



The April 1, 2015 Inspection of the Kensington Gold Mine

Action Items:

- Place barrels and containers in secondary containment at the Comet Wastewater Treatment Plant.
- Clean up the “spill” of Z-flocc at the Comet Wastewater Treatment Plant.
- Pull and fold the liners in the old storm water ponds near the Mill.
- Correct the minor pooling near the new storm water ponds.
- Inspect the tailings discharge pipe and ensure that it deposits tailings properly.

This report covers the April 1, 2015 inspection of the Kensington Gold Mine. The multi-agency inspection team (team) consisted of Curtis Caton (Geologist) and Matt Reece (Minerals Program Manager) from the United States Forest Service (USFS), and David Wilfong (Engineer) from the Alaska Department of Natural Resources (ADNR). Transportation to and from the mine that was provided by a United States Forest Service chartered Cessna floatplane operated by Ward Air. The team was accompanied by Kevin Eppers (Environmental Manager) from Coeur Alaska for the duration of the inspection.

The team was met at Kensington’s Marine Terminal by Kevin, where we were shuttled to the camp area, and then to the Mill building to acquire additional personal protective equipment for underground travel. After traveling through the almost 3 mile-long tunnel, the team emerged at the Comet Wasterock Pile. The double berms designed to restrict haul trucks from dumping waste rock down the west slope of the pile and into Ophir Creek continues to work well. The pile continues to grow in size and Kevin revealed plans to realign the Comet Wastewater Treatment



Figure 1 Comet Wasterock Pile Showing the Approximate Alignment of the New Road

Plant access road to run down the west side of the pile (Figure 1), thereby allowing for additional waste rock to be placed on the uphill (eastern) side of the pile. The toe of the west embankment of the pile is already very close to the seasonal channel of Ophir Creek, and construction of the road would need to be handled very carefully to ensure that no wasterock enters the creek. The new road would be of similar construction and length as the current road, and will likely not require an authorization from the ADNR.

The team moved on to the Comet Wastewater Treatment Plant (WTP). Mine water was being discharged into Pond One and was significantly clearer than in the past. Water from the mine passes through three sumps in the mine before it is discharged. The “triple sumps” are designed to settle as much sediment as



Figure 2 Pond 1

possible before reaching the water treatment plant. Coeur has been improving the efficiency of settling the sediment and cleaning the sumps, and the product of the improvements is evident at the outfall (Figure 2). While walking around the exterior of the WTP, the team spotted two pallets with four black 55 gallon barrels strapped to each (Figure 3). The two pallets containing the barrels were not within secondary containment, and several of the barrels showed minor damage to the exterior, likely caused by a forklift. One of the barrels was visibly leaking a polyacrylamide flocculant called Z-Flocc. Z-Flocc is a very viscous fluid with a consistency similar to automotive grease. According to the Material Data

Safety Sheet (MSDS), the flocculant is not toxic to humans or animals. The viscous liquid was running from a hole near the seam at the bottom of the barrel (Figure 4). It appeared to have stopped flowing, and it was not an imminent danger. Pond Two was not operating and was nearly dry. The water flow rate from the mine was very low for April, when spring runoff normally creates the highest annual flow for the WTP.



Figure 3 Barrels outside of secondary containment.



Figure 4 Barrel leaking Z-flocc



Figure 5 White residue coating rock in Sherman Creek

The team moved down the wooden walkway to the water outfall manifold, and then on to the discharge point in Sherman Creek. A dirty white “residue”¹ was clearly visible on the rocks within the Creek at, and downstream of the outfall (Figure 5). The residue appears to be caused by the water treatment process, however it is not clear why it occurs, or exactly what it is. Testing shows that it may have an organic nature, and does not appear to be the same material (gypsum) that was found in Slate Creek in 2014.

Testing also shows very low toxicity, and it does not appear to pose an immediate threat. The residue cannot be found upstream of the outfall lines, but continues downstream for about 100 yards. Recent water quality tests show the water in the WTP and in Sherman to be within Alaska’s Water Quality Standards. Testing by Coeur and the Alaska Department of Fish and Game continues to occur on the residue to better understand the residue and its source.

The team moved back to the truck and returned to the Kensington side of the mine and stopped on the ore pad. The pebble reject piles continue to grow. The acorn sized pebbles are rejected from the ball mill after not crushing to a size suitable for the floatation process (consistency of talcum powder). About 10% of the pebble reject material is considered to be ore, while the rest is wasterock. Coeur will be implementing an ore sorting machine which utilizes x-ray technology to separate the ore from the waste so the ore can be integrated back into the mill feed. The new machine, due to arrive on site in June, will initially be positioned near the growing reject piles until sorted, and then moved into the mill building where it will be assimilated into the mill circuit. Coeur has proposed to use the non-ore that is rejected from the separation sequence as aggregate used in underground support backfill, as it has good geotechnical properties.

Wasterock from the mine continues to be placed on the east side of the Mill Bench access road trending southward. The area was prepped to receive the wasterock in December, 2014 and seems well suited for its disposal. However, the toe of the wasterock pile is encroaching on the old and inoperable storm water runoff ponds (Figure 6). The approved Reclamation Plan requires the pond liners to be



Figure 6 Wasterock is beginning to cover up the liner in the old pond

¹ Residue is used for lack of a better term.

removed and folded prior to burial so the pond will no longer retain water after being covered with wasterock.

