



MEADOWBANK DIVISION

## **Monitoring Program Summary Report**

**November 2016**

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 November 2016 is summarized in Table 2-1 below.

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

Water Location	Source	January	February	March	April	May	June	July
Camp	Third Portage Lake	3,181	3,061	3,418	3,297	3,478	3,235	3,441
Mill (freshwater tank)	Third Portage Lake	38,578	47,316	84,254	84,309	37,388	41,429	35,270
Emulsion plant	No-name Lake	135	125	119	138	147	54	116
<b>Total Freshwater Usage (m<sup>3</sup>)</b>		<b>41,894</b>	<b>50,502</b>	<b>87,791</b>	<b>87,744</b>	<b>41,013</b>	<b>44,718</b>	<b>38,827</b>
<b>Reclaim Water Usage (m<sup>3</sup>)</b>	South Cell TSF	261,513	207,769	204,407	200,883	268,825	231,995	273,558

Water Location	Source	August	September	October	November	Total 2016
Camp	Third Portage Lake	3,530	3,342	3,601	3,570	30,443
Mill (freshwater tank)	Third Portage Lake	33,516	27,030	44,773	45,980	447,749
Emulsion plant	No-name Lake	124	116	152	136	1,103
<b>Total Freshwater Usage (m<sup>3</sup>)</b>		<b>37,170</b>	<b>30,488</b>	<b>48,526</b>	<b>49,686</b>	<b>558,359</b>
<b>Reclaim Water Usage (m<sup>3</sup>)</b>	South Cell TSF	264,956	259,254	240,238	235,292	2,648,690

### 2.2 WASTE ROCK STORAGE FACILITY SEEPAGE

In November 2016, no water was pumped back to the North Cell TSF from the ST-16 sump. Total year to date pumped from ST-16 was 26,340 m<sup>3</sup>.

Inspections/Monitoring as per the Freshet Action Plan will resume in 2017 Freshet. As well, sampling at WEP1 (Station ST-30), WEP2 (Station ST-31), ST-16, NP2, and the downstream lakes required under the Freshet Action Plan will resume in 2017 Freshet. NP2- Winter water sampling through ice into NP-2 Lake will be done once the ice condition permit safe sampling.

### 2.3 CENTRAL DIKE SEEPAGE

In November 2016, 453,439 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 4,132,372 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 November 2016, no water was pumped from the interception trench back to the mill as it is all frozen. The total water pumped for 2016 is 11,078 m<sup>3</sup>.

## 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 November, water was observed seeping on the eastern wall of the Vault Pit. It was not possible to assess flow. In November, 517 m<sup>3</sup> of water was pumped out of Vault Pit to the Vault Attenuation Pond. No water was pumped out of Portage Pit North and South to the South Cell TSF.

## 2.7 SEWAGE TREATMENT PLANT

One (1) effluent wastewater sample was collected at the onsite sewage treatment plant (STP) in November 2016.

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 twice a year during summer months.

**Table 2.7.1: Seprotech Effluent Results**

Parameters	Units	November 28, 2016
Ammonia (NH <sub>3</sub> )	mg N/L	0.42
Ammonia-Nitrogen (NH <sub>3</sub> -NH <sub>4</sub> )	mg N/L	33.1
Total Kjeldahl Nitrogen	mg N/L	37.9
BOD-5	mg/L	17
COD	mg/L	64
Total Suspended Solids	mg/L	30
Nitrate	mg N/L	4.42
Nitrite	mg N/L	2.05
pH*	Units	7.40
Fecal Coliform	UFC/100 mL	30
Total Coliform	UFC/100 mL	1,700

\*Parameter measured by STP operators

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

Parameters	Units	November 28, 2016
Ammonia (NH <sub>3</sub> )	mg N/L	<0.01
Ammonia-Nitrogen (NH <sub>3</sub> -NH <sub>4</sub> )	mg N/L	0.59
Total Kjeldahl Nitrogen	mg N/L	2.44
BOD-5	mg/L	12
COD	mg/L	54
Total Suspended Solids	mg/L	13
Nitrate	mg N/L	14.9
Nitrite	mg N/L	0.11
pH*	Units	6.90

Fecal Coliform	UFC/100 mL	18
Total Coliform	UFC/100 mL	120

\*Parameter measured by STP operators

## 2.8 VAULT ATTENUATION POND EFFLUENT

No discharge occurred from the Vault Attenuation Pond into Wally Lake in November. Total year to date is 1,008,457 m<sup>3</sup>.

## 2.9 EAST DIKE SEEPAGE EFFLUENT

Discharge from the East Dike Seepage occurred for the entire month of November. A total of 13,439 m<sup>3</sup> of water was discharged into Second Portage Lake in November 2016. Total year to date is 167,072 m<sup>3</sup>.

