CNRC·NRC Énergie, mines et environnement

AMENDMENT - Detection of toxicity and characterization of geochemistry/mineralogy and physical/chemical properties of sediments at Sedimentation Ponds 1 and 2 of DSO3 effluent.

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Date: July 20 2017
N/d: NRC-EME …..

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Contents

1. Field Work Technical Note

This Technical Note presents the activities held by NRC staff, between May 23 and May 26, 2017, at Tata Steel Minerals Canada (TSMC) DSO3 site as part of the contractual agreement regarding «Amendment - Detection of toxicity and characterization of geochemistry/mineralogy and physical/chemical properties of sediments at Sedimentation Ponds 1 and 2 of DSO3 effluent».

1.1 Project Objectives

Considering that the goal of the work is to identify sources of toxicity that generate the water toxicity at the DSO3 effluent point, the objectives of the proposed activities of this amendment are:

- Verify if sediments collected in Sedimentation Ponds 1 and 2 are toxic;
- Verify if sediments accumulated at the foot of the discharge culvert of the DSO3 effluent point are toxic;
- Verify if Total Suspended Solids (TSS) at the discharge culvert of Sedimentation Pond 2 (DSO3 effluent point) are toxic;
- Characterize the geochemistry, mineralogy, physical properties, inorganics-organics and toxicity of the three (3) sediments and one (1) TSS samples collected;
- Verify the quality of three (3) water samples collected in Sedimentation Ponds 1 and 2 and at DSO3 effluent point (Sedimentation Pond 2 discharge culvert) by evaluating the total content for specific metals and anions, PAH, DDT and conventional parameters.

The results of these additional characterization measurements and analyses will provide essential information required for developing the DSO3 Sedimentation Ponds Management Plan.

2. Approach and Methodology

Initially, the approach was to collect sediments before snowmelt, through the ice cover of the Sedimentation Ponds. However, due to the snowmelt conditions this year that have caused flooding of the land, the sediments were sampled nearly two weeks after the snowmelt. The method to collect sediments was adapted and the sample quantity was changed.

The sediments at Sedimentation Pond 1 (SP1), Sedimentation Pond 2 (SP2) and Silt Trap were collected using a hand-auger at the time when Sedimentation Ponds were free of ice, by walking in the water using fishing thigh boot. To sample the water TSS at the culverts discharge of the Sedimentation Pond 1, a filter bag with 10 µm pores was installed. A 5-gallon bucket of turbid surface water was collected at the culverts discharge of the Sedimentation Pond 2 (DSO3 effluent). Lastly, one sample from Timmins 2 Waste Rock Pile was grabbed to be compared to the collected sediment samples and the TSS (Appendix 1).

The sediment samples and water sample were shipped by Air Inuit airline to AGAT Laboratory in Montréal, Thursday May 25 2017 in afternoon.

All the sampling activities on site were carried out by Didier Barré, NRC, with the support of Pallav Sinha and Jordan Gallant of TSMC.

2.1 Sampling Activities

Before the collection of samples, a survey of the site was realized to identify and localize the proposed sampling points and their access. Eight sampling points were identified, which included: five (5) sediment sampling points, one (1) Waste Rock Pile sampling point, one (1) TSS sampling point and one (1) surface water sampling point (Appendix 1).

The five (5) sediment samples and the Waste Rock Pile sample were collected on May 24, 2017. Each sample, weighing between 0.5 and 3 kg, was placed separately in a Whirl-Pak plastic type bag.

TSS sample was collected using a Filter bag with 10 µm pores, installed directly at the discharge point of Sedimentation Pond 1 culvert, during 17 hours, from May 24 PM to May 25 AM.

The water sample of the DSO3 effluent water was collected May 25 2017 AM at the culverts discharge point of the DSO3 effluent.

2.2 Testing and Analytical Program

The tests, analytical measurements and assays to be performed on the liquid and solid samples are done in part by NRC, in Ottawa and by AGAT Laboratory, in Montreal. The conventional parameters, for a analyses of inorganics and organics, and the Microtox bioassays are realized by AGAT Laboratory. NRC Ottawa performs, on the sediment and TSS samples, all characterization measurements related to: XRF (X-ray fluorescence spectrometry), XRD (X-ray diffraction), SEM-EDX (scanning electron mincroscopy-energy-dispersive X-ray spectroscopy) , CHNS analyses (total contents of carbon, hydrogen, nitrogen and sulfur), and Laser Scattering Particle Size Distribution. The list of parameters to be analyzed and tested is presented in Appendix 2.

Nota Bene - To be consistent with former data provided by TSMC, the analytical methods applied for the chemical analysis to be performed by AGAT Laboratory will follow the environmental methods prescribed by the CEAEQ of the Province of Quebec.

2.3 Sample Description and Localization

A brief description of each sample is provided hereafter.

The samples collected during the field work are: SP1 A, SP1 B, SP1 C, SP1 D, SP1 E, Waste Rock Pile T2, TSS CHANNEL, CHANNEL, WATER TSS and SP2. Their approximate localization is shown on a Sketch in Appendix 1.

Site Sedimentation Pond 1: The terrain was submerged under 1.5 meters of water, creating a wide flooding area along the East side and difficulties to access to the bottom of the pond. All

samples were collected along the West side of Sedimentation Pond 1, because the access to the bottom of the pond was easier there (Figure 1).

