N/A	1	1350959
Bicarbonates (HCO3 as CaCO3)	mg/L	2	N/A	1350959	<1	N/A	1	1350959
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	1350959	<1	N/A	1	1350959
Chloride (Cl)	mg/L	0.10	N/A	1353102	0.06	0.10	0.05	1353102
Sulfates (SO4)	mg/L	<0.5	N/A	1353102	<0.5	<0.5	0.5	1353102
Total Dissolved Solids	mg/L	32	N/A	1351308	15	N/A	10	1351308
Total suspended solids (TSS)	mg/L	8	N/A	1351233	<2	N/A	2	1351233

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

2014/09/02 13:59

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD except for the following:
Dissolved Organic Carbon: Analyses requested past holding time: Z54855, Z54965, Z54966, Z54967, Z54968

HYDROCARBONS BY GCFID (WATER)

Please note that the results have not been corrected for QC recoveries (spiked blank and surrogates). Please note that the results have been corrected for the method blank.

METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

TOTAL EXTRACTABLE METALS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

Dissolve organic carbon: Samples received at the laboratory in between the 24hours following the sampling. Filtration and preservation of samples performed past holding time.

Results relate only to the items tested.

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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
1350957	CG0	QC Standard	pH	2014/08/21		99	%
1350959	CG0	QC Standard	Alkalinity Total (as CaCO3) pH 4.5	2014/08/21		103	%
1350959	CG0	Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2014/08/21	<1		mg/L
1350960	CG0	QC Standard	Conductivity	2014/08/21		99	%
1350960	CG0	Method Blank	Conductivity	2014/08/21	<0.001		mS/cm
1350972	CG0	Spiked Blank	Turbidity	2014/08/21		94	%
1350972	CG0	Method Blank	Turbidity	2014/08/21	<0.1		NTU
1350985	CG0	QC Standard	Orthophosphate (P)	2014/08/21		106	%
1350985	CG0	Method Blank	Orthophosphate (P)	2014/08/21	<0.01		mg/L
1350988	CG0	Spiked Blank	Real Color	2014/08/21		100	%
1350988	CG0	Method Blank	Real Color	2014/08/21	<2		UCV
1351233	AG5	Spiked Blank	Total suspended solids (TSS)	2014/08/22		103	%
1351233	AG5	Method Blank	Total suspended solids (TSS)	2014/08/22	<2		mg/L
1351308	BD	Spiked Blank	Total Dissolved Solids	2014/08/22		106	%
1351308	BD	Method Blank	Total Dissolved Solids	2014/08/22	<10		mg/L
1351821	CG0	QC Standard	Reactive silica (SiO2)	2014/08/22		98	%
1351821	CG0	Method Blank	Reactive silica (SiO2)	2014/08/22	<0.1		mg/L
1352000	OZP	QC Standard	Mercury (Hg)	2014/08/26		108	%
1352000	OZP	Spiked Blank	Mercury (Hg)	2014/08/26		101	%
1352000	OZP	Method Blank	Mercury (Hg)	2014/08/26	<0.00001		mg/L
1352015	VBO	Spiked Blank	1-Chlorooctadecane	2014/08/25		100	%
			Petroleum Hydrocarbons (C10-C50)	2014/08/25		103	%
1352015	VBO	Method Blank	1-Chlorooctadecane	2014/08/29		97	%
			Petroleum Hydrocarbons (C10-C50)	2014/08/29	<100		ug/L
1352155	JS2	QC Standard	Antimony (Sb)	2014/08/25		106	%
			Beryllium (Be)	2014/08/25		103	%
			Manganese (Mn)	2014/08/25		102	%
			Thallium (Tl)	2014/08/25		101	%
			Vanadium (V)	2014/08/25		101	%
1352155	JS2	Spiked Blank	Aluminum (Al)	2014/08/25		99	%
			Antimony (Sb)	2014/08/25		104	%
			Silver (Ag)	2014/08/25		102	%
			Arsenic (As)	2014/08/25		101	%
			Barium (Ba)	2014/08/25		96	%
			Beryllium (Be)	2014/08/25		99	%
			Bismuth (Bi)	2014/08/25		103	%
			Boron (B)	2014/08/25		105	%
			Cadmium (Cd)	2014/08/25		97	%
			Calcium (Ca)	2014/08/25		95	%
			Chromium (Cr)	2014/08/25		96	%
			Cobalt (Co)	2014/08/25		94	%
			Copper (Cu)	2014/08/25		94	%
			Tin (Sn)	2014/08/25		106	%
			Iron (Fe)	2014/08/25		103	%
			Magnesium (Mg)	2014/08/25		102	%
			Manganese (Mn)	2014/08/25		102	%
			Molybdenum (Mo)	2014/08/25		104	%
			Nickel (Ni)	2014/08/25		95	%
			Total phosphorous	2014/08/25		96	%
			Lead (Pb)	2014/08/25		95	%
			Potassium (K)	2014/08/25		100	%

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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Selenium (Se)	2014/08/25		95	%
			Sodium (Na)	2014/08/25		101	%
			Strontium (Sr)	2014/08/25		99	%
			Thallium (Tl)	2014/08/25		94	%
			Titanium (Ti)	2014/08/25		101	%
			Uranium (U)	2014/08/25		97	%
			Vanadium (V)	2014/08/25		97	%
			Zinc (Zn)	2014/08/25		98	%
1352155	JS2	Method Blank	Aluminum (Al)	2014/08/25	<10		ug/L
			Antimony (Sb)	2014/08/25	<1.0		ug/L
			Silver (Ag)	2014/08/25	<1.0		ug/L
			Arsenic (As)	2014/08/25	<1.0		ug/L
			Barium (Ba)	2014/08/25	<2.0		ug/L
			Beryllium (Be)	2014/08/25	<2.0		ug/L
			Bismuth (Bi)	2014/08/25	<1.0		ug/L
			Boron (B)	2014/08/25	<50		ug/L
			Cadmium (Cd)	2014/08/25	<0.20		ug/L
			Calcium (Ca)	2014/08/25	<500		ug/L
			Chromium (Cr)	2014/08/25	<5.0		ug/L
			Cobalt (Co)	2014/08/25	<1.0		ug/L
			Copper (Cu)	2014/08/25	<1.0		ug/L
			Total Hardness (CaCO3)	2014/08/25	<1000		ug/L
			Tin (Sn)	2014/08/25	<2.0		ug/L
			Iron (Fe)	2014/08/25	<60		ug/L
			Magnesium (Mg)	2014/08/25	<100		ug/L
			Manganese (Mn)	2014/08/25	<1.0		ug/L
			Molybdenum (Mo)	2014/08/25	<1.0		ug/L
			Nickel (Ni)	2014/08/25	<2.0		ug/L
			Total phosphorous	2014/08/25	<10		ug/L
			Lead (Pb)	2014/08/25	<0.50		ug/L
			Potassium (K)	2014/08/25	<500		ug/L
			Selenium (Se)	2014/08/25	<3.0		ug/L
			Sodium (Na)	2014/08/25	<500		ug/L
			Strontium (Sr)	2014/08/25	<2.0		ug/L
			Thallium (Tl)	2014/08/25	<2.0		ug/L
			Titanium (Ti)	2014/08/25	<10		ug/L
			Uranium (U)	2014/08/25	<1.0		ug/L
			Vanadium (V)	2014/08/25	<2.0		ug/L
			Zinc (Zn)	2014/08/25	<7.0		ug/L
1352364	AG5	QC Standard	Sulfides (S2-)	2014/08/25		87	%
1352364	AG5	Method Blank	Sulfides (S2-)	2014/08/25	<0.02		mg/L
1352489	AG5	QC Standard	Sulfides (S2-)	2014/08/26		95	%
1352489	AG5	Method Blank	Sulfides (S2-)	2014/08/26	<0.02		mg/L
1353100	VB	Spiked Blank	Nitrates (N-NO3-)	2014/08/27		103	%
			Nitrites (N-NO2-)	2014/08/27		104	%
1353100	VB	Method Blank	Nitrates (N-NO3-)	2014/08/27	<0.02		mg/L
			Nitrites (N-NO2-)	2014/08/27	<0.02		mg/L
1353102	VB	Spiked Blank	Chloride (Cl)	2014/08/27		99	%
			Sulfates (SO4)	2014/08/27		100	%
1353102	VB	Method Blank	Chloride (Cl)	2014/08/27	<0.05		mg/L
			Sulfates (SO4)	2014/08/27	<0.5		mg/L