Four (4) weekly effluent samples were collected at ST-8 in November 2016. TSS results did not exceed the maximum allowable grab sample concentration (30 mg/L) and maximum average concentration (15 mg/L) permitted by Water License, Part F, Item 6. TSS monitoring results for November 2016 are shown in Table 2.9.2 below.

**Table 2.9.2: November 2016 East Dike Seepage Results**

Parameters	Units	7-Nov-16	14-Nov-16	22-Nov-16	28-Nov-16	Maximum Average Concentration
Total Suspended Solids	mg/L	6	5	2	2	3.8

Monthly regular sampling pursuant to the Water license was also conducted at this location. Results are shown in Table 2.9.3 below. There have been no exceedances of MMER or Water License criteria.

**Table 2.9.3: November 2016 Monthly Monitoring Results**

Parameters	Units	28-Nov-16
Aluminum	mg/L	0.034
Sulphate	mg/L	0.9
Arsenic	mg/L	<0.0005
Copper	mg/L	0.0008
Nickel	mg/L	0.0006
Lead	mg/L	<0.0003
Zinc	mg/L	<0.001
Radium 226	mg/L	<0.002
Total Cyanide	mg/L	0.015

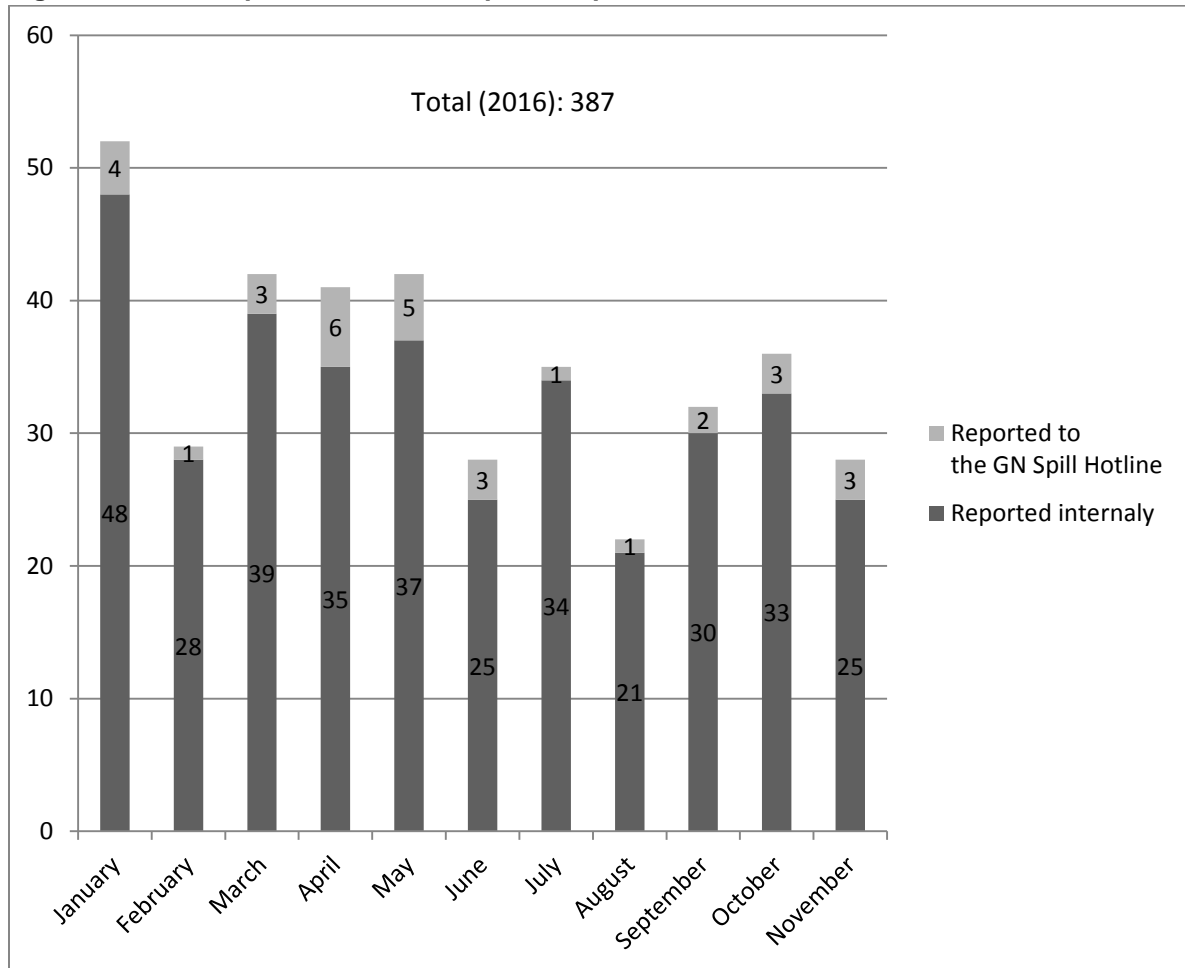
## **2.10 NON CONTACT WATER**

No water sampling at ST-5 and ST-6 were completed in November due to frozen condition.