The newly built storm water runoff ponds are now in operation, and were full of water. Water from the Mill area is routed through a series of pipes and ditches to an outfall pipe located at the top pond. Storm water subsequently flows through the series of ponds which creates sufficient resident time for solids to settle out. A small preferential flow path has developed on the road leading to the ponds. Water flows along the Mill Bench access road, and then down the short pond access road where it pools near the head of the pond (Figure 7). The flow was low during our visit, but may be higher during heavy rain events. Grading should be performed to divert the water into the ponds.



Figure 7 Water pooling near the head on the upper pond

After breaking for lunch, the team moved to the Tailings Treatment Facility (TTF). Upon arriving, it was immediately noticed that the tailings discharge pipeline was discharging to the surface of the TTF (Figure 8). The pipe's outlet is typically submerged beneath the surface of the water as required by the Integrated Waste Management and Disposal Plan. Much of the surface of the TTF was covered by a thin sheet of ice, but open water was seen near the banks and surrounding the tailings placement barge and pipeline.



Figure 8 The tailings slurry was discharging to the surface of the TTF

3", the area looked much as it had during the last inspection the ADNR attended a few months prior, and no issues were noted.

The team moved south to the TTF Dam. At the crest of the dam, it was found that the preferential flow path that was noted during the previous inspection had been corrected. The rill leading to the dam's crest had been filled, and the erosion on the dam itself had been filled and compacted. Concrete blocks and an HDPE sheet had been placed to ensure the erosion would not return. The team moved to the downstream toe of the dam and milled about. By this time in the inspection, the sun had appeared, and the temperature climbed into the low 50's. Aside from the new sign identifying the foot bridge as "Bridge

The team then turned around and headed back to the north end of the TTF where the graphitic phyllite (GP) had accidentally been placed and the barrel tests are located. Due to the very mild and rainy winter, water samples were recovered every month, unlike the previous winter when the barrels overflowed with ice. The team walked to the area where the GP was placed and staining could still be seen at the base of the pile. Water flowing from the seeps continues to be collected and tested and Kevin mentioned that more of the black colored rock



Figure 9 Water collection sump

may be excavated during the upcoming summer (Figure 9). The water collected from the sump at the bottom of the pile is taken to the small WTP near the dam for treatment. The containment cell remains in the center of the gravel pad to hold the excavated material until loaded into a haul truck and driven underground for disposal. The access road to the area has not been realigned yet, and the water level may not rise enough to require its movement for some time due to the lack of snowmelt.

The team drove to the main TTF WTP and inspected the inside of the plant and surrounding area. At one container, the double redundant secondary containment liners were rendered ineffective

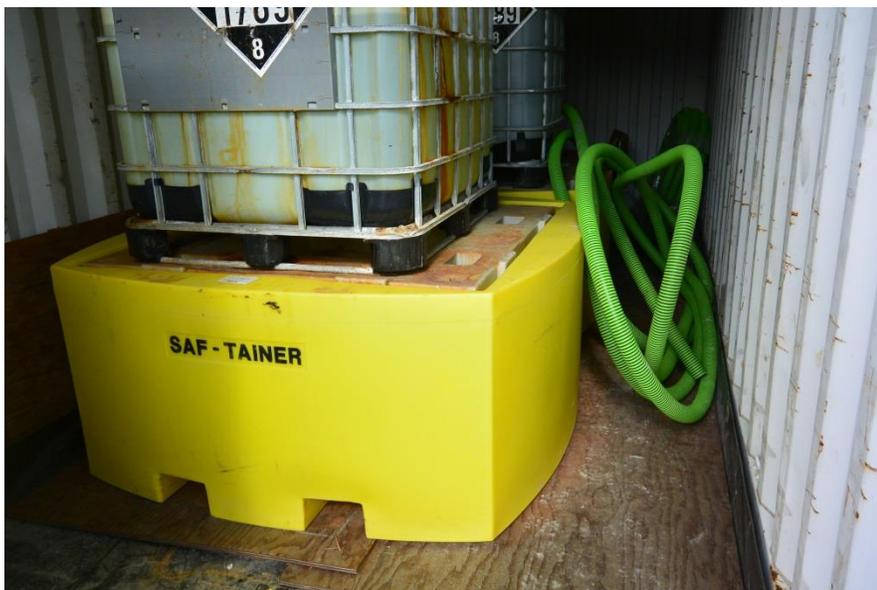


Figure 10 A tote on secondary containment

due to rain water filling them, but there were no chemicals inside the container. Coeur is using individual containment for the containers that have liquids inside (Figure 10). As for the secondary containment structures made from “heavy timbers” that were featured in a previous report... Machinery operators have once again defied the impossible, and destroyed the indestructible design.

The team had a few extra minutes and traveled to Pit 4. Pebble reject material is being

stored at the site, and the pile is growing large. No water was found in the bottom of the pit where the potentially acid generating material was excavated for use in the improvement of the mine access road. The visual inspections of the road continue, but show no signs of ARD. The

team loaded back into the pickup, and traveled back to the Marine Terminal for the short wait until the float plane returned.

The ADNR would like to thank Coeur Alaska for the safe and informative inspection and for supplying lunch, and the USFS for providing the floatplane transportation to and from the Kensington Gold Mine.