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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
1353223	DKH	QC Standard	Nitrogen ammonia (N-NH3)	2014/08/27		100	%
1353223	DKH	Spiked Blank	Nitrogen ammonia (N-NH3)	2014/08/27		90	%
1353223	DKH	Method Blank	Nitrogen ammonia (N-NH3)	2014/08/27	<0.02		mg/L
1353975	DB2	QC Standard	Phenols-4AAP	2014/08/28		96	%
1353975	DB2	Spiked Blank	Phenols-4AAP	2014/08/28		97	%
1353975	DB2	Method Blank	Phenols-4AAP	2014/08/28	<0.002		mg/L
1354109	VB	Spiked Blank	Dissolved organic carbon	2014/08/28		102	%
1354109	VB	Method Blank	Dissolved organic carbon	2014/08/28	1.7 , RDL=0.2		mg/L
1354135	MR4	Spiked Blank	Total Organic Carbon	2014/08/28		105	%
1354135	MR4	Method Blank	Total Organic Carbon	2014/08/28	0.3 , RDL=0.2		mg/L
1354202	CG0	QC Standard	Conductivity	2014/08/28		101	%
1354202	CG0	Method Blank	Conductivity	2014/08/28	<0.001		mS/cm

RDL = Reportable Detection Limit

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Alexandre Lemire, M.Sc., Analyst 2

<Original signed by>

Delia Barbul, B.Sc., Chemist

<Original signed by>

Dochka Koleva Hristo, B.Sc., Chemist

<Original signed by>

David Provencher, B.Sc., Chemist

<Original signed by>

Marc Bouchard, B.Sc., Biochimiste, Québec

<Original signed by>

Madina Hamrouni, B.Sc., Chemist

<Original signed by>

Veronic Beausejour, B.Sc., Chemist, Supervisor

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Maxxam Job #: B451327
Report Date: 2014/09/02

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Your P.O. #: 2200000001
Sampler Initials: LC

VALIDATION SIGNATURE PAGE(CONT'D)

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your P.O. #: 2200000001
Your Project #: QUARTERLY MONITORING
Site#: TSMC
Site Location: DSO3 1A
Your C.O.C. #: 96191-01-01

Attention:Loic Didillon

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2014/09/08
Report #: R1915637
Version: 2R

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B453121
Received: 2014/08/28, 18:00

Sample Matrix: SURFACE WATER
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary Reference
Total Alkalinity (pH end point 4.5)***	1	N/A	2014/08/29	QUE SOP-00142	MA.303-TitrAuto 2.1
Anions*	1	N/A	2014/08/29	QUE SOP-00141	MA. 300-Ions 1.3
Anions*	1	N/A	2014/08/29	QUE SOP-00141	MA. 300-Ions 1.3
Real Color*	1	N/A	2014/08/29	QUE SOP-00115	MA. 103 - Col. 2.0
Conductivity*	1	N/A	2014/08/29	QUE SOP-00142	MA.303-TitrAuto 2.1
Dissolved Organic Carbon (1, 2)***	1	2014/08/30	2014/09/02	STL SOP-00243	SM 21 5310-B m
Total Extractable Mercury - Cold Vapour (1)***	1	2014/09/02	2014/09/03	STL SOP-00042	MA200-Hg 1.1 R1 m
Total Suspended Solids*	1	2014/08/29	2014/08/29	QUE SOP-00111	SM 2540 D
Total Extractable Metals (Low Level) (1)*	1	2014/09/03	2014/09/03	STL SOP-00006	MA200–Mét 1.2 R4 m
Ammonia Nitrogen (1)*	1	N/A	2014/09/02	STL SOP-00040	MA300–N 2.0 R1 m
pH*	1	N/A	2014/08/29	QUE SOP-00142	MA.303-TitrAuto 2.1
Total Phenols by 4-AAP (1)*	1	2014/09/03	2014/09/03	STL SOP-00033	MA404-I.Phé 2.2 R2 m
Ortho Phosphate*	1	N/A	2014/08/29	QUE SOP-00121	MA.303 - P 1.1
Sulfides (S2-)*	1	2014/08/29	2014/08/29	QUE SOP-00107	MA 300 - S 1.1
Reactive Silica (SiO2)***	1	N/A	2014/08/29	QUE SOP-00132	HACH, Method 8186
Total Dissolved Solids*	1	2014/09/02	2014/09/02	QUE SOP-00119	MA. 103 - S.T. 1.0
Turbidity*	1	N/A	2014/08/29	QUE SOP-00118	MA.103-TUR. 1.0

Note: RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam -Ville St. Laurent
(2) DOC present in the sample should be considered as non-purgeable DOC

* Maxxam is accredited as per the MDDELCC program.
*** This analysis is not subject to MDDELCC accreditation.

2014/09/08 09:07

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Your P.O. #: 2200000001
Your Project #: QUARTERLY MONITORING
Site#: TSMC
Site Location: DSO3 1A
Your C.O.C. #: 96191-01-01

Attention:Loic Didillon

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2014/09/08
Report #: R1915637
Version: 2R

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B453121
Received: 2014/08/28, 18:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Mathieu Letourneau, B.Sc., chimist, Customer Service
Email: MLetourneau@maxxam.ca
Phone# (418) 658-5784

==========

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Maxxam Job #: B453121
Report Date: 2014/09/08

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

METALS (SURFACE WATER)

Maxxam ID		Z64002		
Sampling Date		2014/08/28 09:00		
COC Number		96191-01-01		
	Units	**COA-SW4-Q3**	**RDL**	**QC Batch**
METALS				
Mercury (Hg)	mg/L	<0.00001	0.00001	1355271

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

2014/09/08 09:07

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Maxxam Job #: B453121
Report Date: 2014/09/08

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Maxxam ID		Z64002		
Sampling Date		2014/08/28 09:00		
COC Number		96191-01-01		
	Units	COA-SW4-Q3	RDL	QC Batch
METALS ICP-MS				
Aluminum (Al)	ug/L	22	10	1355975
Antimony (Sb)	ug/L	<1.0	1.0	1355975
Silver (Ag)	ug/L	<1.0	1.0	1355975
Arsenic (As)	ug/L	<1.0	1.0	1355975
Barium (Ba)	ug/L	2.4	2.0	1355975
Beryllium (Be)	ug/L	<2.0	2.0	1355975
Bismuth (Bi)	ug/L	<1.0	1.0	1355975
Boron (B)	ug/L	<50	50	1355975
Cadmium (Cd)	ug/L	<0.20	0.20	1355975
Calcium (Ca)	ug/L	1800	500	1355975
Chromium (Cr)	ug/L	<5.0	5.0	1355975
Cobalt (Co)	ug/L	<1.0	1.0	1355975
Copper (Cu)	ug/L	<1.0	1.0	1355975
Total Hardness (CaCO3)	ug/L	9900	1000	1355975
Tin (Sn)	ug/L	<2.0	2.0	1355975
Iron (Fe)	ug/L	86	60	1355975
Magnesium (Mg)	ug/L	1300	100	1355975
Manganese (Mn)	ug/L	8.0	1.0	1355975
Molybdenum (Mo)	ug/L	<1.0	1.0	1355975
Nickel (Ni)	ug/L	<2.0	2.0	1355975
Total phosphorous	ug/L	<10	10	1355975
Lead (Pb)	ug/L	<0.50	0.50	1355975
Potassium (K)	ug/L	<500	500	1355975
Selenium (Se)	ug/L	<3.0	3.0	1355975
Sodium (Na)	ug/L	1000	500	1355975
Strontium (Sr)	ug/L	7.0	2.0	1355975
Thallium (Tl)	ug/L	<2.0	2.0	1355975
Titanium (Ti)	ug/L	<10	10	1355975
Uranium (U)	ug/L	<1.0	1.0	1355975
Vanadium (V)	ug/L	<2.0	2.0	1355975
Zinc (Zn)	ug/L	<7.0	7.0	1355975

