



MEADOWBANK DIVISION

**Monitoring Program Summary Report**  
**September 2017**

Type A Water License 2AM-MEA1525

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## **SECTION 1 • BACKGROUND**

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As required under Part I, Item 20 of Type A Water License 2AM-MEA1525, this report documents the water management and monitoring activities at the mine site for the month. This includes water usage, Vault Attenuation Pond discharge water quality, East Dike Seepage discharge water quality, RSF Seepage, Central Dike Seepage, Assay Road Seepage, and sewage treatment plant discharge water quality (which are directed to the onsite storm water management pond).

In addition, a summary of spills/actions for the month is reported.

## SECTION 2 • WATER MANAGEMENT

### 2.1 WATER USAGE

Fresh and reclaim water usage for September 2017 is summarized in Table 2-1 below.

**Table 2-1: Freshwater Usage (m<sup>3</sup>)**

Water Location	Source Lake	Jan	Feb	March	April	May	June	July
Camp	Third Portage Lake	3,623	3,144	3,444	3,490	3,692	3,697	3,818
Mill (freshwater tank)	Third Portage Lake	45,068	41,345	33,328	53,001	53,152	39,661	43,494
Emulsion plant	No-name Lake	86	97	97	96	101	100	129
<b>Total Freshwater Usage (m<sup>3</sup>)</b>		<b>48,777</b>	<b>44,586</b>	<b>36,869</b>	<b>56,587</b>	<b>56,944</b>	<b>43,459</b>	<b>47,441</b>
<b>Reclaim Water Usage (m<sup>3</sup>)</b>	Tailings Pond	<b>252,232</b>	<b>232,324</b>	<b>247,396</b>	<b>227,667</b>	<b>246,007</b>	<b>247,131</b>	<b>251,549</b>

Water Location	Source Lake	Aug	Sept	Oct	Nov	Dec	Total
Camp	Third Portage Lake	3,433	3,389				<b>31,730</b>
Mill (freshwater tank)	Third Portage Lake	38,174	34,107				<b>381,330</b>
Emulsion plant	No-name Lake	123	98				<b>925</b>
<b>Total Freshwater Usage (m<sup>3</sup>)</b>		<b>41,730</b>	<b>37,594</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>413,985</b>
<b>Reclaim Water Usage (m<sup>3</sup>)</b>	Tailings Pond	<b>257,421</b>	<b>241,498</b>				<b>2,203,225</b>

### 2.2 WASTE ROCK STORAGE FACILITY SEEPAGE

In September 2017, 2,804 m<sup>3</sup> of water was pumped back to the North Cell TSF from the ST-16 sump. Of that amount, 1,269 m<sup>3</sup> and 1,147 m<sup>3</sup> were transferred from the WEP1 and WEP2 sumps respectively to the ST-16 sump. Total year to date pumped from ST-16 sump is 50,206 m<sup>3</sup>.

Agnico Eagle completed in September the freshet inspections at the Portage and Vault RSFs, and NP-2 Lake. No issues were observed. Open water sampling at WEP1 (Station ST-30) and WEP2 (Station ST-31) required under the Freshet Action Plan was completed in September. Open water sampling was also completed in September for ST-16, NP-2 and the downstream lakes.

### 2.3 CENTRAL DIKE SEEPAGE

In September 2017, 130,262 m<sup>3</sup> of water was pumped from the ST-S-5 sump back into the South Cell TSF. Total year to date is 3,623,739 m<sup>3</sup>. In September, Agnico also continued to pumped a part of the Central Dike seepage water into Goose Pit. A total of 258,065 m<sup>3</sup> of water was transferred in September for a total year to date of 284,954 m<sup>3</sup>.

Sampling was conducted monthly at ST-S-5 and the South Cell TSF (ST-21) as per the requirements of the NWB water license.

Daily visual inspections were also completed by the Engineering Department.

## 2.4 ASSAY ROAD SEEPAGE

In September 2017, 6,687 m<sup>3</sup> of water was pumped back from the trench to the mill. Weekly inspections of the area were conducted this month. Well monitoring for CN downstream of the trench as well as open water monitoring required under the Freshet Action Plan was completed in September.

## 2.5 SEEPAGE AND RUNOFF FROM THE LANDFILL

The landfill was inspected weekly and no seepage or runoff was observed.

