

December 5, 2019

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Subject: W2016D0003: Spill 2019456 Report

Pursuant to Part C Condition 18(c) of Land Use Permit W2016D0003, Dominion Diamond Mines ULC (Dominion) is providing a detailed report on Spill 2019456 which occurred on November 6, 2019 within the Sable Maintenance Shelter.

Summary

Between 16:30 and 19:00 on November 6, 2019 the O-ring failed on a filter of a pressurized "Lube Island" in the Sable Maintenance Shelter. The failure caused approximately 450 L of 5W-40 engine oil from the steel tank to be pumped out through the damaged oil filter onto the ground in the shop. The shop floor is constructed of rig-matting (aka. access matting). See Figure 1 for the location of the spill.

Root Cause

Several factors contributed to this spill:

- The exposed seal on this model of oil filter makes failures of this nature possible (See Figure 2)
- The Lube Island was left pressurized while the shop was unattended between shifts, so the spill was not discovered until personnel arrived at the shop for night-shift
- The shop floor is not made of solid concrete, thus creating the potential for small, isolated leaks between the mats onto the ground (see Figure 3)

Figure 1: Location of Spill 2019456
Sable Maintenance Shelter, Ekati Diamond Mine

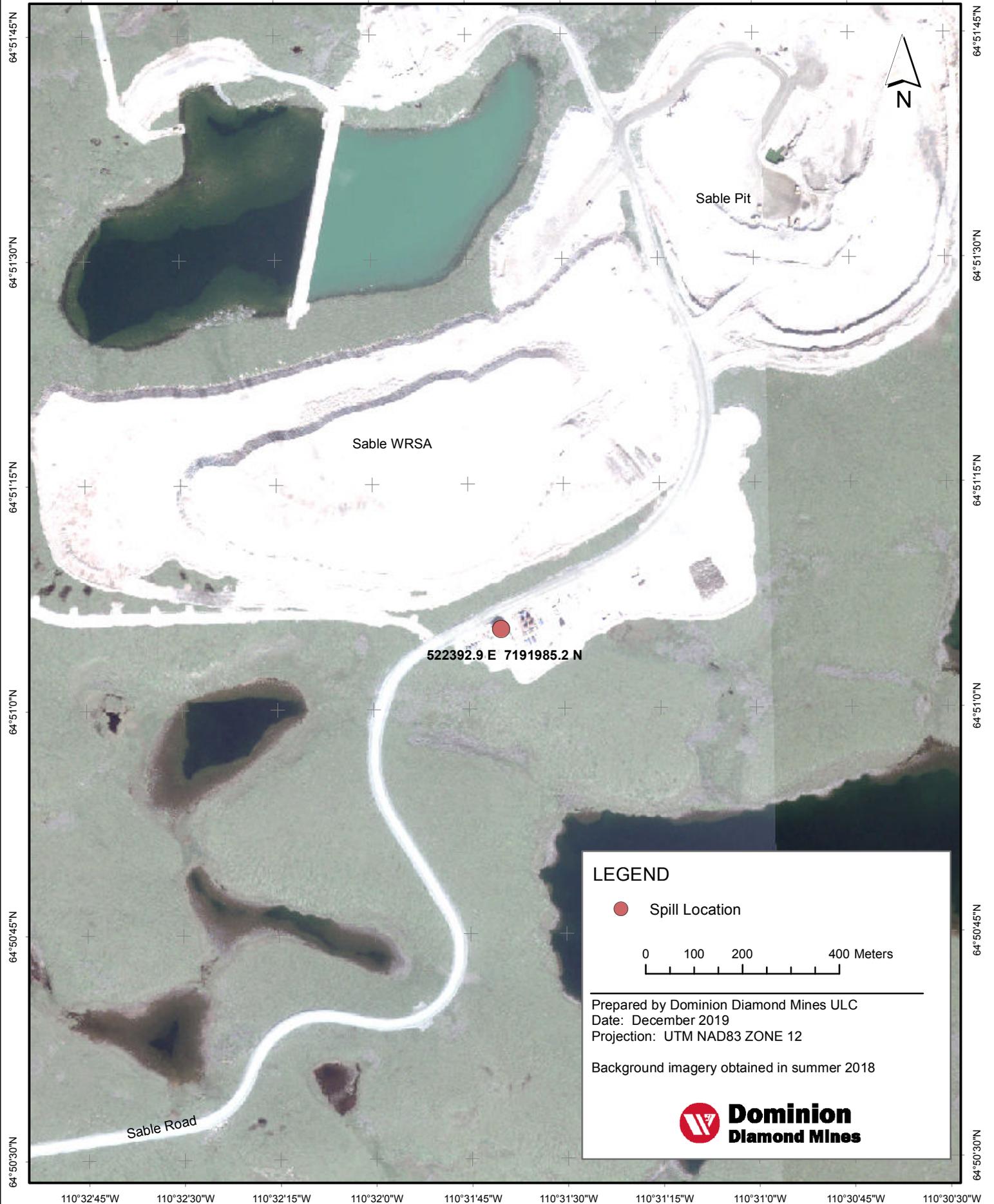


Figure 2. Failed oil filter on Lube Island



Figure 3. Small gaps between rig mats





Immediate Actions Taken

- Sable Maintenance Shelter personnel stopped the flow of oil from the Lube Island and contacted their Team Leader and reported the spill to the Environment Department. The Sable Maintenance Team reported the spill volume internally to the Environment Department as between 400 L – 2,000 L based on the visual estimation of the spill (400 L) and the maximum capacity of the tank (2,000 L). The workers used absorbent pads to retrieve the free standing oil, which had migrated underneath a nearby piece of equipment that was being serviced (See Figure 4). The used absorbent pads were placed into sealed drums, labelled, and sent to Waste Management for eventual off-site disposal.