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Maxxam Job #: B453121
Report Date: 2014/09/08

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

CONVENTIONAL PARAMETERS (SURFACE WATER)

Maxxam ID		Z64002	Z64002		
Sampling Date		2014/08/28 09:00	2014/08/28 09:00		
COC Number		96191-01-01	96191-01-01		
	Units	COA-SW4-Q3	COA-SW4-Q3 Lab-Dup	RDL	QC Batch
CONVENTIONALS					
Conductivity	mS/cm	0.024	N/A	0.001	1354834
Dissolved organic carbon	mg/L	0.4	N/A	0.2	1355134
Nitrogen ammonia (N-NH3)	mg/L	0.06	N/A	0.02	1355332
Orthophosphate (P)	mg/L	<0.01	N/A	0.01	1354837
pH	pH	6.26	N/A	N/A	1354832
Phenols-4AAP	mg/L	<0.002	N/A	0.002	1356138
Reactive silica (SiO2)	mg/L	5.0	N/A	0.1	1354850
Real Color	UCV	5	N/A	2	1354856
Sulfides (S2-)	mg/L	<0.02	N/A	0.02	1354982
Turbidity	NTU	14	15	0.1	1354855
Alkalinity Total (as CaCO3) pH 4.5	mg/L	3	N/A	1	1354833
Bicarbonates (HCO3 as CaCO3)	mg/L	3	N/A	1	1354833
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	1	1354833
Chloride (Cl)	mg/L	1.2	N/A	0.05	1354549
Nitrites (N-NO2-)	mg/L	<0.01	N/A	0.01	1354547
Nitrates (N-NO3-)	mg/L	0.91	N/A	0.01	1354547
Nitrate (N) and Nitrite(N)	mg/L	0.91	N/A	0.02	1354549
Sulfates (SO4)	mg/L	1.4	N/A	0.5	1354549
Total Dissolved Solids	mg/L	53	N/A	10	1355356
Total suspended solids (TSS)	mg/L	2	N/A	2	1354466

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

2014/09/08 09:07

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Maxxam Job #: B453121
Report Date: 2014/09/08

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD

Note that the report was re-emitted to include cobalt, as it was not reported in the first version, but required by client.

METALS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

Results relate only to the items tested.

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Maxxam Job #: B453121
Report Date: 2014/09/08

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
1354466	AG5	Spiked Blank	Total suspended solids (TSS)	2014/08/29		106	%
1354466	AG5	Method Blank	Total suspended solids (TSS)	2014/08/29	<2		mg/L
1354547	MCC	QC Standard	Nitrates (N-NO3-)	2014/08/29		99	%
1354547	MCC	Spiked Blank	Nitrites (N-NO2-)	2014/08/29		110	%
1354547	MCC	Method Blank	Nitrites (N-NO2-)	2014/08/29	<0.01		mg/L
			Nitrates (N-NO3-)	2014/08/29	<0.01		mg/L
1354549	MCC	QC Standard	Chloride (Cl)	2014/08/29		105	%
			Nitrate (N) and Nitrite(N)	2014/08/29		99	%
			Sulfates (SO4)	2014/08/29		95	%
1354549	MCC	Spiked Blank	Nitrate (N) and Nitrite(N)	2014/08/29		110	%
1354549	MCC	Method Blank	Chloride (Cl)	2014/08/29	<0.05		mg/L
			Nitrate (N) and Nitrite(N)	2014/08/29	<0.02		mg/L
			Sulfates (SO4)	2014/08/29	<0.5		mg/L
1354832	CG0	QC Standard	pH	2014/08/29		99	%
1354833	CG0	QC Standard	Alkalinity Total (as CaCO3) pH 4.5	2014/08/29		104	%
1354833	CG0	Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2014/08/29	<1		mg/L
1354834	CG0	QC Standard	Conductivity	2014/08/29		102	%
1354834	CG0	Method Blank	Conductivity	2014/08/29	<0.001		mS/cm
1354837	FTN	QC Standard	Orthophosphate (P)	2014/08/29		114	%
1354837	FTN	Method Blank	Orthophosphate (P)	2014/08/29	<0.01		mg/L
1354850	CG0	QC Standard	Reactive silica (SiO2)	2014/08/29		82	%
1354850	CG0	Method Blank	Reactive silica (SiO2)	2014/08/29	<0.1		mg/L
1354855	FTN	Spiked Blank	Turbidity	2014/08/29		92	%
1354855	FTN	Method Blank	Turbidity	2014/08/29	<0.1		NTU
1354856	FTN	Spiked Blank	Real Color	2014/08/29		99	%
1354856	FTN	Method Blank	Real Color	2014/08/29	<2		UCV
1354982	AG5	QC Standard	Sulfides (S2-)	2014/08/29		82	%
1354982	AG5	Method Blank	Sulfides (S2-)	2014/08/29	<0.02		mg/L
1355134	MR4	Spiked Blank	Dissolved organic carbon	2014/09/02		103	%
1355134	MR4	Method Blank	Dissolved organic carbon	2014/09/02	0.5 , RDL=0.2		mg/L
1355271	OZP	QC Standard	Mercury (Hg)	2014/09/03		108	%
1355271	OZP	Spiked Blank	Mercury (Hg)	2014/09/03		107	%
1355271	OZP	Method Blank	Mercury (Hg)	2014/09/03	<0.00001		mg/L
1355332	DKH	QC Standard	Nitrogen ammonia (N-NH3)	2014/09/02		113	%
1355332	DKH	Spiked Blank	Nitrogen ammonia (N-NH3)	2014/09/02		113	%
1355332	DKH	Method Blank	Nitrogen ammonia (N-NH3)	2014/09/02	0.06 , RDL=0.02		mg/L
1355356	MCC	Spiked Blank	Total Dissolved Solids	2014/09/02		105	%
1355356	MCC	Method Blank	Total Dissolved Solids	2014/09/02	<10		mg/L
1355975	JF1	QC Standard	Antimony (Sb)	2014/09/03		110	%
			Beryllium (Be)	2014/09/03		103	%
			Manganese (Mn)	2014/09/03		104	%
			Thallium (Tl)	2014/09/03		105	%
			Vanadium (V)	2014/09/03		104	%
1355975	JF1	Spiked Blank	Aluminum (Al)	2014/09/03		101	%
			Antimony (Sb)	2014/09/03		110	%
			Silver (Ag)	2014/09/03		94	%
			Arsenic (As)	2014/09/03		104	%

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Maxxam Job #: B453121
Report Date: 2014/09/08