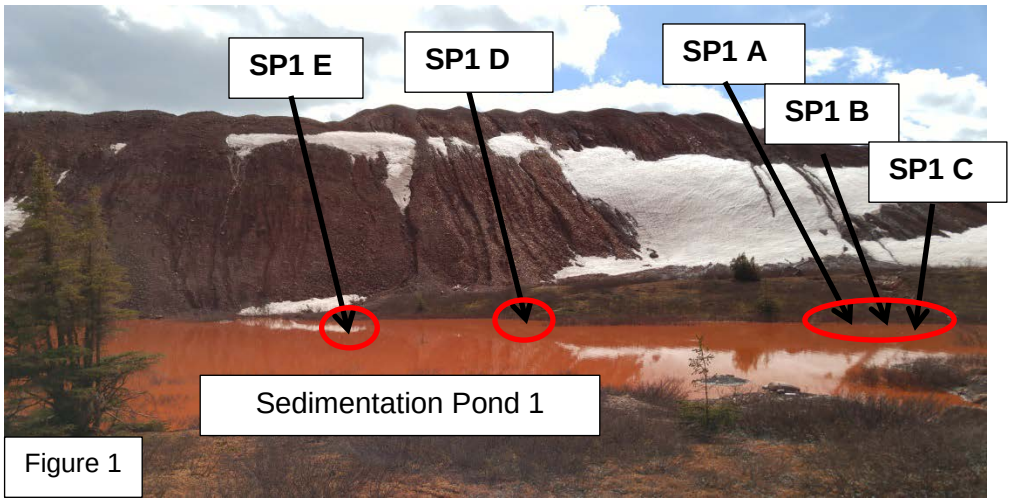


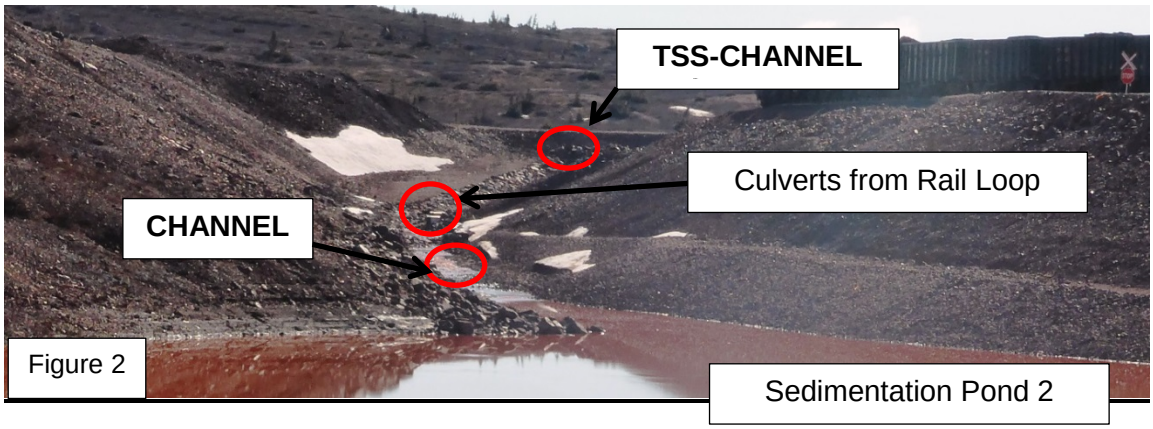
Figure 1

Samples SP1 A, SP1 B, SP1 C were mixed together to form a composite sample named **SP1 A,B,C**. In general, the material of the three samples is composed of sandy silt and gravel with a trace of clay. The material is loose with few moss and roots. According to the Munsell Soil Colour Chart, the colour of the sediment is Weak Red (10R 4/2) to Very Dusky Red (10R 2.5/2), associated to iron oxides.

Sample **SP1 D** is composed of sandy gravel with silt and traces of clay. The sample is relatively dense with traces of moss and roots. According to the Munsell Soil Colour Chart, the colour of the sediment is Dark Red (10R 3/6), associated to iron oxides.

Sample **SP1 E** is composed of clayed silt. The sample is relatively dense and homogeneous. According to the Munsell Soil Colour Chart, the colour of the sediment is Dark Red (10R 3/6), associated to iron oxides.

Site Channel Section: The Channel Section is located between the sedimentation basins 1 and 2. Downstream of the Sedimentation Pond 1 discharge culverts, at approximately one-third of the channel length, are located two culverts that drain water from the Rail Loop to Sedimentation Pond 2. The CHANNEL sediment sample was grabbed from the bottom of the channel, at nearly 20 meters downstream of the two culverts (Figure 2).



Sample **CHANNEL** is composed of sand with trace of silt. The sample is relatively dense and homogeneous. According to the Munsell Soil Colour Chart, the colour of the sediment is Dusky Red (10R 3/3), associated to iron oxides (Figure 3).

