Howse Property Annual Report

April 2019 - March 2020 Activities

TATA

June 2020

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1 HOWSE PROPERTY PROJECT UPDATE

As of March 31st, 2020, Tata Steel Minerals Canada (TSMC) has not started any work, including any construction activities, on the Howse Property Project and the development of the Howse Property is not in TSMC's 5-year mining plan. As per the Annual Report requirement of the Howse Property Iron Mine Project Decision Statement issued in June 2018, the present report covers the pre-construction phase for the reporting period of April 1st, 2019 to March 31st, 2020

A Table of Concordance for Conditions is provided at the end of the text.

In Winter 2020, TSMC updated its Environmental Protection Plan (EPP) document and submitted the final version to communities for their feedback. The document provides information on TSMC's procedures for protecting environmental components at site.

2 GENERAL CONDITIONS

Section 2 covers Conditions 2.1-2.13

As per condition 2.5.21, the Wetland Monitoring Plan was modified in Summer 2018, (see Section 4.2 for details) and request for feedback was forwarded via email to members of all five Indigenous groups on September 14th, 2018, with the invitation to submit comments. No feedback has been received as of June 2020.

No other updates were done on the follow-up programs and there have been no changes to the project during the reporting year.

Notice Regarding Laboratory Services

Between April 1st, 2019 and March 31st, 2020, TSMC secured the services of AGAT Laboratories Ltd (AGAT) to conduct the analytical analyses of the biophysical samples related to compliance and operational monitoring for the Howse Project. Unfortunately, the quality of the services provided were compromised due to internal difficulties experience by AGAT. As a result, AGAT did not provide results for several samples collected by TSMC. APPENDIX I is a letter provided by AGAT which explains the difficulties. Missing samples are described in the text below.

3 FISH AND FISH HABITAT

3.1 Erosion and sediment control

No activities were undertaken regarding erosion and sediment control during the reporting year. Currently, there is no deposition of deleterious substances in waters frequented by fish in relation to the Howse Property Project, which is not started. Note that the Timmins 1 pit has been designated 'non fish-bearing' by the department of Fisheries and Oceans.

3.2 Follow Up Program

3.2.1 Surface Water Quality

Surface water quality samples were taken between June 20th and September 23rd, 2019 for four quarters (taken at least 1 month apart). These samples are collected as a part of the baseline monitoring of surface water quality for the Water Chemistry Analysis Program in the creeks and lakes in conjunction with the effluent discharge when the Howse project will go into the construction and subsequently into the mining phase. The locations sampled are Triangle Lake (TL), Burnetta Creek (BC), Burnetta Lake (BL), Pinette Lake (SW5) and 4 points along Goodream Creek (SW1,2,3 and 4) that fall into the watershed and might be affected by Howse operations. Due to logistical and service issues with AGAT Labs, the second quarterly surface water samples for the Howse project collected in July and sent by air cargo was never received or analyzed. As such, only 3 quarters of surface water analytical results are presented for Howse in 2019.

Sampling results for the baseline surface water monitoring are presented in Appendix II.

3.2.2 Lake Water Levels

Appendix III presents a monitoring report of estimated daily water surface elevations based on hydrometric data recorded at 5 sites (O'Nelly, Triangle, Morley, Pinette and Burnetta) between October 2018 and August 2019. Annual lake level fluctuations are largest at Morley Lake, but are generally under 1m.

3.3 Groundwater Levels

See Section 4.2 for Howse Wetland Monitoring.

3.4 Snow Sampling

Snow sampling is to be conducted to assess dustfall amounts during the winter months. TSMC's Follow up program for air quality, which includes provisions for snow sampling, is set to be implemented from the start of construction to the end of decommissioning of the Designated Project.

4 MIGRATORY BIRDS

4.1 Bank Swallow

No Bank Swallows were observed in the designated Howse project area between April 1st, 2019 to March 31st, 2020.

4.2 Howse Wetland Monitoring

Results of measurement of water levels at wetlands are presented in Appendix IV Groundwater levels.

The wetlands monitoring plan was adjusted due to field conditions. The field installation of the wells was more complex that initially planned and so only 21 wells were installed across Howse wetlands, rather than the planned 30. As a result, the Wetlands Monitoring Plan was modified.

5 HEALTH AND SOCIO-ECONOMIC CONDITIONS OF INDIGENOUS PEOPLES

5.1 Air Quality

TSMC's Follow up program for air quality is set to be implemented from the start of construction to the end of decommissioning of the Designated Project.

Certificates of analysis for air sampling programs for NO2, PM2.5 and TPM are provided in Appendix V Air Monitoring.

TSMC continues to limit the traffic from its site into the local community in order to minimize dust effects. In 2016, the Proponent implemented a policy which restricts 90% of its vehicles from travelling to Schefferville. Of those 10% with special authorization to travel to Schefferville, they do so to go to the airport or in the course of the work of environmental technicians or for logistical purposes. More vehicles will travel, occasionally, during shift changes (1 day every 2 weeks). Currently, there is a shuttle service in place with a local Indigenous company for travel to the airport on shift-change days.

5.2 Country Foods

Under the Country Food Follow Up Plan, the Proponent is committed to duplicating the Country Foods sampling program 2 years after the commencement of the Howse Operations phase and, subsequently, every five years for the duration of the operations phase.

6 CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES

6.1 Follow Up Program

Bypass road upgrades have not commenced and are not required to commence until the Construction Phase starts on the Howse Project.

In September 2018, TSMC's Mining Operations Supervisor met with members of the NNK and NIMLJ communities, including their chiefs, to understand their concerns regarding the bypass road, and devise a collaborative plan for the bypass road upgrade. The length of the road was inspected by the group.

Following this visit, Martin Simon produced a summary document of what was discussed in French and English, with sketches, which was transferred to the attendees for their feedback. Feedback has not been received and the bypass road repairs did not take place during the reporting period.

6.2 Caribou

Due to financial complications, TSMC has not yet received data on Caribou locations for the reporting year.

7 PHYSICAL AND CULTURAL HERITAGE AND STRUCTURES, SITES OR THINGS OF HISTORICAL, ARCHAEOLOGICAL, PALEONTOLOGICAL OR ARCHITECTURAL SIGNIFICANCE

All conditions pertaining to Conditions 7.1-7.6 were respected during the reporting year.

8 CUMULATIVE EFFECTS

As the Howse Project is not yet in the Construction Phase, this requirement is not yet in place.

9 ACCIDENTS AND MALFUNCTIONS

9.1 Timmins 4 Sedimentation Pond 3

The Timmins 4 Sedimentation Pond 3 (SP3) is planned to serve as a component of the water management plan for the Howse Property Project. In Spring 2019, a red water incident occurred at this pond. The following section provides an overview of the incident and Appendix V provides additional details, including adverse environmental effects, residual adverse environmental effects, mitigation measures, views from Indigenous groups and relevant authorities, and future actions.

Refer to the Figure below:

- Between May 12th and 17th, red water was observed pooling (**red circle**) against the berm of SP3, for which TSMC has the mine operating permit from GNFL;
- The cause was uncontrolled runoff from T4 ditches and uncaptured runoff from ditches upstream of this area (**green circles**);
- Water accumulation wore down the berm and a breach occurred. Water entered the pond, and so no action was taken (i.e. not flowing into the natural environment);
- Red water exited through the culvert (**blue circle**), as per design, and found its way to the adjacent wetland. However, the force of the outflow damaged the ditch and effluent entered the wetland instead of being directed to Goodream as per design;
- Coinciding with this, TSMC received notice that a complaint was raised through the National Environment Emergency Center (NEEC). TSMC subsequently responded to GNFL on facts on the status of the incident and measures being taken to mitigate effects;
- Once possible (after snow melt): 6 sediment fences were installed, an expert was brought to site to assess status of SP3, and remaining water in the periphery of the pond was redirected.

On May 29th, 2019, a site visit indicated that the situation was completely stable.

Subsequently, TSMC completed a series of specific earthworks to aimed at restoring the function of the sedimentation pond in order to eliminate the possibility of a re-occurrence in Spring 2020.

9.2 Communication Plan

No changes were made to the Communication Plan during the reporting year.

10 SCHEDULES AND RECORD KEEPING

Conditions 10.1-10.4 of the Howse Property Decision Statement indicate how the Proponent will submit to the Agency schedules associated with the Howse Property Project after the start of construction. Currently, this is not applicable, as construction phase has not started.

TSMC has maintained all records required to demonstrate compliance with the conditions of the release of the Howse Property Project.

The Annual Report requirements under conditions 2.8 and 2.9 of the Howse Property Iron Mine Project Decision Statement issued in June 2018 are presented below for the reporting period of April 1st, 2019 to March 31st, 2020. The item number in Table 1 below corresponds to the section number in the text above.

Table 1. Table of Concordance for Conditions

	CEAA Release Condition	2019 Activities
2. General Conditions		
2.1	The Proponent shall ensure that its actions in meeting the conditions set out in this Decision Statement are considered in a careful and precautionary manner, promote sustainable development, are informed by the best information and knowledge available at the time the Proponent takes action, including community and Indigenous traditional knowledge, are based on methods and models that are recognized by standard-setting bodies, are undertaken by qualified individuals, and have applied the best available economically and technically feasible technologies.	▪ TSMC is committed to follow best practices for all its activities.
2.2	The Proponent shall, where consultation is a requirement of a condition set out in this Decision Statement: 2.2.1 provide a written notice of the opportunity for the party or parties being consulted to present their views and information on the subject of the consultation; 2.2.2 provide sufficient information on the scope and the subject matter of the consultation and a reasonable period of time to permit the party or parties being consulted to prepare their views and information; 2.2.3 undertake an impartial consideration of all views and information presented by the party or parties being consulted on the subject matter of the consultation; and 2.2.4 advise in a timely manner the party or parties being consulted on how the views and information received have been considered by the Proponent.	▪ TSMC is committed to follow this requirement for all consultation activities.
2.3	The Proponent shall, where consultation with Indigenous groups is a requirement of a condition set out in this Decision Statement, communicate with each Indigenous group with respect to the manner by which to satisfy the consultation requirements referred to in condition 2.2, including methods of notification, the type of information, the period of time to be provided when seeking input, the process to be used by the Proponent to undertake impartial consideration of all views and information presented on the subject of the consultation, the period of time to advise Indigenous groups of how their views and information were considered by the Proponent and the means by which Indigenous groups will be advised.	▪ TSMC is committed to follow this requirement for all consultation activities.
2.4	The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement, determine the following information, for each follow-up program: 2.4.1 the methodology, location, frequency, timing and duration of monitoring associated with the follow-up program; 2.4.2 the scope, content and frequency of reporting of the results of the follow-up program; 2.4.3 the levels of environmental change relative to baseline conditions that would require the Proponent to implement modified or additional mitigation measure(s), including instances where the Proponent may require Designated Project activities to be stopped; and 2.4.4 the technically and economically feasible mitigation measures to be implemented by the Proponent if monitoring conducted as part of the follow-up program shows that the levels of environmental change referred to in condition 2.4.3 have been reached or exceeded.	▪ Existing follow-up programs for TSMC's DSO and Howse sites, include this information.
2.5	The Proponent shall submit the information referred to in condition 2.4 to the Agency prior to the implementation of each follow-up program. The Proponent shall update that information in consultation with Indigenous groups and relevant authorities during the implementation of each follow-up program, and shall provide the updated	▪ No updates were done on the follow-up program during this reporting year

	CEAA Release Condition	2019 Activities
	information to the Agency, Indigenous groups and relevant authorities within 30 days of the information being updated.	
2.6	The Proponent shall, where a follow-up program is a requirement of a condition set out in this Decision Statement:	▪ This was complied with
	2.6.1 conduct the follow-up program according to the information determined pursuant to condition 2.4;	
	2.6.2 undertake monitoring and analysis to verify the accuracy of the environmental assessment as it pertains to the particular condition and/or to determine the effectiveness of any mitigation measure(s);	
	2.6.3 determine whether modified or additional mitigation measures are required based on the monitoring and analysis undertaken pursuant to condition 2.6.2; and	
	2.6.4 if modified or additional mitigation measures are required pursuant to condition 2.6.3, implement these mitigation measures in a timely manner and monitor them pursuant to condition 2.6.2.	
2.7	Where consultation with Indigenous groups is a requirement of a follow-up program, the Proponent shall discuss with each Indigenous group opportunities for the participation of that Indigenous group in the implementation of the follow-up program, including the analysis of the follow-up results and whether modified or additional mitigation measures are required, as set out in condition 2.6.	▪ TSMC is committed to follow this requirement for all consultation activities.
2.8	The Proponent shall, commencing in the reporting year during which the Proponent begins the implementation of the conditions set out in this Decision Statement, prepare an annual report that sets out:	▪ TSMC has produced an annual report for its 2018-2019 activities and the current report covers 2019-2020 activities.
	2.8.1 the activities undertaken by the Proponent in the reporting year to comply with each of the conditions set out in this Decision Statement;	
	2.8.2 how the Proponent complied with condition 2.1;	
	2.8.3 for conditions set out in this Decision Statement for which consultation is a requirement, how the Proponent considered any views and information that the Proponent received during or as a result of the consultation;	
	2.8.4 the information referred to in conditions 2.4 and 2.5 for each follow-up program;	
	2.8.5 the results of the follow-up program requirements identified in conditions 3.6, 4.7, 4.8, 5.9, 5.10, 6.6, 6.7, and 7.5; and	
	2.8.6 any modified or additional mitigation measures implemented or proposed to be implemented by the Proponent, as determined under condition 2.6.	
2.9	The Proponent shall submit to the Agency the annual report referred to in condition 2.8, including an executive summary in both official languages, no later than June 30 following the reporting year to which the annual report applies.	▪ TSMC is committed to comply with this condition
2.10	The Proponent shall publish on the Internet, or any medium which is publicly available, the annual reports and the executive summaries referred to in conditions 2.8 and 2.9, the dust management strategy referred to in condition 5.7, the communication plan referred to in condition 6.8, the cultural heritage control plan referred to in condition 7.6, the communication plan referred to in condition 9.5, the schedules referred to in conditions 10.1, and 10.2, and any update(s) or revision(s) to the above documents, upon submission of these documents to the parties referenced in the respective conditions. The Proponent shall keep these documents publicly available for 25 years following the end of operation, or until the end of decommissioning of the Designated Project, whichever comes first. The Proponent shall notify the Agency and Indigenous groups of the availability of these documents within 48 hours of their publication.	▪ Annual reports will be placed on the TSMC website as soon as it is operational.

	CEAA Release Condition	2019 Activities
2.11	The Proponent shall notify the Agency and Indigenous groups in writing no later than 60 days after the day on which there is a transfer of ownership, care, control or management of the Designated Project in whole or in part.	▪ TSMC is committed to comply with this condition
2.12	The Proponent shall consult with Indigenous groups prior to initiating any material change(s) to the Designated Project that may result in adverse environmental effects and shall notify the Agency in writing no later than 60 days prior to initiating the change(s).	▪ There were no changes to the Designated Project in the reporting year.
2.13	In notifying the Agency pursuant to condition 2.12, the Proponent shall provide the Agency with a description of the potential adverse environmental effects of the change(s) to the Designated Project, the proposed mitigation measures and follow-up requirements to be implemented by the Proponent and the results of the consultation with Indigenous groups.	▪ TSMC is committed to comply with this condition
3. Fish and fish habitat		
3.1	The Proponent shall implement erosion and sedimentation control measures within the Designated Project area during all phases of the Designated Project to avoid the deposit of deleterious substances in waters frequented by fish.	▪ There is no deposition of deleterious substances in waters frequented by fish in relation to the Howse Property Project, which is not started.
3.2	The Proponent shall collect site runoff and pit dewatering water into HowseA and Timmins4 sedimentations ponds. The Proponent shall treat water at the sedimentation ponds prior to its discharge into the environment, if necessary, to meet the requirements of subsection 36(3) of the Fisheries Act.	▪ Not applicable, as the Project has not started.
3.3	The Proponent shall use a time delay blasting technique when blasting.	▪ Not applicable as there is no activity, including blasting, on the Howse Property.
3.4	The Proponent shall not set the blast charge per delay to above 1092 kilograms.	▪ Not applicable as there is no activity, including blasting, on the Howse Property
3.5	The Proponent shall manage waste rock acid generation taking into account the Mine Environment Neutral Drainage program's *Prediction Manual for Drainage Chemistry from Sulphidic Geological Materials*.	▪ TSMC is committed to comply with this condition once the Project starts.
3.6	The Proponent shall develop, prior to construction, a follow-up program to verify the accuracy of the environmental assessment as it pertains to fish and fish habitat and to determine the effectiveness of mitigation measures referred to in conditions 3.1 to 3.5. The Proponent shall provide the follow-up program to the Agency prior to construction. The Proponent shall implement the follow-up program from the start of construction to the end of decommissioning. The Proponent shall review and update the follow-up program in consultation with Indigenous groups and relevant authorities and shall provide this update to the Agency prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first. As part of the follow-up program, the Proponent shall:	▪ Follow-up programs for the Howse Project were submitted to the Agency and Indigenous groups in Spring 2018.
	3.6.1 monitor water quality and quantity parameters as per the Water Management Plan (October 2015) in the environmental impact statement and at locations outlined in figure 1 of the Proponent's final response to Information Request 106 (July 24, 2017), including:	▪ TSMC is committed to comply with this condition, see below
	3.6.1.1 water levels in Triangle Lake, Morley Lake, Burnetta Lake and Pinette Lake;	▪ Water gauges were installed at these locations in fall 2017 ▪ Data collection has been, and

	CEAA Release Condition	2019 Activities
		continues to be taken, continuously since that time
	3.6.1.2 groundwater levels at monitoring well locations outlined in figure 1 or equivalent locations where groundwater may be impacted by the Designated Project;	▪ Additional monitoring wells will be installed at the beginning of the construction phase near Triangle Lake
	3.6.1.3 iron concentration at the final discharge points of the HowseA and Timmins 4 sedimentation ponds;	▪ Not applicable, as the Project has not started.
	3.6.1.4 effluent quality at the final discharge points of the HowseA and Timmins 4 sedimentation ponds, in accordance with the Metal Mining Effluent Regulations and taking into account the Canadian Council of Ministers of the Environment's Water Quality Guidelines for the Protection of Aquatic Life; and	▪ Not applicable, as the Project has not started.
	3.6.1.5 water quality between the HowseA sedimentation pond final discharge point and Triangle Lake, and in Triangle Lake, Burnetta Lake and Pinette Lake.	▪ Not applicable, as the Project has not started.
	3.6.2 update the hydrogeological groundwater model from the Proponent's final response to Information Request 106 (July 24, 2017) at the end of mining phases I, II and III based on the results from 3.6.1; and	▪ Updates will be done following the mining phases
	3.6.3 monitor fish and fish habitat in Triangle Lake, Burnetta Lake, Pinette Lake and Goodream Creek.	▪ Not applicable at this time
4. Migratory birds		
4.1	The Proponent shall carry out the Designated Project in a manner that protects migratory birds and avoids harming, killing or disturbing migratory birds or destroying, disturbing or taking their nests or eggs. In this regard, the Proponent shall take into account Environment and Climate Change Canada's Avoidance Guidelines. The Proponent's actions when taking into account the Avoidance Guidelines shall be in compliance with the Migratory Birds Convention Act, 1994 and with the Species at Risk Act.	▪ Not applicable, as the Project has not started.
4.2	The Proponent shall have a qualified individual survey, during operation, the mine pit walls annually during the nesting period to determine if bank swallows (Riparia riparia) are using the open pit as a nesting site. The Proponent shall conduct an additional survey one to two days prior to undertaking any new activity associated with the Designated Project during the nesting period areas where bank swallows (Riparia riparia) may occur. The Proponent shall identify, in consultation with Environment and Climate Change Canada and other relevant authorities, and implement a setback distance in which no Designated Project activity shall take place around any bank swallow (Riparia riparia) nest(s) found and shall maintain the setback distance until the young have permanently left the area of the nest. The Proponent shall implement additional measures to deter bank swallows (Riparia riparia) from nesting in the area prior to the next breeding period.	▪ Not applicable as the operations phase has not begun at Howse
4.3	The Proponent shall notify Environment and Climate Change Canada if it finds bank swallow (*Riparia riparia*) nests within the Designated Project area.	▪ Bank Swallow were not observed in the Howse Property area during the reporting year
4.4	The Proponent shall control lighting required for the construction, operation and decommissioning of the Designated Project, including direction, timing and intensity, to avoid adverse effects on migratory birds, while meeting health and safety requirements.	▪ Not applicable as construction activities have not begun at Howse
4.5	The Proponent shall prohibit vehicles and heavy equipment associated with the Designated Project from entering wetlands except those affected by components of the Designated Project as identified in figure 7-33 of the	▪ No vehicles and/or heavy equipment entered wetlands

	CEAA Release Condition	2019 Activities
	environmental impact statement.	during the reporting year.
4.6	The Proponent shall not undertake vehicle, machinery and equipment cleaning, fueling and maintenance and shall not store substance with the potential to cause harmful effects to the receiving environment, within 20 metres of any wetland.	▪ This was respected in the reporting year.
4.7	The Proponent shall develop, prior to construction and in consultation with relevant authorities, a follow-up program to determine the effectiveness of all mitigation measures to avoid harm to migratory birds, their eggs and nests. The Proponent shall provide the follow-up program to the Agency prior to construction. The Proponent shall implement the follow-up program during all phases of the Designated Project. The Proponent shall review and update the follow-up program in consultation with Indigenous groups and relevant authorities and shall provide this update to the Agency prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first. As part of the follow-up program, the Proponent shall:	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018.
	4.7.1 conduct migratory bird surveys in the Triangle Lake, Burnetta Lake and Pinette Lake watersheds every year for the first three years following completion of construction. After three years, the Proponent shall determine, in consultation with Indigenous groups and relevant authorities, the frequency of additional surveys based on the results of the follow-up program.	▪ Not applicable at this time.
4.8	The Proponent shall develop, prior to construction, and implement a follow-up program to verify the predictions of the environmental assessment as it pertains to the adverse environmental effects of the Designated Project on wetland functions that support migratory birds, and to determine the effectiveness of the mitigation measures referred to in conditions 4.5 and 4.6 during all phases of the Designated Project. The Proponent shall provide the follow-up program to the Agency prior to construction. The Proponent shall review and update the follow-up program in consultation with Indigenous groups and Environment and Climate Change Canada and shall provide this update to the Agency prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first. As part of the follow-up program, the Proponent shall:	▪ This condition was complied with.
	4.8.1 have a qualified individual conduct a wetland disturbance survey every five years, with the first survey conducted at the start of construction, to assess wetland functions that support migratory birds; and	▪ Not applicable, as the Project has not started.
	4.8.2 monitor groundwater levels associated with the wetlands located north of the open pit to verify the effects of pit dewatering on wetlands. Monitoring wells shall be spaced no more than 50 metres apart and measurements shall be taken every two weeks during operation.	▪ This information is provided in the annual report.
5. Health and socio-economic conditions of Indigenous peoples		
5.1	The Proponent shall, in consultation with Indigenous groups, undertake progressive reclamation of the areas disturbed by the Designated Project, including by stabilizing, compacting and revegetating with native plant species overburden stockpiles and waste rock piles.	▪ Not applicable, as the Designated project area has not been disturbed.
5.2	Using a qualified individual, the Proponent shall design overburden stockpiles and waste rock piles, in consultation with Indigenous groups and relevant authorities, and in consideration of reducing effects to viewscapes. The Proponent shall implement the design throughout all phases of the Designated Project.	▪ The design of the overburden stockpiles and waste rock piles was completed during the Howse EIS.
5.3	The Proponent shall apply dust suppressant on the Howse haul road during all phases of the Designated Project to control the release of dust. The Proponent shall select, in consultation with relevant authorities, dust suppressants with the least potential effects on human health and the environment.	▪ Not applicable at this time
5.4	The Proponent shall control dust, if observed visually, during the unloading of ore from trucks, except if not feasible for safety reasons.	▪ Not applicable at this time

	CEAA Release Condition	2019 Activities
5.5	The Proponent shall implement measures to mitigate dust emissions at the conveyor transfer and drop points when the conveyor is active, in the drum scrubber when ore is mixed and at the crude ore recovery tunnel, the secondary crusher and the dryer during ore processing activities	▪ Not applicable, as the Project has not started.
5.6	The Proponent shall fill borehole necks with clean crushed rock to reduce dust and gas emissions from blasting during construction and operation.	▪ Not applicable, as the Project has not started.
5.7	The Proponent shall develop, prior to construction, a dust management strategy to control dust generated by vehicles associated with the Designated Project using the road to Schefferville and for vehicles entering Schefferville. The Proponent shall implement the strategy during all phases of the Designated Project. The Proponent shall provide the dust management strategy to the Agency prior to the start of construction. The Proponent shall review and update the dust management strategy in consultation with Indigenous groups, relevant authorities and the Town of Schefferville prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first.	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018.
5.8	Throughout all phases of the Designated Project, the Proponent shall implement incentive measures to reduce the number of vehicles from the Designated Project, including by providing shuttle buses to transport workers to and from the Designated Project area.	▪ TSMC is complying with this condition.
5.9	The Proponent shall develop, prior to construction, a follow-up program to verify the accuracy of the environmental assessment as it pertains to air quality and the effects of dust on the health of Indigenous peoples and to determine the effectiveness of the mitigation measures referred to in conditions 5.3 to 5.8. The Proponent shall provide the follow-up program to the Agency prior to the start of construction. The Proponent shall implement the follow-up program from the start of construction to the end of decommissioning of the Designated Project. The Proponent shall review and update the follow-up program in consultation with Indigenous groups and relevant authorities and shall provide the update to the Agency prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first. As part of the follow-up program, the Proponent shall:	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018
	5.9.1 monitor air quality at receptors R3, R9, R10, R16, R18, R24, R36, R38 and R40 identified by the Proponent in Table 7-13 of the environmental impact statement, including for total particulate matter, particulate matter less than 10 microns, particulate matter less than 2.5 microns, dustfall, nitrogen oxides, sulfur oxides, carbon monoxide, and periodic monitoring of nitrogen dioxides after blasting activities;	
	5.9.2 monitor dust generation and deposition from the Designated Project at locations potentially affected by the Designated Project, using a dust tracking system and mobile monitoring equipment;	
	5.9.3 analyse concentrations of contaminants of concern in dust, including a minimum of one sampling of heavy metal content between the months of June and August of every year that analyses are conducted; and	
	5.9.4 if the results of the follow-up program demonstrate that modified or additional mitigation measures are required, as determined in condition 2.6, at the Howse mini-plant, Designated Project roads, waste rock piles or overburden stockpiles, the Proponent shall implement modified or additional mitigation measures.	
5.10	The Proponent shall develop, prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first, and in consultation with Indigenous groups and relevant authorities, a follow-up program to verify the accuracy of the environmental assessment as it pertains to country foods. Country foods may include game birds, mammals, fish, and plant species. The Proponent shall implement the follow-up program. As part of the follow-up program, the Proponent shall:	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018
	5.10.1 sample country food species commonly consumed by Indigenous groups and identified in consultation with Indigenous groups including brook trout (Salvelinus fontinalis) and lake trout (Salvelinus namaycush);	

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	5.10.2 sample species identified in condition 5.10.1 for heavy metals, and other contaminants of concern identified in consultation with Indigenous groups and relevant authorities;	
	5.10.3 sample in areas where Indigenous groups harvest country foods and that may be adversely affected by the Designated Project and in a control site that is not affected by activities of the Designated Project. Fish sampling shall include sampling in Goodream Creek, Triangle Lake, and Pinette Lake; and	
	5.10.4 start sampling two years after the start of operation and continue sampling at a frequency and for a duration determined in consultation with Indigenous groups and relevant authorities.	
6. Current use of lands and resources for traditional purposes		
6.1	The Proponent shall upgrade, from the start of construction, a bypass road around the Designated Project in order to provide access for Indigenous groups to Pinette Lake, Kauteitnat and the Howells River Valley. The Proponent shall maintain the bypass road at least twice per calendar year until the end of decommissioning to ensure its usability.	▪ Not applicable at this time
6.2	The Proponent shall upgrade, from the start of construction, a bypass road around the Direct Shipping Ore 4 area in order to provide access for Indigenous groups to hunting grounds to the northwest of the Designated Project near the Kivivic and Goodwood deposits. The Proponent shall maintain the bypass road at least twice per calendar year until the end of decommissioning to ensure its usability.	▪ Not applicable at this time
6.3	The Proponent shall not use the bypass roads, referred to in conditions 6.1 and 6.2, for Designated Project activities, except when undertaking the maintenance of those bypass roads as required by conditions 6.1 and 6.2, or if required for safety or emergency reasons.	▪ The Proponent has not used the bypass road for any Project activities during the reporting year, with the exception of environmental monitoring, when other accesses are impassable
6.4	The Proponent shall prohibit employees and contractors associated with the Designated Project from fishing and hunting within the designated project area, unless an employee or a contractor is provided access by the Proponent for traditional purposes or for exercising Aboriginal rights, to the extent that such access is safe.	▪ This was respected during the reporting year
6.5	If the Proponent is made aware of or observes caribou within a 20-kilometre radius of the active pit or of the Howse mini-plant, the Proponent shall consult the Newfoundland and Labrador Department of Fisheries and Land Resources to determine the appropriate course of action.	▪ TSMC is not aware of any caribou within 20km of the active pit or the Howse mini-Plant
6.6	The Proponent shall develop, prior to construction, and implement during all phases of the Designated Project, a follow-up program to verify the accuracy of the environmental assessment as it pertains to the adverse effects of the Designated Project on the current use of lands and resources for traditional purposes and to determine the effectiveness of the mitigation measures referred to in conditions 6.1 to 6.4, including maintenance of the bypass roads. The Proponent shall provide the follow-up program to the Agency prior to the start of construction. The Proponent shall review and update the follow-up program in consultation with Indigenous groups and shall provide this update to the Agency prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first.	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018
6.7	The Proponent shall develop, prior to construction, and implement during all phases of the Designated Project, a follow-up program to verify the accuracy of the environmental assessment as it pertains to the adverse effects of the Designated Project on the George River herd of Eastern migratory caribou (Rangifer tarandus caribou). The Proponent shall provide the follow-up program to the Agency prior to the start of construction. The Proponent shall review and update the follow-up program in consultation with Indigenous groups and the Government of Newfoundland and Labrador, and shall provide this update to the Agency prior to operation or within 120 days of	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018