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Barium (Ba)	2014/09/03		107	%
			Beryllium (Be)	2014/09/03		103	%
			Bismuth (Bi)	2014/09/03		99	%
			Boron (B)	2014/09/03		101	%
			Cadmium (Cd)	2014/09/03		105	%
			Calcium (Ca)	2014/09/03		102	%
			Chromium (Cr)	2014/09/03		99	%
			Cobalt (Co)	2014/09/03		97	%
			Copper (Cu)	2014/09/03		95	%
			Tin (Sn)	2014/09/03		109	%
			Iron (Fe)	2014/09/03		100	%
			Magnesium (Mg)	2014/09/03		100	%
			Manganese (Mn)	2014/09/03		105	%
			Molybdenum (Mo)	2014/09/03		106	%
			Nickel (Ni)	2014/09/03		95	%
			Total phosphorous	2014/09/03		96	%
			Lead (Pb)	2014/09/03		101	%
			Potassium (K)	2014/09/03		101	%
			Selenium (Se)	2014/09/03		98	%
			Sodium (Na)	2014/09/03		104	%
			Strontium (Sr)	2014/09/03		103	%
			Thallium (Tl)	2014/09/03		99	%
			Titanium (Ti)	2014/09/03		104	%
			Uranium (U)	2014/09/03		97	%
			Vanadium (V)	2014/09/03		99	%
			Zinc (Zn)	2014/09/03		99	%
1355975	JF1	Method Blank	Aluminum (Al)	2014/09/03	<10		ug/L
			Antimony (Sb)	2014/09/03	<1.0		ug/L
			Silver (Ag)	2014/09/03	<1.0		ug/L
			Arsenic (As)	2014/09/03	<1.0		ug/L
			Barium (Ba)	2014/09/03	<2.0		ug/L
			Beryllium (Be)	2014/09/03	<2.0		ug/L
			Bismuth (Bi)	2014/09/03	<1.0		ug/L
			Boron (B)	2014/09/03	<50		ug/L
			Cadmium (Cd)	2014/09/03	<0.20		ug/L
			Calcium (Ca)	2014/09/03	<500		ug/L
			Chromium (Cr)	2014/09/03	<5.0		ug/L
			Cobalt (Co)	2014/09/03	<1.0		ug/L
			Copper (Cu)	2014/09/03	<1.0		ug/L
			Total Hardness (CaCO3)	2014/09/03	<1000		ug/L
			Tin (Sn)	2014/09/03	<2.0		ug/L
			Iron (Fe)	2014/09/03	<60		ug/L
			Magnesium (Mg)	2014/09/03	<100		ug/L
			Manganese (Mn)	2014/09/03	<1.0		ug/L
			Molybdenum (Mo)	2014/09/03	<1.0		ug/L
			Nickel (Ni)	2014/09/03	<2.0		ug/L
			Total phosphorous	2014/09/03	<10		ug/L
			Lead (Pb)	2014/09/03	<0.50		ug/L
			Potassium (K)	2014/09/03	<500		ug/L
			Selenium (Se)	2014/09/03	<3.0		ug/L

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Maxxam Job #: B453121
Report Date: 2014/09/08

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Sodium (Na)	2014/09/03	<500		ug/L
			Strontium (Sr)	2014/09/03	<2.0		ug/L
			Thallium (Tl)	2014/09/03	<2.0		ug/L
			Titanium (Ti)	2014/09/03	<10		ug/L
			Uranium (U)	2014/09/03	<1.0		ug/L
			Vanadium (V)	2014/09/03	<2.0		ug/L
			Zinc (Zn)	2014/09/03	<7.0		ug/L
1356138	DB2	QC Standard	Phenols-4AAP	2014/09/03		95	%
1356138	DB2	Spiked Blank	Phenols-4AAP	2014/09/03		100	%
1356138	DB2	Method Blank	Phenols-4AAP	2014/09/03	<0.002		mg/L

RDL = Reportable Detection Limit

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

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Maxxam Job #: B453121
Report Date: 2014/09/08

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Alexandre Lemire, M.Sc., Analyst 2

<Original signed by>

Dochka Koleva Hristo, B.Sc., Chemist

<Original signed by>

David Provencher, B.Sc., Chemist

<Original signed by>

Maria Chrifi Alaoui, B.Sc., Chemist

<Original signed by>

Madina Hamrouni, B.Sc., Chemist

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Your P.O. #: 2200000001
Your Project #: QUARTERLY MONITORING
Site#: TSMC
Site Location: DSO3 1A
Your C.O.C. #: 102664-01-01

Attention:Loic Didillon

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2014/10/10
Report #: R1929974
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B461144
Received: 2014/09/30, 08:30

Sample Matrix: SURFACE WATER
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Primary Reference
Total Alkalinity (pH end point 4.5)	6	N/A	2014/09/30	QUE SOP-00142	MA.303-TitrAuto 2.1
Anions	6	N/A	2014/09/30	QUE SOP-00141	MA. 300-Ions 1.3
Anions	6	N/A	2014/09/30	QUE SOP-00141	MA. 300-Ions 1.3
Petroleum Hydrocarbons (C10-C50)	1	2014/10/01	2014/10/01	QUE SOP-00209	MA. 400 - Hyd. 1.1
Real Color	6	N/A	2014/09/30	QUE SOP-00115	MA. 103 - Col. 2.0
Conductivity	5	N/A	2014/09/30	QUE SOP-00142	MA.303-TitrAuto 2.1
Conductivity	1	N/A	2014/10/06	QUE SOP-00142	MA.303-TitrAuto 2.1
Dissolved Organic Carbon (1, 2)	6	2014/10/01	2014/10/02	STL SOP-00243	SM 21 5310-B m
Total Extractable Mercury - Cold Vapour (1)	6	2014/10/06	2014/10/07	STL SOP-00042	MA200-Hg 1.1 R1 m
Total Suspended Solids	6	2014/10/01	2014/10/01	QUE SOP-00111	SM 2540 D
Total Extractable Metals (Low Level) (1)	6	2014/10/02	2014/10/04	STL SOP-00006	MA200–Mét 1.2 R4 m
Ammonia Nitrogen (1)	6	N/A	2014/10/02	STL SOP-00040	MA300–N 2.0 R1 m
pH	6	N/A	2014/09/30	QUE SOP-00142	MA.303-TitrAuto 2.1
Total Phenols by 4-AAP (1)	6	2014/10/09	2014/10/09	STL SOP-00033	MA404-I.Phé 2.2 R2 m
Ortho Phosphate	6	N/A	2014/09/30	QUE SOP-00121	MA.303 - P 1.1
Sulfides (S2-)	6	2014/10/01	2014/10/01	QUE SOP-00107	MA 300 - S 1.1
Reactive Silica (SiO2)	6	N/A	2014/09/30	QUE SOP-00132	HACH, Method 8186
Total Dissolved Solids	6	2014/10/01	2014/10/01	QUE SOP-00119	MA. 103 - S.T. 1.0
Turbidity	6	N/A	2014/09/30	QUE SOP-00118	MA.103-TUR. 1.0

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam -Ville St. Laurent
(2) DOC present in the sample should be considered as non-purgeable DOC

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Your P.O. #: 2200000001
Your Project #: QUARTERLY MONITORING
Site#: TSMC
Site Location: DSO3 1A
Your C.O.C. #: 102664-01-01

Attention:Loic Didillon

TATA STEEL MINERALS CANADA
1000, RUE SHERBROOKE OUEST
BUREAU 1120
MONTRÉAL, PQ
CANADA H3A 3G4

Report Date: 2014/10/10
Report #: R1929974
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B461144
Received: 2014/09/30, 08:30

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Mathieu Letourneau, B.Sc., chimist, Customer Service
Email: MLetourneau@maxxam.ca
Phone# (418) 658-5784
==========
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Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

HYDROCARBONS BY GCFID (SURFACE WATER)

Maxxam ID		AA6550		
Sampling Date		2014/09/29		
COC Number		102664-01-01		
	Units	**COA-SW10-Q4**	**RDL**	**QC Batch**
PETROLEUM HYDROCARBONS				
Petroleum Hydrocarbons (C10-C50)	ug/L	<100	100	1369164
Surrogate Recovery (%)				
1-Chlorooctadecane	%	73	N/A	1369164

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

METALS (SURFACE WATER)

Maxxam ID		AA6484	AA6525	AA6526	AA6527	AA6550	AA6551		
Sampling Date		2014/09/29	2014/09/29	2014/09/29	2014/09/29	2014/09/29	2014/09/29		
COC Number		102664-01-01	102664-01-01	102664-01-01	102664-01-01	102664-01-01	102664-01-01		
	Units	COA-SW3-Q4	COA-SW4-Q4	COA-SW7-Q4	COA-SW8-Q4	COA-SW10-Q4	COA-SW13-Q4	RDL	QC Batch
METALS									
Mercury (Hg)	mg/L	<0.00001	<0.00001	<0.00001	<0.00001	0.00010	<0.00001	0.00001	1371104