Sample T**SS-CHANNEL** is composed of the TSS (silt with a trace of clay), collected during 17 hours by a Filter bag with 10 µm pores, at the discharge of Sedimentation Pond 1 culverts. The water has a continuous flow (approx. 1m/5sec.) and a Dark Red (10R 3/6), associated to iron oxides. The water was highly turbid and reddish. The flow of the water was steady during all the period of the 23 to the 26 of May 2017. Please note that two Filters bags (50µm and 25µm) were tested to verify the capacity of each one to collect the TSS. The test concluded that

because of the size of the TSS particles, only the 10µm Filter bag had the capacity to retain TSS (Figure 4).

Figure 4

Site Sedimentation Pond 2: No sediment sample was collected in Sedimentation Pond 2 because it was not accessible due to the depth of the water present (Figure 5).

Figure 5

Site DSO3 effluent and Silt Trap: The samples associated are SP2 and WATER TSS, collected at the outflow of the discharge of the culverts of the Sedimentation Pond 2 corresponding to the DSO3 effluent and in the Silt Trap (Figure 6).

Sample **SP2** is composed of clay with silt and trace of sand accumulated in the Silt Trap. The sample is dense, compact and homogeneous. According to the Munsell Soil Colour Chart, the colour of the sediment is Dusky Red (10R 3/4), associated to iron oxides. More than a foot of

sediments is accumulating in the Silt Trap. A portion of sediment is mobilized by the water toward Timmins 1.

Sample **WATER TSS** is a highly turbid water sample characterized by fine particles (clay and silt with colloids; <10µm). The reddish colour of the water is similar to the colour of the water in Sedimentation Ponds 1 and 2.

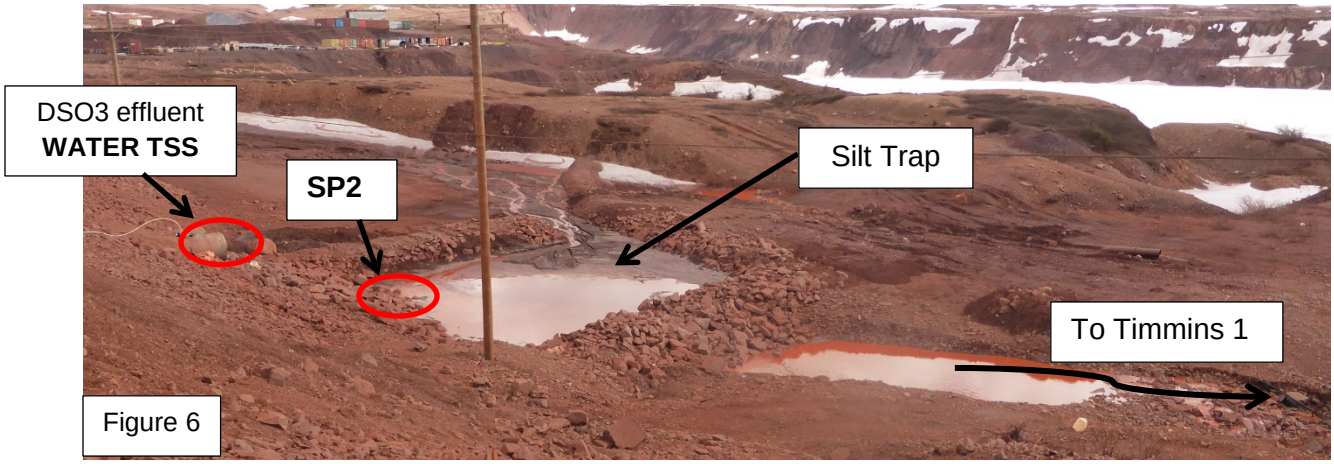


Figure 6

<u>Site Timmins 2 Waste Rock Pile:</u> One sample was taken from Timmins 2 Waste Rock pile in order to identify the components of the material to compare to the results to the sediment samples. The sample was collected on a small accumulation of granular waste rock located at mid-slope on the East side of the Waste Rock Pile (Figure 7).

Figure 7

Sample **Waste Rock Pile T2** is composed of silty sand with angular gravel, loose but relatively dense. According to the Munsell Soil Colour Chart, the colour of the material is Dark Reddish Brown (2.5 YR 3/4), associated to iron oxides.

2.4 Sample Transportation and Chain of custody

From DSO3 site to AGAT Laboratory in Montréal, the sediment and filter bag samples were placed in a cooler with ice bags to preserve the temperature at 4 ° Celsius.

For the transportation of the surface water sample from DSO3 effluent to Ottawa NRC, a plastic bag was filled with the water sample, and then it was placed in a 5 gallons plastic container to protect it. No preservative agent was added.

The sediment samples and water sample were shipped by Air Inuit airline to AGAT Laboratory in Montréal, Thursday May 25 2017PM. The samples arrived at the AGAT laboratory Friday May 25 2017 at noon. The 5 gallons water sample was shipped the same day to Ottawa NRC by Purolator. The 5 gallons bucket arrived in Ottawa around May 29 2017.