## 2.6 SEEPAGE AT PIT WALL AND PIT WALL FREEZE/THAW AND PERMAFROST AGGRADATION

In September, 17,745 m<sup>3</sup> were pumped out from Vault Pit to the Vault Attenuation Pond. A total of 13,940 m<sup>3</sup> was pumped out from Portage Pit North to the South Cell TSF. No water was pumped out from the Portage Pit South.

## 2.7 SEWAGE TREATMENT PLANT

One (1) effluent wastewater sample was collected at the onsite sewage treatment plant (STP) in September 2017.

The Seprotech STP results are shown in Table 2.7.1 below; the LJ-Mix STP results are shown in Table 2.7.2. The effluent is discharged to the Stormwater Management pond which is pumped to the South Cell TSF during summer months. In September, no water has been discharged from the Stormwater Management pond to the South Cell TSF.

**Table 2.7.1: Seprotech Effluent Results**

Parameters	Units	September 5 <sup>th</sup> , 2017
Ammonia (NH <sub>3</sub> )	mg N/L	0.32
Ammonia-Nitrogen (NH <sub>3</sub> -NH <sub>4</sub> )	mg N/L	54
Total Kjeldahl Nitrogen	mg N/L	55
BOD-5	mg/L	7
COD	mg/L	76
Total Suspended Solids	mg/L	9
Nitrate	mg N/L	1.4
Nitrite	mg N/L	1.59
pH*	Units	7.40
Fecal Coliform	UFC/100 mL	300
Total Coliform	UFC/100 mL	10,000

\*Parameter measured by STP operators

**Table 2.7.2: LJ-Mix Effluent Results**

Parameters	Units	September 5 <sup>th</sup> , 2017
Ammonia (NH <sub>3</sub> )	mg N/L	<0.01
Ammonia-Nitrogen (NH <sub>3</sub> -NH <sub>4</sub> )	mg N/L	7.6
Total Kjeldahl Nitrogen	mg N/L	11
BOD-5	mg/L	6
COD	mg/L	55
Total Suspended Solids	mg/L	4
Nitrate	mg N/L	21.9
Nitrite	mg N/L	0.65
pH*	Units	6.90
Fecal Coliform	UFC/100 mL	>6,000
Total Coliform	UFC/100 mL	300,000

\*Parameter measured by STP operators

## 2.8 VAULT ATTENUATION POND EFFLUENT

Discharge from the Vault Attenuation Pond into Wally Lake was in operation from September 11th to September 15<sup>th</sup>. A total of 42,917 m<sup>3</sup> of water was discharged. Total year to date is 658,659 m<sup>3</sup>.

No Actiflo Water Treatment Plant was necessary during the month as the TSS levels were below the effluent criteria stated in Part F, Item 4 of Water Licence 2AM-MEA1525. One (1) weekly effluent samples were taken at ST-10 in September. Results are presented in Table 2.8.1. No water license exceedances were recorded.

**Table 2.8.1: September 2017 Vault attenuation pond effluent results**

Date Parameters	Units	Maximum Grab Concentration	September 11th, 2017	Maximum Average Concentration
pH*		6.0-9.0	8.17	6.0-9.0
TSS	mg/L	30	9	15
TDS	mg/L	1400	276	1400
Turbidity*	NTU	15	21.9	15
Aluminium	mg/L	3	0.273	1.5
Dissolved Aluminium	mg/L	2	< 0.006	1
Arsenic	mg/L	0.2	< 0.0005	0.1
Cadmium	mg/L	0.004	0.00005	0.002
Copper	mg/L	0.2	0.0032	0.1
Mercury	mg/L	0.008	0.00005	0.004
Ammonia nitrogen	mg N/L	40	2.86	20
Nickel	mg/L	0.4	0.0037	0.2
Nitrate	mg N/L	100	7.46	50
Lead	mg/L	0.2	< 0.0003	0.1
Phosphorus	mg/L	3	<0.01	1.5
Zinc	mg/L	0.4	0.003	0.2
Chloride	mg/L	1000	13.7	500

\*Parameter measured by technician in the field

## 2.9 EAST DIKE SEEPAGE EFFLUENT

Discharge from the East Dike Seepage occurred from September 5<sup>th</sup> to September 22<sup>th</sup>. A total of 14,154 m<sup>3</sup> was discharged into Second Portage Lake in September 2017. Total year to date is 67,061 m<sup>3</sup>.