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Maxxam ID		AA6484	AA6525	AA6526	AA6527	AA6527	AA6550		
Sampling Date		2014/09/29	2014/09/29	2014/09/29	2014/09/29	2014/09/29	2014/09/29		
COC Number		102664-01-01	102664-01-01	102664-01-01	102664-01-01	102664-01-01	102664-01-01		
	Units	COA-SW3-Q4	COA-SW4-Q4	COA-SW7-Q4	COA-SW8-Q4	COA-SW8-Q4 Lab-Dup	COA-SW10-Q4	RDL	QC Batch
METALS ICP-MS									
Aluminum (Al)	ug/L	96	29	53	120	130	8300	10	1369976
Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1369976
Silver (Ag)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1369976
Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	5.8	1.0	1369976
Barium (Ba)	ug/L	8.5	2.4	<2.0	2.9	2.7	51	2.0	1369976
Beryllium (Be)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1369976
Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1369976
Boron (B)	ug/L	<50	<50	<50	<50	<50	<50	50	1369976
Cadmium (Cd)	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	1369976
Calcium (Ca)	ug/L	2000	2000	<500	<500	<500	2000	500	1369976
Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	23	5.0	1369976
Cobalt (Co)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	6.9	1.0	1369976
Copper (Cu)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	23	1.0	1369976
Total Hardness (CaCO3)	ug/L	11000	10000	2600	1800	1800	19000	1000	1369976
Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1369976
Iron (Fe)	ug/L	180	110	67	310	250	28000	60	1369976
Magnesium (Mg)	ug/L	1300	1200	320	210	210	3500	100	1369976
Manganese (Mn)	ug/L	12	10	4.1	18	17	550	1.0	1369976
Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1369976
Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	17	2.0	1369976
Total phosphorous	ug/L	<10	<10	<10	<10	<10	260	10	1369976
Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	6.6	0.50	1369976
Potassium (K)	ug/L	<500	<500	<500	<500	<500	1600	500	1369976
Selenium (Se)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	1369976
Sodium (Na)	ug/L	1100	1500	1000	840	790	1400	500	1369976
Strontium (Sr)	ug/L	6.2	6.9	3.1	2.8	2.7	13	2.0	1369976
Thallium (Tl)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	1369976
Titanium (Ti)	ug/L	<10	<10	<10	<10	<10	280	10	1369976
Uranium (U)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1369976
Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	17	2.0	1369976
Zinc (Zn)	ug/L	<7.0	<7.0	<7.0	7.3	<7.0	55	7.0	1369976

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Analytics International Corporation o/a Maxxam Analytique 2690, Avenue Dalton, Sainte-Foy, Québec G1P 3S4 Tél.: (418) 658-5784 Télécopieur: (418) 658-6594

Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Maxxam ID		AA6551		
Sampling Date		2014/09/29		
COC Number		102664-01-01		
	Units	COA-SW13-Q4	RDL	QC Batch
METALS ICP-MS				
Aluminum (Al)	ug/L	17	10	1369976
Antimony (Sb)	ug/L	<1.0	1.0	1369976
Silver (Ag)	ug/L	<1.0	1.0	1369976
Arsenic (As)	ug/L	<1.0	1.0	1369976
Barium (Ba)	ug/L	<2.0	2.0	1369976
Beryllium (Be)	ug/L	<2.0	2.0	1369976
Bismuth (Bi)	ug/L	<1.0	1.0	1369976
Boron (B)	ug/L	<50	50	1369976
Cadmium (Cd)	ug/L	<0.20	0.20	1369976
Calcium (Ca)	ug/L	<500	500	1369976
Chromium (Cr)	ug/L	<5.0	5.0	1369976
Cobalt (Co)	ug/L	<1.0	1.0	1369976
Copper (Cu)	ug/L	<1.0	1.0	1369976
Total Hardness (CaCO3)	ug/L	1800	1000	1369976
Tin (Sn)	ug/L	<2.0	2.0	1369976
Iron (Fe)	ug/L	<60	60	1369976
Magnesium (Mg)	ug/L	210	100	1369976
Manganese (Mn)	ug/L	3.6	1.0	1369976
Molybdenum (Mo)	ug/L	<1.0	1.0	1369976
Nickel (Ni)	ug/L	<2.0	2.0	1369976
Total phosphorous	ug/L	<10	10	1369976
Lead (Pb)	ug/L	<0.50	0.50	1369976
Potassium (K)	ug/L	<500	500	1369976
Selenium (Se)	ug/L	<3.0	3.0	1369976
Sodium (Na)	ug/L	700	500	1369976
Strontium (Sr)	ug/L	2.1	2.0	1369976
Thallium (Tl)	ug/L	<2.0	2.0	1369976
Titanium (Ti)	ug/L	<10	10	1369976
Uranium (U)	ug/L	<1.0	1.0	1369976
Vanadium (V)	ug/L	<2.0	2.0	1369976
Zinc (Zn)	ug/L	<7.0	7.0	1369976

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

CONVENTIONAL PARAMETERS (SURFACE WATER)

Maxxam ID		AA6484	AA6484	AA6525	AA6525	AA6526	AA6526		
Sampling Date		2014/09/29	2014/09/29	2014/09/29	2014/09/29	2014/09/29	2014/09/29		
COC Number		102664-01-01	102664-01-01	102664-01-01	102664-01-01	102664-01-01	102664-01-01		
	Units	COA-SW3-Q4	COA-SW3-Q4 Lab-Dup	COA-SW4-Q4	COA-SW4-Q4 Lab-Dup	COA-SW7-Q4	COA-SW7-Q4 Lab-Dup	RDL	QC Batch
CONVENTIONALS									
Conductivity	mS/cm	0.026	N/A	0.026	N/A	0.008	N/A	0.001	1368906
Dissolved organic carbon	mg/L	0.5	N/A	0.3	N/A	2.7	N/A	0.2	1369350
Nitrogen ammonia (N-NH3)	mg/L	<0.02	N/A	0.02	N/A	0.02	N/A	0.02	1369799
Orthophosphate (P)	mg/L	<0.01	N/A	<0.01	N/A	<0.01	N/A	0.01	1368976
pH	pH	7.32	N/A	6.90	N/A	6.35	N/A	N/A	1368873
Phenols-4AAP	mg/L	<0.002	N/A	<0.002	N/A	<0.002	N/A	0.002	1373213
Reactive silica (SiO2)	mg/L	3.2	N/A	4.8	N/A	3.1	N/A	0.1	1368977
Real Color	UCV	10	N/A	6	N/A	12	N/A	2	1368911
Sulfides (S2-)	mg/L	<0.02	N/A	<0.02	N/A	<0.02	N/A	0.02	1369134
Turbidity	NTU	12	12	15	16	0.8	N/A	0.1	1368981
Alkalinity Total (as CaCO3) pH 4.5	mg/L	11	N/A	6	N/A	2	N/A	1	1368894
Bicarbonates (HCO3 as CaCO3)	mg/L	11	N/A	6	N/A	2	N/A	1	1368894
Carbonate (CO3 as CaCO3)	mg/L	<1	N/A	<1	N/A	<1	N/A	1	1368894
Chloride (Cl)	mg/L	0.34	N/A	1.1	N/A	0.23	N/A	0.05	1368847
Nitrites (N-NO2-)	mg/L	<0.01	N/A	<0.01	N/A	<0.01	N/A	0.01	1368655
Nitrates (N-NO3-)	mg/L	0.22	N/A	0.86	N/A	0.02	N/A	0.01	1368655
Nitrate (N) and Nitrite(N)	mg/L	0.22	N/A	0.86	N/A	0.02	N/A	0.02	1368847
Sulfates (SO4)	mg/L	1.8	N/A	1.4	N/A	0.7	N/A	0.5	1368847
Total Dissolved Solids	mg/L	22	N/A	28	N/A	19	22	10	1369313
Total suspended solids (TSS)	mg/L	<2	N/A	<2	N/A	<2	N/A	2	1369145

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

CONVENTIONAL PARAMETERS (SURFACE WATER)