Appendices

Appendix 1: Sampling Protocol Analytical Program

Appendix 2: Sketch

Appendix 3: AGAT Chain of custody

Appendix 4: Air Inuit Way Bill

Appendix 5: PUROLATOR Shipping documentation

Appendix 1

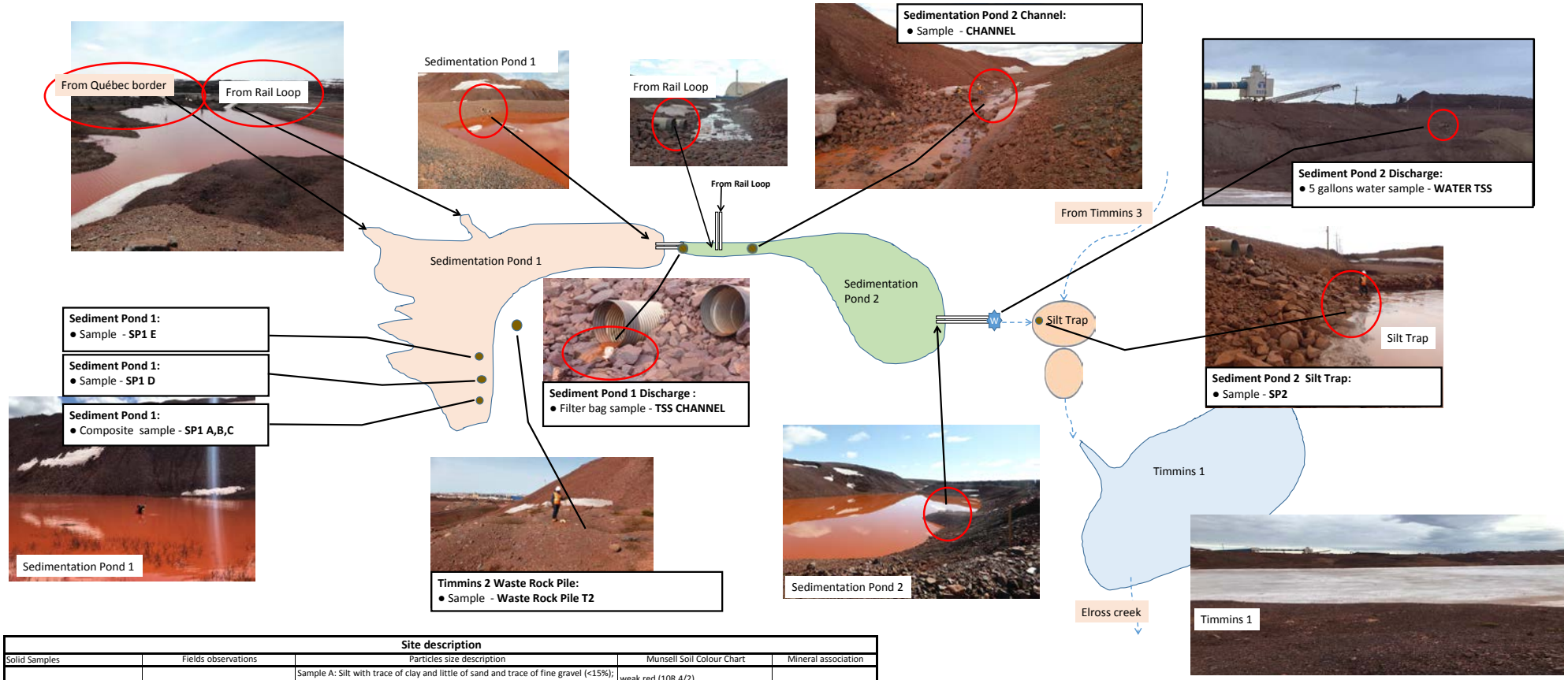
Sampling Campaign											
Sample				Analytical program							
Sample		Sampling Date	Sample Source	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
1	Composite SP1 A,B,C	24-05-2017	SP1 A	completed	completed	completed	completed	completed	completed	√	-
		24-05-2017	SP1 B								
		24-05-2017	SP1 C								
2	Composite SP1 D	24-05-2017	SP1 D	completed	completed	-	completed	completed	completed	√	-
3	Composite SP1 E	24-05-2017	SP1 E	-	-	completed	-	-	completed	√	completed
4	CHANNEL	24-05-2017	Sed. Pond 2 CHANNEL	completed	completed	completed	completed	completed	completed	√*	-
5	TSS-CHANNEL	25-05-2017	Sed. Pond 1 Discharge	completed	-	-	-	-	√	√	completed
6	SP2	25-05-2017	Sed. Pond 2 Discharge	completed	completed	completed	completed	completed	completed	√*	-
7	WASTE ROCK PILE - T2	25-05-2017	Timmins 2 Waste rock pile	-	-	-	-	-	completed	√*	completed
8	WATER-TSS	25-05-2017	Sed. Pond 2 Discharge	-	-	-	-	-	√	√*	completed

Sediment Sampling Protocol
Unique sample: A Sediment unique sample is composed of one sample taken between 0 and 20 cm of the bottom of a Sedimentation Pond.
Composite sample: A Sediment composite sample is composed of 3 sub-samples taken at the same depth, between 0 and 20 cm of the bottom of a Sedimentation Pond.
Description:The description of each sample will considers: color, structure and fabric, homogeneity, grain size description, boundary, hardness and organic matter, etc.)
Weigh: Each sample will weighed between 2 to 3 kg
Container: Sediment composite samples can be placed in plastic bags
Preservation: In a cooler with ice-pack at 4^{o} Celsius - NONE FROZEN, NO PRESERVATIVE AGENT
Identification: Sedimentation Pond 1 = SP1 …; Sedimentation Pond 2 = SP2 …