	CEAA Release Condition	2019 Activities
	the issuance of this Decision Statement, whichever comes first. As part of the follow-up program, the Proponent shall monitor movement of the George River herd of Eastern migratory caribou (*Rangifer tarandus caribou*) and develop and implement modified or additional mitigation measures if the range of the George River herd of Eastern migratory caribou (*Rangifer tarandus caribou*) expands to occupy areas within a 20-kilometre radius of the Designated Project.	
6.8	The Proponent shall develop, prior to construction and in consultation with Indigenous groups, a communication plan to share information related to the Designated Project with Indigenous groups. The Proponent shall implement and maintain the communication plan up to date during all phases of the Designated Project. The communication plan shall include procedures, including timing, for sharing information on the following: 6.8.1 the Designated Project activities requiring notification to Indigenous groups and the timing of these notifications. For blasting, the Proponent shall advertise blasting schedules via local radio stations and directly to Indigenous groups at a minimum 48 hours prior to each blasting event; 6.8.2 follow-up activities and monitoring results referred to in conditions 3.6, 4.7, 4.8, 5.9, 5.10, 6.6, 6.7, and 7.5; and 6.8.3 temporary and permanent restrictions on access to traditional territories, including the location and timing of these restrictions, the availability of alternate routes, and the timing of maintenance activities for the bypass roads as per 6.1 and 6.2.	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018 ▪ TSMC is committed to comply with this condition
6.9	The Proponent shall develop, as part of the communication plan referred to in condition in 6.8, procedures for Indigenous groups to provide feedback to the Proponent about adverse environmental effects caused by the Designated Project related to access to and use of traditional territories, traffic, air quality, including dust and dust deposition, and country foods and procedures for the Proponent to document and respond in a timely manner to the feedback received and demonstrate how issues have been addressed. The Proponent shall implement these procedures during all phases of the Designated Project.	▪ These procedures were in place during the reporting year
6.10	The Proponent shall provide Indigenous groups with the schedules referred to in conditions 10.1 and 10.2 and updates or revisions to the initial schedules pursuant to condition 10.3 and 10.4 at the same time these documents are provided to the Agency.	▪ Not applicable at this time
7. Physical and cultural heritage and structures, sites or things of historical, archaeological, paleontological or architectural significance		
7.1	If requested by Indigenous groups 48 hours prior to their planned use of Kauteitnat, the Proponent shall refrain from blasting for a period of 24 hours during that time of planned use of Kauteitnat, or less if Indigenous groups are no longer using Kauteitnat.	▪ Not applicable
7.2	The Proponent shall not conduct any Designated Project activity to the south of proposed water diversion ditch, identified in figure 2 in the environmental assessment report, except for activities required for the construction and maintenance of the diversion ditch. The Proponent shall clearly identify the exclusion zone with signage on the ground, within its lease area, posted at the edge of the exclusion zone.	▪ Not applicable as no project activity has taken place
7.3	During the months of June, July, August and September, the Proponent shall not blast more than twice in a week and more than five times per month.	▪ Not applicable as no project activity has taken place
7.4	The Proponent shall develop, prior to construction, and implement during all phases of the Designated Project, a protocol for receiving complaints related to the exposure to noise from the Designated Project. The Proponent shall provide the protocol to the Agency and Indigenous groups prior to the start of construction. The Proponent shall review and update the protocol in consultation with Indigenous groups and shall provide this update to the Agency and Indigenous groups prior to operation or within 120 days of the issuance of this Decision Statement,	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018

	CEAA Release Condition	2019 Activities
	whichever comes first. The Proponent shall respond to any noise complaints within 48 hours of the complaint being received and shall implement corrective actions to reduce exposure to noise in a timely manner.	
7.5	The Proponent shall develop prior to construction, and implement during all phases of the Designated Project, a follow-up program to verify the accuracy of the environmental assessment as it pertains to the effects of the Designated Project on the use of cultural and other sites as a result of noise levels. The Proponent shall provide the follow-up program to the Agency prior to the start of construction. The Proponent shall review and update the follow-up program in consultation with Indigenous groups and shall provide this update to the Agency prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first. As part of the follow-up program, the Proponent shall:	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018
	7.5.1 monitor noise levels at receptor sites R9, R10, R11, R13 and R24 identified by the Proponent in figure 7.10 of the environmental impact statement. The Proponent shall implement modified or additional mitigation measures if noise levels at these sites exceed 5 decibels above the baseline noise levels as a result of the Designated Project, except during blasting.	
7.6	The Proponent shall develop, prior to construction, and implement during all phases of the Designated Project a cultural heritage control plan. The Proponent shall provide the cultural heritage control plan to the Agency prior to the start of construction. The Proponent shall review and update the plan in consultation with Indigenous groups and the Government of Newfoundland and Labrador and shall provide this update to the Agency prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first. If any previously unidentified structures, sites or things of historical, archaeological, paleontological or architectural significance are discovered within the Designated Project area by the Proponent or brought to the attention of the Proponent by an Indigenous group or another party during construction, the Proponent shall:	▪ All required programs for the Howse Project were submitted to the Agency in Spring 2018
	7.6.2 delineate an area of at least 30 metres around the discovery as a no-work zone. The no-work requirement shall not apply to action(s) required to be undertaken to protect the integrity of the discovery;	
	7.6.3 have a qualified individual conduct an assessment at the location of the discovery;	
	7.6.4 inform Indigenous groups within 24 hours of the discovery, and allow for monitoring by Indigenous groups during work related to the discovery; and	
	7.6.5 comply, in consultation with Indigenous groups and relevant authorities, with all applicable legislative or legal requirements and associated regulations and protocols respecting the discovery, recording, transferring and safekeeping of previously unidentified structures, sites or things of historical, archaeological, paleontological or architectural significance.	
8. Cumulative Effects		
8.1	The Proponent shall participate in regional initiative(s), if requested by a relevant authority or the Town of Schefferville, relating to the monitoring, assessment and management of cumulative environmental effects, including cumulative health effects related to dust likely to result from the Designated Project in combination with other mining activities that have or will be carried out in the region, should there be any such initiative(s) during the construction and operation phases of the Designated Project.	▪ TSMC will continue to participate in regional initiatives if requested by regional Indigenous groups and/or authorities
9. Accidents and malfunctions		
9.1	The Proponent shall take all reasonable measures to prevent accidents and malfunctions that may result in adverse environmental effects. The measures taken by the Proponent shall include measures to prevent slope failures, sedimentation pond failures, ditch failures, destabilization of waste rock piles and overburden stockpiles, and rock slides.	▪ TSMC's environmental protection plan (EPP) and EPP and ERP lists measures to prevent accidents and malfunctions

	CEAA Release Condition	2019 Activities
		▪ In 2020, TSMC's EPP was updated. ▪ Those documents contain a retroaction process in which TSMC improves measures to prevent accidents and malfunctions.
9.2	The Proponent shall develop, prior to construction, and implement during all phases of the Designated Project, an accident and malfunction response plan. The accident and malfunction plan shall include the types of accidents and malfunctions that may cause adverse environmental effects, and response plans for slope failures, sedimentation pond failures, ditch failures, destabilization of waste rock piles and overburden stockpiles, or rock slides in addition to all emergency response plans identified in the environmental impact statement. The Proponent shall provide the accident and malfunction response plan to the Agency prior to the start of construction.	▪ Follow-up programs and plans for the Howse Project were submitted to the Agency in Spring 2018.
9.3	The Proponent shall review and update the measures to be implemented to prevent accidents and malfunctions and the accidents and malfunctions response plan in consultation with Indigenous groups and relevant authorities prior to operation or within 120 days of the issuance of this Decision Statement, whichever comes first.	▪ Not applicable for this reporting year.
9.4	In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall implement the accidents and malfunctions response plan referred to in condition 9.2 or any subsequent update(s) referred to in condition 9.3 and shall:	▪ An incident involving red water being discharged into the natural environment from the outlet culvert of Timmins 4 Sedimentation Pond 3 occurred in Spring 2019. The event was reported on, and a written report was submitted to the Agency.
	9.4.1 notify, as soon as possible, Indigenous groups and relevant authorities of the accident or malfunction, and notify the Agency in writing no later than 24 hours following the accident or malfunction. When notifying Indigenous groups and in the notification to the Agency, the Proponent shall specify;	
	9.4.1.1 the date the accident or malfunction occurred;	
	9.4.1.2 a description of the accident or malfunction;	
	9.4.1.3 a list of all substances potentially released in the environment as a result of the accident or malfunction.	
	9.4.2 implement immediate measures to mitigate any adverse environmental effects caused by the accident or malfunction;	
	9.4.3 submit a written report to the Agency no later than 30 days after the day on which the accident or malfunction took place. The written report shall include:	▪ An incident involving red water being discharged into the natural environment from the outlet culvert of Timmins 4 Sedimentation Pond 3 occurred in Spring 2019. The event was reported on, and a written report was submitted to the Agency.
	9.4.3.1 a description of the accident or malfunction and of its adverse environmental effects;	
	9.4.3.2 the measures that were taken by the Proponent to mitigate the adverse environmental effects caused by the accident or malfunction;	
	9.4.3.3 any view(s) from Indigenous groups and advice from relevant authorities received with respect to the accident or malfunction, its adverse environmental effects and the measures taken by the Proponent to mitigate these adverse environmental effects;	
	9.4.3.4 a description of any residual adverse environmental effects and any modified or additional measures required by the Proponent to mitigate residual adverse environmental effects; and	
	9.4.3.5 details concerning the implementation of the accident or malfunction response plan referred to in condition	

	CEAA Release Condition	2019 Activities
	9.2 or any subsequent update(s) referred to in condition 9.3.	
	9.4.4 submit a written report to the Agency no later than 90 days after the day on which the accident or malfunction took place, on the changes made to avoid a subsequent occurrence of the accident or malfunction and on the implementation of any modified or additional measure(s) to mitigate and monitor residual adverse environmental effects and to carry out any required progressive reclamation, taking into account the information submitted in the written report pursuant to condition 9.4.3. The report shall include all additional views from Indigenous groups and advice from relevant authorities since the views and advice referred to in condition 9.4.3.3 have been received by the Proponent.	▪ An incident involving red water being discharged into the natural environment from the outlet culvert of Timmins 4 Sedimentation Pond 3 occurred in Spring 2019. The event was reported on, and a written report was submitted to the Agency.
9.5	The Proponent shall develop a communication plan in consultation with Indigenous groups. The Proponent shall develop the communication plan prior to construction and shall implement and keep it up to date during all phases of the Designated Project. The plan shall include:	▪ Follow-up programs for the Howse Project were submitted to the Agency in Spring 2018.
	9.5.1 the types of accidents and malfunctions requiring the Proponent to notify the respective Indigenous groups;	
	9.5.2 the manner by which Indigenous group shall be notified by the Proponent of an accident or malfunction and of any opportunities for the Indigenous groups to assist in the response to the accident or malfunction; and	
	9.5.3 the contact information of the representatives of the Proponent that the Indigenous groups may contact and of the representatives of the respective Indigenous groups to which the Proponent provides notification.	
10. Schedules		
10.1	The Proponent shall submit to the Agency a schedule for all conditions set out in this Decision Statement no later than 30 days after the start of construction. The schedule shall detail all activities planned to fulfill each condition set out in this Decision Statement and the commencement and estimated completion month(s) and year(s) for each of these activities.	▪ Not applicable, as construction phase has not started.
10.2	The Proponent shall submit to the Agency a schedule outlining all activities required to carry out all phases of the Designated Project no later than 30 days after the start of construction. The schedule shall indicate the commencement and estimated completion month(s) and year(s) and duration of each of these activities.	▪ Not applicable, as construction phase has not started.
10.3	The Proponent shall submit to the Agency in writing an update to schedules referred to in conditions 10.1 and 10.2 every year no later than June 30, until completion of all activities referred to in each schedule.	▪ Not applicable, as construction phase has not started.
10.4	The Proponent shall provide to the Agency revised schedules if any change(s) are made to the initial schedules referred to in condition 10.1 and 10.2 or to any subsequent update(s) referred to in condition 10.3, upon revision of the schedules.	▪ Not applicable, as construction phase has not started.
11. Record Keeping		
11.1	The Proponent shall maintain all records required to demonstrate compliance with the conditions set out in this Decision Statement. The Proponent shall provide the aforementioned records to the Agency upon demand within a timeframe specified by the Agency.	▪ TSMC is committed to comply with this condition.
11.2	The Proponent shall retain all records referred to in condition 11.1 at a facility in Canada. The records shall be retained and made available throughout construction and operation and for 25 years following the end of operation or until the end of decommissioning of the Designated Project, whichever comes first. The Proponent shall notify the Agency at least 30 days prior to any change to the physical location of the facility where the records are retained, and shall provide to the Agency the address of the new location.	▪ TSMC is committed to comply with this condition.

Appendix 1 Laboratory Services Notice

July 18, 2019

Mariana Trindade, PhD
Corporate Environmental Manager
Tata Steel Minerals Canada Ltd
1000 Sherbrooke West, Suite 1120
Montreal, QC H3A 3G4

RE: Service Issues and Delayed Laboratory Results, May to July 2019

Ms. Trindade,

AGAT Laboratories Ltd (AGAT) was retained in May 2019 by Tata Steel Minerals Canada Ltd (TSMC) to perform analytical chemistry services related to compliance and operational monitoring in Schefferville, Quebec.

The scope of services included analysis of air, effluent, surface water, groundwater, and potable water for various organic and inorganic parameters related to compliance and operational requirements at the mine site. TSMC submitted samples to AGAT for 22 separate monitoring events dating back to May, of which, 17 remained outstanding as of July 18, 2019. TSMC has expressed concern that AGAT's service level and laboratory turnaround time are not meeting expectations. These issues have impacted TSMC's monitoring program schedules and regulatory obligations.

The intent of this letter is to provide TSMC an acknowledgement / explanation for the issues encountered over the last two months, as well as a description of the actions being taken to resolve the outstanding files and to ensure future files are serviced and reported in-line with expectations. Service-level issues include:

1) Delays in shipment of properly prepared bottle orders;
2) Delays in supply of required materials to facilitate monitoring programs;
3) Delays in response on various queries from TSMC;
4) Inadequate communication from AGAT to TSMC;
5) Delayed / missed results; and
6) No regulatory reporting of XML files to Newfoundland and Labrador regulator.

The issues are associated primarily with workload management and resource allocation in our Quebec operations. An unusually high volume of projects (significantly high) is ongoing during a time that is typically a reasonably slow period for the industry. It has resulted in a misalignment of capable resources relative to the demands and training levels on front-line staff, in particular, project management staff. Despite AGAT's best efforts to increase staff compliment, train new staff, and parachute senior resources into Quebec, the project management team is not yet fully equipped to manage the extensive backlog. As a result, there are significant delays in logging samples, preparing confirmations, reviewing confirmations, and issuing work orders to the laboratory and logistics staff (e.g., bottle orders). Furthermore, the support staff for project management are being trained and mentored during peak-season levels of backlog, but they are not proficient as of yet.

Effective immediately, AGAT has assigned Ms. Janetta Fraser, Client Services Manager in Atlantic Canada, to act as the project manager for all activities between TSMC and AGAT, from bottle orders through to reporting. Ms. Fraser will act as the liaison between TSMC and the laboratories in Quebec. She has extensive experience managing projects of this nature for mine operations in remote (fly-in) geographies such as northern Labrador and central Newfoundland. Ms. Fraser is well-versed on the regulatory requirements and routinely works with the regulators in Newfoundland and Labrador.

Ms. Fraser will be supported by Mr. Phil Morneau, Chief Science Director (resides in Quebec), to complete a detailed review of the current status of TSMC, while facilitating improved service levels moving forward, including but not limited to:

- All outstanding files will be expedited
- XML reports will be issued
- Chain of custody documentation will be customized to TSMC's specific monitoring programs
- TSMC parameter packages will be customized within AGAT's Laboratory Information Management System (LIMS) and Environmental Reporting System (ERS) to reflect the requirements of the monitoring programs, including regulatory detection limits
- And more…

We trust that the information presented herein is of sufficient detail to explain the issues and the impact to TSMC, while demonstrating that we have taken the necessary actions to address the deficiencies such that our delivery of services will meet your expectations as we approach the end of July.

If you have any questions regarding the information herein, please do not hesitate to contact me at any time.

Sincerely,

<Original signed by>

Scott Preston
Vice President
Office: <Personal information removed>
Mobile: <Personal information removed>

Appendix 2 Surface Water Certificates of Analysis

AGAT Laboratories

9770 ROUTE TRANSCANADIENNE
ST. LAURENT, QUEBEC
CANADA H4S 1V9
TEL (514)337-1000
FAX (514)333-3046
http://www.agatlabs.com

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Howse Quarterly Surface Water

AGAT WORK ORDER: 19M484630

WATER ANALYSIS REVIEWED BY: Amar Bellahsene, Chimiste

DATE REPORTED: 2019-08-07

VERSION*: 1

PAGES (INCLUDING COVER): 14

Should you require any information regarding this analysis please contact your client services representative at (514) 337-1000

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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FAX (514)333-3046
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Certificate of Analysis

AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

Inorganic Analyses

DATE RECEIVED: 2019-06-25

DATE REPORTED: 2019-08-07

SAMPLE DESCRIPTION:				HOW-SW1-Q1-2019	HOW-SW2-Q1-2019	HOW-SW3-Q1-2019	HOW-SW4-Q1-2019	HOW-SW5-Q1-2019	HOW-BC-Q1-2019	HOW-BL-Q1-2019	HOW-TL-Q1-2019
SAMPLE TYPE:				SW	SW	SW	SW	SW	SW	SW	SW
DATE SAMPLED:				2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20
Parameter	Unit	G / S	RDL	307536	311867	311868	311869	311870	311871	311872	311873
Alkalinity	mg/L - CaCO3		1.5	10.2	<1.5	<1.5	5.9	<1.5	<1.5	10.8	9.2
Ammonia Nitrogen	mg/L - N		0.02	0.17	0.09	0.08	0.03	0.10	0.04	0.14	0.08
Total Kjeldahl Nitrogen	mg/L - N		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Bicarbonate	mg/L - CaCO3		1.5	10.2	<1.5	<1.5	5.9	<1.5	<1.5	10.8	9.2
Carbonate	mg/L - CaCO3		1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Dissolved Organic Carbon	mg/L		0.30	1.03	3.65	3.94	1.44	1.81	5.24	4.10	2.06
Chloride	mg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Conductivity (25 Celsius)	µmhos/cm		2	27	5	4	20	4	6	28	24
True Colour	TCU		5	7	25	23	7	8	41	35	18
Total Suspended Solids	mg/L		2	<2	<2	<2	<2	<2	<2	12	<2
Nitrite + Nitrate	mg/L - N		0.04	0.13	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Nitrate	mg/L - N		0.02	0.13	<0.02	<0.02	0.18	<0.02	<0.02	<0.02	0.04
Nitrite	mg/L - N		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
ortho-Phosphate	mg/L - P		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Oxygen	mg/L		3	12	7	9	10	8	7	8	9
pH	pH		NA	8.10	6.15	5.47	6.70	6.21	5.61	6.50	6.92
Total Phenols	mg/L		0.002	0.003	<0.002	<0.002	<0.002	0.002	<0.002	0.003	0.002
Total Phosphorus	mg/L - P		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Reactive silica	mg/L		0.05	4.82	1.15	1.60	3.30	1.15	2.59	4.10	3.60
Dissolved Solids	mg/L		10	26	14	16	22	16	26	32	24
Sulfate	mg/L		0.5	1.9	0.7	<0.5	2.0	<0.5	0.7	1.8	1.9
Total Sulfide	mg/L S-2		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02
Turbidity	NTU		0.2	0.4	1.0	<0.2	0.5	0.7	0.8	2.0	1.6
Nitrite-Nitrate (Montreal) (mg/L -N)	mg/L - N		0.04	0.13	<0.04	<0.04	0.18	<0.04	<0.04	<0.04	0.04

Certified By: <Original signed by>

Amar Bellahse 2011-214

AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDELCC where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDELCC.

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CANADA H4S 1V9
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FAX (514)333-3046
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

Inorganic Analyses

DATE RECEIVED: 2019-06-25

DATE REPORTED: 2019-08-07

		SAMPLE DESCRIPTION:		HOW-NL-Q1-2019
		SAMPLE TYPE:		SW
		DATE SAMPLED:		2019-06-20
Parameter	Unit	G / S	RDL	311874
Alkalinity	mg/L - CaCO3		1.5	3.4
Ammonia Nitrogen	mg/L - N		0.02	0.33
Total Kjeldahl Nitrogen	mg/L - N		0.3	<0.3
Bicarbonate	mg/L - CaCO3		1.5	3.4
Carbonate	mg/L - CaCO3		1.5	<1.5
Dissolved Organic Carbon	mg/L		0.30	2.79
Chloride	mg/L		0.5	<0.5
Conductivity (25 Celsius)	µmhos/cm		2	10
True Colour	TCU		5	37
Total Suspended Solids	mg/L		2	2
Nitrite + Nitrate	mg/L - N		0.04	<0.04
Nitrate	mg/L - N		0.02	<0.02
Nitrite	mg/L - N		0.02	<0.02
ortho-Phosphate	mg/L - P		0.02	<0.02
Dissolved Oxygen	mg/L		3	7
pH	pH		NA	6.53
Total Phenols	mg/L		0.002	0.003
Total Phosphorus	mg/L - P		0.02	<0.02
Reactive silica	mg/L		0.05	1.05
Dissolved Solids	mg/L		10	26
Sulfate	mg/L		0.5	1.7
Total Sulfide	mg/L S-2		0.02	<0.02
Turbidity	NTU		0.2	6.7
Nitrite-Nitrate (Montreal) (mg/L -N)	mg/L - N		0.04	<0.04

Certified By: <Original signed by>

CHIMISTE Amar Bellahse 2011-214 QUEBEC

AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDELCC where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDELCC.

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Certificate of Analysis

AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

Inorganic Analyses

DATE RECEIVED: 2019-06-25 **DATE REPORTED: 2019-08-07**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

307536 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range or reduce matrix interference. The holding time for pH had passed.

311867-311874 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range or reduce matrix interference.

Certified By:

<Original signed by>

AGAT Laboratories
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Certificate of Analysis

AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

Total Extractable Metals

DATE RECEIVED: 2019-06-25

DATE REPORTED: 2019-08-07

SAMPLE DESCRIPTION:				HOW-SW1-Q1-2019	HOW-SW2-Q1-2019	HOW-SW3-Q1-2019	HOW-SW4-Q1-2019	HOW-SW5-Q1-2019	HOW-BC-Q1-2019	HOW-BL-Q1-2019	HOW-TL-Q1-2019
SAMPLE TYPE:				SW	SW	SW	SW	SW	SW	SW	SW
DATE SAMPLED:				2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20
Parameter	Unit	G / S	RDL	307536	311867	311868	311869	311870	311871	311872	311873
Aluminum	µg/L		5	15	83	60	21	31	143	78	38
Antimony	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Silver	µg/L		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	µg/L		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	<0.3
Barium	µg/L		2	2	3	<2	<2	2	2	4	3
Beryllium	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Bismuth	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Boron	µg/L		40	<40	<40	<40	<40	<40	<40	<40	<40
Cadmium	µg/L		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Calcium	µg/L		100	2120	371	251	1530	496	501	3030	2080
Chromium	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper	µg/L		1	<1	<1	<1	<1	<1	2	4	<1
Tin	µg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Iron	µg/L		60	145	218	<60	<60	140	189	1030	162
Magnesium	µg/L		100	2010	236	165	1490	228	412	1500	1940
Manganese	µg/L		1	8	35	8	2	7	16	63	10
Mercury	µg/L		0.01	<0.01	<0.01	<0.01	0.04	0.01	0.02	0.02	0.03
Molybdenum	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	µg/L		1	<1	<1	<1	<1	<1	1	2	<1
Lead	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Potassium	µg/L		100	287	<100	<100	239	103	<100	478	316
Selenium	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Sodium	µg/L		200	918	452	343	563	691	739	1730	908
Strontium	µg/L		10	<10	<10	<10	<10	<10	<10	14	<10
Thallium	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Titanium	µg/L		3	<3	<3	<3	<3	<3	<3	<3	<3

Certified By: <Original signed by>

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AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

Total Extractable Metals

DATE RECEIVED: 2019-06-25

DATE REPORTED: 2019-08-07

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: HOW-SW1-Q1-2019	HOW-SW2-Q1-2019	HOW-SW3-Q1-2019	HOW-SW4-Q1-2019	HOW-SW5-Q1-2019	HOW-BC-Q1-2019	HOW-BL-Q1-2019	HOW-TL-Q1-2019
				SAMPLE TYPE: SW	SW	SW	SW	SW	SW	SW	SW
				DATE SAMPLED: 2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20	2019-06-20
				307536	311867	311868	311869	311870	311871	311872	311873
Uranium	µg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	µg/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L		3	17	4	5	<3	23	16	37	15
Hardness	µg/L - CaCO3		1000	13600	1900	1310	9960	2180	2950	13700	13200

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PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

Total Extractable Metals

DATE RECEIVED: 2019-06-25

DATE REPORTED: 2019-08-07

		SAMPLE DESCRIPTION:		HOW-NL-Q1-2019
		SAMPLE TYPE:		SW
		DATE SAMPLED:		2019-06-20
Parameter	Unit	G / S	RDL	311874
Aluminum	µg/L		5	95
Antimony	µg/L		1	<1
Silver	µg/L		0.2	<0.2
Arsenic	µg/L		0.3	<0.3
Barium	µg/L		2	<2
Beryllium	µg/L		1	<1
Bismuth	ug/L		1	<1
Boron	µg/L		40	<40
Cadmium	µg/L		0.2	<0.2
Calcium	µg/L		100	1070
Chromium	µg/L		1	<1
Cobalt	µg/L		0.5	<0.5
Copper	µg/L		1	<1
Tin	µg/L		5	<5
Iron	µg/L		60	184
Magnesium	µg/L		100	834
Manganese	µg/L		1	11
Mercury	µg/L		0.01	0.02
Molybdenum	µg/L		1	<1
Nickel	µg/L		1	<1
Lead	µg/L		0.5	<0.5
Potassium	µg/L		100	179
Selenium	µg/L		1	<1
Sodium	µg/L		200	470
Strontium	µg/L		10	<10
Thallium	µg/L		1	<1
Titanium	µg/L		3	<3

Certified By: <Original signed by>

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AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

Total Extractable Metals

DATE RECEIVED: 2019-06-25

DATE REPORTED: 2019-08-07

			SAMPLE DESCRIPTION:	HOW-NL-Q1-2019
			SAMPLE TYPE:	SW
			DATE SAMPLED:	2019-06-20
Parameter	Unit	G / S	RDL	311874
Uranium	µg/L		0.5	<0.5
Vanadium	µg/L		1	<1
Zinc	µg/L		3	11
Hardness	µg/L - CaCO3		1000	6110

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

307536-311874 Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range or reduce matrix interference.

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
AGAT WORK ORDER: 19M484630
PROJECT: Howse Quarterly Surface Water
ATTENTION TO: Mariana Trindade
SAMPLED BY:Adam Calvat
SAMPLING SITE:HOWSE

Water Analysis

RPT Date: 2019-08-07			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Extractable Metals															
Aluminum	304598		87	85	2.3%	< 5	106%	80%	120%	100%	80%	120%	NA	80%	120%
Antimony	304598		<1	<1	NA	< 1	106%	80%	120%	97%	80%	120%	118%	80%	120%
Silver	304598		<0.2	<0.2	NA	< 0.2	NA	80%	120%	100%	80%	120%	105%	80%	120%
Arsenic	304598		<0.3	<0.3	NA	< 0.3	102%	80%	120%	102%	80%	120%	NA	80%	120%
Barium	304598		12	12	0.0%	< 2	90%	80%	120%	90%	80%	120%	NA	80%	120%
Beryllium	304598		<1	<1	NA	< 1	108%	80%	120%	105%	80%	120%	NA	80%	120%
Bismuth	304598		<1	<1	NA	< 1	NA	80%	120%	103%	80%	120%	104%	80%	120%
Boron	304598		59	59	NA	< 40	120%	80%	120%	100%	80%	120%	NA	80%	120%
Cadmium	304598		<0.2	<0.2	NA	< 0.2	103%	80%	120%	101%	80%	120%	NA	80%	120%
Calcium	304598		9290	9640	3.7%	< 100	98%	80%	120%	100%	80%	120%	NA	80%	120%
Chromium	304598		1	1	NA	< 1	111%	80%	120%	100%	80%	120%	109%	80%	120%
Cobalt	304598		<0.5	<0.5	NA	< 0.5	104%	80%	120%	100%	80%	120%	102%	80%	120%
Copper	304598		17	17	0.0%	< 1	105%	80%	120%	99%	80%	120%	NA	80%	120%
Tin	304598		<5	<5	NA	< 5	NA	80%	120%	101%	80%	120%	104%	80%	120%
Iron	304598		61	61	NA	< 60	104%	80%	120%	102%	80%	120%	NA	80%	120%
Magnesium	304598		1970	2020	2.5%	< 100	110%	80%	120%	96%	80%	120%	NA	80%	120%
Manganese	304598		11	11	0.0%	< 1	104%	80%	120%	97%	80%	120%	NA	80%	120%
Mercury	1		NA	NA	0.0%	< 0.01	89%	80%	120%	94%	80%	120%	NA	80%	120%
Molybdenum	304598		<1	<1	NA	< 1	103%	80%	120%	101%	80%	120%	108%	80%	120%
Nickel	304598		1	1	NA	< 1	106%	80%	120%	98%	80%	120%	115%	80%	120%
Lead	304598		0.7	0.7	NA	< 0.5	101%	80%	120%	104%	80%	120%	91%	80%	120%
Potassium	304598		557	567	1.8%	< 100	110%	80%	120%	96%	80%	120%	113%	80%	120%
Selenium	304598		<1	<1	NA	< 1	107%	80%	120%	102%	80%	120%	NA	80%	120%
Sodium	304598		8650	9070	4.7%	< 200	114%	80%	120%	97%	80%	120%	NA	80%	120%
Strontium	304598		32	32	NA	< 10	101%	80%	120%	101%	80%	120%	110%	80%	120%
Thallium	304598		<1	<1	NA	< 1	100%	80%	120%	103%	80%	120%	104%	80%	120%
Titanium	304598		<3	<3	NA	< 3	NA	80%	120%	100%	80%	120%	113%	80%	120%
Uranium	304598		<0.5	<0.5	NA	< 0.5	99%	80%	120%	103%	80%	120%	103%	80%	120%
Vanadium	304598		2	2	NA	< 1	107%	80%	120%	102%	80%	120%	107%	80%	120%
Zinc	304598		249	257	3.2%	< 3	107%	80%	120%	99%	80%	120%	NA	80%	120%
Inorganic Analyses															
Alkalinity	307838		32.0	32.8	2.5%	< 1.5	96%	80%	120%	92%	80%	120%	87%	80%	120%
Ammonia Nitrogen	292619		627	638	1.7%	< 0.02	119%	80%	120%	96%	80%	120%	NA	80%	120%
Bicarbonate	307838		32.0	32.8	2.5%	< 1.5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carbonate	307838		<1.5	<1.5	NA	< 1.5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Organic Carbon	1		NA	NA	0.0%	< 0.30	111%	80%	120%	106%	80%	120%	NA	80%	120%

Comments: NA : Non applicable
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
NA as the percent recovery for the matrix spike indicates that the result is not provided due to the heterogeneity of the sample or the spiked analyte concentration was lower than the matrix contribution.
NA in the spiked blank or CRM indicates that it is not required by the procedure.
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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD | **AGAT WORK ORDER: 19M484630**

PROJECT: Howse Quarterly Surface Water | **ATTENTION TO: Mariana Trindade**

SAMPLED BY:Adam Calvat | **SAMPLING SITE:HOWSE**

Water Analysis (Continued)

RPT Date: 2019-08-07			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Chloride	306246		<0.5	<0.5	NA	< 0.5	99%	80%	120%	88%	80%	120%	89%	80%	120%
Conductivity (25 Celsius)	316798		631	636	0.8%	< 2	103%	80%	120%	85%	80%	120%	103%	80%	120%
True Colour	1					< 5		80%	120%		80%	120%		80%	120%
Total Suspended Solids	309279		8	9	NA	< 2	99%	80%	120%	NA			105%	80%	120%
Nitrate	306246		<0.02	<0.02	NA	< 0.02	99%	80%	120%	100%	80%	120%	101%	80%	120%
Nitrite	306246		<0.02	<0.02	NA	< 0.02	NA	80%	120%	95%	80%	120%	95%	80%	120%
ortho-Phosphate	304010		17.8	17.9	0.6%	< 0.02	104%	80%	120%	90%	80%	120%	NA	80%	120%
pH	310589		6.23	6.23	0.0%		100%	80%	120%	99%	80%	120%	NA		
Total Phenols	307536	307536	0.003	0.003	NA	< 0.002	86%	80%	120%	110%	80%	120%	80%	80%	120%
Reactive silica	307536	307536	4.81	4.80	0.2%	< 0.05	113%	90%	110%	120%	70%	130%	107%	70%	130%
Dissolved Solids	312162		58	58	0.0%	< 10	102%	80%	120%	NA			106%	80%	120%
Sulfate	306246		1.8	1.8	NA	< 0.5	101%	80%	120%	97%	80%	120%	98%	80%	120%
Turbidity	311874		6.7	6.7	0.0%	< 0.2	118%	80%	120%	100%	80%	120%	107%	80%	120%

Comments: NA : Non applicable
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NA in the spiked blank or CRM indicates that it is not required by the procedure.
The percent recovery of the CRM may be outside of the acceptability criteria of 80-120%, if conform to the criteria provided on the Certificate of Analysis of the reference material.

