



MEADOWBANK DIVISION

## **Monitoring Program Summary Report**

**August 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 August 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	35,397	44,255	80,836	81,012	33,910	38,194	35,270
Emulsion plant	No-name Lake	135	125	119	138	147	144	116
<b>Total Freshwater Usage (m<sup>3</sup>)</b>		<b>38,713</b>	<b>47,441</b>	<b>84,373</b>	<b>84,447</b>	<b>37,535</b>	<b>41,573</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	Total 2016
Camp	Third Portage Lake	3,530	26,641
Mill (freshwater tank)	Third Portage Lake	33,516	382,390
Emulsion plant	No-name Lake	124	1,048
<b>Total Freshwater Usage (m<sup>3</sup>)</b>		<b>37,170</b>	<b>410,079</b>
<b>Reclaim Water Usage (m<sup>3</sup>)</b>	South Cell TSF	264,956	1,913,906

### 2.2 WASTE ROCK STORAGE FACILITY SEEPAGE

In August 2016, 3,577 m<sup>3</sup> of water was pumped back to the North Cell TSF from the ST-16 sump. Of that amount, 1,252 m<sup>3</sup> was transferred from the WEP1 sump to the ST-16 sump.

In August, Agnico Eagle completed inspections at the Portage and Vault RSFs, and NP-2 Lake as per the 2016 Freshet Action Plan. No major issues were observed. Open water sampling at WEP1 (Station ST-30), WEP2 (Station ST-31), ST-16, NP2, and the downstream lakes required under the Freshet Action Plan was completed in August.

### 2.3 CENTRAL DIKE SEEPAGE

In August 2016, 395,629 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 2,812,626 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 August 2016, 3,599 m<sup>3</sup> of water was pumped from the interception trench back to the mill. The total for 2016 is 8,457 m<sup>3</sup>. Weekly inspections of the area were conducted this month.

## 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 August, water was observed seeping on the eastern wall of the Vault Pit. It was not possible to assess flow. In August, 9,236 m<sup>3</sup> of water were pumped out of Portage Pit South to the South Cell TSF. No water was pumped from Portage Pit North. 13,245 m<sup>3</sup> of water was pumped out of Vault Pit to the Vault Attenuation Pond.

## 2.7 SEWAGE TREATMENT PLANT

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

**Table 2.7.1: Seprotech Effluent Results**

Parameters	Units	August 1, 2016
Ammonia (NH <sub>3</sub> )	mg N/L	0.59
Ammonia-Nitrogen (NH <sub>3</sub> -NH <sub>4</sub> )	mg N/L	46.0
Total Kjeldahl Nitrogen	mg N/L	50.6
BOD-5	mg/L	9
COD	mg/L	57
Total Suspended Solids	mg/L	14
Nitrate	mg N/L	5.86
Nitrite	mg N/L	1.
pH*	Units	6.80
Fecal Coliform	UFC/100 mL	400
Total Coliform	UFC/100 mL	12,000

\*Parameter measured by STP operators

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

Parameters	Units	August 1, 2016
Ammonia	mg N/L	<0.01
Ammonia-Nitrogen	mg N/L	14.1
Total Kjeldahl Nitrogen	mg N/L	15.2
BOD-5	mg/L	7
COD	mg/L	50
Total Suspended Solids	mg/L	12
Nitrate	mg N/L	19.2
Nitrite	mg N/L	0.45
pH*	Units	5.3

Fecal Coliform	UFC/100 mL	22
Total Coliform	UFC/100 mL	<1000

\*Parameter measured by STP operators

## 2.8 PHASER LAKE DEWATERING

Phaser Lake dewatering stated on August 26, 2016. In August, a total of 77,616m<sup>3</sup> of water were transferred. Water was managed according to NWB water license 2AM-MEA1525 and is directed through the approved Vault Attenuation pond. During dewatering and operations, Agnico Eagle continue to meet approved license discharge limits of effluent from the Vault Attenuation Pond prior to discharge through Wally Lake diffuser. Discharging water during dewatering and operations follow Part F effluent discharge limits, monitoring and acute lethality testing (See section 2.9 below). The approved monitoring of Wally Lake receiving environment as part of the CREMP and MMER monitoring continue.

## 2.9 VAULT ATTENUATION POND EFFLUENT

Discharge from the Vault Attenuation pond stopped on August 17 with a one day discharge on August 22. A total of 236,699 m<sup>3</sup> of water was discharged into Wally Lake in August 2016. Total year to date is 475,257 m<sup>3</sup>.

Four (4) weekly effluent samples were taken at ST-10 in August. 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.