Maxxam ID		AA6527			AA6550	AA6550		
Sampling Date		2014/09/29			2014/09/29	2014/09/29		
COC Number		102664-01-01			102664-01-01	102664-01-01		
	Units	COA-SW8-Q4	RDL	QC Batch	COA-SW10-Q4	COA-SW10-Q4 Lab-Dup	RDL	QC Batch
CONVENTIONALS								
Conductivity	mS/cm	0.005	0.001	1368906	0.023	N/A	0.001	1371447
Dissolved organic carbon	mg/L	4.6	0.2	1369350	0.9	N/A	0.2	1369350
Nitrogen ammonia (N-NH3)	mg/L	<0.02	0.02	1369799	0.06	N/A	0.02	1369799
Orthophosphate (P)	mg/L	<0.01	0.01	1368976	0.03	N/A	0.01	1368976
pH	pH	5.82	N/A	1368873	6.84	N/A	N/A	1368873
Phenols-4AAP	mg/L	<0.002	0.002	1373213	<0.002	N/A	0.002	1373213
Reactive silica (SiO2)	mg/L	3.5	0.1	1368977	4.6	N/A	0.1	1368977
Real Color	UCV	29	2	1368911	540	N/A	2	1368911
Sulfides (S2-)	mg/L	<0.02	0.02	1369134	<0.02	N/A	0.02	1369134
Turbidity	NTU	2.5	0.1	1368981	1400	1400	0.1	1368981
Alkalinity Total (as CaCO3) pH 4.5	mg/L	<1	1	1368894	5	N/A	1	1368894
Bicarbonates (HCO3 as CaCO3)	mg/L	<1	1	1368894	5	N/A	1	1368894
Carbonate (CO3 as CaCO3)	mg/L	<1	1	1368894	<1	N/A	1	1368894
Chloride (Cl)	mg/L	0.27	0.05	1368847	<0.5	N/A	0.5	1368847
Nitrites (N-NO2-)	mg/L	<0.01	0.01	1368655	<0.1	N/A	0.1	1368655
Nitrates (N-NO3-)	mg/L	<0.01	0.01	1368655	0.9	N/A	0.1	1368655
Nitrate (N) and Nitrite(N)	mg/L	<0.02	0.02	1368847	0.9	N/A	0.2	1368847
Sulfates (SO4)	mg/L	<0.5	0.5	1368847	2	N/A	1	1368847
Total Dissolved Solids	mg/L	23	10	1369313	280	N/A	10	1369313
Total suspended solids (TSS)	mg/L	<2	2	1369145	310	N/A	2	1369145

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

CONVENTIONAL PARAMETERS (SURFACE WATER)

Maxxam ID		AA6551		
Sampling Date		2014/09/29		
COC Number		102664-01-01		
	Units	**COA-SW13-Q4**	**RDL**	**QC Batch**
CONVENTIONALS				
Conductivity	mS/cm	0.005	0.001	1368906
Dissolved organic carbon	mg/L	1.6	0.2	1369350
Nitrogen ammonia (N-NH3)	mg/L	<0.02	0.02	1369799
Orthophosphate (P)	mg/L	<0.01	0.01	1368976
pH	pH	6.39	N/A	1368873
Phenols-4AAP	mg/L	<0.002	0.002	1373213
Reactive silica (SiO2)	mg/L	1.7	0.1	1368977
Real Color	UCV	6	2	1368911
Sulfides (S2-)	mg/L	0.05	0.02	1369541
Turbidity	NTU	0.9	0.1	1368981
Alkalinity Total (as CaCO3) pH 4.5	mg/L	2	1	1368894
Bicarbonates (HCO3 as CaCO3)	mg/L	2	1	1368894
Carbonate (CO3 as CaCO3)	mg/L	<1	1	1368894
Chloride (Cl)	mg/L	0.13	0.05	1368847
Nitrites (N-NO2-)	mg/L	<0.01	0.01	1368655
Nitrates (N-NO3-)	mg/L	0.03	0.01	1368655
Nitrate (N) and Nitrite(N)	mg/L	0.03	0.02	1368847
Sulfates (SO4)	mg/L	<0.5	0.5	1368847
Total Dissolved Solids	mg/L	24	10	1369313
Total suspended solids (TSS)	mg/L	<2	2	1369378

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

GENERAL COMMENTS

Condition of sample(s) upon receipt: GOOD

HYDROCARBONS BY GCFID (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries (spiked blank and surrogates). Please note that the results have been corrected for the method blank.

METALS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

TOTAL EXTRACTABLE METALS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

CONVENTIONAL PARAMETERS (SURFACE WATER)

Please note that the results have not been corrected for QC recoveries nor for the method blank results.

Detection limit raised due to matrix interference.
Sample AA6550 : anions.

Results relate only to the items tested.

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Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
1368655	MCC	QC Standard	Nitrates (N-NO3-)	2014/09/30		98	%
1368655	MCC	Spiked Blank	Nitrites (N-NO2-)	2014/09/30		100	%
1368655	MCC	Method Blank	Nitrites (N-NO2-)	2014/09/30	<0.01		mg/L
			Nitrates (N-NO3-)	2014/09/30	<0.01		mg/L
1368847	MCC	QC Standard	Chloride (Cl)	2014/09/30		103	%
			Nitrate (N) and Nitrite(N)	2014/09/30		98	%
			Sulfates (SO4)	2014/09/30		94	%
1368847	MCC	Spiked Blank	Nitrate (N) and Nitrite(N)	2014/09/30		101	%
1368847	MCC	Method Blank	Chloride (Cl)	2014/09/30	<0.05		mg/L
			Nitrate (N) and Nitrite(N)	2014/09/30	<0.02		mg/L
			Sulfates (SO4)	2014/09/30	<0.5		mg/L
1368873	CG0	QC Standard	pH	2014/09/30		99	%
1368894	CG0	QC Standard	Alkalinity Total (as CaCO3) pH 4.5	2014/09/30		105	%
1368894	CG0	Method Blank	Alkalinity Total (as CaCO3) pH 4.5	2014/09/30	<1		mg/L
1368906	CG0	QC Standard	Conductivity	2014/09/30		103	%
1368906	CG0	Method Blank	Conductivity	2014/09/30	<0.001		mS/cm
1368911	CG0	Spiked Blank	Real Color	2014/09/30		100	%
1368911	CG0	Method Blank	Real Color	2014/09/30	<2		UCV
1368976	FTN	QC Standard	Orthophosphate (P)	2014/09/30		100	%
1368976	FTN	Method Blank	Orthophosphate (P)	2014/09/30	<0.01		mg/L
1368977	FTN	QC Standard	Reactive silica (SiO2)	2014/09/30		99	%
1368977	FTN	Method Blank	Reactive silica (SiO2)	2014/09/30	<0.1		mg/L
1368981	FTN	Spiked Blank	Turbidity	2014/09/30		99	%
1368981	FTN	Method Blank	Turbidity	2014/09/30	<0.1		NTU
1369134	AG5	QC Standard	Sulfides (S2-)	2014/10/01		80	%
1369134	AG5	Method Blank	Sulfides (S2-)	2014/10/01	<0.02		mg/L
1369145	BD	Spiked Blank	Total suspended solids (TSS)	2014/10/01		98	%
1369145	BD	Method Blank	Total suspended solids (TSS)	2014/10/01	<2		mg/L
1369164	MEP	Spiked Blank	1-Chlorooctadecane	2014/10/01		65	%
			Petroleum Hydrocarbons (C10-C50)	2014/10/01		73	%
1369164	MEP	Method Blank	1-Chlorooctadecane	2014/10/01		83	%
			Petroleum Hydrocarbons (C10-C50)	2014/10/01	<100		ug/L
1369313	BD	Spiked Blank	Total Dissolved Solids	2014/10/01		107	%
1369313	BD	Method Blank	Total Dissolved Solids	2014/10/01	<10		mg/L
1369350	JL1	Spiked Blank	Dissolved organic carbon	2014/10/02		101	%
1369350	JL1	Method Blank	Dissolved organic carbon	2014/10/02	0.2 , RDL=0.2		mg/L
1369378	BD	Spiked Blank	Total suspended solids (TSS)	2014/10/01		101	%
1369378	BD	Method Blank	Total suspended solids (TSS)	2014/10/01	<2		mg/L
1369541	BD	QC Standard	Sulfides (S2-)	2014/10/01		86	%
1369541	BD	Method Blank	Sulfides (S2-)	2014/10/01	<0.02		mg/L
1369799	DKH	QC Standard	Nitrogen ammonia (N-NH3)	2014/10/02		100	%
1369799	DKH	Spiked Blank	Nitrogen ammonia (N-NH3)	2014/10/02		102	%
1369799	DKH	Method Blank	Nitrogen ammonia (N-NH3)	2014/10/02	0.02 , RDL=0.02		mg/L
1369976	AL5	QC Standard	Antimony (Sb)	2014/10/02		105	%
			Beryllium (Be)	2014/10/02		97	%
			Manganese (Mn)	2014/10/02		102	%
			Thallium (Tl)	2014/10/02		102	%