Three (3) weekly effluent samples were collected at ST-8 in September 2017. TSS monitoring results are presented in Table 2.9.1.below. One (1) water license exceedances was recorded on September 18<sup>th</sup>, the level of Total Suspended Solids (TSS) from the East Dike Discharge exceeded the limits, set out in Water License Part F Item 6 and MMER Schedule 4, of 30 mg/L for the maximum authorized concentration in a grab sample. The monthly average concentration is below the maximum authorized of 15 mg/L.

**Table 2.9.1: East Dike Seepage Results for TSS**

Parameters	Units	September 6th, 2017	September 11th, 2017	September 18th, 2017	Maximum Average concentration
Total Suspended Solids	mg/L	3	3	32	12.67

Monthly regular sampling pursuant to the Water License was also conducted at this location. Results are shown in Table 2.9.2 below. There have been no exceedances of MMER for those criteria.

**Table 2.9.2 September 2017 Monthly Monitoring Results**

Parameters	Units	September 6th, 2017
Aluminium	mg/L	0.015
Sulphate	mg/L	19
Arsenic	mg/L	< 0.0005
Copper	mg/L	0.0008
Nickel	mg/L	0.0008
Lead	mg/L	< 0.0003
Zinc	mg/L	< 0.001
Radium 226	mg/L	< 0.002
Total Cyanide	mg/L	0.003

More details concerning the TSS exceedances:

On September 18<sup>th</sup>, East Dike Discharge exceeded TSS results regarding the maximum allowable grab sample concentration (30 mg/L) and maximum average concentration (15 mg/L) permitted by Water License, Part F, Item 6. The event was reported via an email sent to the NU Spill Line on September 22<sup>th</sup>, 2017.

The East Dike Discharge effluent was sampled on September 18<sup>th</sup>, 2017 at 08:30 CT. Laboratory result of this sample was received on September 22<sup>nd</sup> at 15:06 CT. The East Dike Discharge to Second Portage Lake was stopped on September 22<sup>nd</sup> at 15:55 CT and was diverted to the Portage Pit. Based on a total flow of 1733 m<sup>3</sup> between September 18<sup>th</sup> and September 22<sup>nd</sup>, the quantity of TSS release is estimated at 58.95 kg.

Water discharge to Second Portage Lake for the regulatory East Dike Discharge has been ongoing during the Meadowbank operations and as required by Water License and MMER, weekly samples are taken and reported monthly via the NWB Monthly report and on a quarterly basis via the ECCC RISS system.

During this period, regulatory results were below the regulatory limit of 30 mg/L maximum authorized concentration and the maximum authorized monthly mean concentration of 15 mg/L.

Furthermore to regulatory sampling and as part of our internal monitoring to ensure the protection of the receiving environment, Agnico analysed on a regular basis a TSS sample from our onsite laboratory, which is not accredited but provides real time data for guidance. Samples from September 4<sup>th</sup> (when discharge was re-started after the May 2017 exceedance, previously reported) until the discharge was stopped on September 22<sup>nd</sup>, showed an average of 3.17 mg/L.



Given the short duration of discharge between the exceedance on September 18<sup>th</sup> and the stop of the discharge in the receiving environment on September 22<sup>nd</sup>, Agnico is confident that the aquatic environment was protected and not impacted. Core receiving environment monitoring in Second Portage Lake has been collected and is ongoing and will confirm these findings.

## 2.10 NON CONTACT WATER

In September, Agnico Eagle completed inspections at ST-5 and ST-6 as per the 2017 Freshet Action Plan. Portage Area East (ST-5) and West diversion ditches (ST-6) water quality results are shown in Tables 2.10.1 and 2.10.2, respectively. TSS results did not exceed the maximum average concentration (15 mg/L) and maximum allowable grab sample concentration (30 mg/L) permitted by the Water License, Part F, Item 6.

