Follow Up Report: #19-485
December 16, 2019 Treated Sewage Water Spill

The following information refers to spill 19-485 reported by Agnico Eagle Mines Ltd. December 16th 2019, and is being provided in accordance with:

- the Nunavut Water Board License 2BB-MEL1424 Water License, part H, item 4b

Description of Incident:

On December 16th at 07:20, the Environment Department received a call that workers had noticed a leak at the retention tanks behind the exploration camp. Sometime during the night a pipe connecting the four tanks together froze, and cracked, which allowed the tanks to slowly drain. The tanks were empty at the time the leak was noticed. After speaking with the Sewage Treatment Plant (STP) operator, they estimate on average 16 m^3 is treated per day, and since the leak happened over night when water usage was low, the water volume released would be approximately 8 m^3, although it was likely less than this.

The retention tanks are normally emptied each day by a water truck and sent to CP1 or the main camp STP. This was done the previous day at 14:30 and nothing out of the ordinary was noted at that time. An hour before receiving the radio call, the Environment Department collected a weekly sample at the MEL-7 sample station inside the STP, which is the same treated water just prior to it flowing into the retention tanks.

Table 1: Lab results summary for samples taken the same morning as the incident.

Parameter	License B Threshold	Lab Result (Sampled 2019-12-16)
pH	6.0 to 9.5	7.45
Biochemical Oxygen Demand	80 mg/L	7 mg/L
Total Suspended Solids	100 mg/L	7 mg/L
Fecal Coliforms	1000 CFU/100 mL	<2 CFU/100 mL
Oil & Grease	5 mg/L & No visible sheen	<0.50 mg/L

No water reached Meliadine Lake, however, it did freeze approximately 10 m from the shore. The retention tanks are located at 63° 1'43.42"N, 92°10'10.22"W. The extent that the frozen material migrated towards Meliadine Lake was 63° 1'41.61"N, 92°10'6.66"W (Figure 1).

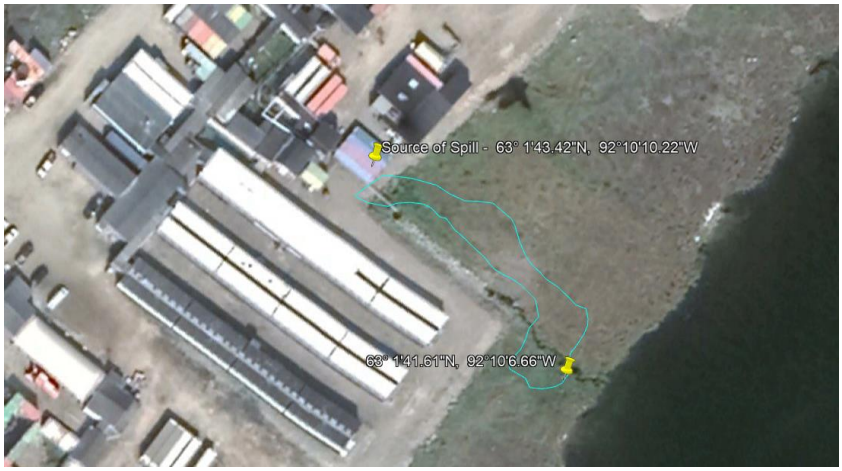

Figure 1: Location and extent of spill area (blue line indicated area of frozen material).

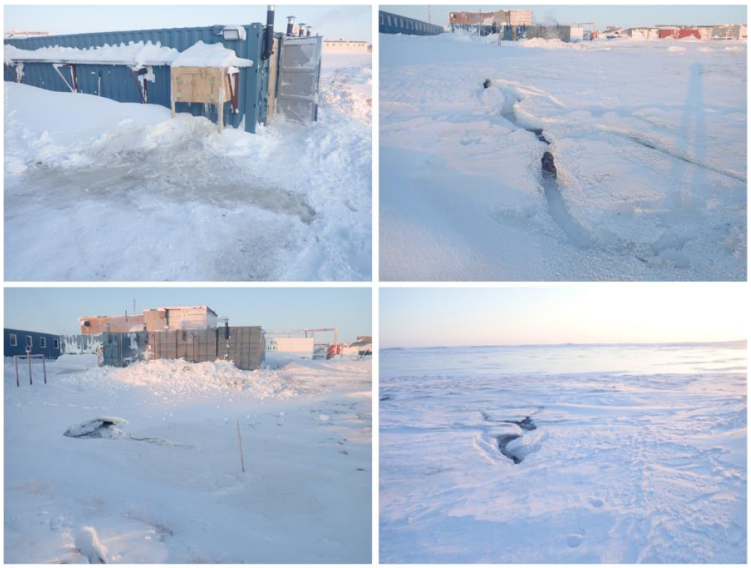

Figure 2: Spill area and proximity to Meliadine Lake.