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Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Vanadium (V)	2014/10/02		102	%
1369976	AL5	Spiked Blank	Aluminum (Al)	2014/10/02		108	%
			Antimony (Sb)	2014/10/02		112	%
			Silver (Ag)	2014/10/02		106	%
			Arsenic (As)	2014/10/02		106	%
			Barium (Ba)	2014/10/02		106	%
			Beryllium (Be)	2014/10/02		100	%
			Bismuth (Bi)	2014/10/02		103	%
			Boron (B)	2014/10/02		104	%
			Cadmium (Cd)	2014/10/02		105	%
			Calcium (Ca)	2014/10/02		104	%
			Chromium (Cr)	2014/10/02		99	%
			Cobalt (Co)	2014/10/02		99	%
			Copper (Cu)	2014/10/02		97	%
			Tin (Sn)	2014/10/02		111	%
			Iron (Fe)	2014/10/02		103	%
			Magnesium (Mg)	2014/10/02		102	%
			Manganese (Mn)	2014/10/02		106	%
			Molybdenum (Mo)	2014/10/02		108	%
			Nickel (Ni)	2014/10/02		100	%
			Total phosphorous	2014/10/02		100	%
			Lead (Pb)	2014/10/02		100	%
			Potassium (K)	2014/10/02		101	%
			Selenium (Se)	2014/10/02		99	%
			Sodium (Na)	2014/10/02		107	%
			Strontium (Sr)	2014/10/02		104	%
			Thallium (Tl)	2014/10/02		102	%
			Titanium (Ti)	2014/10/02		105	%
			Uranium (U)	2014/10/02		105	%
			Vanadium (V)	2014/10/02		102	%
			Zinc (Zn)	2014/10/02		100	%
1369976	AL5	Method Blank	Aluminum (Al)	2014/10/02	<10		ug/L
			Antimony (Sb)	2014/10/02	<1.0		ug/L
			Silver (Ag)	2014/10/02	<1.0		ug/L
			Arsenic (As)	2014/10/02	<1.0		ug/L
			Barium (Ba)	2014/10/02	<2.0		ug/L
			Beryllium (Be)	2014/10/02	<2.0		ug/L
			Bismuth (Bi)	2014/10/02	<1.0		ug/L
			Boron (B)	2014/10/02	<50		ug/L
			Cadmium (Cd)	2014/10/02	<0.20		ug/L
			Calcium (Ca)	2014/10/02	<500		ug/L
			Chromium (Cr)	2014/10/02	<5.0		ug/L
			Cobalt (Co)	2014/10/02	<1.0		ug/L
			Copper (Cu)	2014/10/02	<1.0		ug/L
			Total Hardness (CaCO3)	2014/10/02	<1000		ug/L
			Tin (Sn)	2014/10/02	<2.0		ug/L
			Iron (Fe)	2014/10/02	<60		ug/L
			Magnesium (Mg)	2014/10/02	<100		ug/L
			Manganese (Mn)	2014/10/02	<1.0		ug/L
			Molybdenum (Mo)	2014/10/02	<1.0		ug/L

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Maxxam Job #: B461144
Report Date: 2014/10/10

TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units
			Nickel (Ni)	2014/10/02	<2.0		ug/L
			Total phosphorous	2014/10/02	<10		ug/L
			Lead (Pb)	2014/10/02	<0.50		ug/L
			Potassium (K)	2014/10/02	<500		ug/L
			Selenium (Se)	2014/10/02	<3.0		ug/L
			Sodium (Na)	2014/10/02	<500		ug/L
			Strontium (Sr)	2014/10/02	<2.0		ug/L
			Thallium (Tl)	2014/10/02	<2.0		ug/L
			Titanium (Ti)	2014/10/02	<10		ug/L
			Uranium (U)	2014/10/02	<1.0		ug/L
			Vanadium (V)	2014/10/02	<2.0		ug/L
			Zinc (Zn)	2014/10/02	<7.0		ug/L
1371104	OZP	Spiked Blank	Mercury (Hg)	2014/10/07		95	%
1371104	OZP	Method Blank	Mercury (Hg)	2014/10/07	<0.00001		mg/L
1371447	CG0	QC Standard	Conductivity	2014/10/06		100	%
1371447	CG0	Method Blank	Conductivity	2014/10/06	<0.001		mS/cm
1373213	MH1	QC Standard	Phenols-4AAP	2014/10/09		100	%
1373213	MH1	Spiked Blank	Phenols-4AAP	2014/10/09		99	%
1373213	MH1	Method Blank	Phenols-4AAP	2014/10/09	<0.002		mg/L

RDL = Reportable Detection Limit

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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TATA STEEL MINERALS CANADA
Client Project #: QUARTERLY MONITORING
Site Location: DSO3 1A
Your P.O. #: 2200000001
Sampler Initials: JFD

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Appendix VI

Benthic Invertebrate Raw Data

Taxon	Burnetta Creek			Triangle Lake		
	A	B	C	A	B	C
NEMATODA						
MOLLUSCA						
Bivalvia						
Sphaeriidae				2	1	
ANNELIDA						
Oligochaeta						
Enchytraeidae		8				
ARTHROPODA						
Chelicerata						
Arachnida						
Acari						
Hydrachnidiae						
Hygrobatidae			1			
Lebertiidae	2					
Sperchontidae	1	1	1			
Crustacea						
Copepoda						
Cyclopoida						
Cyclopidae (benthique)						
Uniramia						
Insecta						
Ephemeroptera						
Baetidae						
Ephemerellidae						
Leptophlebiidae						
Plecoptera						
Chloroperlidae						
Leuctridae						
Nemouridae						
Taeniopterygidae	3					
Trichoptera (petit)						
Hydropsychidae						
Hydroptilidae						
Lepidostomatidae						
Rhyacophilidae						
Diptera						
Nematocera						
Ceratopogonidae						
Chironomidae (pupes)						
Chironomidae (larves)	5	2	2			
Simuliidae						
Brachycera						
Empididae						
Number of organisms (N)	11	11	4	2	1	0
Taxonimic richness (T)	4	3	3	1	1	0
Shannon-Weiner index (H')	1,79	1,096	1,5			
Equitability (J')	0,895	0,691	0,946			
Hilsenhoff family index (FBI)	5,545	7,818	7	6	6	

Appendix VII

Habitat Suitability Index and Habitat Equivalent Unit Calculation for Streams

Habitat characteristics

#	Tronçon	Segment	Longueur (m)	Largeur (m)	Supperficie (m²)	RM%	B%	GA%	CA%	GR%	SA%	SI%	MO%	Total	V1/3	V1/2	V2/3
1	PIN1	A	185	1,00	185			35	35	15	15			100		0,050	
2	Goodream	A	118	4,80	566		20	30	30	20				100	0,640	0,900	0,820
3	Goodream	B	258	2,60	671		30	30	30	10				100	0,940	0,120	0,980
4	Goodream	C	184	4,90	902		20	30	40	10				100	1,170	1,050	0,810
5	Goodream	D	242	10,00	2 420		10	10				80		100		0,050	
6	Goodream	E	1305	4,50	5 873		14	30	28				27	100		0,867	
7	Goodream	F	293	45,00	13 185							50	50	100		0,005	
8	Goodream	G	302	1,50	453				30	10	50		10	100		0,050	
9	Goodream	H	218	2,50	545		10	40	40				10	100		0,070	

HSI of substrate for Brook Trout

SAFO										
		RM	B	G	C	G	S	F	O	
	Émergence	0,00	0,00	0,00	1,00	1,00	1,00	0,33	0,33	
	Alevin	0,00	1,00	1,00	1,00	1,00	0,33	0,00	0,00	
	Juvenile	0,00	1,00	1,00	1,00	1,00	1,00	1,00	0,00	
	Adulte	0,67	1,00	1,00	1,00	1,00	0,67	0,33	0,33	