**Table 2.9.1: August 2016 Vault Discharge Results**

Date Parameters	Units	Max. grab conc.	01-Aug-16	08-Aug-16	15-Aug-16	22-Aug-16	Monthly Average	Max. avg. conc.
pH*		6.0-9.0	7.85	7.35	7.46	7.36	7.51	6.0-9.0
TSS	mg/L	30	3	6	4	5	3.6	15
TDS	mg/L	1400	133	148	155	182	154.5	1400
Turbidity*	NTU	15	4.09	5.05	5.83	8.79	5.94	15
Aluminium	mg/L	3.0	0.112	0.077	0.095	0.152	0.109	1.5
Dissolved Aluminium	mg/L	2.0	0.016	<0.006	0.009	<0.006	0.0076	1.0
Arsenic	mg/L	0.2	<0.0005	0.001	<0.0005	0.0041	0.0014	0.1
Cadmium	mg/L	0.004	<0.00002	<0.00002	<0.00002	0.00008	0.00003	0.002
Copper	mg/L	0.2	0.0022	0.0057	0.0029	0.0030	0.0035	0.1
Mercury	mg/L	0.008	0.00041	<0.00001	<0.00001	<0.00001	0.000106	0.004
Ammonia nitrogen	mg N/L	40	0.78	0.75	0.76	1.14	0.86	20
Nickel	mg/L	0.4	0.0034	0.0055	0.0048	0.0039	0.0044	0.2
Nitrate	mg N/L	100	3.40	3.92	4.15	6.26	4.43	50
Lead	mg/L	0.2	<0.0003	<0.0003	<0.0003	<0.0003	0.00015	0.1
Phosphorus	mg/L	3.0	<0.01	0.03	0.01	<0.01	0.013	1.5
Zinc	mg/L	0.4	<0.001	<0.001	0.002	0.001	0.001	0.2
Chloride	mg/L	1000	5.9	5.8	6.5	8.5	6.68	500

\*Parameter measured by Environment Technician on field

## 2.10 EAST DIKE SEEPAGE EFFLUENT

Discharge from the East Dike Seepage occurred for the entire month of August. A total of 18,476 m<sup>3</sup> of water was discharged into Second Portage Lake in August 2016. Total year to date is 122,746 m<sup>3</sup>.

Five (5) weekly effluent samples were collected at ST-8 in August 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 August 2016 are shown in Table 2.9.2 below.

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

Parameters	Units	1-Aug-16	8-Aug-16	15-Aug-16	22-Aug-16	29-Aug-16	Maximum Average Concentration
Total Suspended Solids	mg/L	1	<1	3	4	<1	1.8

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: August 2016 Monthly Monitoring Results**

Parameters	Units	8-Aug-16
Aluminum	mg/L	0.03
Sulphate	mg/L	15.7
Arsenic	mg/L	<0.0005
Copper	mg/L	0.0008
Nickel	mg/L	0.0022
Lead	mg/L	<0.0003
Zinc	mg/L	<0.001
Radium 226	mg/L	<0.002
Total Cyanide	mg/L	<0.005

## 2.11 NON CONTACT WATER

In August, Agnico Eagle completed inspections at ST-5 and ST-6 as per the 2016 Freshet Action Plan. Portage Area East (ST-5) and West (ST-6) diversion ditches water quality results are shown in Tables 2.10.1 and 2.10.2, respectively. TSS results didn't 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	2-Aug-16
Total Suspended Solids	mg/l	<1

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

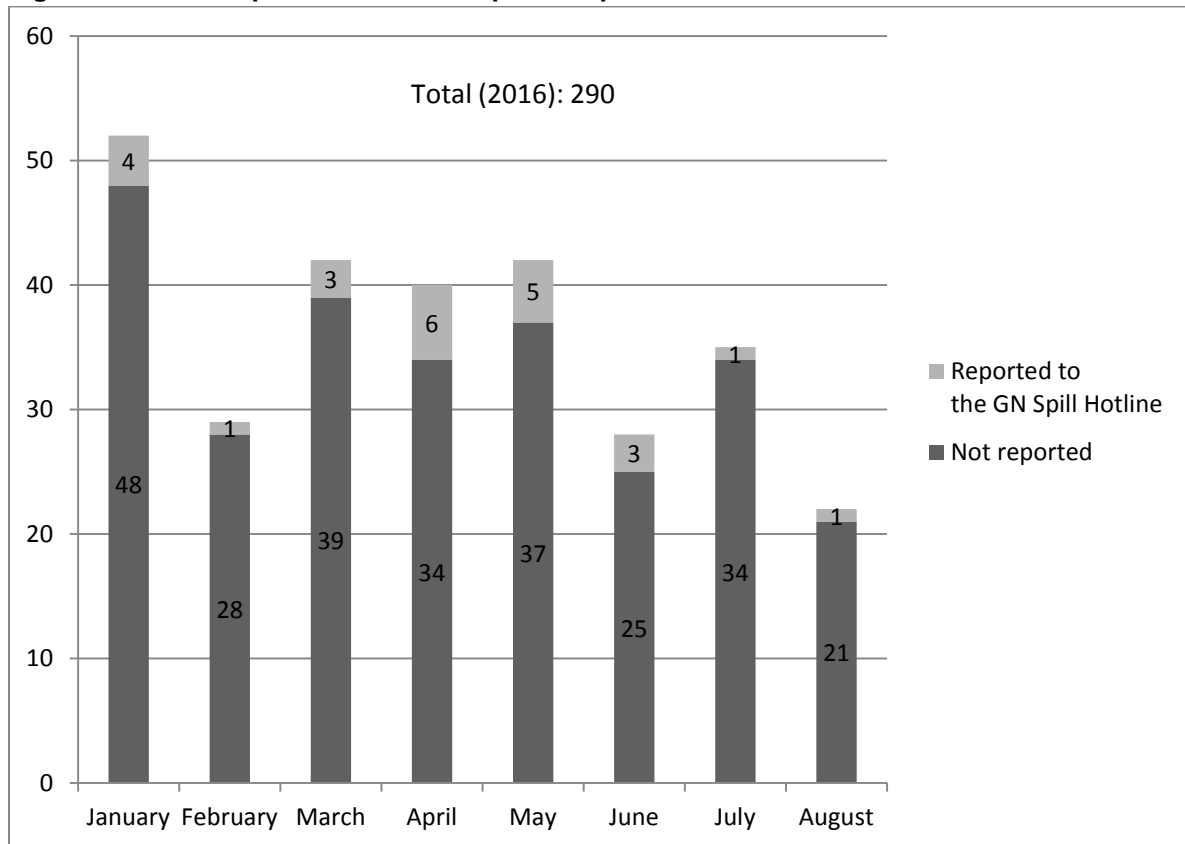
Parameters	Units	2-Aug-16
Total Suspended Solids	mg/l	<1