Spill Response & Cleanup:

The leak was noticed around 07:00, and by this time the tanks were empty and the released water had frozen in place. The STP was put on stand-by while the Energy and Infrastructure (E&I) Department worked to locate and replace the broken piping.

A backhoe was used to remove as much contaminated snow and ice as possible without damaging the tundra (Figure 3). The material was loaded into a 40 tonne haul truck and trucked to the CP1 snow dump pile since this is the where the treated water is sent to normally (CP1). Nine full loads of material were removed and trucked to the snow dump.

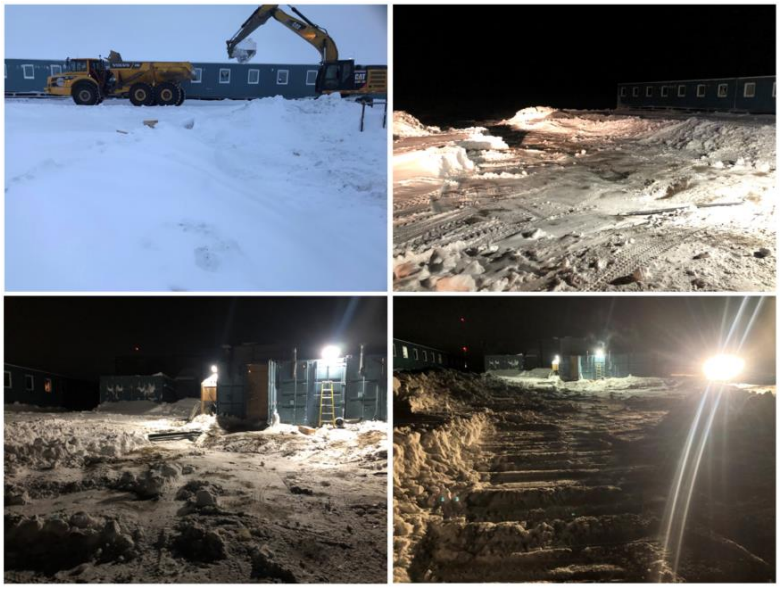

Figure 3: Spill location following clean-up.

Corrective Measures

A major re-design of the storage containers, which house the retention tanks, has been completed. At the time of the incident, there were four retention tanks which sit inside individual sea-cans. The tanks were connected in series by pipes and small pumps which sit on the floor, and pass through the walls of each sea-can. This setup allowed for very small sections of the piping to be exposed to the cold, causing them to freeze. To mitigate this in the past, each sea-can is also outfitted with an industrial heater (frost-fighter) controlled by a thermostat, which was meant to prevent any piping from freezing.

The new setup (Figure 4) involves connecting each sea-can together from the inside so that no components need to be exposed to exterior temperatures. Large sections were cut from the wall of each sea-can so that they could be connected together, essentially creating one large container so that nothing is exposed to the outside. An improved heating setup has also been established which directs more heat to the floor where the temperatures are colder.

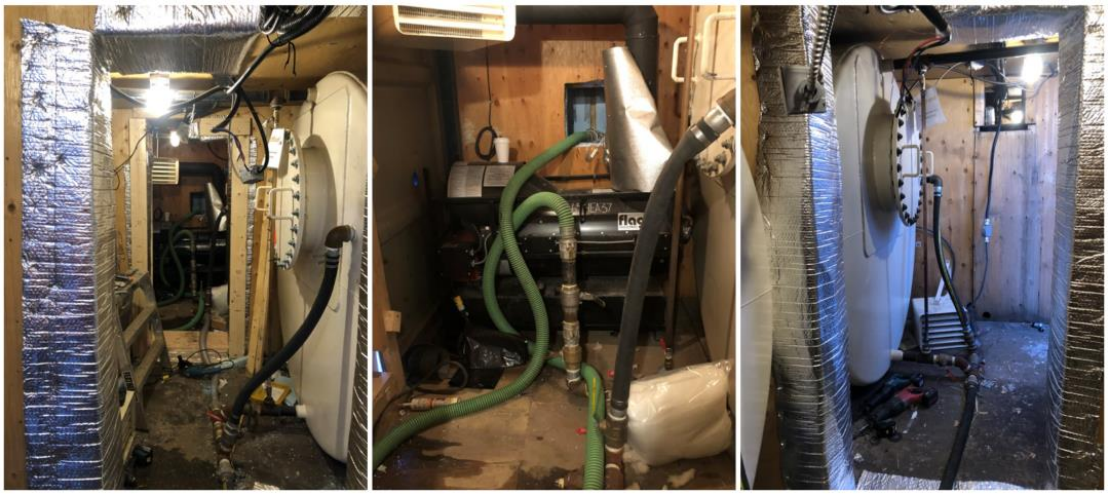

Figure 4: Improvements made to the interior of the retention tank storage containers. Four containers have been connected so that all lines running between tanks, are no longer exposed to external temperature. An additional heater was installed at ground level.

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