



July 23, 2015

Weather: Mostly Cloudy  
Light Wind  
Temp: Upper 50's  
No Precipitation

**Action Items:**

- **Remove the liner from the decommissioned storm water treatment pond<sup>1</sup>**
- **Clean up the spill of hydraulic oil in the warehouse at Comet Beach**
- **Repair the lid on the garbage disposal container near the incinerator**
- **Reinstate 9 feet of water cover above the exposed tailings.**
- **Ensure 9 feet of water cover remains above all tailings deposited in the TTF**

## **The June 17, 2015 Inspection of the Kensington Gold Mine**

This report covers the June 17, 2015 inspection of the Kensington Gold Mine. Travel to and from the mine was provided by a United States Forest Service (USFS) chartered, Cessna floatplane operated by Ward Air. The inspection team (team) consisted of David Wilfong from the Alaska Department of Natural Resources (ADNR) and Curtis Caton from the USFS. The team was accompanied by Kevin Eppers from Coeur Alaska (Coeur) for the entire duration of the inspection.

The team stopped by the camp area for short time before driving to the mill to gather the extra Personal Protective Equipment (PPE) needed to travel underground, and traveled through the mine to the Comet Wasterock Pile. The southern part of the wasterock pile is built in lifts from the bottom up, and piles (Figure 1) are pushed off the top to meet the lifts. Pipes, lumber, hoses and other mine infrastructure parts are stored on the pile for easy access. The road realignment mentioned



**Figure 1** The top of the Comet Wasterock Pile. The piles in the distance are waiting to be pushed off the end

<sup>1</sup> See the footnote on Page 6

in the last Inspection Report has been put on hold. It was expected that the realignment would gain more space for wasterock disposal, but the first design showed little promise for additional capacity.

The team moved on to the Comet Water Treatment Plant (WTP). The majority of the mine water was being deposited into Pond One, but a small amount of water was draining into Pond Two.



Figure 2 Pond 1 and Pond 2 as seen from the Comet Wasterock Pile. Note the difference in Color of the two ponds.

The quantity of water flowing from the mine was very low for this time of year. The low flow is likely due to the very low snowpack received during the winter of 2014-2015. A sediment dredge was floating in Pond One, but was not actively dredging at the time of the inspection. Kevin stated that dredging has historically occurred on an almost constant basis.

The new Triple Sumps in the mine retain the majority of the sediment, and dredging operations should be required on a less frequent basis. The water in Pond One was much less turbid than in previous years' inspections, likely due to the efficiency of the Triple Sumps. The water level in Pond Two was very low at the time of the inspection, but was higher than the inspection performed on April 1, 2015. The sediment in Pond Two was orange in color, and distinctly different than the gray-blue color of the sediment in Pond One (Figure 2). The orange color was likely due to high iron content in the sediment, possibly due to pyrite oxidation after being exposed to air. The water in both Ponds are treated to meet Alaska Water Quality Standards, and then discharged into Sherman Creek.

Unbeknownst to the team, we were being watched... While we were milling about and taking pictures, a curious porcupine set up camp in front of the pickup (Figure 3). The little critter watched us intently as we moved about. Even when we were within 10 feet of it, the porcupine showed no fear. Kensington has a strict policy about dealing with wildlife at the mine. Employees caught feeding the bears and other predators are terminated, and the workers are taught hazing techniques to keep them out of the camp. Bears in particular have been an issue at the mine, particularly around the camp area where the smell of food emanates around-the-clock. Revised policies



Figure 3 A curious Porcupine ensuring quality control

pertaining to the handling of garbage and food, along with employee training has dramatically reduced the occurrences of bears interacting with humans on the mine site. The presence of the porcupine is not a concern to the workers at the mine, but the slow moving creature may pose a hazard to itself due to porcupine – tire interactions.



Figure 4 White residue in Sherman Creek

The team traveled around the WTP and down the length of the wooden walkway leading to the treated water discharge point in Sherman Creek. The walkway felt firm underfoot, and appeared to be in good shape. Upon arriving at Sherman Creek, the white residue<sup>2</sup> that has been noted in previous inspections unmistakably persists in the creek bed (Figure 4). The residue has been vigorously tested in an attempt to identify what it is and what is causing it. The

water treatment plant can safely be identified as the source, due to the discoloration starting at the discharge point and continuing downstream, but the discharged water meets Alaska water quality standards. Coeur has contracted with the University of Montana to conduct deoxyribonucleic acid (DNA) tests to further classify the substance. However, there has been a significant delay in receiving the results of the DNA testing. Golder Associates, a consulting firm hired by Coeur Alaska, used a modeling program called PHREEQC and found that under a very narrow range of conditions, it would be possible to precipitate a substance similar to what has been found coating the rocks in Sherman Creek. It is apparent that the substance in Sherman Creek is not the same as the white gypsum precipitate that occurred in Slate Creek in 2014. Testing on the residue continues in an attempt to track down its cause.