- The Environment Department worked closely with the Team Leader Sable Maintenance to determine a more accurate volume estimation for the spill. The tank is equipped with a Graco “Fire-Ball 300” air-powered pump with a stated delivery rate of only 3 L/min. The longest possible time the shop could have been left unattended would have been from 16:30 to 19:00 as the crews transitioned from day-shift to night-shift. At a flow rate of 3 L/min for 2.5 hours the highest possible volume for the spill would be 450 L. Dominion feels this is a conservative, worst-case estimate because the spill was likely not taking place for the full 2.5 hour period, and the oil was only being pumped through a leaking oil filter instead of being delivered at full flow rate through the delivery nozzle.
- The majority of the spill was captured with absorbent pads immediately after the spill was discovered. Some of the spill was absorbed by the rig-matting which makes up the floor surface in the area of the spill. This flooring is made up of hardwood tightly cased between steel I-beams which are interlocked. The mats are utilized in the Sable Maintenance Shelter to support the weight of heavy equipment and to provide a protective surface to absorb spills which may occur during service. After a thorough inspection on November 26th it seems possible that oil could have leaked between the small junctions in the mats. The steel I-beams and hardwood lay flat on the packed, level ground surface beneath, therefore any oil that leaked through would be isolated between the small cracks in the flooring. The rig-matting cannot be lifted because several mats are welded together and extend beyond the perimeter of the shop to provide a stable, safe working surface for the heavy equipment in the shop (See Figure 6 for design).