Inorganic Analyses

Reactive silica	311867		3.152	3.16	0.3%	< 0.05	102%	90%	110%	111%	70%	130%	NA	70%	130%

Comments: NA : Non applicable
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
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Comments: NA : Non applicable
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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

Water Analysis (Continued)

RPT Date: 2019-08-07			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Inorganic Analyses															
Reactive silica	311867		3.152	3.16	0.3%	< 0.05	102%	90%	110%	111%	70%	130%	NA	70%	130%

Comments: NA : Non applicable
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
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The percent recovery of the CRM may be outside of the acceptability criteria of 80-120%, if conform to the criteria provided on the Certificate of Analysis of the reference material.

Inorganic Analyses															
Reactive silica	311867		3.152	3.16	0.3%	< 0.05	102%	90%	110%	111%	70%	130%	NA	70%	130%
Total Sulfide	312492		0.61	0.62	0.0%	< 0.02	92%	80%	120%	90%	80%	120%	NA	80%	120%

Comments: NA : Non applicable
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
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The percent recovery of the CRM may be outside of the acceptability criteria of 80-120%, if conform to the criteria provided on the Certificate of Analysis of the reference material.

Inorganic Analyses															
Reactive silica	311867		3.152	3.16	0.3%	< 0.05	102%	90%	110%	111%	70%	130%	NA	70%	130%
Total Sulfide	290306		0.043	0.047	0.0%	< 0.02	97%	80%	120%	91%	80%	120%	108%	80%	120%

Comments: NA : Non applicable
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
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<Original signed by>

Certified By:

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FAX (514)333-3046
http://www.agatlabs.com

Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis					
Alkalinity	2019-07-04	2019-07-04	INOR-101-6000F, unaccredited by MDDELCC	MA. 315 - Alc-Aci 1.0	TITRATION
Ammonia Nitrogen	2019-07-10	2019-07-10	INOR-101-6051F	MA. 303 - N 2.0	COLORIMETRY
Total Kjeldahl Nitrogen	2019-07-18	2019-07-18	INOR-101-6048F	MA.300-NTPT 2.0	COLORIMETRY
Bicarbonate	2019-07-04	2019-07-04	INOR-101-6000F	MA. 315 - Alc-Aci 1.0	TITRATION
Carbonate	2019-07-04	2019-07-04	INOR-101-6000F	MA. 315 - Alc-Aci 1.0	TITRATION
Dissolved Organic Carbon	2019-07-05	2019-07-05	INOR-101-6049F, unaccredited by MDDELCC	MA.300-C1.0	INFRARED DETECTION
Chloride	2019-07-06	2019-07-06	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Conductivity (25 Celsius)	2019-07-03	2019-07-03	INOR-101-6016F	MA.115-Cond. 1.1	CONDUCTIVIMETER
True Colour	2019-06-28	2019-06-28	INOR-101-6046F	MA. 103 - Col 2.0	SPECTROPHOTOMETRY
Total Suspended Solids	2019-07-02	2019-07-03	INOR-101-6028F	MA. 115 - S.S. 1.2	GRAVIMETRY
Nitrite + Nitrate			INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Nitrate	2019-07-06	2019-07-06	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Nitrite	2019-07-06	2019-07-06	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
ortho-Phosphate	2019-08-02	2019-08-02	INOR-101-6052F	MA.300-P 1.1	COLORIMETRY
Dissolved Oxygen	2019-07-05	2019-07-05	Special	SM 4500-O G . 21 ième ed.	ELECTROMETRIC
pH	2019-06-28	2019-06-28	INOR-101-6021F	MA. 100 - pH 1.1	ELECTROMETRIC
Total Phenols	2019-07-05	2019-07-05	INOR-101-6062F	MA. 404 - I. Phé 2.2	COLORIMETRY
Total Phosphorus	2019-07-17	2019-07-17	INOR-101-6048F	MA.300-NTPT 2.0	COLORIMETRY
Reactive silica	2019-07-25	2019-08-05	INOR-101-6071F, non accrédité MDDELCC	AQ2 EPA-122A Rev 5	COLORIMETRY
Dissolved Solids	2019-07-11		INOR-101-6054F	MA.115-S.D. 1.0	GRAVIMETRY
Sulfate	2019-07-06	2019-07-06	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Total Sulfide	2019-07-04	2019-07-05	INOR-101-6055F	MA.300-S 1.2	SPECTROPHOTOMETRY
Turbidity	2019-06-28	2019-06-28	INOR-101-6044F	MA.103 Tur.1.0	NEPHELOMETER
Aluminum	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Antimony	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Silver	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Arsenic	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Barium	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Beryllium	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Bismuth	2019-07-02	2019-07-03	MET-101-6105F, non accrédité par le MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Boron	2019-07-02	2019-07-03	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Cadmium	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Calcium	2019-07-02	2019-07-03	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Met 1.2	ICP/MS
Chromium	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Cobalt	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Copper	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Tin	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Iron	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Magnesium	2019-07-02	2019-07-03	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Met 1.2	ICP/MS
Manganese	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Mercury	2019-07-02	2019-07-02	MET-101-6102F	MA. 200 Hg 1.1	COLD VAPOR/AA
Molybdenum	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Nickel	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Lead	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19M484630

PROJECT: Howse Quarterly Surface Water

ATTENTION TO: Mariana Trindade

SAMPLED BY:Adam Calvat

SAMPLING SITE:HOWSE

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Potassium	2019-07-02	2019-07-03	MET-101-6105F, non accrédité par le MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Selenium	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Sodium	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Strontium	2019-07-02	2019-07-03	MET-101-6105F, non accrédité par le MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Thallium	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Titanium	2019-07-02	2019-07-03	MET-101-6105F, non accrédité par le MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Uranium	2019-07-02	2019-07-03	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Vanadium	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Zinc	2019-07-02	2019-07-03	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Hardness	2019-07-03	2019-07-03	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Met 1.2	ICP/MS

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Chaîne de traçabilité Environnement

Eau potable RQEP (réseau) – Veuillez utiliser le formulaire du MDDELCC

À l'usage exclusif du laboratoire
Bon de travail AGAT: 19M484630
Nb. de glacières:
Température à l'arrivée: 22,6 2 3,2 2 2,4
☐ Glace ☒ Bloc réfrigérant ☐ Aucun
Scélé légal Intact: ☐ Oui ☒ Non ☐ N/A

Information pour le rapport
Compagnie : Tata Steel Minerals Canada
Adresse : 1000 Rue Shubrooke Ouest, Montreal, QC, H3A 3G4
Téléphone : 514.764.6700 Téléc. :
Projet : Howse Quarterly Surface Water
Lieu de prélèvement : Howse
Prélevé par : Adam Calvert

Rapport envoyé à
1. Nom: Mariana Trindade
Courriel: mariana.trindade@tatasteelcanada.com
2. Nom: Team Email List
Courriel: (provided to AGAT)

Format de rapport
☒ Portrait *(échantillon/page)* ☐ Paysage *(échantillons/page)*

Critères à respecter
☐ PRTC ABC ☐ RESC
☐ CCME
☐ Eau consommation
☐ Eau résurg. Surface
☐ Eau résurg. Salée
CMM Sanitaire ☐ Pluvial ☐
☐ Autre.

Délais d'analyse requis (jours ouvrables)
Environnemental:
Régulier: ☒ 5 à 7 jours
Urgent: ☐ Même jour ☐ 1 jour ☐ 2 jours ☐ 3 jours
Haute Résolution:
Régulier: ☐ 10 à 15 jours
Urgent: ☐ < 10 jours
Date Requise: ________ AA/MM/JJ

Facturé à Même adresse : ☒ Oui ☐ Non
Compagnie :
Contact :
Courriel :
Adresse :
Bon de commande : 3000000242 Soumission :

Commentaires:

Matrice (légende)
S	Sol	B	Boue	EP	Eau potable	EB	Eau brute
SL	Solide	EU	Eau usée	SE	Sédiment	ES	Eau de surface
				EF	Effluent	ST	Eau souterraine
				EPI	Eau de piscine	AF	Affluent
				A	Air		

Analyses (colonnes): Hydrocarbures pétroliers C10-C50; HAP; BTEX ☐ HAM ☐ HAC-HAM ☐ THM ☐; Chlorobenzènes ☐ Phtalates ☐ COSV ☐; BPC: Congénères ☐ Aroclor ☐ CBNC ☐; Éthylène glycol ☐ Formaldéhyde ☐; Huiles et graisses: Minérales ☐ Totales ☐; Pesticides: OC ☐ OP ☐ Herbicides ☐; Diquat / Paraquat ☐ Glyphosate ☐; Phénols (GC-MS) ☐ Indice phénolique (4AAP) ☐; Métaux - Sol ☐ Hg ☐ Se ☐ CrVI ☐; Métaux - ST ☐ Hg ☐ CrVI ☐ CrIII ☐ U ☐; Métaux: Filtré sur terrain ☐ Filtré au lab ☐; Métaux (spécifier): ; Dureté totale ☐; Alcalinité ☐ Bromates ☐ Conductivité ☐; Chlorures ☐ Fluorures ☐ Sulfates ☐ Bromures ☐; Cyanures: Totaux ☐ Disponibles ☐ Oxydables ☐; DCO ☐ COT ☐; $NH_3 + NH_4$ ☐ NTK ☐ $NO_2 + NO_3$ ☐ P total ☐; Solides: Totaux ☐ Dissous ☐ MES ☐ MESV ☐; Sulfures - Eau ☐ Soufre total - Sol ☐; COURT DÉLAI DE CONSERVATION: pH ☐ NO_2 ☐ NO_3 ☐ o-PO4 ☐ COD ☐; Absorbance UV ☐ Couleur ☐ Turbidité ☐; DBO_5 ☐ DBO_5 Carbonée ☐; Coliformes: Totaux ☐ Fécaux ☐ E.coli ☐; Microbiologie (autre): ; HR/MS: Dioxines/Furanes ☐ HAP ☐ BPC ☐; CMM 2008-47: Sanitaire ☐ Pluvial ☐ NP ☐ NPE ☐; RMD ☐ REIMR art.

IDENTIFICATION DE L'ÉCHANTILLON	PRÉLÈVEMENT DATE (AA/MM/JJ)	PRÉLÈVEMENT HEURE	MATRICE	NB. DE CONTENANTS	Analyses
HOW-SW1-Q1-2019	(19/06/20)	12:05pm	ES	10	"APPENDIX A p2/12 – Laboratory Analyses" + TKN and NH3
HOW-SW2-Q1-2019	"	10:35am	"	"	" + "
HOW-SW3-Q1-2019	"	10:15am	"	"	" + "
HOW-SW4-Q1-2019	"	11:35am	"	"	" + "
HOW-SW5-Q1-2019	"	2:00pm	"	"	" + "
HOW-BC-Q1-2019	"	10:20am	"	"	" + "
HOW-BL-Q1-2019	"	11:50am	"	"	" + "
HOW-TL-Q1-2019	"	11:01am	"	"	" + "
HOW-NL-Q1-2019	"	8:15am	"	"	" + "

Échantillon remis par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure	Échantillon reçu par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure	
Adam Calvert <Original signed by>	(19/06/21)	1300	AB	23/06/2019		Page 1 de 1
Échantillon remis par (nom en lettres moulées et signature)	Date (AA/MM/JJ) 21	Heure	Échantillon reçu par (nom en lettres moulées et signature)	Date (AA/MM/JJ) 18h00	Heure	Nº: 072183

No. de document: DIV-111-1542F.010

Copies: Rose – Client Jaune – AGAT Blanche – AGAT

Date de révision: 1 mai, 2018

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CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Howse Quarterly Surface water

AGAT WORK ORDER: 19M509629

WATER ANALYSIS REVIEWED BY: Marie-Flora Coustou, Report Writer

DATE REPORTED: 2019-09-27

VERSION*: 1

PAGES (INCLUDING COVER): 12

Should you require any information regarding this analysis please contact your client services representative at (514) 337-1000

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 19M509629

PROJECT: Howse Quarterly Surface water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:

SAMPLING SITE:

Tata Steel - QC Package - Metals

DATE RECEIVED: 2019-08-24

DATE REPORTED: 2019-09-27

		SAMPLE DESCRIPTION:		HOW- SW1		HOW- SW2		HOW- SW3	HOW- SW4	HOW- SW5	HOW-BC
		SAMPLE TYPE:		SW		SW		SW	SW	SW	SW
		DATE SAMPLED:		2019-08-23		2019-08-23		2019-08-23	2019-08-23	2019-08-23	2019-08-23
Parameter	Unit	G / S	RDL	470858	RDL	470898	RDL	470899	470900	470901	470902
Mercury	µg/L		0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Total Phosphorus	µg/L - P		20	<20	20	<20	20	<20	<20	<20	47
Aluminum	µg/L		10	<10	10	116	10	92	<10	16	177
Antimony	µg/L		1	<1	5	<5	1	<1	<1	<1	1
Silver	µg/L		0.2	<0.2	0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	µg/L		1	<1	1	<1	1	<1	<1	<1	<1
Barium	µg/L		5	<5	5	<5	5	<5	<5	<5	<5
Beryllium	µg/L		500	<500	500	<500	500	<500	<500	<500	<500
Boron	µg/L		40	<40	40	<40	40	<40	<40	<40	<40
Bismuth	µg/L		1	<1	1	<1	1	<1	<1	<1	<1
Cadmium	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Calcium	µg/L		100	2570	100	578	100	353	2090	233	404
Chromium	µg/L		1	<1	1	<1	1	1	<1	1	1
Cobalt	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Copper	µg/L		1	<1	1	<1	1	<1	<1	<1	1
Total hardness	µg/L - CaCO3		1000	14570	1000	2670	1000	1710	12690	1280	2360
Tin	mg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Iron	µg/L		70	<70	70	948	70	229	<70	170	327
Manganese	µg/L		1	7	1	147	1	31	1	9	21
Molybdenum	µg/L		1	<1	1	<1	1	<1	<1	<1	<1
Nickel	µg/L		1	<1	1	2	1	<1	<1	<1	<1
Lead	µg/L		1	<1	1	<1	1	<1	<1	<1	<1
Potassium	µg/L		100	218	100	<100	100	<100	128	<100	<100
Strontium	µg/L		10	<10	10	<10	10	<10	<10	<10	<10
Thallium	µg/L		1	<1	1	<1	1	<1	<1	<1	<1
Titanium	µg/L		3	<3	3	<3	3	<3	<3	<3	<3
Uranium	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	µg/L		1	<1	1	<1	1	1	<1	1	<1

Certified By:

CHIMISTE Marie-Flora Coustou 2015-119 QUEBEC

<Original signed by>

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Certificate of Analysis

AGAT WORK ORDER: 19M509629

PROJECT: Howse Quarterly Surface water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:

SAMPLING SITE:

Tata Steel - QC Package - Metals

DATE RECEIVED: 2019-08-24

DATE REPORTED: 2019-09-27

		SAMPLE DESCRIPTION:		HOW- SW1		HOW- SW2		HOW- SW3	HOW- SW4	HOW- SW5	HOW-BC
		SAMPLE TYPE:		SW		SW		SW	SW	SW	SW
		DATE SAMPLED:		2019-08-23		2019-08-23		2019-08-23	2019-08-23	2019-08-23	2019-08-23
Parameter	Unit	G / S	RDL	470858	RDL	470898	RDL	470899	470900	470901	470902
Zinc	µg/L		3	3	3	5	3	3	3	<3	19
Magnesium	µg/L		100	1980	100	297	100	200	1810	169	327
Selenium	µg/L		1	<1	1	<1	1	<1	<1	<1	<1
Sodium	µg/L		200	705	200	464	200	390	567	426	690

Certified By: <Original signed by>

Marie-Flora Coustol
2015-119
QUEBEC

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Certificate of Analysis

AGAT WORK ORDER: 19M509629

PROJECT: Howse Quarterly Surface water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:

SAMPLING SITE:

Tata Steel - QC Package - Metals

DATE RECEIVED: 2019-08-24

DATE REPORTED: 2019-09-27

SAMPLE DESCRIPTION:				HOW-BL	HOW-TL	HOW-NL (HOW-ML SUR BOUTEILLES)
SAMPLE TYPE:				SW	SW	SW
DATE SAMPLED:				2019-08-23	2019-08-23	2019-08-23
Parameter	Unit	G / S	RDL	470903	470904	470905
Mercury	µg/L		0.1	<0.1	<0.1	<0.1
Total Phosphorus	µg/L - P		20	1202	<20	<20
Aluminum	µg/L		10	<10	12	31
Antimony	µg/L		1	<1	<1	<1
Silver	µg/L		0.2	<0.2	<0.2	<0.2
Arsenic	µg/L		1	<1	<1	<1
Barium	µg/L		5	<5	<5	<5
Beryllium	µg/L		500	<500	<500	<500
Boron	µg/L		40	<40	<40	<40
Bismuth	µg/L		1	<1	<1	<1
Cadmium	µg/L		0.5	<0.5	<0.5	<0.5
Calcium	µg/L		100	4130	3070	1770
Chromium	µg/L		1	<1	1	<1
Cobalt	µg/L		0.5	<0.5	<0.5	<0.5
Copper	µg/L		1	<1	<1	<1
Total hardness	µg/L - CaCO3		1000	22640	17380	9610
Tin	mg/L		0.5	<0.5	<0.5	<0.5
Iron	µg/L		70	<70	<70	<70
Manganese	µg/L		1	2	8	4
Molybdenum	µg/L		1	<1	<1	<1
Nickel	µg/L		1	<1	<1	<1
Lead	µg/L		1	<1	<1	<1
Potassium	µg/L		100	231	229	<100
Strontium	µg/L		10	<10	<10	<10
Thallium	µg/L		1	<1	<1	<1
Titanium	µg/L		3	<3	<3	<3

Certified By: <Original signed by>

CHIMISTE Marie-Flora Cousto 2015-119 QUEBEC

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Certificate of Analysis

AGAT WORK ORDER: 19M509629

PROJECT: Howse Quarterly Surface water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:

SAMPLING SITE:

Tata Steel - QC Package - Metals

DATE RECEIVED: 2019-08-24

DATE REPORTED: 2019-09-27

SAMPLE DESCRIPTION:				HOW-BL	HOW-TL	HOW-NL (HOW-ML SUR BOUTEILLES)
SAMPLE TYPE:				SW	SW	SW
DATE SAMPLED:				2019-08-23	2019-08-23	2019-08-23
Parameter	Unit	G / S	RDL	470903	470904	470905
Uranium	µg/L		0.5	<0.5	<0.5	<0.5
Vanadium	µg/L		1	<1	<1	<1
Zinc	µg/L		3	<3	3	<3
Magnesium	µg/L		100	3000	2360	1260
Selenium	µg/L		1	<1	<1	<1
Sodium	µg/L		200	802	660	258

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

<Original signed by>

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19M509629

PROJECT: Howse Quarterly Surface water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:

SAMPLING SITE:

Tata Steel - QC Packages - Conventionals

DATE RECEIVED: 2019-08-24

DATE REPORTED: 2019-09-27

		SAMPLE DESCRIPTION:		HOW- SW1	HOW- SW2	HOW- SW3	HOW- SW4	HOW- SW5	HOW-BC	HOW-BL	HOW-TL
		SAMPLE TYPE:		SW	SW	SW	SW	SW	SW	SW	SW
		DATE SAMPLED:		2019-08-23	2019-08-23	2019-08-23	2019-08-23	2019-08-23	2019-08-23	2019-08-23	2019-08-23
Parameter	Unit	G / S	RDL	470858	470898	470899	470900	470901	470902	470903	470904
Conductivity (Salinity - mS/cm)	mS/cm		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Organic Carbon	mg/L		0.30	0.88	5.80	6.42	0.99	1.68	7.30	0.52	1.05
Dissolved Oxygen	mg/L		3	11	9	9	10	8	9	11	10
Ammonia Nitrogen	mg/L - N		0.02	0.12	0.05	0.09	0.04	0.11	0.06	0.06	0.06
Total Kjeldahl Nitrogen	mg/L - N		0.3	<0.3	0.7	0.8	<0.3	0.7	1.0	0.4	1.2
pH	pH		NA	6.92	5.89	5.14	6.81	6.36	5.32	6.91	7.40
Reactive Silica	mg/L		0.05	4.31	4.66	2.17	3.89	0.61	4.44	5.37	4.22
Alkalinity	mg/L - CaCO3		1.5	12.2	<1.5	<1.5	10.3	<1.5	1.7	25.6	16.5
Chloride	mg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrite + Nitrate	mg/L - N		0.04	0.13	<0.04	<0.04	0.19	<0.04	<0.04	<0.04	0.04
Nitrate	mg/L - N		0.02	0.13	<0.02	<0.02	0.19	<0.02	<0.02	<0.02	0.04
Nitrite	mg/L - N		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sulfate	mg/L		0.5	2.2	<0.5	<0.5	2.5	<0.5	<0.5	2.0	2.2
Total Suspended Solids	mg/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Dissolved Solids	mg/L		10	28	20	22	16	12	30	24	18
Total Sulfide	mg/L S-2		0.02	<0.02	0.13	0.27	<0.02	<0.02	0.06	<0.02	0.07
Total Phenols (colorimetry)	mg/L		0.002	0.003	0.009	0.005	0.003	0.003	0.005	0.003	0.003
Total Phosphorus	mg/L - P		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	1.20	<0.02
ortho-Phosphate	mg/L - P		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
True Colour	TCU		5	26.0	65.6	44.0	25.6	36.0	79.8	18.5	20.0
Turbidity	NTU		0.2	0.6	1.3	0.3	0.3	0.9	0.5	0.2	0.7
Bicarbonate	mg/L - CaCO3		1.5	12.2	<1.5	<1.5	10.3	<1.5	1.7	25.6	16.5
Carbonate	mg/L - CaCO3		1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5

Certified By:

CHIMISTE Marie-Flora Coustou 2015-119 QUEBEC

<Original signed by>

AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDELCC where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDELCC.

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Certificate of Analysis

AGAT WORK ORDER: 19M509629

PROJECT: Howse Quarterly Surface water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:

SAMPLING SITE:

Tata Steel - QC Packages - Conventionals

DATE RECEIVED: 2019-08-24

DATE REPORTED: 2019-09-27

SAMPLE DESCRIPTION:				HOW-NL (HOW-ML SUR BOUTEILLES)
SAMPLE TYPE:				SW
DATE SAMPLED:				2019-08-23
Parameter	Unit	G / S	RDL	470905
Conductivity (Salinity - mS/cm)	mS/cm		2	<2
Dissolved Organic Carbon	mg/L		0.30	2.26
Dissolved Oxygen	mg/L		3	10
Ammonia Nitrogen	mg/L - N		0.02	0.07
Total Kjeldahl Nitrogen	mg/L - N		0.3	0.4
pH	pH		NA	6.95
Reactive Silica	mg/L		0.05	0.91
Alkalinity	mg/L - CaCO3		1.5	6.3
Chloride	mg/L		0.5	<0.5
Nitrite + Nitrate	mg/L - N		0.04	<0.04
Nitrate	mg/L - N		0.02	<0.02
Nitrite	mg/L - N		0.02	<0.02
Sulfate	mg/L		0.5	2.5
Total Suspended Solids	mg/L		2	<2
Total Dissolved Solids	mg/L		10	30
Total Sulfide	mg/L S-2		0.02	<0.02
Total Phenols (colorimetry)	mg/L		0.002	0.003
Total Phosphorus	mg/L - P		0.02	<0.02
ortho-Phosphate	mg/L - P		0.02	<0.02
True Colour	TCU		5	40.3
Turbidity	NTU		0.2	1.4
Bicarbonate	mg/L - CaCO3		1.5	6.3
Carbonate	mg/L - CaCO3		1.5	<1.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

470858 Holding time passed for pH and Colour.

Certified By: <Original signed by>

Marie-Flora Cousto 2015-119 QUEBEC

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
AGAT WORK ORDER: 19M509629
PROJECT: Howse Quarterly Surface water
ATTENTION TO: Mariana Trindade
SAMPLED BY:
SAMPLING SITE:

Water Analysis

RPT Date: 2019-09-27			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Tata Steel - QC Package - Metals															
Mercury	470858	470858	<0.1	<0.1	NA	< 0.1	99%	80%	120%	105%	80%	120%	100%	80%	120%
Total Phosphorus	470858		< 20	< 20	NA	< 20	95%	80%	120%	95%	80%	120%	NA	80%	120%
Aluminum	466776		59	62	5.0%	< 10	103%	80%	120%	107%	80%	120%	NA	80%	120%
Antimony	466776		<1	<1	NA	< 1	109%	80%	120%	90%	80%	120%	NA	80%	120%
Silver	466776		0.3	0.3	NA	< 0.2	NA	80%	120%	95%	80%	120%	85%	80%	120%
Arsenic	466776		<1	<1	NA	< 1	98%	80%	120%	97%	80%	120%	116%	80%	120%
Barium	466776		28	29	3.5%	< 5	90%	80%	120%	91%	80%	120%	NA	80%	120%
Beryllium	466776		<500	<500	NA	< 500	89%	80%	120%	86%	80%	120%	107%	80%	120%
Boron	466776		<40	<40	NA	< 40	89%	80%	120%	100%	80%	120%	NA	80%	120%
Bismuth	466776		<1	<1	NA	< 1	NA	80%	120%	92%	80%	120%	118%	80%	120%
Cadmium	466776		<0.5	<0.5	NA	< 0.5	98%	80%	120%	98%	80%	120%	NA	80%	120%
Calcium	466776		34400	34200	0.6%	< 100	96%	80%	120%	85%	80%	120%	NA	80%	120%
Chromium	466776		<1	1	NA	< 1	99%	80%	120%	97%	80%	120%	107%	80%	120%
Cobalt	466776		<0.5	<0.5	NA	< 0.5	93%	80%	120%	94%	80%	120%	102%	80%	120%
Copper	466776		804	814	1.2%	< 1	102%	80%	120%	113%	80%	120%	NA	80%	120%
Tin	466776		<0.5	<0.5	NA	< 0.5	NA	80%	120%	94%	80%	120%	NA	80%	120%
Iron	466776		127	130	NA	< 70	104%	80%	120%	103%	80%	120%	NA	80%	120%
Manganese	466776		10	10	0.0%	< 1	95%	80%	120%	100%	80%	120%	119%	80%	120%
Molybdenum	466776		1	1	NA	< 1	96%	80%	120%	96%	80%	120%	110%	80%	120%
Nickel	466776		17	17	1.4%	< 1	102%	80%	120%	108%	80%	120%	NA	80%	120%
Lead	466776		<1	<1	NA	< 1	107%	80%	120%	102%	80%	120%	112%	80%	120%
Potassium	466776		1690	1690	0.1%	< 100	82%	80%	120%	83%	80%	120%	NA	80%	120%
Strontium	466776		171	172	0.6%	< 10	103%	80%	120%	104%	80%	120%	NA	80%	120%
Thallium	466776		<1	<1	NA	< 1	101%	80%	120%	100%	80%	120%	118%	80%	120%
Titanium	466776		<3	3	NA	< 3	NA	80%	120%	89%	80%	120%	118%	80%	120%
Uranium	466776		<0.5	<0.5	NA	< 0.5	100%	80%	120%	102%	80%	120%	NA	80%	120%
Vanadium	466776		<1	<1	NA	< 1	97%	80%	120%	97%	80%	120%	109%	80%	120%
Zinc	466776		5	6	NA	< 3	99%	80%	120%	96%	80%	120%	NA	80%	120%
Magnesium	466776		8380	8400	0.2%	< 100	87%	80%	120%	92%	80%	120%	NA	80%	120%
Selenium	466776		<1	<1	NA	< 1	96%	80%	120%	102%	80%	120%	113%	80%	120%
Sodium	466776		34000	33700	0.9%	< 200	93%	80%	120%	94%	80%	120%	NA	80%	120%
Tata Steel - QC Packages - Conventionals															
Conductivity (Salinity - mS/cm)	470858		< 2	< 2	NA	< 2	104%	80%	120%	105%	80%	120%	97%	80%	120%
Dissolved Organic Carbon	1		NA	NA	0.0%	< 0.30	97%	80%	120%	118%	80%	120%	NA	80%	120%
Ammonia Nitrogen	484672		1.19	1.21	1.7%	< 0.02	112%	80%	120%	82%	80%	120%	NA	80%	120%
Total Kjeldahl Nitrogen	478636		113	122	7.7%	< 0.3	117%	80%	120%	112%	80%	120%	NA	80%	120%
pH	470688		9.46	9.49	0.3%		100%	80%	120%	100%	80%	120%	NA		
Reactive Silica	462306		< 0.05	< 0.05	0.0%	< 0.05	88%	80%	120%	91%	80%	120%	92%	80%	120%
Alkalinity	470858	470858	12.2	12.4	1.6%	< 1.5	95%	80%	120%	101%	80%	120%	97%	80%	120%
Chloride	470858	470858	<0.5	<0.5	NA	< 0.5	89%	80%	120%	86%	80%	120%	88%	80%	120%
Nitrate	470858	470858	0.13	0.15	14.3%	< 0.02	88%	80%	120%	101%	80%	120%	102%	80%	120%