#	Stade	RM	B	G	C	G	S	F	O	Total
1	Émergence	0,00	0,00	0,00	0,35	0,15	0,15	0,00	0,00	**0,65**
1	Alevin	0,00	0,00	0,35	0,35	0,15	0,05	0,00	0,00	**0,90**
1	Juvenile	0,00	0,00	0,35	0,35	0,15	0,15	0,00	0,00	**1,00**
1	Adulte	0,00	0,00	0,35	0,35	0,15	0,10	0,00	0,00	**0,95**
2	Émergence	0,00	0,00	0,00	0,30	0,20	0,00	0,00	0,00	**0,50**
2	Alevin	0,00	0,20	0,30	0,30	0,20	0,00	0,00	0,00	**1,00**
2	Juvenile	0,00	0,20	0,30	0,30	0,20	0,00	0,00	0,00	**1,00**
2	Adulte	0,00	0,20	0,30	0,30	0,20	0,00	0,00	0,00	**1,00**
3	Émergence	0,00	0,00	0,00	0,30	0,10	0,00	0,00	0,00	**0,40**
3	Alevin	0,00	0,30	0,30	0,30	0,10	0,00	0,00	0,00	**1,00**
3	Juvenile	0,00	0,30	0,30	0,30	0,10	0,00	0,00	0,00	**1,00**
3	Adulte	0,00	0,30	0,30	0,30	0,10	0,00	0,00	0,00	**1,00**
4	Émergence	0,00	0,00	0,00	0,40	0,10	0,00	0,00	0,00	**0,50**
4	Alevin	0,00	0,20	0,30	0,40	0,10	0,00	0,00	0,00	**1,00**
4	Juvenile	0,00	0,20	0,30	0,40	0,10	0,00	0,00	0,00	**1,00**
4	Adulte	0,00	0,20	0,30	0,40	0,10	0,00	0,00	0,00	**1,00**
5	Émergence	0,00	0,00	0,00	0,00	0,00	0,00	0,26	0,00	**0,26**
5	Alevin	0,00	0,10	0,10	0,00	0,00	0,00	0,00	0,00	**0,20**
5	Juvenile	0,00	0,10	0,10	0,00	0,00	0,00	0,80	0,00	**1,00**
5	Adulte	0,00	0,10	0,10	0,00	0,00	0,00	0,26	0,00	**0,46**
6	Émergence	0,00	0,00	0,00	0,28	0,00	0,00	0,00	0,09	**0,37**
6	Alevin	0,00	0,14	0,30	0,28	0,00	0,00	0,00	0,00	**0,73**
6	Juvenile	0,00	0,14	0,30	0,28	0,00	0,00	0,00	0,00	**0,73**
6	Adulte	0,00	0,14	0,30	0,28	0,00	0,00	0,00	0,09	**0,82**
7	Émergence	0,00	0,00	0,00	0,00	0,00	0,00	0,17	0,17	**0,33**
7	Alevin	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	**0,00**
7	Juvenile	0,00	0,00	0,00	0,00	0,00	0,00	0,50	0,00	**0,50**
7	Adulte	0,00	0,00	0,00	0,00	0,00	0,00	0,17	0,17	**0,33**
8	Émergence	0,00	0,00	0,00	0,30	0,10	0,50	0,00	0,03	**0,93**
8	Alevin	0,00	0,00	0,00	0,30	0,10	0,17	0,00	0,00	**0,57**
8	Juvenile	0,00	0,00	0,00	0,30	0,10	0,50	0,00	0,00	**0,90**
8	Adulte	0,00	0,00	0,00	0,30	0,10	0,34	0,00	0,03	**0,77**
9	Émergence	0,00	0,00	0,00	0,40	0,00	0,00	0,00	0,03	**0,43**
9	Alevin	0,00	0,10	0,40	0,40	0,00	0,00	0,00	0,00	**0,90**
9	Juvenile	0,00	0,10	0,40	0,40	0,00	0,00	0,00	0,00	**0,90**
9	Adulte	0,00	0,10	0,40	0,40	0,00	0,00	0,00	0,03	**0,93**

HSI of water velocity for Brook Trout

SAFO	**Stade**	**Vitesse de courant**	
		Minimum	**Maximum**
	Émergence	<0,01	<0,9
	Alevin	<0,02	<0,4
	Juvenile	<0,01	<1,5
	Adulte	<0,01	<0,5

#	**Stade**	
1	Émergence	**1,00**
1	Alevin	**1,00**
1	Juvenile	**1,00**
1	Adulte	**1,00**
2	Émergence	**0,67**
2	Alevin	**0,00**
2	Juvenile	**1,00**
2	Adulte	**0,00**
3	Émergence	**0,33**
3	Alevin	**0,33**
3	Juvenile	**1,00**
3	Adulte	**0,33**
4	Émergence	**0,33**
4	Alevin	**0,00**
4	Juvenile	**1,00**
4	Adulte	**0,00**
5	Émergence	**1,00**
5	Alevin	**1,00**
5	Juvenile	**1,00**
5	Adulte	**1,00**
6	Émergence	**1,00**
6	Alevin	**0,00**
6	Juvenile	**1,00**
6	Adulte	**0,00**
7	Émergence	**0,00**
7	Alevin	**0,00**
7	Juvenile	**0,00**
7	Adulte	**0,00**
8	Émergence	**1,00**
8	Alevin	**1,00**
8	Juvenile	**1,00**
8	Adulte	**1,00**
9	Émergence	**1,00**
9	Alevin	**1,00**
9	Juvenile	**1,00**
9	Adulte	**1,00**

Composite HSI, substrate x water velocity for Brook Trout

Segment	Stade	Substrat	Vitesse	Composite
1	Émergence	0,65	1,00	**0,83**
1	Alevin	0,90	1,00	**0,95**
1	Juvenile	1,00	1,00	**1,00**
1	Adulte	0,95	1,00	**0,98**
2	Émergence	0,50	0,67	**0,58**
2	Alevin	1,00	0,00	**0,00**
2	Juvenile	1,00	1,00	**1,00**
2	Adulte	1,00	0,00	**0,00**
3	Émergence	0,40	0,33	**0,37**
3	Alevin	1,00	0,33	**0,67**
3	Juvenile	1,00	1,00	**1,00**
3	Adulte	1,00	0,33	**0,67**
4	Émergence	0,50	0,33	**0,42**
4	Alevin	1,00	0,00	**0,00**
4	Juvenile	1,00	1,00	**1,00**
4	Adulte	1,00	0,00	**0,00**
5	Émergence	0,26	1,00	**0,63**
5	Alevin	0,20	1,00	**0,60**
5	Juvenile	1,00	1,00	**1,00**
5	Adulte	0,46	1,00	**0,73**
6	Émergence	0,37	1,00	**0,69**
6	Alevin	0,73	0,00	**0,00**
6	Juvenile	0,73	1,00	**0,86**
6	Adulte	0,82	0,00	**0,00**
7	Émergence	0,33	0,00	**0,00**
7	Alevin	0,00	0,00	**0,00**
7	Juvenile	0,50	0,00	**0,00**
7	Adulte	0,33	0,00	**0,00**
8	Émergence	0,93	1,00	**0,97**
8	Alevin	0,57	1,00	**0,78**
8	Juvenile	0,90	1,00	**0,95**
8	Adulte	0,77	1,00	**0,88**
9	Émergence	0,43	1,00	**0,72**
9	Alevin	0,90	1,00	**0,95**
9	Juvenile	0,90	1,00	**0,95**
9	Adulte	0,93	1,00	**0,97**

HEU calculation for Brook Trout

#	Tronçon	Segment	HSI composite (m²)	Superficie (m²)	HEU (m²)	HEU (100m²)	Total/Stream (m²)
1	PIN1	A	1,00	185	185	2	185
2	Goodream	A	1,00	566	566	6	
3	Goodream	B	1,00	671	671	7	
4	Goodream	C	1,00	902	902		
5	Goodream	D	1,00	2 420	2 420	24	
6	Goodream	E	0,86	5 873	5 070	51	
7	Goodream	F	0,00	13 185	0	0	
8	Goodream	G	0,97	453	438	4	
9	Goodream	H	0,97	545	527	5	10 593