Figure 4. Spill 2019456 during clean up

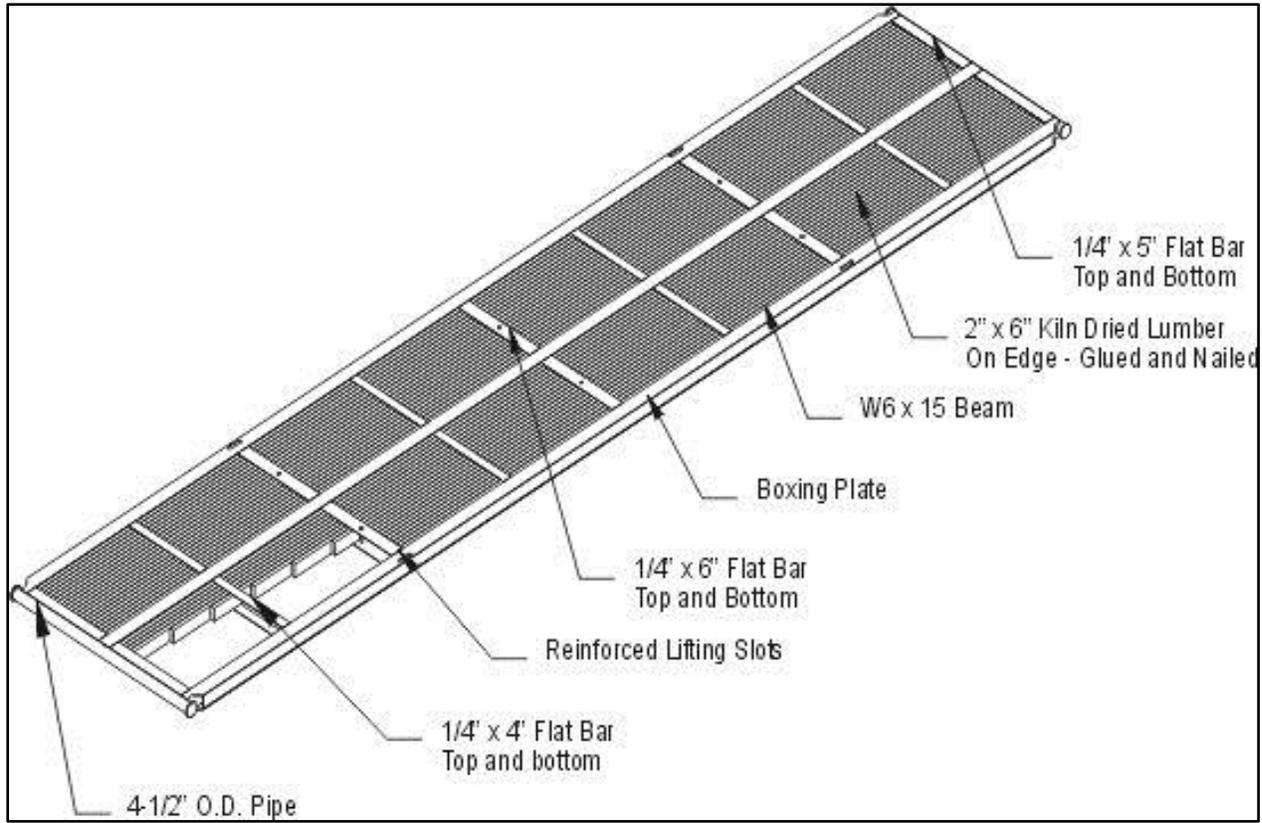


Figure 5. Spill 2019456 after Shop floor clean up





Figure 6. Design of rig-matting



Follow Up Actions Taken

- Dominion has ordered new low-flow canister filters for the Lube Island. Unlike the filter which failed on November 6th, the canister filters have no exposed seals and will eliminate the risk of spill reoccurrence. These filters will be installed immediately upon delivery to Ekati mine.
- Maintenance staff have created a new policy of shutting off the air pressure to the Lube Island when the shop is unattended. Dominion is exploring the opportunity to install timers on the air delivery system which would only allow air pressure to be applied to the Lube Island for a prescribed amount of time. This would eliminate the risk of the pump running continuously in the unlikely event of another spill.
- As per the Interim Closure and Reclamation Plan v.3.0 (currently under review), all hydrocarbon-impacted soils will be isolated, removed, or remediated prior to site closure. As per Part C, Condition 18 of Land Use Permit W2016D0003, a record of all spills at the Ekati Diamond Mine is maintained by the Environment Department so that



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contaminated areas can be revisited and remediated effectively. Upon breakdown of the Sable Maintenance Shelter, Dominion will assess the entire surface of the work area, including the area beneath the rig-matting. Any contaminated soil found beneath the rig-matting will be excavated and transported to Zone S or the landfarm (depending on grain size of the contaminated material) for disposal.

We trust this report is clear and informative. If you have any questions or comments please contact the undersigned at dustin.chaffee@ddcorp.ca or (867) 669-6164 or Lynn Boettger at lynn.boettger@ddcorp.ca or (867) 766-6914.

Yours Sincerely,

Dustin Chaffee
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