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
AGAT WORK ORDER: 19M509629
PROJECT: Howse Quarterly Surface water
ATTENTION TO: Mariana Trindade
SAMPLED BY:
SAMPLING SITE:

Water Analysis (Continued)

RPT Date: 2019-09-27			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Nitrite	470858	470858	<0.02	<0.02	NA	< 0.02	NA	80%	120%	93%	80%	120%	93%	80%	120%
Sulfate	470858	470858	2.2	2.2	NA	< 0.5	92%	80%	120%	97%	80%	120%	96%	80%	120%
Total Suspended Solids	479185		15	14	6.9%	< 2	103%	80%	120%	NA			106%	80%	120%
Total Dissolved Solids	470758		12	28	NA	< 10	103%	80%	120%	NA			105%	80%	120%
Total Sulfide	470933	470933	< 0.02	< 0.02	NA	< 0.02	95%	80%	120%	97%	80%	120%	89%	80%	120%
Total Phenols (colorimetry)	470858	470858	0.003	0.003	NA	< 0.002	97%	80%	120%	110%	80%	120%	90%	80%	120%
Total Phosphorus	431065		< 0.02	< 0.02	0.0%	< 0.02	96%	80%	120%	91%	80%	120%	92%	80%	120%
ortho-Phosphate	510498		< 0.02	< 0.02	0.0%	< 0.02	88%	80%	120%	106%	80%	120%	NA	80%	120%
True Colour	470858	470858	26.0	24.3	NA	< 5	116%	80%	120%	107%	80%	120%	106%	80%	120%
Turbidity	470858	470858	0.6	0.6	NA	< 0.2	103%	80%	120%	100%	80%	120%	100%	80%	120%
Bicarbonate	470858	470858	12.2	12.4	1.6%	< 1.5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carbonate	470858	470858	<1.5	<1.5	NA	< 1.5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Tata Steel - QC Packages - Conventionals															
Total Sulfide	470933		< 0.02	< 0.02	0.0%	< 0.02	95%	80%	120%	97%	80%	120%	89%	80%	120%

<Original signed by>

Certified By:

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
AGAT WORK ORDER: 19M509629
PROJECT: Howse Quarterly Surface water
ATTENTION TO: Mariana Trindade
SAMPLED BY:
SAMPLING SITE:

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis					
Mercury	2019-08-28	2019-08-28	MET-101-6102F	MA. 200 Hg 1.1	COLD VAPOR/AA
Total Phosphorus	2019-09-07	2019-09-07	INOR-101-6048F	MA.300-NTPT 2.0	COLORIMETRY
Aluminum	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Antimony	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Silver	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Arsenic	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Barium	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Beryllium	2019-08-30	2019-08-30	MET-101-6107F	MA. 200 - Mét 1.2	ICP/OES
Boron	2019-08-30	2019-08-30	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Bismuth	2019-08-30	2019-08-30	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Cadmium	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Calcium	2019-08-30	2019-08-30	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Chromium	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Cobalt	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Copper	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Total hardness	2019-08-28	2019-08-29	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Tin	2019-08-30	2019-08-30	MET-101-6107F	MA. 200 - Mét 1.2	ICP/OES
Iron	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Manganese	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Molybdenum	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Nickel	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Lead	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Potassium	2019-08-30	2019-08-30	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Strontium	2019-08-30	2019-08-30	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Thallium	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Titanium	2019-08-30	2019-08-30	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Uranium	2019-08-30	2019-08-30	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Vanadium	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Zinc	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Magnesium	2019-08-30	2019-08-30	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Selenium	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Sodium	2019-08-30	2019-08-30	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Conductivity (Salinity - mS/cm)	2019-08-30	2019-08-30	INOR-101-6016F	Standard Method 2520	CONDUCTIVIMETRY
Dissolved Organic Carbon	2019-08-29	2019-08-29	INOR-101-6049F, unaccredited by MDDELCC	MA.300-C1.0	INFRARED DETECTION
Dissolved Oxygen		2019-08-26	INOR-101-6000F, unaccredited by MDDELCC	MA. 315 - DBO 1.1	DO METER
Ammonia Nitrogen	2019-09-09	2019-09-09	INOR-101-6051F	MA. 303 - N 2.0	COLORIMETRY
Total Kjeldahl Nitrogen	2019-09-11	2019-09-11	INOR-101-6048F	MA.300-NTPT 2.0	COLORIMETRY
pH	2019-08-26	2019-08-26	INOR-101-6021F	MA. 100 - pH 1.1	ELECTROMETRY
Reactive Silica	2019-08-28	2019-08-28	INOR-101-6071F, non accrédité MDDELCC	AQ2 EPA-122A Rev 5	COLORIMETRY
Alkalinity	2019-08-29	2019-08-29	INOR-101-6000F, unaccredited by MDDELCC	MA. 315 - Alc-Aci 1.0	TITRATION

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19M509629

PROJECT: Howse Quarterly Surface water

ATTENTION TO: Mariana Trindade

SAMPLED BY:

SAMPLING SITE:

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Chloride	2019-08-27	2019-08-28	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Nitrite + Nitrate	2019-08-28	2019-08-28	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Nitrate	2019-08-27	2019-08-28	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Nitrite	2019-08-27	2019-08-28	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Sulfate	2019-08-27	2019-08-28	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Total Suspended Solids	2019-08-29	2019-08-30	INOR-101-6028F	MA. 115 - S.S. 1.2	GRAVIMETRY
Total Dissolved Solids	2019-08-28		INOR-101-6054F	MA.115-S.D. 1.0	GRAVIMETRY
Total Sulfide	2019-08-29	2019-08-30	INOR-101-6055F	MA.300-S 1.2	SPECTROPHOTOMETRY
Total Phenols (colorimetry)	2019-08-27	2019-08-27	INOR-101-6062F	MA. 404 - I. Phé 2.2	COLORIMETRY
Total Phosphorus	2019-09-07	2019-09-07	INOR-101-6048F	MA.300-NTPT 2.0	COLORIMETRY
ortho-Phosphate	2019-09-17	2019-09-18	INOR-101-6052F	MA.300-P 1.1	COLORIMETRY
True Colour	2019-08-28	2019-08-28	INOR-101-6046F	MA. 103 - Col 2.0	SPECTROPHOTOMETRY
Turbidity	2019-08-27	2019-08-27	INOR-101-6044F	MA.103 Tur.1.0	NEPHELOMETER
Bicarbonate	2019-08-29	2019-08-29	INOR-101-6000F	MA. 315 - Alc-Aci 1.0	TITRATION
Carbonate	2019-08-29	2019-08-29	INOR-101-6000F	MA. 315 - Alc-Aci 1.0	TITRATION

19M 509629

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Fax.: 514.333.3046
agatlabs.com

Laboratory use Only
Arrival Condition: ☐ Good ☐ Poor (complete 'notes')
Arrival Temperature: 7 - 10.9 10.9 AGAT Job Number: 163
Notes:

Report To:
Company: Tata Steel Minerals Canada
Contact: Marlana Trindade
Address: 1000 Sherbrooke West, Suite 1120
Montreal, QC H3A 3G4

Project #: Howse Quarterly Surface Water
Quote #: RFQ 20190118

Invoice to: Same (Y/N) - Circle
Company: Tata Steel Minerals Canada
Contact: Jay Adhvaryu
Email: jay.adhvaryu@tatasteelcanada.com
Phone: Fax:
PO#: 3000000242

Report Information
1. Name: Mariana Trindade
Email: mariana.trindade@tatasteelcanada.com
2. Name: Jean-Francois Dion
Email: jeanfrancois.dion@tatasteelcanada.com

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do Not List Guidelines on Report
☐ PIRI Site Info (check all that apply):
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Ind
☐ Com
☐ Res/P
☐ Ag
☐ FWAL
☐ Sediment
☐ Other NL MMER

Report Format
☐ Single PDF sample per page
■ Multiple PDF samples per page
☐ Excel Format Included

Turnaround Time (TAT) Business Days
Regular TAT: ■ 5 - 7 days
Rush TAT: ☐ 1 day ☐ 2 days ☐ 3 - 4 days

SAMPLE IDENTIFICATION	DATE / TIME SAMPLED	SAMPLE MATRIX	# OF CONTAINERS	COMMENTS - Site/Sample Info, Sample Containment	Field Filtered/Preserved	Metals + Cations, Total	Mercury, Total	Hardness	Total Phosphorous & TKN	Conductivity	Dissolved Organic Carbon	Dissolved Oxygen	Nitrate & Nitrite	Ammonia as N	Orthophosphate, Reactive Silica	pH	Phenols -4AAP - Mississauga	Real Color & Turbidity	Sulphide as S2-	Alkalinity, Bicarbonates, Carbonate	Chloride & Sulfate	Total Dissolved Solids	Total Suspended Solids	Atlantic RBCA Tier 1 BTEX/TPH
HOW-SW1 Aug 23, 2019	6:00 AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HOW-SW2 "	7:10AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HOW-SW3 "	7:00AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HOW-SW4 "	6:30AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HOW-SW5 "	7:55AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HOW-BC "	9:35AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HOW-BL "	9:10 AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HOW-TL "	10:02AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
HOW-NL Aug 23, 2019	10:29AM	water		02 03	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	Special Instructions
Adam Calvert <Original signed by>	13:00			
Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign)	Date/Time	Tata Steel - NL Package SW
				Page 1 of 1

Heather
2019 08 24. 12:00

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CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Howse Quarterly Surface Water

AGAT WORK ORDER: 19M521784

WATER ANALYSIS REVIEWED BY: Marie-Flora Coustou, Report Writer

DATE REPORTED: 2019-11-06

VERSION*: 1

PAGES (INCLUDING COVER): 12

Should you require any information regarding this analysis please contact your client services representative at (514) 337-1000

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 19M521784

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:ADAM CALVERT

SAMPLING SITE:HOWSE

Tata Steel - QC Package - Metals

DATE RECEIVED: 2019-09-24

DATE REPORTED: 2019-11-06

SAMPLE DESCRIPTION:				HOW-SW1-Q4-2019	HOW-SW2-Q4-2019	HOW-SW3-Q4-2019		HOW-SW4-Q4-2019		HOW-SW5-Q4-2019
SAMPLE TYPE:				SW	SW	SW		SW		SW
DATE SAMPLED:				2019-09-23	2019-09-23	2019-09-23		2019-09-23		2019-09-23
Parameter	Unit	G / S	RDL	557211	557314	557316	RDL	557317	RDL	557318
Mercury	µg/L		0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1
Aluminum	µg/L		10	<10	92	63	10	<10	10	<10
Antimony	µg/L		1	<1	<1	<1	1	<1	1	<1
Silver	µg/L		0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.2	<0.2
Arsenic	µg/L		1	<1	<1	<1	1	<1	1	<1
Barium	µg/L		5	<5	<5	<5	5	<5	5	<5
Beryllium	µg/L		1	<1	<1	<1	1	<1	1	<1
Bismuth	ug/L		1	<1	<1	<1	1	<1	2	<2
Boron	µg/L		40	<40	<40	<40	40	<40	40	<40
Cadmium	µg/L		0.5	<0.5	<0.5	<0.5	2.0	<2.0	0.5	<0.5
Calcium	µg/L		100	2620	664	295	100	2200	100	221
Chromium	µg/L		1	<1	<1	<1	1	1	1	<1
Cobalt	µg/L		0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5
Copper	µg/L		1	<1	<1	<1	1	<1	1	<1
Total hardness	µg/L - CaCO3		1000	16000	3330	1540	1000	15300	1000	1420
Tin	µg/L		5	<5	<5	<5	5	<5	5	<5
Iron	µg/L		70	<70	1190	115	70	<70	70	<70
Magnesium	µg/L		100	2300	406	195	100	2390	100	211
Manganese	µg/L		1	5	186	21	1	<1	1	4
Molybdenum	µg/L		1	<1	<1	<1	1	2	1	<1
Nickel	µg/L		1	<1	1	<1	1	<1	1	<1
Lead	µg/L		1	<1	<1	<1	1	<1	1	<1
Potassium	µg/L		100	340	112	106	100	320	100	<100
Selenium	µg/L		1	<1	<1	<1	1	<1	1	<1
Sodium	µg/L		200	651	607	597	200	642	200	498
Strontium	µg/L		10	<10	<10	<10	10	<10	10	<10
Thallium	µg/L		1	<1	<1	<1	1	<1	1	<1

Certified By: <Original signed by>

CHIMISTE Marie-Flora Coustou 2015-119 QUÉBEC

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Certificate of Analysis

AGAT WORK ORDER: 19M521784

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:ADAM CALVERT

SAMPLING SITE:HOWSE

Tata Steel - QC Package - Metals

DATE RECEIVED: 2019-09-24

DATE REPORTED: 2019-11-06

Parameter	Unit	G / S	RDL	HOW-SW1-Q4-2019 SW 2019-09-23 557211	HOW-SW2-Q4-2019 SW 2019-09-23 557314	HOW-SW3-Q4-2019 SW 2019-09-23 557316	RDL	HOW-SW4-Q4-2019 SW 2019-09-23 557317	RDL	HOW-SW5-Q4-2019 SW 2019-09-23 557318
Titanium	µg/L		3	<3	<3	<3	3	<3	3	<3
Uranium	µg/L		0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5
Vanadium	µg/L		1	<1	<1	<1	1	<1	1	<1
Zinc	µg/L		3	<3	6	<3	3	<3	3	<3

<Original signed by>

Certified By:

CHIMISTE Marie-Flora Coustou 2015-119 QUÉBEC

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Certificate of Analysis

AGAT WORK ORDER: 19M521784

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:ADAM CALVERT

SAMPLING SITE:HOWSE

Tata Steel - QC Package - Metals

DATE RECEIVED: 2019-09-24

DATE REPORTED: 2019-11-06

Parameter	Unit	G / S	RDL	HOW-ML-Q4-2019 SW 2019-09-23 557319	HOW-BL-Q4-2019 SW 2019-09-23 557322	HOW-BC-Q4-2019 SW 2019-09-23 557323	HOW-TL-Q4-2019 SW 2019-09-23 557329
Mercury	µg/L		0.1	<0.1	<0.1	<0.1	<0.1
Aluminum	µg/L		10	18	<10	136	<10
Antimony	µg/L		1	<1	<1	<1	<1
Silver	µg/L		0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	µg/L		1	<1	<1	<1	<1
Barium	µg/L		5	<5	<5	<5	<5
Beryllium	µg/L		1	<1	<1	<1	<1
Bismuth	ug/L		1	<1	<1	<1	<1
Boron	µg/L		40	<40	<40	<40	<40
Cadmium	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Calcium	µg/L		100	1990	4060	371	3180
Chromium	µg/L		1	<1	<1	1	<1
Cobalt	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Copper	µg/L		1	<1	<1	<1	<1
Total hardness	µg/L - CaCO3		1000	11700	24700	2770	20260
Tin	µg/L		5	<5	<5	<5	<5
Iron	µg/L		70	<70	<70	172	<70
Magnesium	µg/L		100	1640	3550	447	2990
Manganese	µg/L		1	2	2	24	3
Molybdenum	µg/L		1	<1	<1	<1	<1
Nickel	µg/L		1	<1	<1	<1	<1
Lead	µg/L		1	<1	<1	<1	<1
Potassium	µg/L		100	129	414	<100	384
Selenium	µg/L		1	<1	<1	<1	<1
Sodium	µg/L		200	287	838	579	665
Strontium	µg/L		10	<10	<10	<10	<10
Thallium	µg/L		1	<1	<1	<1	<1

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Certificate of Analysis

AGAT WORK ORDER: 19M521784

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:ADAM CALVERT

SAMPLING SITE:HOWSE

Tata Steel - QC Package - Metals

DATE RECEIVED: 2019-09-24

DATE REPORTED: 2019-11-06

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: HOW-ML-Q4-2019	HOW-BL-Q4-2019	HOW-BC-Q4-2019	HOW-TL-Q4-2019
				SAMPLE TYPE: SW	SW	SW	SW
				DATE SAMPLED: 2019-09-23	2019-09-23	2019-09-23	2019-09-23
				557319	557322	557323	557329
Titanium	µg/L		3	<3	<3	<3	<3
Uranium	µg/L		0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	µg/L		1	<1	<1	<1	<1
Zinc	µg/L		3	<3	<3	<3	<3

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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Certificate of Analysis

AGAT WORK ORDER: 19M521784

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:ADAM CALVERT

SAMPLING SITE:HOWSE

Tata Steel - QC Packages - Conventionals

DATE RECEIVED: 2019-09-24

DATE REPORTED: 2019-11-06

				HOW-SW1-Q4-2019	HOW-SW2-Q4-2019	HOW-SW3-Q4-2019	HOW-SW4-Q4-2019	HOW-SW5-Q4-2019	HOW-ML-Q4-2019	HOW-BL-Q4-2019	HOW-BC-Q4-2019
SAMPLE DESCRIPTION:											
SAMPLE TYPE:				SW	SW	SW	SW	SW	SW	SW	SW
DATE SAMPLED:				2019-09-23	2019-09-23	2019-09-23	2019-09-23	2019-09-23	2019-09-23	2019-09-23	2019-09-23
Parameter	Unit	G / S	RDL	557211	557314	557316	557317	557318	557319	557322	557323
Conductivity (Salinity - mS/cm)	mS/cm		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Organic Carbon	mg/L		0.30	0.74	4.93	4.50	0.79	1.78	1.90	<0.30	4.08
Dissolved Oxygen	mg/L		3	7	4	3	7	7	7	7	7
Nitrite + Nitrate	mg/L - N		0.04	0.21	<0.04	0.06	0.22	<0.04	<0.04	<0.04	<0.04
Nitrate	mg/L - N		0.02	0.21	<0.02	0.06	0.22	<0.02	<0.02	0.03	<0.02
Nitrite	mg/L - N		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ammonia Nitrogen	mg/L - N		0.02	0.13	0.12	0.24	0.09	0.07	0.24	0.08	0.09
ortho-Phosphate	mg/L - P		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
pH	pH		NA	6.89	5.85	5.74	6.69	6.13	6.89	6.86	5.99
Total Phenols (colorimetry)	mg/L		0.002	0.004	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002
Reactive silica	mg/L		0.05	4.97	5.77	2.89	4.44	0.76	0.80	4.86	5.15
True Colour	TCU		5	10	63	23	<5	8	10	<5	36
Turbidity	NTU		0.2	0.5	1.4	0.4	0.3	0.6	0.7	0.2	0.7
Alkalinity	mg/L - CaCO3		1.5	14.6	<1.5	<1.5	10.0	<1.5	7.6	24.5	<1.5
Bicarbonate	mg/L - CaCO3		1.5	14.6	<1.5	<1.5	10.0	<1.5	7.6	24.5	<1.5
Carbonate	mg/L - CaCO3		1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Chloride	mg/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulfate	mg/L		0.5	3.6	0.9	1.1	3.2	0.8	3.5	2.5	1.1
Total Suspended Solids	mg/L		2	<2	4	<2	<2	2	<2	<2	<2
Total Dissolved Solids	mg/L		10	46	36	24	38	16	40	46	30
Total Kjeldahl Nitrogen	mg/L - N		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total Phosphorus	mg/L - P		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

<Original signed by>

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19M521784

PROJECT: Howse Quarterly Surface Water

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:ADAM CALVERT

SAMPLING SITE:HOWSE

Tata Steel - QC Packages - Conventionals

DATE RECEIVED: 2019-09-24

DATE REPORTED: 2019-11-06

Parameter	Unit	G / S	RDL	HOW-TL-Q4-2019 (SW, 2019-09-23) 557329
Conductivity (Salinity - mS/cm)	mS/cm		2	<2
Dissolved Organic Carbon	mg/L		0.30	<0.30
Dissolved Oxygen	mg/L		3	7
Nitrite + Nitrate	mg/L - N		0.04	0.1
Nitrate	mg/L - N		0.02	0.10
Nitrite	mg/L - N		0.02	<0.02
Ammonia Nitrogen	mg/L - N		0.02	0.14
ortho-Phosphate	mg/L - P		0.02	<0.02
pH	pH		NA	7.00
Total Phenols (colorimetry)	mg/L		0.002	<0.002
Reactive silica	mg/L		0.05	4.29
True Colour	TCU		5	7
Turbidity	NTU		0.2	0.5
Alkalinity	mg/L - CaCO3		1.5	20.3
Bicarbonate	mg/L - CaCO3		1.5	20.3
Carbonate	mg/L - CaCO3		1.5	<1.5
Chloride	mg/L		0.5	<0.5
Sulfate	mg/L		0.5	3.1
Total Suspended Solids	mg/L		2	<2
Total Dissolved Solids	mg/L		10	42
Total Kjeldahl Nitrogen	mg/L - N		0.3	<0.3
Total Phosphorus	mg/L - P		0.02	<0.02

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

<Original signed by>

Certified By:

AGAT Laboratories
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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
AGAT WORK ORDER: 19M521784
PROJECT: Howse Quarterly Surface Water
ATTENTION TO: Mariana Trindade
SAMPLED BY:ADAM CALVERT
SAMPLING SITE:HOWSE

Water Analysis

RPT Date: 2019-11-06			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Tata Steel - QC Package - Metals															
Mercury	1		NA	NA	NA	< 0.1	100%	80%	120%	104%	80%	120%	NA	80%	120%
Aluminum	557211	557211	<10	<10	NA	< 10	92%	80%	120%	103%	80%	120%	119%	80%	120%
Antimony	557211	557211	<1	<1	NA	< 1	106%	80%	120%	100%	80%	120%	110%	80%	120%
Silver	557211	557211	<0.2	<0.2	NA	< 0.2	NA	80%	120%	101%	80%	120%	104%	80%	120%
Arsenic	557211	557211	<1	<1	NA	< 1	94%	80%	120%	100%	80%	120%	111%	80%	120%
Barium	557211	557211	<5	<5	NA	< 5	93%	80%	120%	101%	80%	120%	NA	80%	120%
Beryllium	557211	557211	<1	<1	NA	< 1	95%	80%	120%	98%	80%	120%	115%	80%	120%
Bismuth	557211	557211	<1	<1	NA	< 1	NA	80%	120%	103%	80%	120%	101%	80%	120%
Boron	557211	557211	<40	<40	NA	< 40	93%	80%	120%	109%	80%	120%	NA	80%	120%
Cadmium	557211	557211	<0.5	<0.5	NA	< 0.5	95%	80%	120%	100%	80%	120%	120%	80%	120%
Calcium	557211	557211	2620	2730	3.9%	< 100	90%	80%	120%	98%	80%	120%	NA	80%	120%
Chromium	557211	557211	<1	<1	NA	< 1	97%	80%	120%	103%	80%	120%	97%	80%	120%
Cobalt	557211	557211	<0.5	<0.5	NA	< 0.5	98%	80%	120%	104%	80%	120%	89%	80%	120%
Copper	557211	557211	<1	<1	NA	< 1	99%	80%	120%	97%	80%	120%	104%	80%	120%
Tin	557211	557211	<5	<5	NA	< 5	NA	80%	120%	107%	80%	120%	98%	80%	120%
Iron	557211	557211	<70	<70	NA	< 70	106%	80%	120%	117%	80%	120%	NA	80%	120%
Magnesium	557211	557211	2300	2470	7.0%	< 100	101%	80%	120%	118%	80%	120%	NA	80%	120%
Manganese	557211	557211	5	6	5.1%	< 1	98%	80%	120%	111%	80%	120%	104%	80%	120%
Molybdenum	557211	557211	<1	<1	NA	< 1	95%	80%	120%	103%	80%	120%	99%	80%	120%
Nickel	557211	557211	<1	<1	NA	< 1	99%	80%	120%	98%	80%	120%	99%	80%	120%
Lead	557211	557211	<1	<1	NA	< 1	99%	80%	120%	105%	80%	120%	92%	80%	120%
Potassium	557211	557211	340	364	NA	< 100	97%	80%	120%	113%	80%	120%	NA	80%	120%
Selenium	557211	557211	<1	<1	NA	< 1	87%	80%	120%	105%	80%	120%	116%	80%	120%
Sodium	557211	557211	651	678	NA	< 200	101%	80%	120%	116%	80%	120%	NA	80%	120%
Strontium	557211	557211	<10	<10	NA	< 10	101%	80%	120%	112%	80%	120%	107%	80%	120%
Thallium	557211	557211	<1	<1	NA	< 1	96%	80%	120%	104%	80%	120%	102%	80%	120%
Titanium	557211	557211	<3	<3	NA	< 3	NA	80%	120%	102%	80%	120%	105%	80%	120%
Uranium	557211	557211	<0.5	<0.5	NA	< 0.5	98%	80%	120%	111%	80%	120%	101%	80%	120%
Vanadium	557211	557211	<1	<1	NA	< 1	100%	80%	120%	105%	80%	120%	96%	80%	120%
Zinc	557211	557211	<3	<3	NA	< 3	98%	80%	120%	91%	80%	120%	NA	80%	120%
Tata Steel - QC Packages - Conventionals															
Conductivity (Salinity - mS/cm)	559978		1340	1340	0.0%	< 2	103%	80%	120%	105%	80%	120%	NA	80%	120%
Dissolved Organic Carbon	1		NA	NA	NA	< 0.30	116%	80%	120%	110%	80%	120%	NA	80%	120%
Nitrate	544702		<0.02	<0.02	NA	< 0.02	96%	80%	120%	98%	80%	120%	100%	80%	120%
Nitrite	544702		<0.02	<0.02	NA	< 0.02	NA	80%	120%	96%	80%	120%	100%	80%	120%
Ammonia Nitrogen	557532		0.53	0.52	1.5%	< 0.02	116%	80%	120%	111%	80%	120%	NA	80%	120%
ortho-Phosphate	556591		<0.02	<0.02	NA	< 0.02	111%	80%	120%	114%	80%	120%	94%	80%	120%
pH	556591		6.71	6.80	1.3%		100%	80%	120%	100%	80%	120%	NA		
Total Phenols (colorimetry)	557211	557211	0.004	0.004	NA	< 0.002	97%	80%	120%	117%	80%	120%	80%	80%	120%
Reactive silica	557211		4.9668	4.8377	2.6%	< 0.05	97%	90%	110%	NA	70%	130%	NA	70%	130%
True Colour	556591		22	25	NA	< 5	102%	80%	120%	94%	80%	120%	NA	80%	120%
Turbidity	556317	556317	0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
PROJECT: Howse Quarterly Surface Water
SAMPLED BY:ADAM CALVERT

AGAT WORK ORDER: 19M521784
ATTENTION TO: Mariana Trindade
SAMPLING SITE:HOWSE

Water Analysis (Continued)

RPT Date: 2019-11-06

PARAMETER	Batch	Sample Id	DUPLICATE			REFERENCE MATERIAL				METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper	Recovery	Acceptable Limits Lower	Acceptable Limits Upper
Alkalinity	556963		<1.5	<1.5	NA	< 1.5	95%	80%	120%	102%	80%	120%	101%	80%	120%
Bicarbonate	556963		<1.5	<1.5	NA	< 1.5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carbonate	556963		<1.5	<1.5	NA	< 1.5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Chloride	544702		4.0	4.0	0.3%	< 0.5	99%	80%	120%	89%	80%	120%	93%	80%	120%
Sulfate	544702		2.5	2.5	0.7%	< 0.5	98%	80%	120%	97%	80%	120%	96%	80%	120%
Total Suspended Solids	560784		7	10	NA	< 2	102%	80%	120%	NA			108%	80%	120%
Total Dissolved Solids	556591		26	28	NA	< 10	103%	80%	120%	NA			106%	80%	120%
Total Kjeldahl Nitrogen	557329	557329	<0.3	<0.3	NA	< 0.3	92%	80%	120%	82%	80%	120%	91%	80%	120%
Total Phosphorus	553660		147	122	18.6%	< 0.02	100%	80%	120%	118%	80%	120%	NA	80%	120%
Tata Steel - QC Packages - Conventionals															
Total Phenols (colorimetry)	557314	557314	<0.002	<0.002	NA	< 0.002	95%	80%	120%	117%	80%	120%	90%	80%	120%
Turbidity	556317		0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%
Tata Steel - QC Packages - Conventionals															
Turbidity	556317		0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%
Tata Steel - QC Packages - Conventionals															
Turbidity	556317		0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%
Tata Steel - QC Packages - Conventionals															
Turbidity	556317	556317	0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%
Tata Steel - QC Packages - Conventionals															
Turbidity	556317	556317	0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%
Tata Steel - QC Packages - Conventionals															
Turbidity	556317	556317	0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%
Tata Steel - QC Packages - Conventionals															
Turbidity	556317	556317	0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%
Tata Steel - QC Packages - Conventionals															
Turbidity	556317	556317	0.3	0.3	NA	< 0.2	90%	80%	120%	90%	80%	120%	114%	80%	120%

CHIMISTE Marie-Flora Coustou 2015-119 QUÉBEC

<Original signed by>

Certified By:

AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDELCC where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDELCC. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
AGAT WORK ORDER: 19M521784
PROJECT: Howse Quarterly Surface Water
ATTENTION TO: Mariana Trindade
SAMPLED BY:ADAM CALVERT
SAMPLING SITE:HOWSE