Analytical Program Parameters						
Group	**Parameters**	**Sediment**	**TSS CHANNEL**	**WASTE ROCK PILE T2**	**WATER TSS**	**To be analyzed by**
Group 1	Kjeldahl Total Ammonia	4	-	-	-	AGAT
	Total Carbon	4	-	-	-	
	Total Sulfur	4	-	-	-	
	pH, Conductivity	4	-	-	-	
	Moisture, Dryness	4	-	-	-	
	Metals scan	4	1	-	-	
	PAH	4	-	-	-	
	TOC	4	-	-	-	
	Total Phosphorus	4	-	-	-	
	Total Ammonia	4	-	-	-	
	Nitrite-Nitrate	4	-	-	-	
	Chlorides, Fluorides, Sulfates	4	-	-	-	
	Total Cyanides	4	-	-	-	
Group 2	DDT	4	-	-	-	
Group 3	Microtox	4	-	-	-	
Group 4	Particles size analysis - sieving	4	-	-	-	
Group 5	CEC	4	-	-	-	
Group 6	XRF	5	1	1	1	CNRC Ottawa
	XRD	5	1	1	1	
	CHNS	5	1	1	1	
Group 7	SEM-EDX	4*	1*	1*	1*	
Group 8	Particles size analysis - optical	5	1	1	1	

* proposed quantity - to be confirmed

Appendix 2



Site description				
Solid Samples	Fields observations	Particles size description	Munsell Soil Colour Chart	Mineral association
SP1 A,B,C	Sedimentation Pond 1:Terrain submerged by 1.5 meters of water during the sampling period	Sample A: Silt with trace of clay and little of sand and trace of fine gravel (<15%); Organic content with moss and roots; Loose	weak red (10R 4/2)	Iron oxides and others mineral from local geology
		Sample B:Silt with trace of clay and little of sand and trace of fine gravel (<15%) ; Organic content with roots; Loose	weak red (10R 4/2)	
		Sample C:Silt with trace of clay and traces of fine to medium gravel (<15%) ; Organic content; Loose	very dusky red (10R 2.5/2)	
SP1 D		Sandy gravel with silt and traces of clay (<15%); Relatively dense with traces of organics	dark red (10R 3/6)	
SP1 E		Clayed silt; Relatively dense and homogeneous	dark red (10R 3/6)	
TSS-CHANNEL	Continuous flow (approx. 1m/5sec.) of highly turbid water	Silt with a trace of clay captured in a filter bag (10µm pores)	dark red (10R 3/6)	
CHANNEL		Sand with trace of silt; Relatively dense and homogeneous	dusky red (10R 3/3)	
SP2	Silt Trap: More than a foot of sediments accumulated in the Silt Trap	Clay with silt and trace of sand; Relatively dense and homogeneous; Surface of the sediment above the water level is dessicated	dusky red (10R 3/4)	
WASTE ROCK PILE - T2	Source of TSS	Silty sand with traces of clay and angular gravel; Loose and relatively dense	dark reddish brown (2.5 YR 3/4)	
WATER TSS	DSO3 effluent water sample of for physical evaluation of TSS particles	Highly turbid water - Clay and silt with colloids; <10µm	na	

AGAT Laboratoires
9770 Route Transcanadienne
St-Laurent, Québec, H4S 1V9
Tél.: 514.337.1000 Téléc.: 514.333.3046
fr.agatlabs.com

À l'usage exclusif du laboratoire
Bon de travail AGAT: 17M221550
Nb. de glacières:
Température à l'arrivée:
Scélé légal intact: ☐ Oui ☐ Non ☐ N/A

Chaîne de traçabilité ▪ Environnement

Information du client
Compagnie : Conseil National de Research
Adresse : 6100 Royal Mount Montréal H4P 2R2
Téléphone : 514-496-1517 Téléc. :
Projet :
Lieu de prélèvement : DS03 (shefferville TSMC)
Prélevé par : Didier Barré

Facturé à Même adresse : ☑ Oui ☐ Non
Compagnie :
Contact :
Courriel :
Adresse :
Bon de commande : Soumission : 162755 V3

Commentaires: Critère sediment eau douce /plan St-Laurent

Rapport envoyé à
1. Nom: Didier Barré
Courriel: DIDIER.BARRE@nrc-cnrc.gc.ca
2. Nom: Patrick Mercier
Courriel: Patrick.Mercier@nrc-cnrc.gc.ca

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

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

Délais d'analyse requis (jours ouvrables)
Environnemental: Haute Résolution: 1 tox
Régulier: ☑ 5 à 7 jours Régulier: ☑ 10 à 15 jours
Urgent: ☐ < 12 heures Urgent: ☐ < 10 jours
☐ 24 heures Date Requise:
☐ 48 heures
☐ 72 heures AA/MM/JJ

LES ÉCHANTILLONS REÇUS APRÈS 16 H SERONT ENREGISTRÉS COMME ÉTANT REÇUS LE JOUR OUVRABLE SUIVANT

Matrice (légende)
S Sol B Boue SE Sédiment ES Eau de surface AF Affluent
SL Solide EU Eau usée EF Effluent ST Eau souterraine A Air
EP Eau potable (Note pour réseau : Veuillez fournir votre formulaire MDDELCC)