### SECTION 3 • SPILL MANAGEMENT

Figure 3.1 shows reported and non-reported spills for 2016 broken down per month and Table 3.1 summarizes AEM spill reports for November 2016. All spills reported internally and to regulators were managed appropriately on site according to AEM'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 2016 Reported and Non-Reported Spills**





**Table 3.1: Summary of Agnico Eagle Internal Spill Reports, November 2016**

Date of Spill	Hazardous Material	Quantity (L/Kg)	Location	Cause of spill	Clean-up action taken	Reported to Spill GN
November 1, 2016	Hydraulic oil	30 L	Vault Pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
November 1, 2016	Hydraulic oil	40 L	Vault Pit	Broken hydraulic hose	Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
November 2, 2016	Hydraulic oil	40 L	Vault Pit	O'ring failure on hydraulic line	Contaminated soil was picked up and disposed of adequately.	No
November 2, 2016	Hydraulic oil	90 L	Portage pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of at the landfarm	No
November 3, 2016	Coolant	1.5 L	Amaruq KM 16.5	Coolant leak	Contaminated soil was picked up and disposed of adequately.	No
November 4, 2016	Hydraulic oil	20 L	Vault Pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of at the landfarm	No
November 6, 2016	Hydraulic oil	30 L	Vault Pit	Broken hydraulic hose	Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
November 10, 2016	Hydraulic oil	15 L	Portage view point	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
November 11, 2016	Hydraulic oil	10 L	Amaruq KM 12.76	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
November 13, 2016	Hydraulic oil	40 L	Winter Parking	Residual oil from shop repairs was dropped on the ground by accident during maintenance.	Contaminated soil was picked up and disposed of adequately.	No
November 16, 2016	Sewage	100 L	Camp	Broken pipe sewage transfer from the Nova Camp lift station to the STP	Stop the transfer pump and use the sewage truck until the repair is done	Yes
November 17, 2016	Hydraulic oil	20 L	Amaruq road KM 19.3	Engine oil pan valve broke	Contaminated soil was picked up and disposed of adequately.	No
November 17, 2016	Hydraulic oil	350 L	Portage pit	Broken hydraulic hose	Spill was picked up as it was on a ore pattern, it went in the primary crusher	Yes
November 19, 2016	Hydraulic oil	15 L	Portage pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
November 19, 2016	Engine Oil	20 L	Vault Pit	Residual oil from shop	Contaminated soil was picked up and disposed of	No

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				repairs was dropped on the ground by accident during maintenance.	adequately.	
November 20, 2016	Engine Oil	20 L	Vault Pit	While performing maintenance repairs	Contaminated soil was picked up and disposed of adequately.	No
November 20, 2016	Hydraulic oil	80 L	Vault Pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of at the landfarm	No
November 22, 2016	Coolant	4 L	Amaruq road KM 19	Overflow	Contaminated soil was picked up and disposed of adequately.	No
November 22, 2016	Hydraulic oil	90 L	Vault Pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of at the landfarm	No
November 24, 2016	Coolant	65 L	Vault parking	Mechanical Repair	Material was picked up and brought to tailings	No
November 26, 2016	Compress or Oil	25 L	Portage pit	Broken coolant line.	Contaminated soil was picked up and disposed of adequately.	No
November 26, 2016	Hydraulic oil	15 L	Vault Rock Storage Facility	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
November 28, 2016	Coolant	60 L	MBK AWAR KM 65	Hauling containers (2) from the Baker Lake laydown area to the Meadowbank site, a tractor-trailer over-roll at km 65.	Contaminated soil was picked up and disposed of adequately in the TSF Meadowbank	Yes
November 30, 2016	Hydraulic oil	40 L	Vault Pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
November 30, 2016	Hydraulic oil	25 L	Vault Pit	Broken body valve	Contaminated soil was picked up and disposed of adequately.	No
November 30, 2016	Transmissi on Oil	50 L	Vault Camp	Broken transmission pump line	Contaminated soil was picked up and disposed of adequately.	No
November 30, 2016	Hydraulic oil	40 L	Vault Pit	Broken Travel Motor seal	Contaminated soil was picked up and disposed of adequately.	No
November 30, 2016	Hydraulic oil	30 L	Portage pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No