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis					
Mercury	2019-09-26	2019-09-26	MET-101-6102F	MA. 200 Hg 1.1	COLD VAPOR/AA
Aluminum	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Antimony	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Silver	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Arsenic	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Barium	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Beryllium	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Bismuth	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Boron	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Cadmium	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Calcium	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Met 1.2	ICP/MS
Chromium	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Cobalt	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Copper	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Total hardness	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Met 1.2	ICP/MS
Tin	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Iron	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Magnesium	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Met 1.2	ICP/MS
Manganese	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Molybdenum	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Nickel	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Lead	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Potassium	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Selenium	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Sodium	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Mét 1.2	ICP/MS
Strontium	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Thallium	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Titanium	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Uranium	2019-09-26	2019-09-27	MET-101-6105F, unaccredited by MDDELCC	MA. 200 - Mét 1.2	ICP/MS
Vanadium	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Zinc	2019-09-26	2019-09-27	MET-101-6105F	MA. 200 - Met 1.2	ICP/MS
Conductivity (Salinity - mS/cm)	2019-09-27	2019-09-27	INOR-101-6016F	Standard method 2520	CONDUCTIVIMÉTRIE
Dissolved Organic Carbon	2019-09-26	2019-09-26	INOR-101-6049F, unaccredited by MDDELCC	MA.300-C1.0	INFRARED DETECTION
Dissolved Oxygen	2019-11-05	2019-11-05	INOR-101-6006F, unaccredited by MDDELCC	MA. 315 - DBO 1.1	DO METER
Nitrite + Nitrate	2019-09-25	2019-09-26	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Nitrate	2019-09-25	2019-09-26	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Nitrite	2019-09-25	2019-09-26	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Ammonia Nitrogen	2019-10-04	2019-10-04	INOR-101-6051F	MA. 303 - N 2.0	COLORIMETRY
ortho-Phosphate		2019-10-10	INOR-101-6052F	MA.300-P 1.1	COLORIMÉTRIE
pH	2019-09-24	2019-09-24	INOR-101-6021F	MA. 100 - pH 1.1	ELECTROMETRY
Total Phenols (colorimetry)	2019-09-27	2019-09-27	INOR-101-6062F	MA. 404 - I. Phé 2.2	COLORIMETRY

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19M521784

PROJECT: Howse Quarterly Surface Water

ATTENTION TO: Mariana Trindade

SAMPLED BY:ADAM CALVERT

SAMPLING SITE:HOWSE

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Reactive silica		2019-10-07	INOR-101-6071F, unaccredited by MDDELCC	AQ2 EPA-122A Rev 5	COLORIMÉTRIE
True Colour	2019-09-25	2019-09-25	INOR-101-6046F	MA. 103 - Col 2.0	SPECTROPHOTOMETRY
Turbidity	2019-09-25	2019-09-25	INOR-101-6044F	MA.103 Tur.1.0	NEPHELOMETER
Alkalinity	2019-09-26	2019-09-30	INOR-101-6000F, unaccredited by MDDELCC	MA. 315 - Alc-Aci 1.0	TITRATION
Bicarbonate	2019-09-26	2019-09-30	INOR-101-6000F, unaccredited by MDDELCC	MA. 315 - Alc-Aci 1.0	TITRATION
Carbonate	2019-09-26	2019-09-30	INOR-101-6000F, unaccredited by MDDELCC	MA. 315 - Alc-Aci 1.0	TITRATION
Chloride	2019-09-25	2019-09-26	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Sulfate	2019-09-25	2019-09-26	INOR-101-6004F	MA. 300 - Ions 1.3	ION CHROMATOGRAPHY
Total Suspended Solids	2019-09-26	2019-09-27	INOR-101-6028F	MA. 115 - S.S. 1.2	GRAVIMETRY
Total Dissolved Solids	2019-09-30		INOR-101-6054F	MA.115-S.D. 1.0	GRAVIMETRY
Total Kjeldahl Nitrogen	2019-10-11	2019-10-11	INOR-101-6048F	MA.300-NTPT 2.0	COLORIMETRY
Total Phosphorus		2019-09-30	INOR-101-6048F	MA.300-NTPT 2.0	COLORIMETRY

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Chaîne de traçabilité Environnement

Eau potable RQEP (réseau) – Veuillez utiliser le formulaire du MDDELCC

À l'usage exclusif du laboratoire
Bon de travail AGAT: 19M 521724
Nb. de glacières: 1
Température à l'arrivée: 9.1 °C
☑ Glace ☐ Bloc réfrigérant ☐ Aucun
Scélé légal intact: ☐ Oui ☐ Non ☑ N/A

Information pour le rapport
Compagnie : Tata Steel Minerals Canada
Adresse : 1000 Rue Sherbrooke Ouest, Montreal, QC H3A 3G4
Téléphone : 514-764-6700 ext. 705 Téléc. :
Projet : House Quarterly Surface Water
Lieu de prélèvement : House
Prélevé par : Adam Calvert

Rapport envoyé à
1. Nom: Mariana Trindade
Courriel: mariana.trindade@tatasteelcanada.com
2. Nom: Team Email List
Courriel: TSMCenvironment@tatasteelcanada.com

Critères à respecter
☐ PRTC ABC ☐ RESC
☐ CCME
☐ Eau consommation
☐ Eau résurg. Surface
☐ Eau résurg. Salée
CMM Sanitaire ☐ Pluvial ☐
☐ Autre.

Délais d'analyse requis (jours ouvrables)
Environnemental: Régulier: ☒ 5 à 7 jours; Urgent: ☐ Même jour ☐ 1 jour ☐ 2 jours ☐ 3 jours
Haute Résolution: Régulier: ☐ 10 à 15 jours; Urgent: ☐ < 10 jours
Date Requise: AA/MM/JJ

Format de rapport
☒ **Portrait** *(échantillon/page)* ☐ **Paysage** *(échantillons/page)*

Facturé à Même adresse : ☒ Oui ☐ Non
Compagnie :
Contact :
Courriel :
Adresse :
Bon de commande : 3000000296 Soumission :

Commentaires:

Matrice (légende)

S	Sol	B	Boue	EP	Eau potable	EB	Eau brute	EPI	Eau de piscine
SL	Solide	EU	Eau usée	SE	Sédiment	ES	Eau de surface	AF	Affluent
				EF	Effluent	ST	Eau souterraine	A	Air

IDENTIFICATION DE L'ÉCHANTILLON	PRÉLÈVEMENT DATE (AA/MM/JJ)	PRÉLÈVEMENT HEURE	MATRICE	NB. DE CONTENANTS
HOW-SW1-Q4-2019	19/09/23	7:15am	ES	9
HOW-SW2-Q4-2019	"	8:23am	"	"
HOW-SW3-Q4-2019	"	8:15am	"	"
HOW-SW4-Q4-2019	"	7:31am	"	"
HOW-SW5-Q4-2019	"	9:35am	"	"
HOW-ML-Q4-2019	"	6:17am	"	"
HOW-BL-Q4-2019	"	7:07am	"	"
HOW-BC-Q4-2019	"	7:49am	"	"
HOW-TL-Q4-2019	"	8:11 am	"	"

Hydrocarbures pétroliers C10-C50 ☐ — "Appendix A pg. 2/12 - Lab Analysis Requirements" + TKN and NH3

HAP ☐ | BTEX ☐ HAM ☐ HAC-HAM ☐ THM ☐ | Chlorobenzènes ☐ Phtalates ☐ COSV ☐ | BPC: Congénères ☐ Aroclor ☐ CBNC ☐ | Éthylène glycol ☐ Formaldéhyde ☐ | Huiles et graisses: Minérales ☐ Totales ☐ | Pesticides: OC ☐ OP ☐ Herbicides ☐ | Diquat / Paraquat ☐ Glyphosate ☐ | Phénols (GC-MS) ☐ Indice phénolique (4AAP) ☐ | Métaux - Sol ☐ Hg ☐ Se ☐ CrVI ☐ | Métaux - ST ☐ Hg ☐ CrVI ☐ CrIII ☐ U ☐ | Métaux: Filtré sur terrain ☐ Filtré au lab ☐ | Métaux (spécifier): | Dureté totale ☐ | Alcalinité ☐ Bromates ☐ Conductivité ☐ | Chlorures ☐ Fluorures ☐ Sulfates ☐ Bromures ☐ | Cyanures : Totaux ☐ Disponibles ☐ Oxydables ☐ | DCO ☐ COT ☐ | NH_3 + NH_4 ☐ NTK ☐ NO_2 +NO_3 ☐ P total ☐ | Solides : Totaux ☐ Dissous ☐ MES ☐ MESV ☐ | Sulfures - Eau ☐ Soufre total - Sol ☐ | pH ☐ NO_2 ☐ NO_3 ☐ o-PO4 ☐ COD ☐ | Absorbance UV ☐ Couleur ☐ Turbidité ☐ | DBO_5 ☐ DBO_5 Carbonée ☐ | Coliformes : Totaux ☐ Fécaux ☐ E.Coli ☐ | Microbiologie (autre) : | HR/MS : Dioxines/Furanes ☐ HAP ☐ BPC ☐ | CMM 2008-47 : Sanitaire ☐ Pluvial ☐ NP ☐ NPE ☐ | RMD ☐ REIMR art. ____ ☐

COURT DÉLAI DE CONSERVATION

Échantillon remis par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure	Échantillon reçu par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure
Adam Calvert <Original signed by>	19/09/23	13:00		19 09 24	1443
Échantillon remis par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure	Échantillon reçu par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure

Page 1 de 1
Nº: 207844

No. de document: DIV 111 1542F 010 — Copies: Rose - Client Jaune - AGAT Blanche - AGAT — Date de révision: 1 mai, 2018

Appendix 3 Lake Water Levels Report

AQUASPHERA

October 9, 2019

Tata Steel Minerals Canada Ltd
1000, rue Sherbrooke West, bureau 1120
Montreal (Québec) H3A 3G4

Attention: Ms. Mariana Trindade, PhD, Corporate Environmental Manager

Subject: Monitoring Report – Lakes Water Levels for 2018-2019 and Corrective Measures

---

Dear Ms. Trindade,

We are pleased to submit the monitoring report carried out by our firm for the above-mentioned project. Please do not hesitate to contact our office if you have any questions or comments.

1. INTRODUCTION

This monitoring report presents estimated daily water surface elevations based on hydrometric data recorded at 5 sites (O'Nelly, Triangle, Morley, Pinette and Burnetta). The data cover the period from October 7, 2018 to August 14, 2019. Water depths were monitored using Rugged TROLL 200. Atmospheric pressure was monitored at the Triangle site using a Rugged BaroTROLL (manufactured by In-Situ inc.). Preliminary atmospheric pressure data from new loggers at O'Nelly, Pinette and Burnetta sites were also used to make additional adjustments on water depths series.

2. WATER LEVEL MONITORING

2.1. FIELD DATA

As mentioned in the 2017-2018 report, all Rugged TROLL-200 were installed by Groupe Hémisphères on August 2, 2017 and on September 14, 2017 for the O'Nelly site.

2018-2019 data were collected by Aquasphera staff on August 14, 2019 and three new BaroTROLL loggers were installed that same day.

It should be noted that on September 13 and 14, 2017, a sleeve with antifreeze was installed on the already deployed probes to prevent damage from ice over the winter period. At the same time, probes' pressure sensor was improperly set to 0. Hence, readings after September 14, 2017

were adjusted for pressure and as a function of vertical position of the probe, following field manipulation when adding antifreeze. On August 14, as recommended in the 2017-2018 report, Aquasphera performed factory resets on the level loggers to correct pressure offsets of future readings.

All probes were adjusted for atmospheric pressure using the Rugged BaroTROLL data for the whole period. Additional corrections were also made to account for elevation differences and resulting atmospheric pressure gaps between Triangle and other sites. These corrections count for an average of 0.17 ± 0.01 cm of water depth for each meters of elevation difference and were based on the preliminary atmospheric pressure data recorded from the new baro loggers installed on August 14, 2019.

Surveys have been performed by TSMC and Aquasphera staffs to record marker and water level at Morley, Triangle, Pinette and O'Nelly sites. For Burnetta site, it was not possible to record coordinates since no signal is available in this remote area. However, coordinates from handled GPS taken last year by Hémisphères are available. Elevations at Burnetta have also been calculated upon preliminary atmospheric pressure data of August 14 and 15.

Meteorological data from the Schefferville Airport station were compiled by Aquasphera.

2.2. RESULTS

Figure 1 to 5 present estimated water levels for the different sites. At those sites, water depths were converted into absolute elevations, using available survey data and preliminary atmospheric pressure data. This conversion was roughly estimated for the Burnetta site as only coordinates from handled GPS and only a few atmospheric pressure data were available.

In order to convert water depths to water elevations, probe elevation must be determined. Typically, the water elevation is surveyed using a precise GPS and water depth given by the probe at the same moment is noted. The difference between these two values gives probe elevation.

In 2018, values from past surveys done by TSMC staff and Hémisphères staff were used to calculate probes elevations. On September 13 and 14, 2017, probes were removed, put in a sleeve with antifreeze and replaced. Hence, it was difficult to establish probes elevations with precision.

When possible, surveys done on August 14 and 15, 2019 were used to correct probes elevations. Probes elevations are presented in Table 1.

Table 1 : Probe Elevation

Site	2018	2019	Comment
Morley	674,63	674,63	No baro logger, correction not possible
Triangle	583,40	583,59	Correction done
Pinette	635,15	635,29	Correction done
Burnetta	525	524	No survey available, rough estimate
O'Nelly	N/A	661,15	Correction done

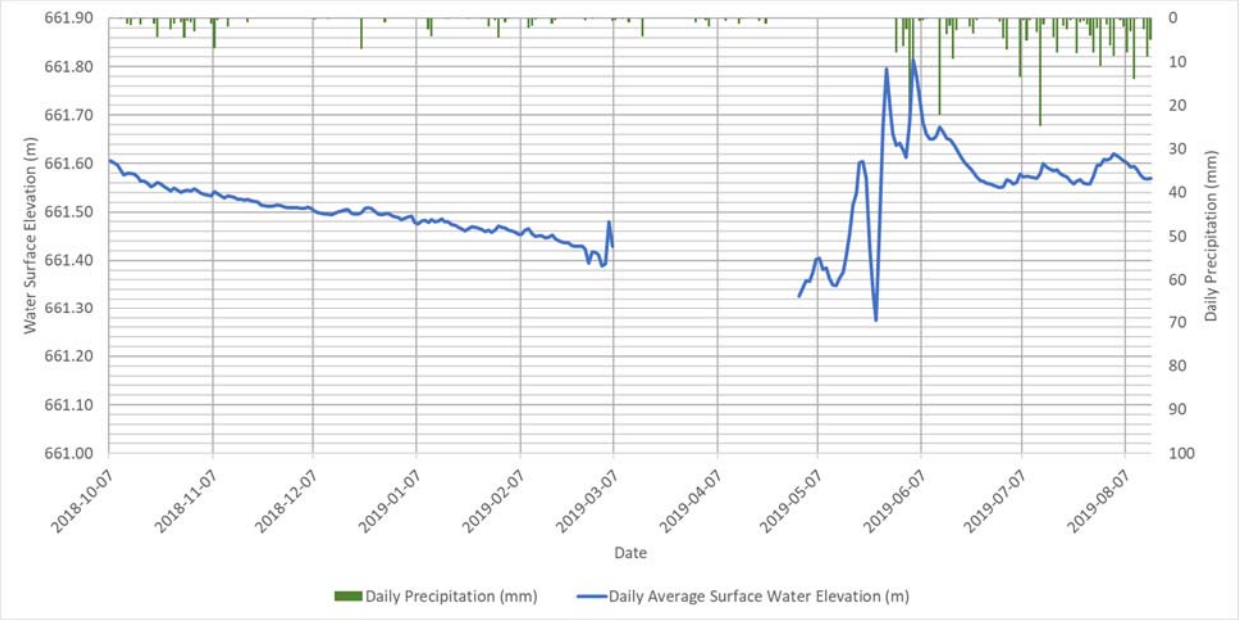

Figure 1: Average Daily Water Surface Elevation and Precipitation at O'Nelly Site

Data at the O'Nelly site is erratic from March 7 through May 1. The probe was probably encased in ice for 4 months. The pressures and vacuums created by expanding and shifting ice make the data from this period completely useless and has not been graphed.

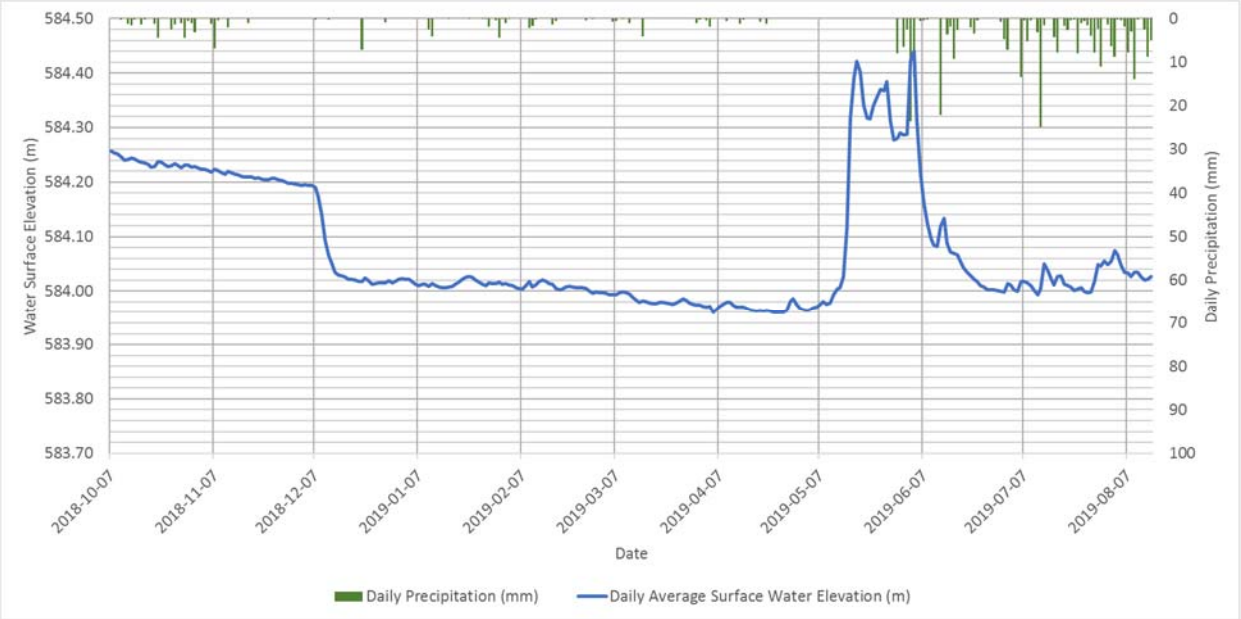

Figure 2: Average Daily Water Surface Elevation and Precipitation at Triangle Site

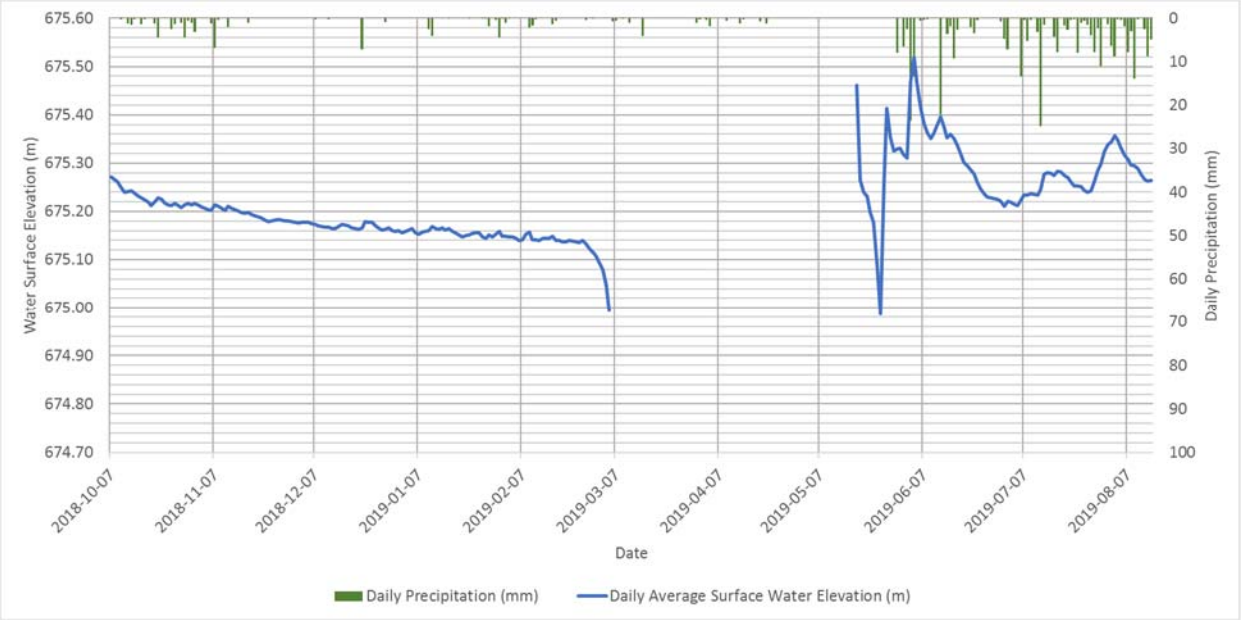

Figure 3: Average Daily Water Surface Elevation and Precipitation at Morley Site

Data at Morley site is also erratic from March 6 to May 17 and cannot be used. Indeed, raw data show many meters of water depth during this period that were probably due to an important ice and snow cover pressure on the probe.

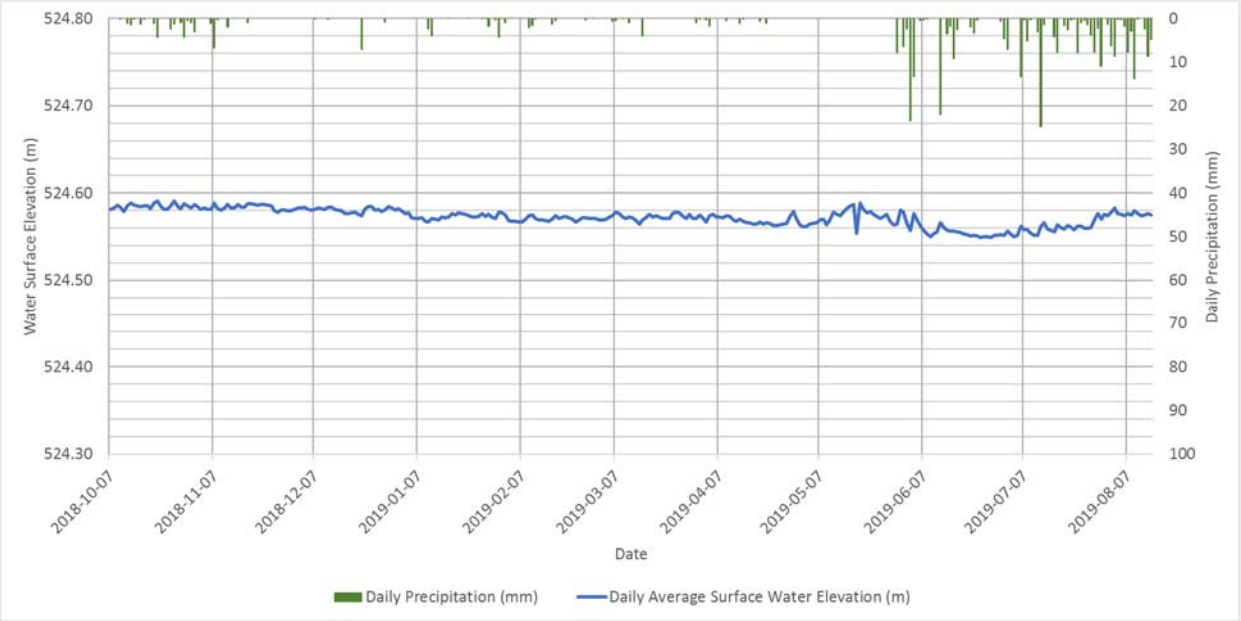

Figure 4: Average Daily Water Surface Elevation and Precipitation at Burnetta Site

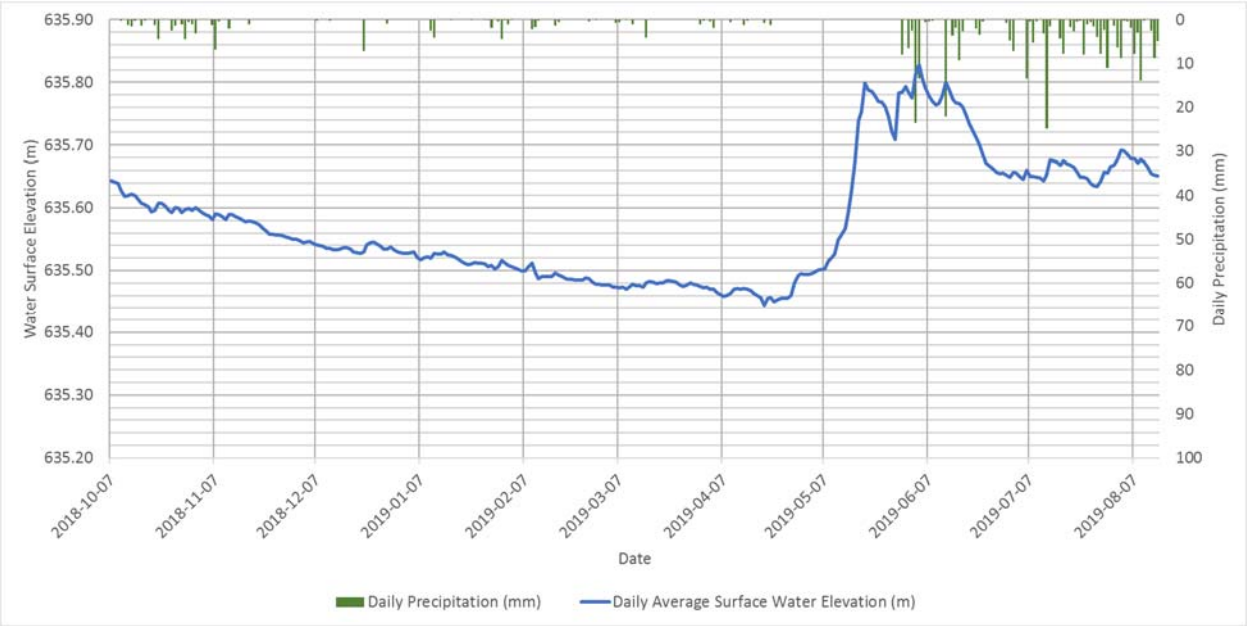

Figure 5: Average Daily Water Surface Elevation and Precipitation at Pinette Site

Annual statistics on water surface elevation (WSE) variations were calculated by combining recent results with the ones used in the 2017-2018 report. Table 2 show extremes and average annual values of daily WSE at each site since 2017. For calculation purposes, the probes elevation at O'Nelly and Burnetta have been assumed the same since the beginning of recording. O'Nelly's depth data used in 2017-2018 have been converted in water surface elevation by adding

661.51 meters to recorded depts and Burnetta's 2017-2018 WSE data have been reduced by 1 meter. It should be noted that the 2019 data availability ended on August 14.

Table 2 : Annual water surface elevation statistics

YEAR	MIN (m)	MAX (m)	AVERAGE (m)
O'Nelly			
2017	661,59	661,70	661,64
2018	661,49	661,82	661,63
2019	661,27	661,81	661,52
TOTAL	661,27	661,82	661,60
Triangle			
2017	583,99	584,21	584,06
2018	583,83	584,26	584,03
2019	583,96	584,44	584,04
TOTAL	583,83	584,44	584,04
Morley			
2017	675,02	675,23	675,07
2018	674,29	675,56	675,03
2019	674,99	675,52	675,23
TOTAL	674,29	675,56	675,08
Burnetta			
2017	524,48	524,53	524,51
2018	524,41	524,59	524,53
2019	524,55	524,59	524,57
TOTAL	524,41	524,59	524,54
Pinette			
2017	635,42	635,56	635,49
2018	635,33	635,68	635,47
2019	635,44	635,83	635,58
TOTAL	635,33	635,83	635,51

3. CONCLUSION AND RECOMMANDATIONS

As previously discussed in the 2017-2018 report, it is recommended to use one BaroTROLL for each Rugged TROLL when monitored sites are more than 2 km apart or when the elevation difference is over 30 meters. However, even if one of the two conditions is sometime respected when comparing locations with Morley site, it remains without BaroTROLL and its overall proximity with other sites is insufficient to use atmospheric pressure records of nearby site while maintaining the manufactured accuracy claimed by In-Situ. To ensure proper monitoring of Morley Lake's levels, the installation of another atmospheric pressure probes should be considered.

There are still no good survey data available for Burnetta and a proper field survey should be done to collect probe, marker and water levels. Those are needed to ensure that loggers operate properly and that water levels are properly calculated.

For Triangle, O'Nelly and Pinette sites with newly installed atmospheric pressure probes and recent survey data, it has been possible to established the probe elevation with precision.

For Triangle, O'Nelly, Pinette and Burnetta, an altimetric relationship has been established for each site using recent barometric data. Theses relationships were used to make corrections to account for elevation differences and resulting atmospheric pressure gaps between Triangle and these sites for year 2018-2019.

Finally, we maintain our recommendations of a minimum of two surveys per year per site, before and after the freezing period.

4. SCOPE AND LIMITATIONS

This document is published in accordance with and subject to an agreement between Aquasphera, Groupe Hémisphères and the Client (TSMC) for whom it has been prepared. It is limited to issues raised by the Client in its commitment and prepared using the standard skill and care commonly exercised by Engineering Scientists in the preparation of such documents. It has been prepared using data collected by TSMC, Groupe Hémisphères and Aquasphera. This document is meant to be read as a whole, and sections or parts thereof should not be read or interpreted out of context. This document is confidential and the property of the Client.

Prepared by:

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Appendix 4 Wetland (groundwater) Levels Report

Montréal, June 26 2020

Mariana Trindade
Corporate Environmental Manager
Tata Steel Minerals Canada Limited
1000 Sherbrooke West, Suite 1120
Montreal, Qc, H3A 3G4

Subject: Howse Wetland Wells Water Level – 2019 Campaign

N/D: PR185-38-19

Mrs. Trindade,

We are pleased to submit the technical report on the above-mentioned project.

Tata Steel Minerals Canada (TSMC) is developing an open-pit iron ore mine in Newfoundland and Labrador. About 46 Mt of iron ore will be extracted over the course of the Howse Property Iron Mine Project's lifespan (Howse Project), or about 15 years.