IDENTIFICATION DE L'ÉCHANTILLON	PRÉLÈVEMENT DATE (AA/MM/JJ)	PRÉLÈVEMENT HEURE	MATRICE	NB. DE CONTENANTS
SP1 A-B-C composite	24-05	PM	SE	2
SP1 D	24-05	PM	SE	1
SP1 E	24-05	PM	SE	1
SP2 Discharge	25-05	AM	SE	2
CHANNEL	24-05	PM	SE	2
TSS - CHANNEL	25-05	AM	Filterbag	1

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
Didier Barré	2017/05/25	AM			
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
			Isabelle Binier	17-05-26	12H00

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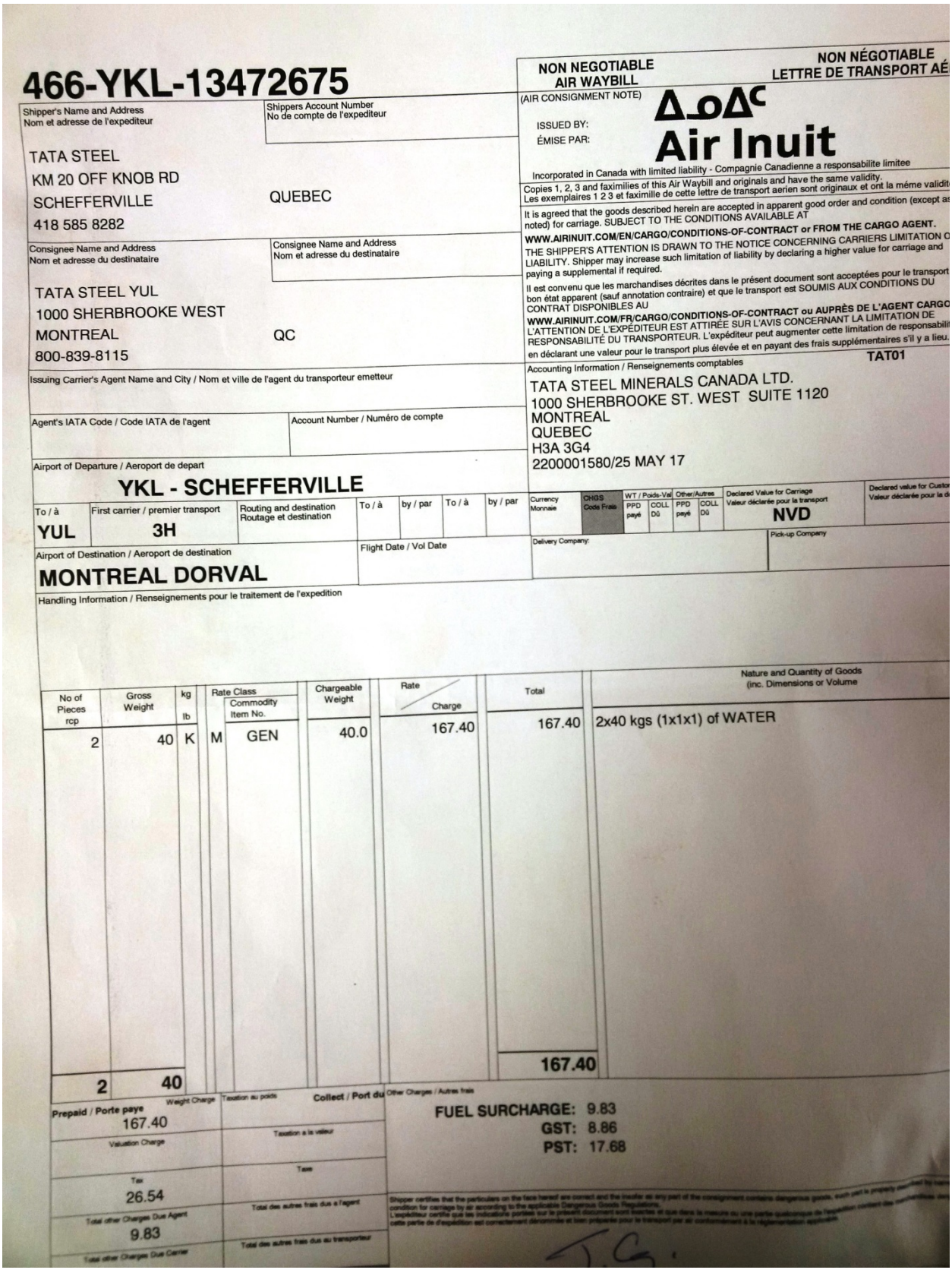
No. de document: DW-111-1542F.009
Copies: Rose – Client Jaune – AGAT Blanche – AGAT
Date de révision: 15 novembre 2016



466-YKL-13472675

NON NEGOTIABLE AIR WAYBILL (AIR CONSIGNMENT NOTE)

NON NÉGOTIABLE LETTRE DE TRANSPORT AÉ

ISSUED BY: ÉMISE PAR: Air Inuit

Incorporated in Canada with limited liability - Compagnie Canadienne a responsabilite limitee