**Table 2.10.1: Portage Area East Diversion Ditch (ST-5) Results**

Parameters	Units	September 3 <sup>rd</sup> , 2017
Total Suspended Solids	mg/l	<1

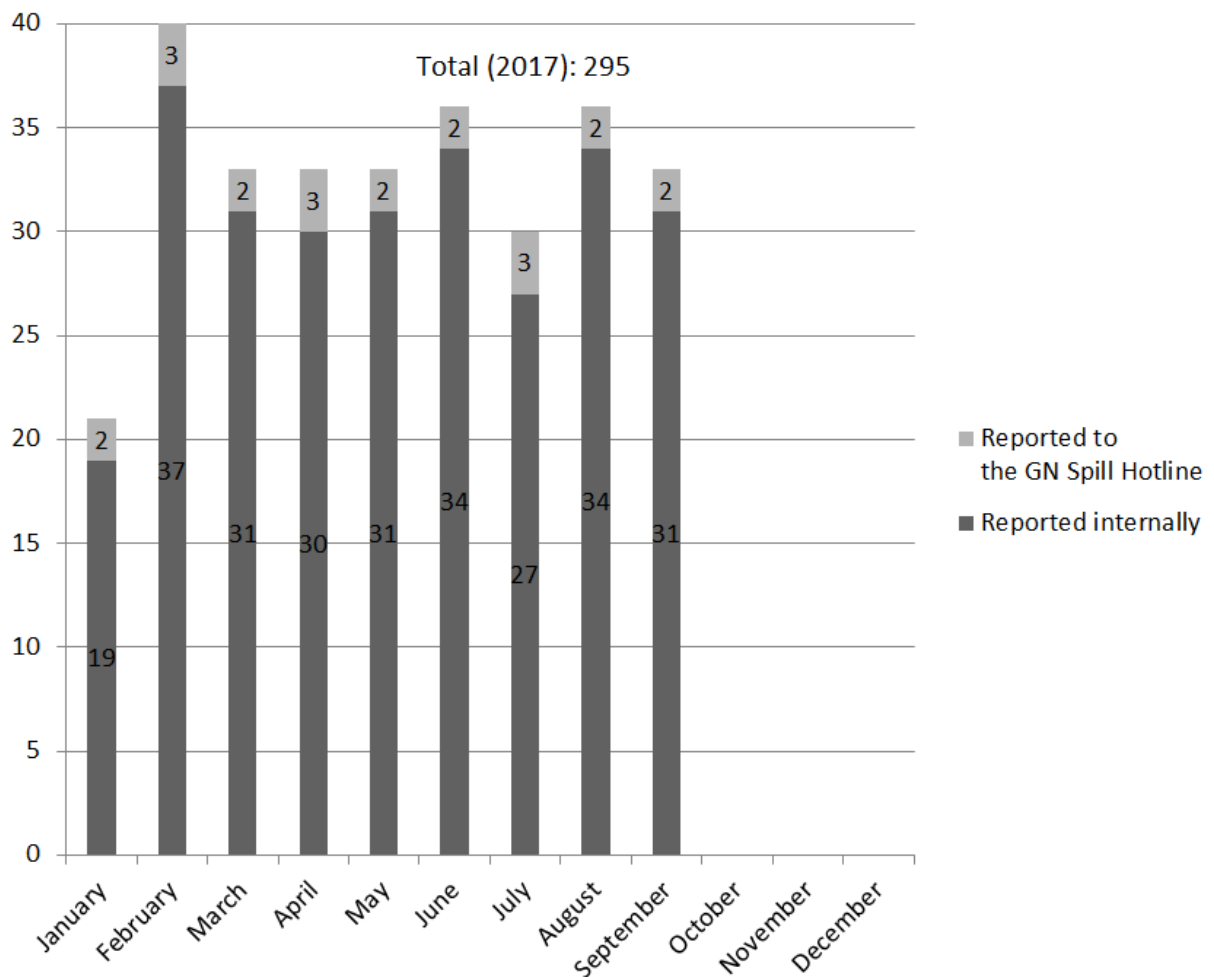
**Table 2.10.2: Portage Area West Diversion Ditch (ST-6) Results**

Parameters	Units	September 3 <sup>rd</sup> , 2017
Total Suspended Solids	mg/l	<1

### SECTION 3 • SPILL MANAGEMENT

Figure 3.1 shows reported and non-reported spills for 2017 broken down per month and Table 3.1 summarizes Agnico spill reports for September 2017. All spills reported internally (31) and to regulators (2) were managed appropriately on site according to Agnico's spill contingency plan. Spills were contained and cleaned, contaminated material was disposed to the appropriate area (landfarm, TSF if required), and the clean-up actions were monitored closely by the Environment Department. There was no off site impact to any watercourses.