In 2014, an environmental assessment of the Howse Project was conducted in accordance with the requirements of the Canadian Environmental Assessment Act, 2012. As a result, the Howse Project was accepted with several requirements. TSMC, in compliance with the migratory Birds Convention Act, 1994 and with the Species at Risk Act, must ensure that migratory bird populations and their habitat are in no way negatively impacted by the Howse Project implantation, operation and decommission.

In this regard and among other requirements, TSMC and Groupe Hémisphères developed a follow-up program to monitor and detect any adverse environmental effects of the Howse Project on wetland functions that support migratory birds, and to determine the effectiveness of the proposed mitigation measures.

This document presents the work mandated to Groupe Hémisphères by TSMC on wetlands water level. It presents the second year of water level monitoring.

1 Methodology

The bottom of the well, which is fixed in the deep mineral soil was used to monitor changes in wetlands water levels. Indeed, the surface of the soil in wetlands is not at a constant altitude: it expands and swells as it is waterlogged. Hence, using the soil level next to the well as a reference altitude would give inaccurate data. While the measures using the bottom of the wells can't be used to compare levels between wells, it is the only way to assure a precise interannual comparison.

Water level was assessed by measuring the distance from the top of the PVC tube to the surface of water. It was then substracted from total length of the pipe.

Water level was measured once in 2019, on August 1st and 2nd. Water levels were generally high throughout the region.

2 Results

Wells location is presented on the figure in Appendix I. Photography of each well is presented in Appendix II. Table 1 presents water level in each well in August. For a few wells, measurement was not done. It was impossible to take the cap off. Results for the 2019 measurement are similar to those in 2018 and they are within the range (min/max level). 2018 mean value is presented in Table 1 for comparison.

Table 1. Wells Water Level– 2019

Wells	Water Level (m)	Comments	2018 Mean Value (m)
WMW01	0.75	Straight	0.73
WMW02	0.62	Straight but no cap	0.63
WMW03	1.17	Straight	1.20
WMW04	0.67	Straight	0.63
WMW05		Straight, unable to open, water at surface level around the well	1.05
WMW06		Straight, unable to open, water at surface level around the well	0.74
WMW08		No access, flooded area	0.98
WMW11	0.72	Straight	0.58
WMW12	1.14	Straight	1.10
WMW13	1.02	Straight	0.62
WMW16	0.7	Straight	0.69
WMW18	0.94	Straight	0.97
WMW19	0.97	Straight	0.62
WMW21	0.74	Straight	0.77
WMW22	0.73	Straight	0.71
WMW24		A bit crooked, unable to open	0.66
WMW25	0.48	Straight	0.52
WMW26	0.74	Straight	0.73
WMW27	1.07	Straight	1.16
WMW29		Straight, unable to open, water at surface level around the well	0.90
WMW30	1.27	Straight	0.75

3 Recommendation

For the 2020 campaign, measurements should be done once a month during summer, by recording the water depth from the top of the well. For the first visits, tools will be needed to pry open the caps for a few wells.

4 Quality assurance

Groupe Hémisphères possesses an internal quality control program based on a review and approval of all concepts and document production by a senior professional. The program considers the management, the control of documentation, the personnel's continuous training, as well as the quality assurance of the deliverables. The system also includes a tight control of the field work and the prevention and safety measures specific to the project.

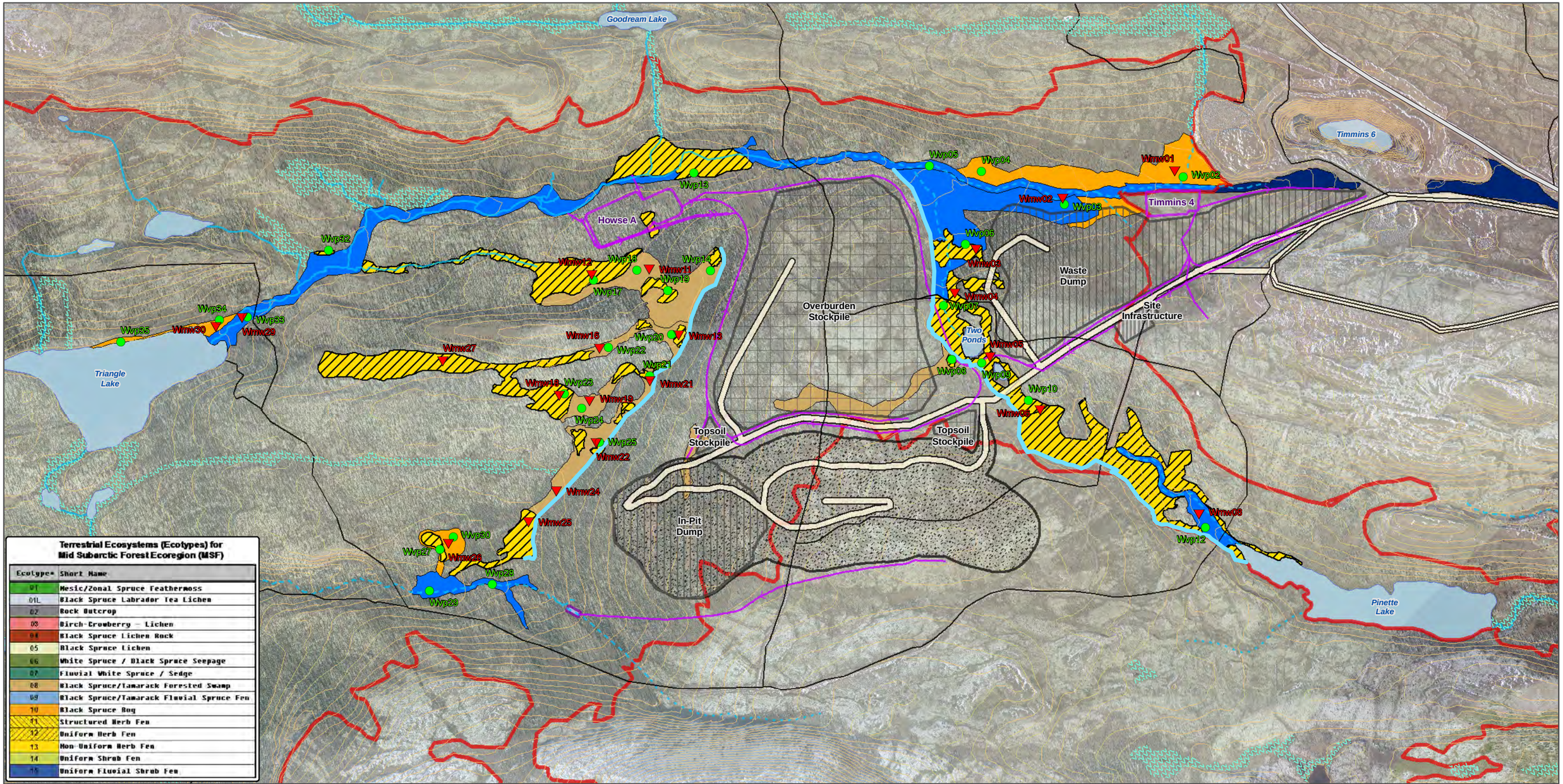
Drafted by :

<Original signed by>

Marie-Ève Dion
Biologist, M. Sc. Env

Appendix I

Wells Location



Terrestrial Ecosystems (Ecotypes) for Mid Subarctic Forest Ecoregion (MSF)

Ecotype	Short Name
01	Mesic/Zonal Spruce Feathermoss
01L	Black Spruce Labrador Tea Lichen
02	Rock Outcrop
03	Birch-Crowberry – Lichen
04	Black Spruce Lichen Rock
05	Black Spruce Lichen
06	White Spruce / Black Spruce Seepage
07	Fluvial White Spruce / Sedge
08	Black Spruce/Tamarack Forested Swamp
09	Black Spruce/Tamarack Fluvial Spruce Fen
10	Black Spruce Bog
11	Structured Herb Fen
12	Uniform Herb Fen
13	Non-Uniform Herb Fen
14	Uniform Shrub Fen
15	Uniform Fluvial Shrub Fen

LEGEND

Wetland survey
- Wetland vegetation point
- Active piezometer
- Wetland Delineation

Basemap
- Contour Line (5m)
- Ecoregion Boundary
- Existing Road

Howse Proposed Infrastructures
- Proposed Howse Pit
- Proposed Topsoil/Overburden Stockpile
- Proposed Waste Dump/In-Pit Dump
- Proposed Site Infrastructure
- Proposed Sedimentation Pond
- Proposed Dissipation Pool
- Haul Road
- Proposed Ditch and Outlet

Hydrography
- Permanent Watercourse
- Intermittent Watercourse
- Storm Runoff
- Water Body
- Other Wetland

FILE, PROJECT, DATE, AUTHOR:
GH-0917 , PR185-38-18, 2018-12-20, jfbrisard

N

0 150 300 450 600
Meters

UTM 19N NAD 83 SCALE: 1:15 000

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

Infrastructure and Mining Components
New Millennium Capital Corp., Mining sites and roads
Howse Minerals Limited/ MET-CHEM Howse Deposit Design for General Layout, 2015

HOWSE PROPERTY PROJECT

Wetlands monitoring stations

Follow Up Program

Groupe Hemispheres

1001, rue De l'Eglise, Suite 208, Québec (QC) Canada, G1V 3V7

1453, rue Beaubien est, Bureau 301, Montréal (QC) Canada, H2G 3C6

Figure 2

Appendix II

Photographic Report

Well #01

Well #02

Well #03

Well #04

Well #05

Well #06

Well #08

Well #11

Well #12

Well #13

Well #16

Well #18

Well #19

Well #21

Well #22

Well #24

Well #25

Well #26

Well #27

Well #29

Well #30

Appendix 5 Air Monitoring Certificates of Analysis

Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your P.O. #: 2200002147
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2019/01/02 - 2019/02/07
Site Location: Timmins, Newfoundland

Attention: TARA OAK

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2019/03/05
Report #: R2693426
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B914500
Received: 2019/02/28, 10:13

Sample Matrix: Air
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis	4	2019/02/28	2019/03/05	PTC SOP-00148	Passive NO2 in ATM

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Results relate only to the items tested.
* 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.
Levi Manchak, Project Manager SR
Email: LManchak@maxxam.ca
Phone# (780)378-8542
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Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 6744 - 50th Street T6B 3M9 Telephone(780) 378-8500 FAX(780) 378-8699

Maxxam Job #: B914500
Report Date: 2019/03/05

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 2200002147
Sampler Initials: PS

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		VH2356	VH2361	VH2364	VH2365		
Sampling Date		2019/01/02 13:20	2019/01/02 12:00	2019/01/05 10:57	2019/01/05 09:07		
	UNITS	**DS03-AQS6-NO2**	**DS03-AQS7-NO2**	**DS03-AQS8-NO2**	**DS03-AQS9-NO2**	**RDL**	**QC Batch**
Passive Monitoring							
Calculated NO2	ppb	0.2	0.9	0.1	0.2	0.1	9335114
RDL = Reportable Detection Limit							

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Maxxam Job #: B914500
Report Date: 2019/03/05

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 2200002147
Sampler Initials: PS

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B914500
Report Date: 2019/03/05

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 2200002147
Sampler Initials: PS

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9335114	YL6	Spiked Blank	Calculated NO2			98	%	90 - 110
9335114	YL6	Method Blank	Calculated NO2		<0.1		ppb	

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 #: B914500
Report Date: 2019/03/05

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 2200002147
Sampler Initials: PS

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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Linda Lin, Supervisor, Centre for Passive Sampling Technology

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Maxxam

6716-50 St. Edmonton AB Canada T6B 3M9

Ph (780) 378-8500, Toll free (800) 386-7247, Fax (780) 378-8699

Maxxam Job Number:

PASSIVE AIR CHAIN OF CUSTODY

Page 1 of 1

Invoice To
Company Name: TSMC
Contact Name:
Address:
Postal Code:
Phone/Fax#: Ph Fax

Report To
Name & Email Address: usual

Service Requested
☐ RUSH (Please contact for TAT)
☒ REGULAR

Company Name: TATA Steel

Project Name/LSD: Timmins Passive

ANALYTICAL INFORMATION

Analysis Required

Sample ID or Location (LSD)	Sample Start Date (DD/MM/YY)	Time (24 hrs) (HH:MM)	Sample End Date (DD/MM/YY)	Time (HH:MM)	Volume (m3) *PM/TSP Only*	SO2	H2S	NO2	O3	NOx	NH3	HNO3	VOC	PM2.5	PM10	TSP	Dustfall
[redacted] AQS6	02/01/19	13:20	06/02/19	9:11				X									
AQS7	02/01/19	17:00	06/02/19	14:37				X									
AQS8	05/01/19	10:57	06/02/19	12:23				X									
AQS9	05/01/19	9:07	07/02/19	11:02				X									
— Blank —																	

Notes/Comments:

Sampled By: Pallav Sinha Phone/Email:

Signature: <Original signed by>

Received By: Date/Time:

Signature: <Original signed by>

RECEIVED FEB 28 2019

Project #:

PO# 220002147

PTC FCD-00457/2

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Your P.O. #: 2200002147
Your Project #: PASSIVE NO2 / DS03-4
Site#: 2019/02/07 - 2019/03/14
Site Location: Timmins, Newfoundland

Attention: TARA OAK

Tata Steel Mineral Canada
1000, Sherbrooke St West
Montreal, QC
CANADA H3A 3G4

Report Date: 2019/03/28
Report #: R2703086
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B920821
Received: 2019/03/22, 12:42

Sample Matrix: Air
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
NO2 Passive Analysis	4	2019/03/25	2019/03/28	PTC SOP-00148	Passive NO2 in ATM

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Email: LManchak@maxxam.ca
Phone# (780)378-8542
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Maxxam Job #: B920821
Report Date: 2019/03/28

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 2200002147
Sampler Initials: JFD

RESULTS OF CHEMICAL ANALYSES OF AIR

Maxxam ID		VK2997	VK2998	VK2999	VK3000		
Sampling Date		2019/02/06 09:11	2019/02/06 14:37	2019/02/06 12:23	2019/02/07 11:02		
	UNITS	DS03-AQS6-NO2	DS03-AQS7-NO2	DS03-AQS8-NO2	DS03-AQS9-NO2	RDL	QC Batch
Passive Monitoring							
Calculated NO2	ppb	<0.1	0.4	<0.1	<0.1	0.1	9357868
RDL = Reportable Detection Limit							

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Maxxam Job #: B920821
Report Date: 2019/03/28

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 2200002147
Sampler Initials: JFD

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 6744 - 50th Street T6B 3M9 Telephone(780) 378-8500 FAX(780) 378-8699

Maxxam Job #: B920821
Report Date: 2019/03/28

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 2200002147
Sampler Initials: JFD

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9357868	YL6	Spiked Blank	Calculated NO2			99	%	90 - 110
9357868	YL6	Method Blank	Calculated NO2		<0.1		ppb	

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 #: B920821
Report Date: 2019/03/28

Tata Steel Mineral Canada
Client Project #: PASSIVE NO2 / DS03-4
Site Location: Timmins, Newfoundland
Your P.O. #: 2200002147
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>

Linda Lin, Supervisor, Centre for Passive Sampling Technology

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Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 6744 - 50th Street T6B 3M9 Telephone(780) 378-8500 FAX(780) 378-8699

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Maxxam 6716-50 St. Edmonton AB Canada T6B 3M9
Ph (780) 378-8500, Toll free (800) 386-7247, Fax (780) 378-8699

Maxxam Job Number:

PASSIVE AIR CHAIN OF CUSTODY

Page 1 of 1

Invoice To
Company Name TSMC
Contact Name
Address
Postal Code
Phone/Fax# Ph Fax

Report To
Name & Email Address usual

Service Requested
☐ **RUSH** (Please contact for TAT)
☒ **REGULAR**

Company Name: **TATA Steel**
Project Name/LSD: **Timmins Passive**

ANALYTICAL INFORMATION

Sample ID or Location (LSD)	Sample Start Date (DD/MM/YY)	Time (24 hrs) (HH:MM)	Sample End Date (DD/MM/YY)	Time (HH:MM)	Volume (m3) *PM/TSP Only*	SO2	H2S	NO2	O3	NOx	NH3	HNO3	VOC	PM2.5	PM10	TSP	Dustfall	
DS03-AQS6	06/02/19	9:11	14/03/19	16:57				X										
DS03-AQS7	06/02/19	14:37	14/03/19	14:37				X										
DS03-AQS8	06/02/19	12:23	14/03/19	15:47				X										
DS03-AQS9	07/02/19	11:02	14/03/19	17:52				X										
Blank								X										

20-Mar-19 15:30
Cristina (Maria) Bacchus
B972670
GK1 AIR-001

Notes/Comments:

RECEIVED MAR 22 2019 <Original signed by>

Sampled By Jean-Francois Drion **Phone/Email** **Received By** NAK **Date/Time** MAR 20 2019 **Project #** Timmins Passive

Signature <Original signed by> **Signature** **PO#** 2200002147

DAISE MATHEW 2019/03/22 09:14 Ice/Seal-Yes 880 20'C Wm/8110 1530

PTC FCD-00457/2
page 1 of 1

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Schefferville

AGAT WORK ORDER: 19C515546

AIR QUALITY MONITORING REVIEWED BY: Carmen Andrei, AQM Lab Coordinator

DATE REPORTED: Sep 18, 2019

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 736-5300

*NOTES

VERSION 1: No blank has been submitted for analysis. All samples are lab blank subtracted.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Air Quality Summary

AGAT WORK ORDER: 19C515546

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Parameter	Unit	Number of Samples	Peak Reading	Network Average
Ambient Nitrogen Dioxide	ppbv	6	1.6	1.0

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Certificate of Analysis

AGAT WORK ORDER: 19C515546

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Passive Air Quality Sampling

DATE RECEIVED: 2019-09-09

DATE REPORTED: 2019-09-18

Parameter	Unit	G / S	RDL	AQS2-Q2 27Jul/19,14:50 26Aug/19,09:30 /NO2 FILTER 511945	AQS4-Q2 26Jul/19,16:56 26Aug/19,10:20 /NO2 FILTER 511946	AQS6-Q2 26Jul/19,14:06 25Aug/19,17:31 /NO2 FILTER 511947	AQS7-Q2 28Jul/19,10:14 31Aug/19,16:59 /NO2 FILTER 511948	AQS8-Q2 28Jul/19,09:54 31Aug/19,14:33 /NO2 FILTER 511949	AQS9-Q2 28Jul/19,08:58 31Aug/19,11:34 /NO2 FILTER 511950
SAMPLE DESCRIPTION:									
SAMPLE TYPE:									
DATE SAMPLED:									
Ambient Nitrogen Dioxide	ppbv		0.4	0.9	0.5	1.2	0.7	0.8	1.6

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Alberta Ambient Air Quality Objective
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

511945-511950 No blank has been submitted for analysis. All samples are lab blank subtracted.

Analysis performed at AGAT Calgary (unless marked by *)

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Certified By:

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C515546

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Air Quality Monitoring

RPT Date: Sep 18, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Passive Air Quality Sampling															
Ambient Nitrogen Dioxide	82	NA				< 0.4	102%	90%	110%	104%	80%	120%	102%	80%	120%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
Sample spikes and duplicates are not from the same sample.

Certified By: <Original signed by>

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C515546

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Ambient Nitrogen Dioxide	AQM-43-16004	Inhouse Method	ION CHROMATOGRAPH

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CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Schefferville

AGAT WORK ORDER: 19C525916

AIR QUALITY MONITORING REVIEWED BY: Carmen Andrei, AQM Lab Coordinator

DATE REPORTED: Oct 11, 2019

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 736-5300

*NOTES

VERSION 1: No blank has been submitted for analysis. All samples are lab blank subtracted.

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Air Quality Summary

AGAT WORK ORDER: 19C525916

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Parameter	Unit	Number of Samples	Peak Reading	Network Average
Ambient Nitrogen Dioxide	ppbv	6	1.3	0.5

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Certificate of Analysis

AGAT WORK ORDER: 19C525916

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Passive Air Quality Sampling

DATE RECEIVED: 2019-10-03

DATE REPORTED: 2019-10-11

				Site#02/AQS2/ 26Aug/19,09:30 28Sep/19,14:55	Site#04/AQS4/ 26Aug/19,10:20 28Sep/19,12:50	Site#06/AQS6/ 25Aug/19,17:31 29Sep/19,10:30	Site#07/AQS7/ 31Aug/19,16:59 30Sep/19,11:21	Site#08/AQS8/ 31Aug/19,14:33 29Sep/19,09:52	Site#09/AQS9/ 31Aug/19,11:34 28Sep/19,17:02
SAMPLE DESCRIPTION:				/NO2	/NO2	/NO2	/NO2	/NO2	/NO2
SAMPLE TYPE:				FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
DATE SAMPLED:				2019-08-26	2019-08-26	2019-08-25	2019-08-31	2019-08-31	2019-08-31
Parameter	Unit	G / S	RDL	584648	584649	584650	584651	584652	584653
Ambient Nitrogen Dioxide	ppbv		0.4	0.5	<0.4	0.8	1.3	<0.4	0.6

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

584648-584653 All samples are field blank subtracted.
No blank has been submitted for analysis. All samples are lab blank subtracted.

Analysis performed at AGAT Calgary (unless marked by *)

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C525916

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Air Quality Monitoring

RPT Date: Oct 11, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Passive Air Quality Sampling															
Ambient Nitrogen Dioxide	83	NA				< 0.4	101%	90%	110%	97%	80%	120%	106%	80%	120%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
Sample spikes and duplicates are not from the same sample.

Certified By: <Original signed by>

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C525916

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Ambient Nitrogen Dioxide	AQM-43-16004	Inhouse Method	ION CHROMATOGRAPH

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1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Schefferville

AGAT WORK ORDER: 19C544043

AIR QUALITY MONITORING REVIEWED BY: Carmen Andrei, AQM Lab Coordinator

DATE REPORTED: Nov 25, 2019

PAGES (INCLUDING COVER): 6

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 736-5300

*NOTES

VERSION 1: No duplicate sample has been measured, as per client's request.

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Air Quality Summary

AGAT WORK ORDER: 19C544043

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Parameter	Unit	Number of Samples	Peak Reading	Network Average
Ambient Nitrogen Dioxide	ppbv	6	0.7	<0.4

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Certificate of Analysis

AGAT WORK ORDER: 19C544043

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Passive Air Quality Sampling

DATE RECEIVED: 2019-11-14

DATE REPORTED: 2019-11-25

Parameter	Unit	G / S	RDL	Site#02/AQS2/ 28Sep/19,14:55 27Oct/19,11:57 /NO2 FILTER 715172	Site#04/AQS4/ 28Sep/19,12:50 27Oct/19,13:15 /NO2 FILTER 715173	Site#06/AQS6/ 29Sep/19,10:30 28Oct/19,11:10 /NO2 FILTER 715182	Site#07/AQS7/ 30Sep/19,11:21 29Oct/19,09:35 /NO2 FILTER 715187	Site#08/AQS8/ 29Sep/19,09:52 28Oct/19,14:23 /NO2 FILTER 715188	Site#09/AQS9/ 28Sep/19,17:02 28Oct/19,10:15 /NO2 FILTER 715189
Ambient Nitrogen Dioxide	ppbv		0.4	<0.4	<0.4	0.6	0.7	<0.4	0.7

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

715172-715189 All samples are field blank subtracted.
No duplicate sample has been measured, as per client's request.

Analysis performed at AGAT Calgary (unless marked by *)

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Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19C544043

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Passive Quality Assurance

DATE RECEIVED: 2019-11-14

DATE REPORTED: 2019-11-25

Parameter	Unit	G / S	RDL	BLANK/ 28Sep/19,17:02 28Oct/19,10:15 /NO2 FILTER 726723
SAMPLE DESCRIPTION:				
SAMPLE TYPE:				
DATE SAMPLED:				
Ambient Nitrogen Dioxide	ppbv		0.4	<0.4

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Calgary (unless marked by *)

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C544043

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Air Quality Monitoring

RPT Date: Nov 25, 2019			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Passive Air Quality Sampling															
Ambient Nitrogen Dioxide	84	NA				< 0.4	103%	90%	110%	95%	80%	120%	100%	80%	120%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
Sample spikes and duplicates are not from the same sample.

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Certified By:

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C544043

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Ambient Nitrogen Dioxide	AQM-43-16004	Inhouse Method	ION CHROMATOGRAPH

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CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Schefferville

AGAT WORK ORDER: 20C571720

AIR QUALITY MONITORING REVIEWED BY: Carmen Andrei, AQM Lab Coordinator

DATE REPORTED: Feb 18, 2020

PAGES (INCLUDING COVER): 6

VERSION*: 1

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*Notes

Disclaimer:

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- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

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Air Quality Summary

AGAT WORK ORDER: 20C571720

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Parameter	Unit	Number of Samples	Peak Reading	Network Average
Ambient Nitrogen Dioxide	ppbv	4	<0.4	<0.4

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Certificate of Analysis

AGAT WORK ORDER: 20C571720

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Passive Air Quality Sampling

DATE RECEIVED: 2020-02-06

DATE REPORTED: 2020-02-18

				Site#06/AQS6/ 28Oct/19,11:10 22Jan/20,12:50	Site#07/AQS7/ 28Oct/19,09:35 22Jan/20,10:50	Site#08/AQS8/ 28Oct/19,14:23 22Jan/20,13:45	Site#09/AQS9/ 28Oct/19,10:14 22Jan/20,14:20
SAMPLE DESCRIPTION:				/NO2	/NO2	/NO2	/NO2
SAMPLE TYPE:				FILTER	FILTER	FILTER	FILTER
DATE SAMPLED:							
Parameter	Unit	G / S	RDL	920542	920543	920544	920545
Ambient Nitrogen Dioxide	ppbv		0.4	<0.4	<0.4	<0.4	<0.4

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

920542-920545 All samples are field blank subtracted.
No duplicates have been measured, as per client's request.

Analysis performed at AGAT Calgary (unless marked by *)

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Certificate of Analysis

AGAT WORK ORDER: 20C571720

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Passive Quality Assurance

DATE RECEIVED: 2020-02-06

DATE REPORTED: 2020-02-18

				BLANK/ 28Oct/19,11:10 22Jan/20,12:50
SAMPLE DESCRIPTION:				/NO2
SAMPLE TYPE:				FILTER
DATE SAMPLED:				
Parameter	Unit	G / S	RDL	920546
Ambient Nitrogen Dioxide	ppbv		0.4	<0.4

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Calgary (unless marked by *)

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 20C571720

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Air Quality Monitoring

RPT Date: Feb 18, 2020			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Passive Air Quality Sampling															
Ambient Nitrogen Dioxide	85	NA				< 0.4	107%	90%	110%	99%	80%	120%	98%	80%	120%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
Sample spikes and duplicates are not from the same sample.

<Original signed by>

Certified By:

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Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 20C571720

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Ambient Nitrogen Dioxide	AQM-43-16004	Inhouse Method	ION CHROMATOGRAPH

AGAT Laboratories

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CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Schefferville

AGAT WORK ORDER: 20C578826

AIR QUALITY MONITORING REVIEWED BY: Bithi Nahar, Lab Technician

DATE REPORTED: Mar 10, 2020

PAGES (INCLUDING COVER): 6

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 736-5300

*Notes

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- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

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Air Quality Summary

AGAT WORK ORDER: 20C578826

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Parameter	Unit	Number of Samples	Peak Reading	Network Average
Ambient Nitrogen Dioxide	ppbv	4	<0.4	<0.4

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20C578826

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Passive Air Quality Sampling

DATE RECEIVED: 2020-02-27

DATE REPORTED: 2020-03-10

				Site#06/AQS6/ 22Jan/20,12:55 22Feb/20,11:07	Site#07/AQS7/ 22Jan/20,10:50 22Feb/20,10:33	Site#08/AQS8/ 22Jan/20,13:45 22Feb/20,13:10	Site#09/AQS9/ 22Jan/20,14:20 22Feb/20,12:04
SAMPLE DESCRIPTION:				/NO2	/NO2	/NO2	/NO2
SAMPLE TYPE:				FILTER	FILTER	FILTER	FILTER
DATE SAMPLED:							
Parameter	Unit	G / S	RDL	974036	974037	974038	974040
Ambient Nitrogen Dioxide	ppbv		0.4	<0.4	<0.4	<0.4	<0.4

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

974036-974040 All samples are field blank subtracted.

Analysis performed at AGAT Calgary (unless marked by *)

<Original signed by>

Certified By:

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 20C578826

PROJECT: Schefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Passive Quality Assurance

DATE RECEIVED: 2020-02-27

DATE REPORTED: 2020-03-10

				BLANK/AQS6/ 22Jan/20,12:55 22Feb/20,11:07
		SAMPLE DESCRIPTION:		/NO2
		SAMPLE TYPE:		FILTER
		DATE SAMPLED:		
Parameter	Unit	G / S	RDL	974041
Ambient Nitrogen Dioxide	ppbv		0.4	0.6

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Calgary (unless marked by *)

<Original signed by>

Certified By:

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 20C578826

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

Air Quality Monitoring

RPT Date: Mar 10, 2020			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Passive Air Quality Sampling															
Ambient Nitrogen Dioxide	85	NA	NA	NA	NA	0.6	93%	90%	110%	93%	80%	120%	102%	80%	120%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.
Sample spikes and duplicates are not from the same sample.