Shipper's Name and Address / Nom et adresse de l'expediteur

TATA STEEL
KM 20 OFF KNOB RD
SCHEFFERVILLE QUEBEC
418 585 8282

Shippers Account Number / No de compte de l'expediteur

Consignee Name and Address / Nom et adresse du destinataire

TATA STEEL YUL
1000 SHERBROOKE WEST
MONTREAL QC
800-839-8115

Consignee Name and Address / Nom et adresse du destinataire

Copies 1, 2, 3 and faximilies of this Air Waybill and originals and have the same validity.
Les exemplaires 1 2 3 et faximille de cette lettre de transport aerien sont originaux et ont la méme validit

It is agreed that the goods described herein are accepted in apparent good order and condition (except as noted) for carriage. SUBJECT TO THE CONDITIONS AVAILABLE AT
WWW.AIRINUIT.COM/EN/CARGO/CONDITIONS-OF-CONTRACT or FROM THE CARGO AGENT.
THE SHIPPER'S ATTENTION IS DRAWN TO THE NOTICE CONCERNING CARRIERS LIMITATION O LIABILITY. Shipper may increase such limitation of liability by declaring a higher value for carriage and paying a supplemental if required.

Il est convenu que les marchandises décrites dans le présent document sont acceptées pour le transport bon état apparent (sauf annotation contraire) et que le transport est SOUMIS AUX CONDITIONS DU CONTRAT DISPONIBLES AU
WWW.AIRINUIT.COM/FR/CARGO/CONDITIONS-OF-CONTRACT ou AUPRÈS DE L'AGENT CARGO
L'ATTENTION DE L'EXPÉDITEUR EST ATTIRÉE SUR L'AVIS CONCERNANT LA LIMITATION DE RESPONSABILITÉ DU TRANSPORTEUR. L'expéditeur peut augmenter cette limitation de responsabili en déclarant une valeur pour le transport plus élevée et en payant des frais supplémentaires s'il y a lieu.

Issuing Carrier's Agent Name and City / Nom et ville de l'agent du transporteur emetteur

Accounting Information / Renseignements comptables

TAT01

TATA STEEL MINERALS CANADA LTD.
1000 SHERBROOKE ST. WEST SUITE 1120
MONTREAL
QUEBEC
H3A 3G4
2200001580/25 MAY 17

Agent's IATA Code / Code IATA de l'agent

Account Number / Numéro de compte

Airport of Departure / Aeroport de depart

YKL - SCHEFFERVILLE

To / à	First carrier / premier transport	Routing and destination / Routage et destination	To / à	by / par	To / à	by / par
YUL	3H					

Currency / Monnaie	CHGS Code / Frais	WT / Poids-Val PPD payé	WT / Poids-Val COLL Dû	Other/Autres PPD payé	Other/Autres COLL Dû	Declared Value for Carriage / Valeur déclarée pour le transport	Declared value for Custo / Valeur déclarée pour le d
						NVD	

Airport of Destination / Aeroport de destination

MONTREAL DORVAL

Flight Date / Vol Date

Delivery Company:

Pick-up Company

Handling Information / Renseignements pour le traitement de l'expedition

No of Pieces rcp	Gross Weight	kg / lb	Rate Class	Commodity Item No.	Chargeable Weight	Rate / Charge	Total	Nature and Quantity of Goods (inc. Dimensions or Volume
2	40	K	M	GEN	40.0	167.40	167.40	2x40 kgs (1x1x1) of WATER
2	40						167.40	

Prepaid / Porte paye — Weight Charge: 167.40

Collect / Port du — Taxation au poids

Other Charges / Autres frais

FUEL SURCHARGE: 9.83
GST: 8.86
PST: 17.68

Valuation Charge — Taxation a la valeur

Tax: 26.54 — Taxes

Total other Charges Due Agent: 9.83 — Total des autres frais dus a l'agent

Total other Charges Due Carrier — Total des autres frais dus au transporteur

Shipper certifies that the particulars on the face hereof are correct and the insofar as any part of the consignment contains dangerous goods, such part is properly described by name and is in proper condition for carriage by air according to the applicable Dangerous Goods Regulations.
L'expéditeur certifie que les indications portées sur le présent document sont exactes et que dans la mesure ou une partie quelconque de l'expedition contient des marchandises dangereuses, cette partie de d'expédition est correctement dénommée et bien préparée pour le transport par air conformément à la réglementation applicable.

Appendix 5

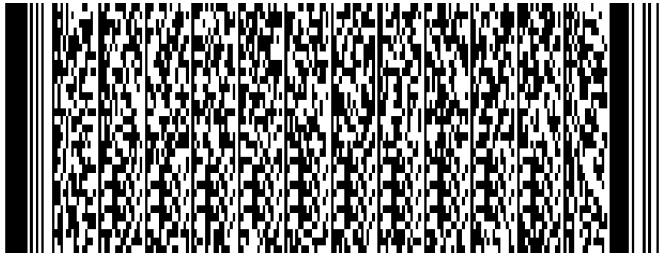
Purolator **Purolator Express 9AM**

FROM / DE
TATA c/o AGAT Laboratories
9770 TRANSCANADIENNE RTE
SAINT-LAURENT, QC
H4S 1V9
514-337-3906

REF: Pallav Sinha

TO / A
Patrick Mercier
National Research Council CDA
1200 MONTREAL RD
Building M-12
OTTAWA, ON
K1A 0R6

613-993-7752



DATE: 26 MAY 2017
PIECES: 1 of/de 1
WEIGHT/POIDS: 30 LB

40

EXP 9:00

PUROLATOR PIN: 331062196489

ESO - PDF

Purolator's published terms and conditions of service apply - see www.purolator.com.
Les Modalités et conditions de service publiées de Purolator s'appliquent - voir www.purolator.com.