**Figure 3.1 2017 Reported and Non-Reported Spills**



**Table 3.1: Summary of Agnico Eagle Internal Spill Reports, September 2017**

Spill Description							
Date of Spill	Hazardous Material	Qty	Units (L / Kg)	Location	Cause of spill	Clean-up action taken	Reported to Spill GN HotLine (Y/N)
September 2 <sup>nd</sup> , 2017	Fuel	6	L	Vault pit	Fuel leak	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 2 <sup>nd</sup> , 2017	Transmission	10	L	Pushback Parking	Cracked hose.	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 3 <sup>rd</sup> , 2017	Hydraulic oil	50	L	Vault pit	Leak	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 4 <sup>th</sup> , 2017	Hydraulic oil	50	L	Vault pit	Leak from a broken hoist cylinder	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 6 <sup>th</sup> , 2017	Coolant	70	L	Vault pit	Broken heater hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 9 <sup>th</sup> , 2017	Coolant	20	L	Saddle dam 3	Broken coolant hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 11 <sup>th</sup> , 2017	Hydraulic Oil	60	L	Vault pit	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 13 <sup>th</sup> , 2017	Hydraulic Oil	80	L	Primary crusher	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 14 <sup>th</sup> , 2017	Diesel	500	L	BL refueling station	The fuel meter was not accurate (new fuel meter)	Spill was contained and contaminated soil picked up and disposed of appropriately	Y
September 15 <sup>th</sup> , 2017	Coolant	10	L	Portage pit	Broken coolant hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N

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September 16 <sup>th</sup> , 2017	Hydraulic Oil	10	L	Refer pad	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 17 <sup>th</sup> , 2017	Hydraulic Oil	50	L	Vault RSF	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 18 <sup>th</sup> , 2017	Hydraulic Oil	60	L	Portage pit	Front right jack cylinder seal broke.	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 18 <sup>th</sup> , 2017	Hydraulic Oil	7	L	Vault parking	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 18 <sup>th</sup> , 2017	Hydraulic Oil	40	L	Vault pit	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 18 <sup>th</sup> , 2017	Coolant	35	L	Vault dump	Broken coolant hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 19 <sup>th</sup> , 2017	Compressor Oil	20	L	Vault Pit	Drain plug broke off	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 20 <sup>th</sup> , 2017	Hydraulic Oil	40	L	Vault Pit	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 21 <sup>st</sup> , 2017	Transmission Fluid	75	L	Vault Pit	Blown Oring on the transmission line	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 22 <sup>nd</sup> , 2017	TSS	5.89 5	KG	Second portage discharge	TSS Exceedance s due to a natural event	Stop the discharge	Y
September 23 <sup>rd</sup> , 2017	Diesel	10	L	Camp/ tankfarm	Fuel nozzle slipped out of tank	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 25 <sup>th</sup> , 2017	Coolant	20	L	Vault parking	Broken radiator hose	Spill was contained and contaminated soil picked up and disposed of appropriately.	N

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September 25 <sup>th</sup> , 2017	Oil	25	L	Lube station	Hose came off of the Used Oil tote	Spill was contained and contaminated soil picked up and disposed of appropriately.	N
September 25 <sup>th</sup> , 2017	Coolant	30	L	Vault parking	Broken coolant hose	Spill was contained and contaminated soil picked up and disposed of appropriately.	N
September 26 <sup>th</sup> , 2017	Transmission Fluid	35	L	South Cell TSF	Broken Transmission	Spill was contained and contaminated soil picked up and disposed of in the land farm.	N
September 26 <sup>th</sup> , 2017	Hydraulic Oil	40	L	Portage Pit	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of in the landfarm	N
September 26 <sup>th</sup> , 2017	Hydraulic Oil	50	L	Vault Road	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately.	N
September 27 <sup>th</sup> , 2017	Hydraulic Oil	50	L	Vault Pit	Busted on "O" ring	Spill was contained and contaminated soil picked up and disposed of appropriately	N
September 28 <sup>th</sup> , 2017	Hydraulic Oil	90	L	Vault Road	Hydraulic fitting	Spill was contained and contaminated soil picked up and disposed of appropriately.	N
September 29 <sup>th</sup> , 2017	Diesel	10	L	Saddle dam 3	Broken welding	Spill was contained and contaminated soil picked up and disposed of appropriately.	N
September 29 <sup>th</sup> , 2017	Diesel	10	L	Saddle Dam 3	Broken welding	Spill was contained and contaminated soil picked up and disposed of appropriately.	N
September 30 <sup>th</sup> , 2017	Hydraulic oil	50	L	Saddle dam 3	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately.	N
September 30 <sup>th</sup> , 2017	Hydraulic oil	50	L	Saddle dam 3	Broken hydraulic hose	Spill was contained and contaminated soil picked up and disposed of appropriately.	N