<Original signed by>

Certified By:

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 20C578826

PROJECT: Schefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Ambient Nitrogen Dioxide	AQM-43-16004	Inhouse Method	ION CHROMATOGRAPH

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Sherbrooke

AGAT WORK ORDER: 19C520252

AIR QUALITY MONITORING REVIEWED BY: Carmen Andrei, AQM Lab Coordinator

DATE REPORTED: Sep 20, 2019

PAGES (INCLUDING COVER): 3

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 736-5300

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19C520252

PROJECT: Sherbrooke

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:DSO 3-4

SAMPLED BY:

Particulate on Filter Paper

DATE RECEIVED: 2019-09-06

DATE REPORTED: 2019-09-20

SAMPLE DESCRIPTION:				Q-7304 (AQS1)	Q-7316 (AQS2)	Q-7310 (AQS2)	Q-47-7323 (AQS2)	Q-7318 (AQS4)	Q-47-7321 (AQS4)	Q-7305 (AQS4)	Q-7313 (AQS6)
SAMPLE TYPE:				FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
DATE SAMPLED:				2019-06-07	2019-06-26	2019-07-10	2019-07-25	2019-06-25	2019-07-23	2019-07-08	2019-07-13
Parameter	Unit	G / S	RDL	543136	543137	543138	543139	543140	543141	543142	543143
Total Suspended Particulate	mg		0.01	0.39	0.42	0.37	0.34	0.27	0.29	0.36	0.35

SAMPLE DESCRIPTION:				Q-7311 (AQS7)	Q-7315 (AQS8)	Q-7301 (AQS9)	Q-47-7324 (AQS8)
SAMPLE TYPE:				FILTER	FILTER	FILTER	FILTER
DATE SAMPLED:				2019-07-03	2019-07-03	2019-05-07	2019-08-02
Parameter	Unit	G / S	RDL	543144	543145	543146	543147
Total Suspended Particulate	mg		0.01	0.44	0.38	0.47	0.30

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

<Original signed by>

Certified By:

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C520252

PROJECT: Sherbrooke

ATTENTION TO: Mariana Trindade

SAMPLING SITE:DSO 3-4

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Total Suspended Particulate	INOR-121-6041	EPA Method 5	GRAVIMETRIC

197501 5.84

AGAT Laboratories

9770 Route Transcanadienne
St-Laurent, Québec, H4S 1V9
Tel: 514.337.1000 Fax.: 514.333.3046
agatlabs.com

Laboratory Use Only
AGAT Work Order:
No. of Coolers: 9
Arrival Temperature:
Custody Seal Intact?: ☐ Yes ☐ No ☐ N/A

Chain of Custody - Environmental Chemistry

Client Information
Company: TSMC
Address:
Phone: Fax.:
Project No: PM 2.5 air monitoring
Sample Location: DSO 3-4
Sampled By: multi

Report Sent To
1. Name: TSMC recipient list
Email:
2. Name:
Email:

Report Format
☐ Portrait (sample/page) ☐ Landscape (multi sample/page)

Guideline Criteria
☐ PRTC ABC ☐ RESC
☐ CCME Other: ______
☐ Eau consommation
☐ Eau résurg. Surface
☐ Eau résurg. Salée
CMM Sanitary ☐ Storm ☐

Turn Around Time Required (Business Days)
Environmental:
Regular: ☐ 5 to 7 days
Rush: ☐ < 12 hours ☐ 24 hours ☐ 48 hours ☐ 72 hours
Ultra Trace:
Regular: ☐ 10 to 15 days
Rush: ☐ < 10 days
Data Required:

SAMPLES RECEIVED AFTER 4 PM WILL BE RECORDED AS RECEIVED ON NEXT BUSINESS DAY

Invoice To Same Address: ☐ Yes ☐ No
Company: TSMC
Contact:
Email:
Address:
PO No: 3000000296 Quote No:

Comments:

Matrix (legend)
S Soil B Sludge EP Drinking Water (MODDEDD Form) SE Sediment ES Surface Water AF Affluent
SL Solid EU Wastewater EF Effluent ST Groundwater A Air

Analysis columns: BTEX ☐ MAH ☐ VOC: THH-MAH ☐ THM ☐; PAH; Petroleum Hydrocabons C10-C50; RFA ☐ Chlorobenzenes ☐ Phthalates ☐; PCB: Congeners ☐ Arochr ☐; Ethylene glycol ☐ Glycols (Scan) ☐; Formaldehyde; Mineral Oil & Grease ☐ Total Oil & Grease ☐; Pesticides (specify):; Phenols (GC-MS) ☐ Phenolic Compounds (4AAP) ☐; 6 Metals (Cd, Cr, Cu, Ni, Pb, Zn); 13 Metals TC - Soil ☐ 17 Metals TC - Water ☐; Metals (specify):; Mercury ☐ Selenium - Soil ☐ Total Hardness ☐; Alkalinity ☐ Bicarbonate ☐ Conductivity ☐; Chloride ☐ Fluoride ☐ Sulphate ☐ Bromide ☐; Cyanide : Total ☐ Available ☐ Oxidizable ☐; COD ☐ P total ☐ TOC ☐; NH_3 ☐ TKN ☐ $NO_2 + NO_3$ ☐; Solides : Total ☐ Dissolved ☐ TSS ☐ VSS ☐; Sulphide - Water ☐ Total Sulphur - Soil ☐; Dissolved Metals filtered by Laboratory; SHORT HOLD TIME: pH ☐ NO_2 ☐ NO_3 ☐ o-PO4 ☐; Absorbance ☐ Colour ☐ Turbidity ☐; BOD_5 ☐ $CBOD_5$ ☐ Hexavalent Chromium ☐; Coliforms : Total ☐ Fecal ☐ Ecoli ☐; Microbiology (other); HR/MS : PCDD/PCDF ☐ PAH ☐ PCB ☐; CMM 2008-47 : Sanitary ☐ Storm ☐; RMD ☐ REIMR art. ___ ☐; Particle weight

SAMPLE IDENTIFICATION	DATE (DD/MM/YY)	TIME	MATRIX	NO. OF CONTAINERS	Particle weight
Q-7304 (AQS1)	6/7/19	13:35		1	Y
Q-7316 (AQS2)	26/6/19	16:20		1	Y
Q-7310 (AQS2)	10/7/19	18:00		1	Y
Q-47-7323 (AQS2)	25/7/19	15:30		1	Y
Q-7318 (AQS4)	25/6/19	10:00		1	Y
Q-47-7321 (AQS4)	23/7/19	15:30		1	Y
Q-7305 (AQS4)	8/7/19	12:00		1	Y
Q-7313 (AQS6)	13/7/19	16:00		1	Y
Q-7311 (AQS7)	3/7/19	12:00		1	X
Q-7315 (AQS8)	30/6/19	14:25		1	X
Q-7301 (AQS9)	5/7/19	9:45		1	Y
Q-47-7324 (AQS8)	2/8/19	14:00		1	X

Samples Released by (Print and Sign)	Date (DD/MM/YY)	Time	Sample Received by (Print and Sign)	Date (DD/MM/YY)	Time	
J-F Dion <Original signed by>	05/08/19	13:00				Page 1 of 1
				11/11/20		N°:

Copies: Red - Client Yellow - AGAT White - AGAT

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Shefferville

AGAT WORK ORDER: 19C531119

AIR QUALITY MONITORING REVIEWED BY: Carmen Andrei, AQM Lab Coordinator

DATE REPORTED: Oct 25, 2019

PAGES (INCLUDING COVER): 3

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 736-5300

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19C531119

PROJECT: Shefferville

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:DSO3-DSO4

SAMPLED BY:JDF,AC.,JDF,AC.

Particulate on Filter Paper

DATE RECEIVED: 2019-10-16

DATE REPORTED: 2019-10-25

				Q47-7325 (AQ54) 13:15/610152	Q47-7320 (AQ52) 10:00/610166	Q47-7327 (AQ51) 13:45/610167	Q47-7333 (AQ54) 15:33/610168	Q47-7348 (AQ55) 16:30/610169	Q47-7346 (AQ53) 17:40/610170	Q47-7331 (AQ56) 17:15/610171	Q47-7347 (AQ59) 18:00/610172
SAMPLE DESCRIPTION:				DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4
SAMPLE TYPE:				FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
DATE SAMPLED:				2019-08-04	2019-08-07	2019-08-15	2019-08-16	2019-08-17	2019-08-18	2019-08-22	2019-08-23
Parameter	Unit	G / S	RDL	620051	620052	620053	620054	620056	620057	620058	620059
Total Suspended Particulate	mg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

				Q47-7337 (AQ52) 09:30/610173	Q47-7357 (AQ54) 13:30/610174	Q47-7352 (AQ52) 10:30/610175	Q47-7359 (AQ58) 15:40/610176	Q47-7361 (AQ52) 08:10/610177	Q47-7350 (AQ51) 13:30/610178	Q47-7358 (AQ53) 09:00/610185	Q47-7351 (AQ55) 12:00/610186
SAMPLE DESCRIPTION:				DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4	DSO3-DSO4
SAMPLE TYPE:				FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
DATE SAMPLED:				2019-08-20	2019-08-28	2019-09-01	2019-09-02	2019-09-13	2019-09-15	2019-09-17	2019-08-18
Parameter	Unit	G / S	RDL	620060	620061	620062	620063	620064	620065	620066	620067
Total Suspended Particulate	mg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

				Q47-7364 (AQ54) 10:00/610187
SAMPLE DESCRIPTION:				DSO3-DSO4
SAMPLE TYPE:				FILTER
DATE SAMPLED:				2019-09-21
Parameter	Unit	G / S	RDL	620068
Total Suspended Particulate	mg		0.01	<0.01

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

620051-620068 The condition of samples was satisfactory at the time of arrival in laboratory.
The Reported Detection Limit RDL is based on the detection limit of the analytical balance used for filters: 0.01mg.

Analysis performed at AGAT Calgary (unless marked by *)

<Original signed by>

Certified By: _____

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C531119

PROJECT: Shefferville

ATTENTION TO: Mariana Trindade

SAMPLING SITE:DSO3-DSO4

SAMPLED BY:JDF,AC.,JDF,AC.

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Total Suspended Particulate	AQM-43-16002	NIOSH 0500	GRAVIMETRIC

AGAT Laboratoires
350 rue Franquet, Ville de Québec, Québec, G1P 4P3
Tél.: 418.266.5511 Téléc.: 418.653.2335
fr.agatlabs.com

19M28362

Chaîne de traçabilité Environnement

Eau potable RQEP (réseau) – Veuillez utiliser le formulaire du MDDELCC

À l'usage exclusif du laboratoire
Bon de travail AGAT:
Nb. de glacières: Aucune.
Température à l'arrivée:
☐ Glace ☐ Bloc réfrigérant ☒ Aucun
Scélé légal intact: ☐ Oui ☐ Non ☒ N/A

Information pour le rapport
Compagnie : TSMC
Adresse : 1000 rue Sherbrooke, bureau 1120, Montréal, Quebec H3A 3G4
Téléphone : 514 764 6700 Téléc. :
Projet : PM 2.5 air monitoring
Lieu de prélèvement : DS03 - DS04
Prélevé par : JFD, AC

Rapport envoyé à
1. Nom:
Courriel:
2. Nom:
Courriel:

Critères à respecter
☐ PRTC ABC ☐ RESC
☐ CCME
☐ Eau consommation
☐ Eau résurg. Surface
☐ Eau résurg. Salée
CMM Sanitaire ☐ Pluvial ☐
☐ Autre.

Délais d'analyse requis (jours ouvrables)
Environnemental: Régulier: ☑ 5 à 7 jours; Urgent: ☐ Même jour ☐ 1 jour ☐ 2 jours ☐ 3 jours
Haute Résolution: Régulier: ☐ 10 à 15 jours; Urgent: ☐ < 10 jours
Date Requise: AA/MM/JJ

Format de rapport
☐ **Portrait** *(échantillon/page)* ☐ **Paysage** *(échantillons/page)*

Facturé à
Même adresse : ☒ Oui ☐ Non
Compagnie : TSMC
Contact :
Courriel :
Adresse :
Bon de commande : Soumission :

Commentaires: 24 hr sampling period @ 16.7 l/min

Matrice (légende)

S	Sol	B	Boue	EP	Eau potable	EB	Eau brute	EPI	Eau de piscine
SL	Solide	EU	Eau usée	EF	Effluent	SE	Sédiment	ES	Eau de surface	AF	Affluent
						ST	Eau souterraine	A	Air

IDENTIFICATION DE L'ÉCHANTILLON	PRÉLÈVEMENT DATE (AA/MM/JJ)	PRÉLÈVEMENT HEURE	MATRICE	NB. DE CONTENANTS	Hydrocarbures pétroliers C10-C50	HAP	BTEX ☐ HAM ☐ HAC-HAM ☐ THM ☐	Chlorobenzènes ☐ Phtalates ☐ COSV ☐	BPC: Congénères ☐ Aroclor ☐ CBNC ☐	Éthylène glycol ☐ Formaldéhyde ☐	Huiles et graisses: Minérales ☐ Totales ☐	Pesticides: OC ☐ OP ☐ Herbicides ☐	Diquat / Paraquat ☐ Glyphosate ☐	Phénols (GC-MS) ☐ Indice phénolique (4AAP) ☐	Métaux - Sol ☐ Hg ☐ Se ☐ CrVI ☐	Métaux - ST ☐ Hg ☐ CrVI ☐ CrIII ☐ U ☐	Métaux: Filtré sur terrain ☐ Filtré au lab ☐	Métaux (spécifier):	Dureté totale ☐	Alcalinité ☐ Bromates ☐ Conductivité ☐	Chlorures ☐ Fluorures ☐ Sulfates ☐ Bromures ☐	Cyanures : Totaux ☐ Disponibles ☐ Oxydables ☐	DCO ☐ COT ☐	$NH_3 + NH_4$ ☐ NTK ☐ $NO_2 + NO_3$ ☐ P total ☐	Solides : Totaux ☐ Dissous ☐ MES ☐ MESV ☐	Sulfures - Eau ☐ Soufre total - Sol ☐	COURT DÉLAI DE CONSERVATION: pH ☐ NO_2 ☐ NO_3 ☐ o-PO4 ☐ COD ☐	Absorbance UV ☐ Couleur ☐ Turbidité ☐	DBO_5 ☐ DBO Carbonée ☐	Coliformes : Totaux ☐ Fécaux ☐ E.coli ☐	Microbiologie (autre) :	HR/MS : Dioxines/Furanes ☐ HAP ☐ BPC ☐	CMM 2008-47 : Sanitaire ☐ Pluvial ☐ NP ☐ NPE ☐	RMD ☐ REIMR art. ☐	dust weight on filter / dust concentration
Q-47-7325 (AQS4)	19/08/04	13:15		1																																X
Q-47-7320 (AQS2)	19/08/07	10:00		1																																X
Q-47-7327 (AQS1)	19/09/15	13:45																																		X
Q-47-7333 (AQS4)	19/09/16	15:33																																		X
Q-47-7348 (AQS5)	19/09/17	16:30																																		X
Q-47-7346 (AQS3)	19/08/18	17:40																																		X
Q-47-7331 (AQS6)	19/08/22	17:15																																		X
Q-47-7347 (AQS9)	19/08/23	18:00																																		X
Q-47-7337 (AQS2)	19/08/20	4:30																																		X
Q-47-7357 (AQS4)	19/08/28	13:30																																		X
Q-47-7352 (AQS2)	19/09/01	10:30																																		X
Q-47-7359 (AQS8)	19/09/02	15:40																																		X

Échantillon remis par (nom en lettres moulées et signature): Jean Francois Dion <Original signed by>	Date (AA/MM/JJ): 19/09/27	Heure: 17:30	Échantillon reçu par (nom en lettres moulées et signature): <Original signed by>
Échantillon remis par (nom en lettres moulées et signature):	Date (AA/MM/JJ):	Heure:	Échantillon reçu par (nom en lettres moulées et signature):

Date (AA/MM/JJ): 19/10/07 Heure: 7h32

N°: 072243

AGAT Laboratoires
350 rue Franquet, Ville de Québec,
Québec, G1P 4P3
Tél.: 418.266.5511 Téléc.: 418.653.2335
fr.agatlabs.com

Chaîne de traçabilité Environnement

Eau potable RQEP (réseau) – Veuillez utiliser le formulaire du MDDELCC

À l'usage exclusif du laboratoire
Bon de travail AGAT:
Nb. de glacières:
Température à l'arrivée:
☐ Glace ☐ Bloc réfrigérant ☐ Aucun
Scélé légal intact: ☐ Oui ☐ Non ☐ N/A

Information pour le rapport
Compagnie :
Adresse :
Téléphone : Téléc. :
Projet :
Lieu de prélèvement :
Prélevé par :

Rapport envoyé à
1. Nom:
Courriel:
2. Nom:
Courriel:

Critères à respecter
☐ PRTC ABC ☐ RESC
☐ CCME
☐ Eau consommation
☐ Eau résurg. Surface
☐ Eau résurg. Salée
CMM Sanitaire ☐ Pluvial ☐
☐ Autre.

Délais d'analyse requis (jours ouvrables)
Environnemental:
Régulier: ☐ 5 à 7 jours
Urgent: ☐ Même jour ☐ 1 jour ☐ 2 jours ☐ 3 jours
Haute Résolution:
Régulier: ☐ 10 à 15 jours
Urgent: ☐ < 10 jours
Date Requise: AA/MM/JJ

Format de rapport
☐ **Portrait** *(échantillon/page)* ☐ **Paysage** *(échantillons/page)*

Facturé à Même adresse : ☐ Oui ☐ Non
Compagnie :
Contact :
Courriel :
Adresse :
Bon de commande : Soumission :

Commentaires: 24 hr. Sampling period @ 16.7 l/m.h

Matrice (légende)

S	Sol	B	Boue	EP	Eau potable	EB	Eau brute
SL	Solide	EU	Eau usée	EF	Effluent	ST	Eau souterraine
EPI	Eau de piscine			SE	Sédiment	ES	Eau de surface
AF	Affluent					A	Air

IDENTIFICATION DE L'ÉCHANTILLON	PRÉLÈVEMENT DATE (AA/MM/JJ)	PRÉLÈVEMENT HEURE	MATRICE	NB. DE CONTENANTS
~~Q-47-7358 (AQS8)~~				
Q-47-7361 (AQS2)	19/09/13	8:10		
Q-47-7350 (AQS1)	19/09/15	13:30		
Q-47-7358 (AQS3)	19/09/17	9:00		
Q-47-7351 (AQS5)	19/09/18	12:00		
Q-47-7364 (AQS4)	19/09/21	10:00		

Hydrocarbures pétroliers C10-C50	HAP	BTEX ☐ HAM ☐ HAC-HAM ☐ THM ☐	Chlorobenzènes ☐ Phtalates ☐ COSV ☐	BPC: Congénères ☐ Aroclor ☐ CBNC ☐	Éthylène glycol ☐ Formaldéhyde ☐	Huiles et graisses: Minérales ☐ Totales ☐	Pesticides: OC ☐ OP ☐ Herbicides ☐	Diquat / Paraquat ☐ Glyphosate ☐	Phénols (GC-MS) ☐ Indice phénolique (4AAP) ☐	Métaux - Sol ☐ Hg ☐ Se ☐ CrVI ☐	Métaux - ST ☐ Hg ☐ CrVI ☐ CrIII ☐ U ☐	Métaux: Filtré sur terrain ☐ Filtré au lab ☐	Métaux (spécifier):	Dureté totale ☐	Alcalinité ☐ Bromates ☐ Conductivité ☐	Chlorures ☐ Fluorures ☐ Sulfates ☐ Bromures ☐	Cyanures : Totaux ☐ Disponibles ☐ Oxydables ☐	DCO ☐ COT ☐	$NH_3 + NH_4$ ☐ NTK ☐ $NO_2 + NO_3$ ☐ P total ☐	Solides : Totaux ☐ Dissous ☐ MES ☐ MESV ☐	Sulfures - Eau ☐ Soufre total - Sol ☐	COURT DÉLAI DE CONSERVATION: pH ☐ NO_2 ☐ NO_3 ☐ o-PO4 ☐ COD ☐	Absorbance UV ☐ Couleur ☐ Turbidité ☐	DBO_5 ☐ DBO_5 Carbonée ☐	Coliformes : Totaux ☐ Fécaux ☐ E.coli ☐	Microbiologie (autre) :	HR/MS : Dioxines/Furanes ☐ HAP ☐ BPC ☐	CMM 2008-47 : Sanitaire ☐ Pluvial ☐ NP ☐ NPE ☐	RMD ☐ REIMR art. _____ ☐	dust weight on filter / dust concentration

Échantillon remis par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure	Échantillon reçu par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure
Échantillon remis par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure	Échantillon reçu par (nom en lettres moulées et signature)	Date (AA/MM/JJ)	Heure

N°: 072239

No. de document: DIV-111-15425.010
Copies: Rose – Client Jaune – AGAT Blanche – AGAT
Date de révision: 1 mai 2018

Work Order Number: 19M528362

Company

4172207 TATA STEEL MINERALS CANADA LTD

1000 SHERBROOKE W., SUTE 1120

MONTREAL QC H3A3G4

Tel: 5147646700 Fax: 5147646725

Contact

Contact Name: Mariana Trindade

Tel: 514-764-6705

Fax:

Email: mariana.trindade@tatasteelcanada.com

Other Information

PO:

AFE:

Project No: PM 2.5 Air monitoring

Submission Date: 10/7/2019 4:30:00 PM

Effective Date: 10/8/2019 8:00:00 AM

Due Date: 10/18/2019 8:00:00 PM

Operations,analysis,materials included in work order

PRODUCT ID	ENV DESCRIPTION	QUANTITY
111004	Frais de transport par courrier	1
101231	Pré-pesée filtre (air)	17
101230	Particules (air)	17

Sample Identification Information, Provided by client

Sample Id	Sample Type	LSD	Container Type	Analysis Required
	Sample Date	Sampling Point	Preserve	Sample Description
				Other Information
610152A	Filtre		Filtre	Dust weight on filter /dust concentration
	Aug 04, 2019		Aucun	Q47-7325 (AQ54)
610166A	Filtre		Filtre	Dust weight on filter /dust concentration
	Aug 07, 2019		Aucun	Q47-7320 (AQ52)
610167A	Filtre		Filtre	Dust weight on filter /dust concentration
	Aug 15, 2019		Aucun	Q47-7327 (AQ51)

AGAT Laboratories

2420-42 AVE. NE
CALGARY, ALBERTA
CANADA T2E 7T6
TEL (403)736-5300

http://www.agatlabs.com

CLIENT NAME: TATA STEEL MINERALS CANADA LTD
1000 SHERBROOKE W., SUTE 1120
MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: Sherbrooke

AGAT WORK ORDER: 19C520268

AIR QUALITY MONITORING REVIEWED BY: Carmen Andrei, AQM Lab Coordinator

DATE REPORTED: Sep 20, 2019

PAGES (INCLUDING COVER): 3

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (403) 736-5300

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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TEL (403)736-5300

http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 19C520268

PROJECT: Sherbrooke

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLING SITE:DSO-3-4

SAMPLED BY:

Particulate on Filter Paper (TSP)

DATE RECEIVED: 2019-08-09

DATE REPORTED: 2019-09-20

				Q-7303	Q-7307	Q-7308	Q-47-7326	Q-73-17	Q-7306	Q-47-7319	Q-7309
SAMPLE DESCRIPTION:				(AQ51)	(AQ52)	(AQ52)	(AQ54)	(AQ54)	(AQ54)	(AQ54)	(AQ57)
SAMPLE TYPE:				FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER	FILTER
DATE SAMPLED:				2019-07-06	2019-06-29	2019-07-11	2019-07-25	2019-06-28	2019-07-08	2019-07-23	2019-07-03
Parameter	Unit	G / S	RDL	543174	543175	543176	543177	543178	543179	543180	543181
Total Suspended Particulate	mg		0.01	0.02	0.02	0.27	0.02	0.02	<0.01	0.02	0.36

				Q-7302
SAMPLE DESCRIPTION:				(AQ59)
SAMPLE TYPE:				FILTER
DATE SAMPLED:				2019-07-05
Parameter	Unit	G / S	RDL	543182
Total Suspended Particulate	mg		0.01	0.03

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

<Original signed by>

Certified By: _____

AGAT Laboratories

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TEL (403)736-5300

http://www.agatlabs.com

Method Summary

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19C520268

PROJECT: Sherbrooke

ATTENTION TO: Mariana Trindade

SAMPLING SITE:DSO-3-4

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Air Quality Monitoring			
Total Suspended Particulate	INOR-121-6041	EPA Method 5	GRAVIMETRIC

AGAT Laboratories

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MONTREAL, QC H3A3G4
(514) 764-6700

ATTENTION TO: Mariana Trindade

PROJECT: TPM Air Monitoring

AGAT WORK ORDER: 19M501574

WATER ANALYSIS REVIEWED BY: Philippe Morneau, chimiste

DATE REPORTED: 2019-09-27

VERSION*: 1

PAGES (INCLUDING COVER): 7

Should you require any information regarding this analysis please contact your client services representative at (514) 337-1000

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 19M501574

PROJECT: TPM Air Monitoring

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:MULTI

SAMPLING SITE:DSO-3-4

Metals on Filters

DATE RECEIVED: 2019-08-06

DATE REPORTED: 2019-09-27

SAMPLE DESCRIPTION:				Q-7303(AQ51)	Q-7307(AQ52)	Q-7308(AQ52)	Q-47-7326 (AQ54)	Q-73-17(AQ54)	Q-7306(AQ54)	Q-47-7319 (AQ54)	Q-7309(AQ57)
SAMPLE TYPE:				Air	Air	Air	Air	Air	Air	Air	Air
DATE SAMPLED:				2019-07-06	2019-06-29	2019-07-11	2019-07-25	2019-06-28	2019-07-08	2019-07-23	2019-07-03
Parameter	Unit	G / S	RDL	420416	420437	420438	420439	420440	420441	420442	420443
Aluminum	ug/Filter		10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Aluminum	ug/m3		10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4
Arsenic	ug/Filter		5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Arsenic	ug/m3		5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2
Boron	ug/Filter		5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Boron	ug/m3		5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2
Cadmium	ug/Filter		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	ug/m3		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	ug/Filter		0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper	ug/m3		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	ug/Filter		5.0	10.0	<5.0	5.0	<5.0	<5.0	<5.0	10.0	15.0
Iron	ug/m3		5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2
Lead	ug/Filter		10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Lead	ug/m3		10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4
Lithium	ug/Filter		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Lithium	ug/m3		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Magnesium	ug/Filter		10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Magnesium	ug/m3		10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4	<10.4
Manganese	ug/Filter		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.5
Manganese	ug/m3		0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Molybdenum	ug/Filter		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Molybdenum	ug/m3		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Selenium	ug/Filter		5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Selenium	ug/m3		5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2	<5.2
Strontium	ug/Filter		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Strontium	ug/m3		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	ug/Filter		2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5

<Original signed by>

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19M501574

PROJECT: TPM Air Monitoring

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:MULTI

SAMPLING SITE:DSO-3-4

Metals on Filters

DATE RECEIVED: 2019-08-06

DATE REPORTED: 2019-09-27

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: Q-7303(AQ51) SAMPLE TYPE: Air DATE SAMPLED: 2019-07-06 420416	Q-7307(AQ52) Air 2019-06-29 420437	Q-7308(AQ52) Air 2019-07-11 420438	Q-47-7326 (AQ54) Air 2019-07-25 420439	Q-73-17(AQ54) Air 2019-06-28 420440	Q-7306(AQ54) Air 2019-07-08 420441	Q-47-7319 (AQ54) Air 2019-07-23 420442	Q-7309(AQ57) Air 2019-07-03 420443
Titanium	ug/m3		2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6
Zinc	ug/Filter		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.5	<1.0
Zinc	ug/m3		1	<1	<1	<1	<1	<1	<1	<1	<1

<Original signed by>

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Certificate of Analysis

AGAT WORK ORDER: 19M501574

PROJECT: TPM Air Monitoring

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:MULTI

SAMPLING SITE:DSO-3-4

Metals on Filters

DATE RECEIVED: 2019-08-06

DATE REPORTED: 2019-09-27

		SAMPLE DESCRIPTION:		Q-7302(AQ59)
		SAMPLE TYPE:		Air
		DATE SAMPLED:		2019-07-05
Parameter	Unit	G / S	RDL	420444
Aluminum	ug/Filter		10.0	<10.0
Aluminum	ug/m3		10.4	<10.4
Arsenic	ug/Filter		5.0	<5.0
Arsenic	ug/m3		5.2	<5.2
Boron	ug/Filter		5.0	<5.0
Boron	ug/m3		5.2	<5.2
Cadmium	ug/Filter		0.2	<0.2
Cadmium	ug/m3		0.2	<0.2
Copper	ug/Filter		0.5	<0.5
Copper	ug/m3		0.5	<0.5
Iron	ug/Filter		5.0	5.0
Iron	ug/m3		5.2	<5.2
Lead	ug/Filter		10.0	<10.0
Lead	ug/m3		10.4	<10.4
Lithium	ug/Filter		1.0	<1.0
Lithium	ug/m3		1.0	<1.0
Magnesium	ug/Filter		10.0	<10.0
Magnesium	ug/m3		10.4	<10.4
Manganese	ug/Filter		0.3	<0.3
Manganese	ug/m3		0.3	<0.3
Molybdenum	ug/Filter		0.5	<0.5
Molybdenum	ug/m3		0.5	<0.5
Selenium	ug/Filter		5.0	<5.0
Selenium	ug/m3		5.2	<5.2
Strontium	ug/Filter		0.1	<0.1
Strontium	ug/m3		0.1	<0.1
Titanium	ug/Filter		2.5	<2.5
Titanium	ug/m3		2.6	<2.6

<Original signed by>

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 19M501574

PROJECT: TPM Air Monitoring

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

ATTENTION TO: Mariana Trindade

SAMPLED BY:MULTI

SAMPLING SITE:DSO-3-4

Metals on Filters

DATE RECEIVED: 2019-08-06

DATE REPORTED: 2019-09-27

		SAMPLE DESCRIPTION:		Q-7302(AQ59)
		SAMPLE TYPE:		Air
		DATE SAMPLED:		2019-07-05
Parameter	Unit	G / S	RDL	420444
Zinc	ug/Filter		1.0	<1.0
Zinc	ug/m3		1	<1

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

420416-420444 **Non-accredited test. Inquire with lab for details.