Fold the Bill of Lading on the dotted line and insert into the adhesive pouch. Attach a Bill of Lading to each package.
Veuillez plier ce connaissement sur la ligne pointillée et l'insérer dans la pochette adhésive. Veuillez joindre un connaissement à chaque colis.

Description: Effluent Sample
No Declared Value Entered By Sender / Aucune valeur déclarée entrée par

CONDITIONS OF CARRIAGE

IMPORTANT - PLEASE READ: The consignor agrees that the act of tendering the shipment to the carrier for transportation shall be sufficient to constitute signature of this bill of lading by the consignor and shall bind the consignor to the conditions of carriage stated below.

RECEIPT Carrier acknowledges receiving from the shipper, at the point of origin and on the date specified, the shipment described in this bill of lading in apparent good order, except as noted (contents and conditions of contents of shipment unknown), and agrees to carry and deliver the shipment to the receiver at the destination set out in this bill of lading, subject to payment of all lawful charges. "Carrier" refers to Purolator Inc. and any connecting and/or successive carriers involved in the transportation of the shipment herein described, including any of their respective subsidiaries, controlled entities, and their respective employees, agents and independent contractors.

LIMITATION ON LIABILITY Carrier's liability in respect of the shipment described in this bill of lading (including for any loss, damage, delay, misdelivery, non-delivery or failure to deliver) is limited to $2.00 per pound ($4.41 per kilogram) computed on the total weight of the shipment, unless a higher value is declared in the specially marked Purolator Online Shipping user entry field, "Declared Value for Insurance ($)". Notwithstanding any disclosure of the nature or value of the goods carried or any special agreement to the contrary, carrier is not liable under any circumstances for the consequences of delay, or for any indirect or consequential damages (including lost profits) howsoever caused.

NOTICE OF CLAIM Carrier is not liable for any loss, damage or delay to any goods carried under this bill of lading unless notice of the claim setting out particulars of the origin, destination and date of shipment of the goods and the estimated amount claimed in respect of such loss, damage or delay is given in writing to the carrier within sixty (60) days after the delivery of the goods, or, in the case of failure to make delivery, within nine (9) months from the date of shipment. Subject to any overriding statutory provisions, the final statement of the claim must be filed within nine (9) months from the date of shipment, together with a copy of the paid freight bill. If the Convention applies, other notice periods may govern. No claim will be entertained until all transportation charges due in connection with this bill of lading have been paid in full. All claims are subject to proof of amount of loss.

TERMS INCORPORATED BY REFERENCE Every service to be performed under this bill of lading is subject to the conditions of carriage contained in this bill of lading, including the terms and conditions contained in Purolator Inc.'s published terms and conditions of carriage and the terms and conditions prescribed by the law of the jurisdiction where the goods originate (including the uniform conditions of carriage thereunder, if any). If the carriage involves an ultimate destination or a stop in a country other than the country of departure, the Convention (as defined below) may apply and limit the liability of the carrier in respect of loss of, damage to or delay of cargo. "Convention" means the Convention for the Unification of Certain Rules relating to International Carriage by Air, signed at Warsaw, Poland, 12 October, 1929, or the Convention for the Unification of Certain Rules for International Carriage by Air, signed at Montreal, Canada, 28 May, 1999, or those Conventions as amended or supplemented as may be applicable to the carriage hereunder.

MISCELLANEOUS Unless otherwise indicated, the consignor's name and address is the sender's name and address indicated on this bill of lading, and the latter is the place of execution and the place of departure; the consignee's name and address is the receiver's name and address indicated on this bill of lading, and the latter is the place of destination; and the date indicated on this bill of lading is the date of execution. There are no specific stopping places which are agreed to, and the carrier reserves the right to select the route and the mode of transportation that the carrier deems appropriate. The consignor warrants that the shipment is properly described on this bill of lading and on any accompanying documentation, and that the shipment is properly marked, addressed and packed to ensure safe transportation in accordance with the carrier's ordinary care in handling. Unless otherwise indicated on this bill of lading, the consignor waives its right to determine the volume or dimensions of the shipment, and to indicate same on this bill of lading. The consignor appoints the carrier as its agent for the performance of customs clearance and selecting a customs broker.

ENTIRE AGREEMENT The terms and conditions contained in this bill of lading, including those incorporated herein by reference, constitute the entire agreement relating to the carriage of the shipment described in this bill of lading, and no agent, servant or representative of the carrier or consignor has the authority to alter, waive or otherwise modify any provision of this agreement. In tendering the shipment described herein for carriage, the consignor agrees to these terms and conditions on his own behalf and on behalf of the consignee and any other party claiming an interest in this shipment.