### 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 August 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, August 2016**

Date of Spill	Hazardous Material	Quantity (L/Kg)	Location	Cause of spill	Clean-up action taken	Reported to Spill GN HotLine
August 1, 2016	Hydraulic oil	30 L	Vault Waste Dump	Broken hydraulic hose.	Contaminated soil was picked up and disposed of adequately.	No
August 1, 2016	Hydraulic oil	90 L	Vault Pit	Broken hydraulic line on brake release.	Contaminated soil was picked up and disposed of adequately.	No
August 4, 2016	Hydraulic oil	40 L	Vault Pit	Broken hydraulic hose.	Contaminated soil was picked up and disposed of adequately.	No
August 7, 2016	Copper Sulphate	6 Kg	Transit Laydown	In the process of moving a c-can in the transit area, product was noticed spilling from the bottom of the container (bulk bag was leaking inside of c-can; small hole)	The majority of product was left inside the c-can and collected and placed in an empty drum. The product that first spilled on the ground and during moving process was collected with a loader and contaminated material was disposed at the tailings storage facility.	Yes
August 7, 2016	Coolant	14 L	Vault Kitchen Parking	Broken coolant line.	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
August 8, 2016	Hydraulic oil	90 L	Portage Pit	Hydraulic line failure.	Contaminated soil was picked up and disposed of adequately.	No
August 10, 2016	Hydraulic oil	75 L	Pushback parking	Hydraulic hose failure.	Contaminated soil was picked up and disposed of adequately.	No
August 10, 2016	Hydraulic oil	63 L	Vault Pit	Hydraulic hose failure.	Contaminated soil was picked up and disposed of adequately.	No
August 13, 2016	Transmission Oil	15 L	Vault Dump	Transmission line leaking.	Contaminated soil was picked up and disposed of adequately.	No

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August 13, 2016	Coolant	83 L	Vault Dump	Engine fan fell in radiator (failed fan bearing).	Contaminated soil was picked up and disposed of adequately.	No
August 15, 2016	Hydraulic oil	90 L	Vault Pit	Cracked final drive cover	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
August 15, 2016	Diesel fuel	10 L	Truck Shop	Spill occurred during fuel transfer between two trucks.	Contaminated soil was picked up and disposed of adequately.	No
August 16, 2016	Hydraulic oil	60 L	Vault Pit	Broken hydraulic hose.	Contaminated soil was picked up and disposed of adequately.	No
August 21, 2016	Steering oil	20 L	Vault Pit	Spill during maintenance operations	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
August 22, 2016	Hydraulic oil	90 L	Vault Pit	Broken steering hose fitting	Contaminated soil was picked up and disposed of adequately.	No
August 25, 2016	Jet A fuel	90 L	Baker Lake tankfarm	Air problem on the tanker truck trailer	Contaminated soil was picked up and disposed of adequately.	No
August 27, 2016	Steering oil	60 L	Pushback Parking washroom	Steering hose failure	Contaminated soil was picked up and disposed of adequately.	No
August 27, 2016	Hydraulic oil	80 L	Vault Pit	O'ring failure	Contaminated soil was picked up and disposed of adequately.	No
August 29, 2016	Hydraulic oil	25 L	Vault Pit	Broken hydraulic hose	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
August 30, 2016	Hydraulic oil	45 L	Vault Pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
August 31, 2016	Hydraulic oil	5 L	Vault Camp Parking	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
August 31, 2016	Hydraulic oil	14 L	Vault Road	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No