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Quality Assurance

CLIENT NAME: TATA STEEL MINERALS CANADA LTD

AGAT WORK ORDER: 19M501574

PROJECT: TPM Air Monitoring

ATTENTION TO: Mariana Trindade

SAMPLED BY:MULTI

SAMPLING SITE:DSO-3-4

Water Analysis

RPT Date: 2019-09-27			DUPLICATE			REFERENCE MATERIAL				METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Metals on Filters															
Aluminum**			0.40	0.34	NA	< 0.1	99%	80%	120%	99%	80%	120%	85%	80%	120%
Arsenic**			0.2	0.2	NA	< 0.1	100%	80%	120%	97%	80%	120%	92%	80%	120%
Boron**			0.09	0.09	NA	< 0.05	113%	80%	120%	111%	80%	120%	108%	80%	120%
Cadmium**			0.08	0.08	0.0%	< 0.01	107%	80%	120%	99%	80%	120%	98%	80%	120%
Copper**			0.09	0.09	0.0%	< 0.01	102%	80%	120%	109%	80%	120%	110%	80%	120%
Iron**			0.4	0.4	NA	< 0.1	107%	80%	120%	110%	80%	120%	107%	80%	120%
Lead**			0.8	0.8	NA	< 0.2	106%	80%	120%	101%	80%	120%	101%	80%	120%
Lithium**			3.02	3.05	1.0%	< 0.01	102%	80%	120%	110%	80%	120%	102%	80%	120%
Magnesium**			2.4	2.5	4.1%	< 0.2	103%	80%	120%	119%	80%	120%	119%	80%	120%
Manganese**			0.094	0.092	2.2%	< 0.005	107%	80%	120%	117%	80%	120%	115%	80%	120%
Molybdenum**			0.08	0.08	0.0%	< 0.01	108%	80%	120%	101%	80%	120%	100%	80%	120%
Selenium**			0.2	<0.2	NA	< 0.2	107%	80%	120%	120%	80%	120%	98%	80%	120%
Strontium**			0.04	0.04	NA	< 0.01	103%	80%	120%	108%	80%	120%	108%	80%	120%
Titanium**			0.41	0.41	0.0%	< 0.05	114%	80%	120%	103%	80%	120%	103%	80%	120%
Zinc**			0.20	0.20	0.0%	< 0.02	109%	80%	120%	101%	80%	120%	100%	80%	120%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

<Original signed by>

Certified By:

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AGAT Laboratories

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Laboratory Use Only
AGAT Work Order: 19Y501-574
No. of Coolers:
Temperature:
Custody Seal Intact?: ☐ Yes ☐ No ☐ N/A

Chain of Custody - Environmental Chemistry

Client Information
Company: TSMC
Address:
Phone: Fax:
Project No: TPM air monitoring
Sample Location: DSO 3-4
Sampled By: multi

Report Sent To
1. Name: TSMC mailing list
Email:
2. Name:
Email:

Guideline Criteria
☐ PRTC ARC ☐ RESC
☐ CCME Other:
☐ Eau consommation
☐ Eau resurg. Surface
☐ Eau résurg. Salée
CMM Sanitary ☐ Storm ☐

Report Format
☐ Portrait (sample/page) ☐ Landscape (multi-sample/page)

Turn Around Time Required (Business Days)
Environmental: Regular: ☒ 5 to 7 days Rush: ☐ < 12 hours ☐ 24 hours ☐ 48 hours ☐ 72 hours
Ultra Trace: Regular: ☐ 10 to 15 days Rush: ☐ < 10 days
Date Required:

SAMPLES RECEIVED AFTER 4 PM WILL BE RECORDED AS RECEIVED ON NEXT BUSINESS DAY

Invoice To Same Address: ☐ Yes ☐ No
Company: TSMC
Contact:
Email:
Address:
PO No: 3000000296 Quote No:

Comments: Appendix A P 10/12

Matrix (Legend)
S Soil B Sludge SE Sediment ES Surface Water AF Affluent
SL Solid EU Wastewater EF Effluent ST Groundwater A Air
EP Drinking Water (Microbiology)

SAMPLE IDENTIFICATION	SAMPLE DATE (DD/MM/YY)	SAMPLE TIME	MATRIX	NO. OF CONTAINERS	BTEX ☐ VOC: THH-MAH ☐ THM ☐	MAH ☐	PAH	Petroleum Hydrocarbons C10-C50	RFA ☐ Chlorobenzenes ☐ Phthalates ☐	PCB Congeners ☐ Acrolein ☐	Ethylene glycol ☐ Glycols (Scan) ☐	Formaldehyde	Mineral Oil & Grease ☐ Total Oil & Grease ☐	Pesticides (specify):	Phenols (4AAP) ☐ Phenols (GC-MS) ☐	6 Metals (Cd, Cr, Cu, Ni, Pb, Zn)	13 Metals TC - Soil ☐ 17 Metals TC - Water ☐	Metals (specify):	Mercury ☐ Selenium - Soil ☐ Total Hardness ☐	Alkalinity ☐ Bicarbonate ☐ Conductivity ☐	Chloride ☐ Fluoride ☐ Sulphate ☐ Bromide ☐	Cyanide : Total ☐ Available ☐ Oxidizable ☐	COD ☐ P total ☐ TOC ☐	NH_3 ☐ TKN ☐ $NO_2 + NO_3$ ☐	Solides : Total ☐ Dissolved ☐ TSS ☐ VSS ☐	Sulphide - Water ☐ Total Sulphur - Soil ☐	Dissolved Metals filtered by Laboratory	pH ☐ NO_2 ☐ NO_3 ☐ o-PO4 ☐	Absorbance ☐ Colour ☐ Turbidity ☐	BOD_5 ☐ $CBOD_5$ ☐ Hexavalent Chromium ☐	Coliforms : Total ☐ Fecal ☐ E.coli ☐	Microbiology (other):	HRMS : PCDD/PCDF ☐ PAH ☐ PCB ☐	CMM 2008-47 : Sanitary ☐ Storm ☐	RMD ☐ REMR str. ☐	Particle weight
Q-7303 (AQS1)	6/7/19	13:35		1														X																		X
Q-7307 (AQS2)	29/6/19	15:45																X																		X
Q-7308 (AQS2)	11/7/19	18:00																X																		X
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Q-7317 (AQS4)	28/6/19	13:50																X																		X
Q-7306 (AQS4)	8/7/19	12:00																X																		X
Q-47-7319 (AQS4)	23/7/19	15:30																X																		X
Q-7309 (AQS7)	3/7/19	13:00																X																		X
[redacted]																																						
Q-7302 (AQS9)	5/7/19	9:40																X																		X
																		X																		X

Samples Released by (Print and Sign)	Date (DD/MM/YY)	Time	Samples Received by (Print and Sign)	Date (DD/MM/YY)	Time
J-F Dion <Original signed by>	05/05/19	13:00			
Samples Released by (Print and Sign)	Date (DD/MM/YY)	Time	Samples Received by (Print and Sign)	Date (DD/MM/YY)	Time

Page ____ of ____
NF:

Copies: Red - Client Yellow - AGAT White - AGAT

AGAT Laboratories

9770 Route Transcanadienne
St-Laurent, Quebec H4S 1V6
Tel: 514.337.1000 Fax: 514.333.3076
agatlabs.com

Laboratory Use Only
AGAT Work Order No. in Cooler: 19M501574
Cooler Temperature:
Custody Seal Intact?: ☐ Yes ☐ No ☐ N/A

Chain of Custody - Environmental Chemistry

Client Information
Company: TSMC
Address:
Phone: Fax:
Project No: TPM air monitoring
Sample Location: DSO 3-4
Sampled By: multi

Report Sent To
1. Name: TSMC mailing list
Email:
2. Name:
Email:

Report Format
☐ Portrait (sample/page) ☐ Landscape (multi-sample/page)

Guideline Criteria
☐ PRTC ABC ☐ RESC
☐ CCME Other:
☐ Eau consommation
☐ Eau résurg. Surface
☐ Eau résurg. Salée
CMM Sanitary ☐ Storm ☐

Turn Around Time Required (Business Days)
Environmental: Regular: ☒ 5 to 7 days Rush: ☐ < 12 hours ☐ 24 hours ☐ 48 hours ☐ 72 hours
Ultra Trace: Regular: ☐ 10 to 15 days Rush: ☐ < 10 days
Date Required:

SAMPLES RECEIVED AFTER 4 PM WILL BE RECORDED AS RECEIVED ON NEXT BUSINESS DAY

Invoice To Same Address: ☐ Yes ☐ No
Company: TSMC
Contact:
Email:
Address:
PO No: 3000000296 Quote No:

Comments: Appendix A P 10/12

Matrix (legend)
EP Drinking Water (MOE/ECA Form)
S Soil B Sludge SE Sediment ES Surface Water AF Affluent
SL Solid EU Wastewater EF Effluent ST Groundwater A Air

SAMPLE IDENTIFICATION	SAMPLE DATE DATE (DD/MM/YY)	TIME	MATRIX	NO. OF CONTAINERS	BTEX ☐ THM ☐ VOC: MAH ☐ THM-MAH ☐	PAH	Petroleum Hydrocarbons C10-C50	RFA ☐ Chlorobenzenes ☐ Phthalates ☐	PCB: Congeners ☐ Aroclor ☐	Ethylene glycol ☐ Glycols (Scan) ☐	Formaldehyde	Mineral Oil & Grease ☐ Total Oil & Grease ☐	Pesticides (specify):	Phenols (GC-MS) ☐ Phenolic Compounds (4AAP) ☐	6 Metals (Cd, Cr, Cu, Ni, Pb, Zn)	13 Metals TC - Soil ☐ 17 Metals TC - Water ☐	Metals (specify):	Mercury ☐ Selenium - Soil ☐ Total Hardness ☐	Alkalinity ☐ Bicarbonate ☐ Conductivity ☐	Chloride ☐ Fluoride ☐ Sulphate ☐ Bromide ☐	Cyanide: Total ☐ Available ☐ Oxidizable ☐	COD ☐ P total ☐ TOC ☐	NH_3 ☐ TKN ☐ $NO_2 + NO_3$ ☐	Solids: Total ☐ Dissolved ☐ TSS ☐ VSS ☐	Sulphide - Water ☐ Total Sulphur - Soil ☐	Dissolved Metals filtered by Laboratory	SHORT HOLD TIME pH ☐ NO_2 ☐ NO_3 ☐ o-PO4 ☐	Absorbance ☐ Colour ☐ Turbidity ☐	BOD_5 ☐ $CBOD_5$ ☐ Hexavalent Chromium ☐	Coliforms: Total ☐ Fecal ☐ E.coli ☐	Microbiology (other):	HRMS: PCDD/PCDF ☐ PAH ☐ PCB ☐	CMM 2008-47: Sanitary ☐ Storm ☐	RMD ☐ REMARKS: Particle weight
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Q-7308 (AQS2)	11/7/19	18:00															X																X
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Q-7317 (AQS4)	28/6/19	13:50															X																X
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[redacted]																	Y																
Q-7302 (AQS9)	5/7/19	9:40																															X
																	Y																

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J-F Dion <Original signed by>	05/05/19	13:00				Page ____ of ____
Samples Released by (Print and Sign)	Date (DD/MM/YY)	Time	Sample Received by (Print and Sign)	Date (DD/MM/YY)	Time	NF:

Copies: Red – Client Yellow – AGAT White – AGAT

Revision Date: 15 novembre 2018

AGAT Laboratories

9770 Route Transcanadienne
St-Laurent, Quebec H4S 1V6
Tel: 514.337.1000 Fax: 514.333.8076
agatlabs.com

Laboratory Use Only
AGAT Work Order: 19Z501574
No. of Coolers:
Temperature:
Custody Seal Intact?: ☐ Yes ☐ No ☐ N/A

Chain of Custody - Environmental Chemistry

Client Information
Company: TSMC
Address:
Phone: Fax:
Project No: TPM air monitoring
Sample Location: DSO 3-4
Sampled By: multi

Report Sent To
1. Name: TSMC mailing list
Email:
2. Name:
Email:

Guideline Criteria
☐ PRTC ABC ☐ RESC
☐ CCME Other:
☐ Eau consommation
☐ Eau resurg. Surface
☐ Eau résurg. Salée
CMM Sanitary ☐ Storm ☐

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Invoice To Same Address: ☐ Yes ☐ No
Company: TSMC
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PO No: 3000000296 Quote No:

Comments: Appendix A P 10/12

Matrix (legend)
S Soil B Sludge SE Sediment ES Surface Water AF Affluent
SL Solid EU Wastewater EF Effluent ST Groundwater A Air
EP Drinking Water (MOE/ECCC form)

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J-F Dion <Original signed by>	05/05/19	13:00				Page ____ of ____
Samples Released by (Print and Sign)	Date (DD/MM/YY)	Time	Samples Received by (Print and Sign)	Date (DD/MM/YY)	Time	NF:

Copies: Red - Client Yellow - AGAT White - AGAT

Work Order Number: 19M528362

610168A	Filtre Aug 16, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7333 (AQ54)
610169A	Filtre Aug 17, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7348 (AQ55)
610170A	Filtre Aug 18, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7346 (AQ53)
610171A	Filtre Aug 22, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7331 (AQ56)
610172A	Filtre Aug 23, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7347 (AQ59)
610173A	Filtre Aug 20, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7337 (AQ52)
610174A	Filtre Aug 28, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7357 (AQ54)
610175A	Filtre Sep 01, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7352 (AQ52)
610176A	Filtre Sep 02, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7359 (AQ58)
610177A	Filtre Sep 13, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7361 (AQ52)

Work Order Number: 19M528362

610178A	Filtre Sep 15, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7350 (AQ51)
610185A	Filtre Sep 17, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7358 (AQ53)
610186A	Filtre Aug 18, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7351 (AQ55)
610187A	Filtre Sep 21, 2019	Filtre Aucun	Dust weight on filter /dust concentration Q47-7364 (AQ54)

Appendix 6 Timmins 4 Sedimentation Pond 3 Incident Report

Report on Sedimentation Pond 3 Incident

August 2019

TATA

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Table of Figures

1. DESCRIPTION OF INCIDENT

Timmins 4 Sedimentation Pond 3 (SP3) is located within the province of Newfoundland and Labrador and was constructed to capture mine waters from the Timmins 4 pit at TSMC's DSO site. In the future, TSMC plans to increase the pond's capacity to allow for utilization in the Howse Water Management Plan. Currently, TSMC has no plans to commence any part of the Howse Property Project, which was released from further federal and provincial environmental assessment in Spring 2017.

1.2 Incident Overview

- Between May 12th and 17th, red water was observed pooling (**red circle**) against the berm of SP3, for which TSMC has the mine operating permit from GNFL;
- Cause was uncontrolled runoff from T4 ditches (**green circles**);
- Water accumulation wore down the berm and a breach occurred. Water entered the pond, and so no action was taken (i.e. not flowing into the natural environment);
- Red water exited through the culvert (**blue circle**), as per design, and found its way to the adjacent wetland;
- Coinciding with this, TSMC received notice that a complaint was raised through the National Environment Emergency Center (NEEC). TSMC subsequently responded to GNFL on facts on the status of the incident and measures being taken to mitigate effects;
- Once possible (after snow melt): 6 sediment fences were installed, an expert was brought to site to assess status of SP3, and remaining water was redirected.

1.3 Detailed Timeline

May 12, 2019

On May 12th, 2019, during snowmelt, TSMC personnel observed the beginnings of a breach opening up at the southeast (SE) corner of SP3, which caused runoff to enter and pool against and around SP3. Given snow conditions, it was not possible to see the origin of the water (see Figure 1).

Figure 1. Breach opening at the SE corner of SP3 allowed runoff to enter and pool against and berm.

Within a few days, a complete breach of the SP3 berm occurred, allowing the pooled water to flow into the pond.

Figure 2. Closeup of breach at the SP3 SE corner, with water flowing into SP3.

On May 16, 2019, the water that had accumulated against the edge of SP3 was flowing into the pond through the breach. Water that could not enter through the breach flowed through the adjacent wetland and into Goodream Creek.

The pond appeared to be at (or beyond) maximum capacity. The water level in the pond was very high – not overtopping the walls, but with minimal retention time in the pond and a substantial flow rate observed from the culvert (see Figure 4).

Figure 3. At the culvert outlet, water had overtopped the snow-filled outlet ditch, spreading into the adjacent wetland rather than being channelled into Goodream Creek.

Runoff was flowing into the pond and flowing out of the culvert (as per design, see Figure 4) and TSMC continued to monitor the situation daily. At this stage, snow cover continued to prevent mitigation.

Figure 4. Water flowing from culvert into adjacent weltand.

On May 17, 2019, further loss of snow cover made it apparent that the ditch draining the area between the T4 and T6 waste piles had also breached (see Figure 5 and Figure 6). Water from T4 that should be conveyed along the ditch and into SP3 had breached the berm and was joining the T6 runoff, contributing to the breach and the buildup of runoff flowing into and around SP3 and overflowing into the adjacent environment.

Figure 5. Aerial view of SP3 and associated infrastructure.

Figure 6. Closeup of T4 ditch that breached.

On May 29th, 2019, a site visit indicated that the situation is completely stable. A better understanding of the situation is being developed. Current water levels in SP3 are well below the culvert.

Figure 7. Appearance of water directly adjacent to SP3 (east side, into wetland), on May 29th.

1.4 Adverse Environmental Effects

The red water that flowed in and around SP3 consisted entirely of large volumes of meltwater, as there have been no mining activities at Timmins 4 since 2017. Red meltwater runoff is a common annual occurrence at the TSMC site. As such, Goodream Creek experienced a significant inflow of meltwater with high TSS and preliminary Daphnia Toxicity reported.

The flow evidently travelled along Goodream Creek and all the way through to Triangle Lake, as the entire water course displayed visible levels of red water. Preliminary analysis of samples taken from Goodream Creek during the red water event indicated detectable levels of Daphnia toxicity. Unfortunately, due to external complications with our laboratory services provider (see Appendix A), final results from the investigation are still pending.

2. MITIGATION MEASURES

On May 12th, when TSMC initially became aware of the problem, on-site personnel confirmed that snow cover prevented TSMC from taking any mitigative action (e.g. sediment fences and/or earthworks), and that the runoff was mostly entering the pond, and not circulating into the natural environment. By May 17th, TSMC initiated the process of requesting that an engineering firm come to site to assess conditions at SP3.

The focus of the mitigation measures was to prevent sediment from flowing into Goodream Creek. As such, a total of six silt fences were installed over a period of several days in the stream leading into Goodream Creek.

3. VIEWS FROM INDIGENOUS GROUPS AND RELEVANT AUTHORITIES

On May 21st, 2019, TSMC was notified that a NEEC incident report, which was not accurate, was submitted, and this was followed up by an updated NEEC report on May 27th. Both NEEC incident reports were filed by local communities. Although TSMC did not immediately initiate discussions with communities due to the sensitive nature of the events involving the media, TSMC understands the high-importance that communities give to red water events at its site.

On May 30th, 2019, TSMC updated the Government of Newfoundland and Labrador on the incident via a phone conference.

Environment Canada visited the site for 6 days in May 2019 and expressed concerns over berm stability. An engineering expert visited the site in early-June and confirmed her findings that SP3 berms are stable (see Appendix B).

On June 6th, a press conference was held in Sept-Iles by VP Stakeholder Relations, Manager Environment and Manager Community to share factual details with media.

4. RESIDUAL ADVERSE ENVIRONMENTAL EFFECTS

By May 29th, 2019, the situation at the SP3 site was entirely stable (see cover photo of this report). This is indicative that the issues are limited to Spring thaw events.

4.2 Mitigation of Residual Adverse Environmental Effects

On June 5th, a TSMC technician modified the drainage at the SE corner of SP3 by digging out sediment to allow more of the water pooling near the pond to flow into the breach, thereby diverting it away from Goodream Creek. After less than half an hour, the water level in the pool had already gone down significantly.

Channels were dug wider and deeper in two areas to direct as much water as possible into the pond:

Figure 8. Inlet into breach, showing minimal water flow into SP3.

The two pictures below show the flow into the pond before and after. The intervention clearly improved the flow of water into SP3, thereby reducing the amount that flowed into the natural environment.

Figure 9. Low flow into breach prior to TSMC intervention.

Figure 10. Stronger flow into breach following intervention.

This action appeared to be very successful as water flowed more rapidly into SP3, and the water level of the pooled water was visibly lower.

Figure 11. Picture showing how water level decreased quickly once TSMC re-directed water into SP3.

5. FUTURE ACTIONS

TSMC will implement several measures to avoid a subsequent occurrence of water flowing uncontrollably into the natural environment at SP3. The way forward was formulated based on field observations, knowledge of the site, and support from a professional engineering firm.

The sketch below describes the actions that TSMC will implement during summer 2019 to correct the issues with the SP3. First, the link from which the largest volume of water flows into the SP3 system will be blocked (large blue triangle and red X in Figure 12). This will be achieved by closing the culvert underneath the existing road and redirecting water into a new ditch that will empty into an old pit (T6 pit).

Next, the ditches that are part of the SP3 system will be upgraded and their berms restored. Furthermore, TSMC will ensure that the ditches will be cleared of snow in the Spring of 2020. Two check dams will be built: one to mitigate any environmental effect should water pool at the same location (SE corner of SP3) in the future – which is not expected. A second check dam will be built at the SP3 outlet, and the berm between the ditch and the wetland at this location will be reinforced.

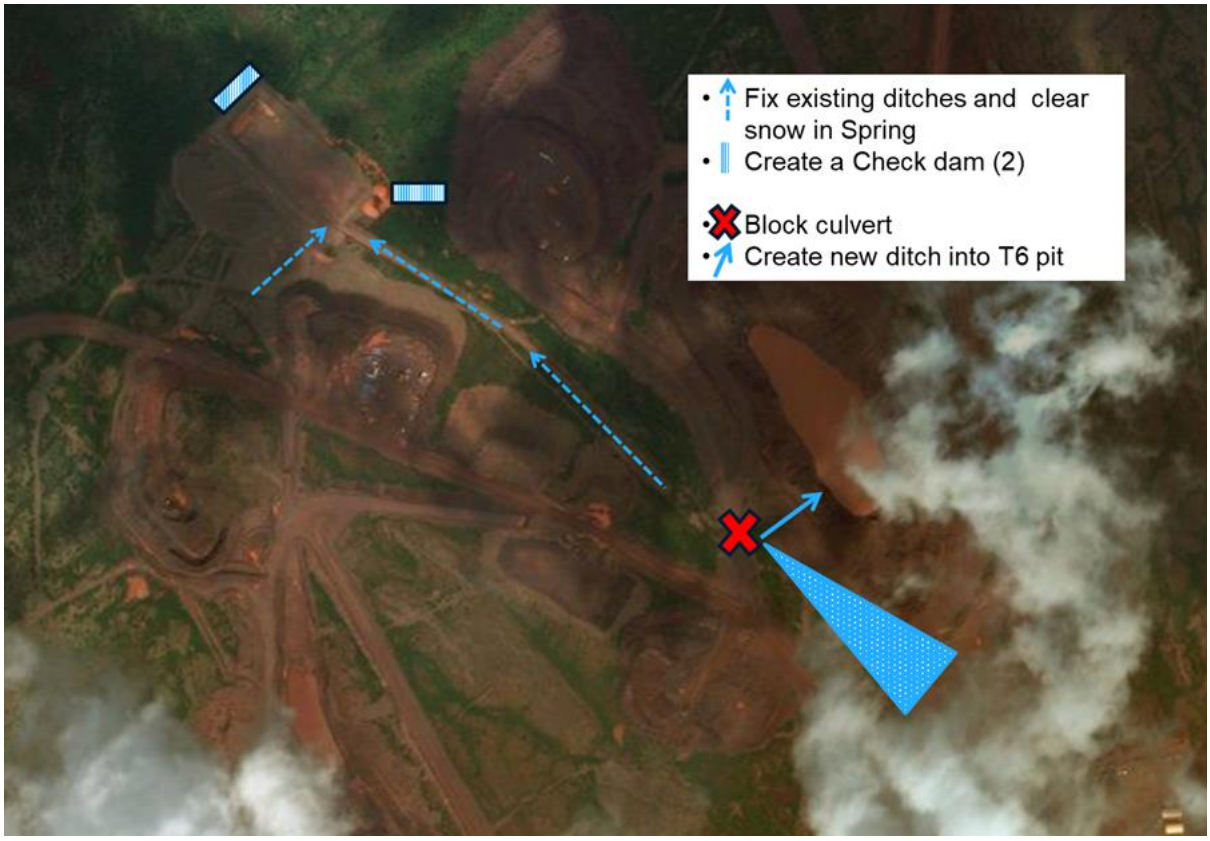

Figure 12. Sketch of 2019 plan for SP3

6. APPENDICES

Appendix A: Letter from Agat Laboratory

Appendix B: Technical note on berm stability

July 18, 2019

Mariana Trindade, PhD
Corporate Environmental Manager
Tata Steel Minerals Canada Ltd
1000 Sherbrooke West, Suite 1120
Montreal, QC H3A 3G4

RE: Service Issues and Delayed Laboratory Results, May to July 2019

Ms. Trindade,

AGAT Laboratories Ltd (AGAT) was retained in May 2019 by Tata Steel Minerals Canada Ltd (TSMC) to perform analytical chemistry services related to compliance and operational monitoring in Schefferville, Quebec.

The scope of services included analysis of air, effluent, surface water, groundwater, and potable water for various organic and inorganic parameters related to compliance and operational requirements at the mine site. TSMC submitted samples to AGAT for 22 separate monitoring events dating back to May, of which, 17 remained outstanding as of July 18, 2019. TSMC has expressed concern that AGAT's service level and laboratory turnaround time are not meeting expectations. These issues have impacted TSMC's monitoring program schedules and regulatory obligations.

The intent of this letter is to provide TSMC an acknowledgement / explanation for the issues encountered over the last two months, as well as a description of the actions being taken to resolve the outstanding files and to ensure future files are serviced and reported in-line with expectations. Service-level issues include:

1) Delays in shipment of properly prepared bottle orders;
2) Delays in supply of required materials to facilitate monitoring programs;
3) Delays in response on various queries from TSMC;
4) Inadequate communication from AGAT to TSMC;
5) Delayed / missed results; and
6) No regulatory reporting of XML files to Newfoundland and Labrador regulator.

The issues are associated primarily with workload management and resource allocation in our Quebec operations. An unusually high volume of projects (significantly high) is ongoing during a time that is typically a reasonably slow period for the industry. It has resulted in a misalignment of capable resources relative to the demands and training levels on front-line staff, in particular, project management staff. Despite AGAT's best efforts to increase staff compliment, train new staff, and parachute senior resources into Quebec, the project management team is not yet fully equipped to manage the extensive backlog. As a result, there are significant delays in logging samples, preparing confirmations, reviewing confirmations, and issuing work orders to the laboratory and logistics staff (e.g., bottle orders). Furthermore, the support staff for project management are being trained and mentored during peak-season levels of backlog, but they are not proficient as of yet.

Effective immediately, AGAT has assigned Ms. Janetta Fraser, Client Services Manager in Atlantic Canada, to act as the project manager for all activities between TSMC and AGAT, from bottle orders through to reporting. Ms. Fraser will act as the liaison between TSMC and the laboratories in Quebec. She has extensive experience managing projects of this nature for mine operations in remote (fly-in) geographies such as northern Labrador and central Newfoundland. Ms. Fraser is well-versed on the regulatory requirements and routinely works with the regulators in Newfoundland and Labrador.

Ms. Fraser will be supported by Mr. Phil Morneau, Chief Science Director (resides in Quebec), to complete a detailed review of the current status of TSMC, while facilitating improved service levels moving forward, including but not limited to:

- All outstanding files will be expedited
- XML reports will be issued
- Chain of custody documentation will be customized to TSMC's specific monitoring programs
- TSMC parameter packages will be customized within AGAT's Laboratory Information Management System (LIMS) and Environmental Reporting System (ERS) to reflect the requirements of the monitoring programs, including regulatory detection limits
- And more…

We trust that the information presented herein is of sufficient detail to explain the issues and the impact to TSMC, while demonstrating that we have taken the necessary actions to address the deficiencies such that our delivery of services will meet your expectations as we approach the end of July.

If you have any questions regarding the information herein, please do not hesitate to contact me at any time.

Sincerely,

<Original signed by>

Scott Preston
Vice President
Office: 902.468.8744
Mobile: 902.830.4635

Québec, le 12 juin 2019

Mme Mariana Trindade, Ph. D.

Gestionnaire des questions environnementales

Tata Steel Minerals Canada Ltd.

1000, rue Sherbrooke Ouest, suite 1120

Montréal (Québec) H3A 3G4

Madame,

Le 5 juin 2019, pour mettre à profit leur présence sur un site situé à proximité, à la suite de votre demande, M. David Collins-Fekete et Mme Louise Chaput de WSP Canada Inc. (WSP) ont fait une visite du bassin de sédimentation n° 3 qui recueille les eaux de surface de la halde à stériles Timmins 4, sur le site de la minière Tata Steel Minerals Canada (TSMC), située au nord de Schefferville, au Québec.

Il a été possible d'y observer une brèche dans la digue est du bassin. Selon l'information transmise par TSMC, le niveau d'eau à l'extérieur du bassin aurait atteint ou dépassé celui de la crête du bassin. D'ailleurs, il y a deux ans, une brèche se serait également produite dans le même secteur et des travaux correctifs ont alors été réalisés pour remettre en service l'ouvrage.

Bien que notre visite ne constitue pas une inspection détaillée de l'ouvrage et de son intégrité, et que WSP n'a pas eu accès à des données d'archives de ce bassin ni à des données sur la qualité des eaux à gérer, voici quelques observations faites lors de notre visite des lieux :

- des signes d'érosion des talus de la digue du bassin ont été observés;
- à l'exception de la zone de brèche, aucun signe de fissuration ou de déformation significative n'a été observé sur la crête et les talus de la digue;
- en circulant à pied en crête de la digue qui ceinture le bassin, l'enfoncement de nos pas est de l'ordre d'un pouce, en référence à l'enfoncement de quelques pouces que le personnel de TSMC aurait noté le 2 juin 2019, à la suite de la fonte printanière. Ainsi, bien que les matériaux constituant la digue du bassin semblent présentement se drainer, ceux-ci semblent encore saturés dans certains secteurs;
- absence d'un déversoir d'urgence;
- l'exutoire (ponceau) du bassin n'était pas obstrué;
- à l'exception de la zone de brèche, aucun signe d'instabilité imminente de la digue du bassin n'a été observé.

Notons qu'au site, la fonte des neiges est presque terminée. Selon l'expérience passée acquise du site, de manière générale, la crue découlant de la fonte des neiges génère annuellement le débit

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maximum de ruissellement de surface. Les débits sont ainsi significativement plus importants que le débit causé par les précipitations le reste de l'année.

Pour cette raison, et dans la mesure où les eaux à gérer par ce bassin ne représentent pas de danger environnemental (à valider par TSMC), plutôt que de procéder à des travaux en urgence dans les prochains jours, il serait judicieux de prendre le recul nécessaire pour bien cerner la ou les problématiques en cause, de procéder à des investigations au site et à des travaux d'ingénierie pour la réalisation de travaux correctifs. Une visite d'inspection détaillée de l'ouvrage devra alors être effectuée par un membre en règle du « Professional Engineers and Geoscientists of Newfoundland & Labrador (PEGNL) ».

Enfin, soulignons que le 5 juin 2019, M. Rudy Tucker, de TSMC, a demandé à WSP de soumettre une offre de service pour étudier les possibilités de gestion des eaux de surface provenant du secteur de Timmins 6, ce qui inclut le bassin nº 3. La portée de ce mandat devra être discutée entre les différents intervenants.

Nous demeurons disponibles pour répondre à vos questions et pour poursuivre notre collaboration dans vos projets.

En l'attente de vos questions ou commentaires, nous espérons le tout à votre entière satisfaction et vous prions d'agréer, Madame, l'expression de nos sentiments les meilleurs.

<Original signed by>

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CH/es

c. c. Mme Louise Chaput., ing. (OIQ), WSP
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