After hiking back up the trail, the team walked back to the truck and found that the porcupine that had been supervising us had wandered off, and was not seen again. The team drove down the road to the Comet Beach area, and stopped in front of the warehouse. The large green building is used to store filter media for the water treatment plant. Various forms of garbage were strewn about; an empty 55 gallon



Figure 5 Refuse outside of the Comet Beach Warehouse

<sup>2</sup> "Residue" is used for lack of a better term.

barrel, various pieces of scrap steel, pallets, and a large flattened buoy were most notable (Figure 5). The building is rarely used due to weight restrictions imposed on some of the log stringer bridges leading from the warehouse up to the WTP. At this time, vehicles no larger than pickup trucks can drive across the bridges, and Coeur is working with Forest Service engineers to rebuild the bridges so that the road can be used again for the transfer of media and parts from the Comet Beach to the Comet WTP.



Figure 6 The Comet Beach Warehouse with the leaking pump in the background

Although the road cannot be used, several super sacks of Filter media for the WTP, and a large Schwing Bioset piston pump, for use in the paste plant, were stored inside the warehouse (Figure 6). In the past, media for the WTP was transferred via landing craft from the Marine terminal in Slate Creek Cove, around Point St. Mary, and northward up Lynn Canal to Comet Beach. The landing craft would beach itself, lower the front gate, and its cargo would be offloaded. Inside the warehouse, the piston pump

was found to be leaking hydraulic oil (Figure 7), and the oil was slowly spreading across the concrete floor. It appeared as though the slow leak had been occurring for some time, and there was no imminent release to the environment. Kevin spread some floor dry on the stained concrete floor in an attempt to soak up the oil. The team returned to the pickup, and drove back through the mine.

Upon emerging from the Kensington portal<sup>3</sup>, Kevin drove the team to a freshly poured concrete slab. The slab will be a foundation for the propane tank which currently fuels the Kensington portal heaters. The propane tank must be moved due to the construction of the Jualin portal. The blasting that



Figure 7 Piston pump leaking a small amount of hydraulic oil

<sup>3</sup> The old Jualin portal, that is. The current portal leading into the mine from the Jualin side is now called the Kensington portal (because it leads to the Kensington side of the mine). The new portal, slated to begin construction in July 2015 will be called the Jualin portal. The old Kensington Portal will now be called the Comet Portal... I think... It is thought that the name change will avoid confusion.



Figure 8 Garbage receptacle with a damaged lid that prevents closure

damaged, likely by a large piece of equipment. Some of the contents of the dumpster were protruding from the top, and hanging over the side of the repository (Figure 8). The dumpster should be repaired or replaced to prevent wildlife, especially bears, from accessing it and retrieving food.

The edge of the bench that the dumpster was located on was a good vantage point to observe the placement of wasterock. Some of the freshly placed piles had paint on them to identify the slope that the uneconomical rock originated from (Figure 9). The current wasterock disposal areas are approaching their capacity, and Coeur has been expanding the pile footprint where possible. The Jualin wasterock pile continues to be built south along the access road that connects the camp to the mine area. The pile began to



Figure 9 Wasterock with paint identifying the slope of origin

encroach upon the storm water treatment ponds, and in December 2014, the settling ponds and the drainage features were relocated further to the south. During the April 1, 2014 inspection conducted by the USFS and ADNR, it was found that a small preferential flow path had developed, and pooling water was infiltrating into the ground instead of draining into the new settling pool as intended. An Action Item was included in the resulting Inspection Report to improve the grade in the area of the pooling. No precipitation fell during this inspection and the ground was dry. As a consequence, it was not possible to ensure that the issue was corrected. However, it appeared that some grading had occurred in the area of the previous pooling, and the problem was likely solved.



Figure 10 Wasterock covering about half of the liner

As the team moved the short distance down to the mill building, the truck skirted around the ever-growing “pebble reject<sup>4</sup>” pile and pulled to a stop at the Mill Building. Walking across the mill bench access road gave the team a good vantage point to see the detailed placement of the wasterock as it is piled along the road. Looking over the edge, it was clear that additional wasterock had been placed in one of the previously used settling ponds (Figure 10) that had been noted during an earlier inspection. The high density polyethylene (HDPE)

sheet that lined the bottom of the pond was still in place. Page 32 of the approved Reclamation Plan states that the area of the ponds will be reclaimed as a wetland area, and also says “The pond liner system would be folded and buried during grading. The treatment pond will be regraded to remove the berm along the east side of the pond”. Filling the area with wasterock may prohibit the approved post-mining land use as a wetland area. If the pond is filled and covered with large amounts of wasterock without removing the liner, water could fill the pond beneath the pile. The increased water level may cause pore pressures to rise and could cause the slope to be unstable, possibly causing a failure. The unreclaimed liner was noticed during the April 1, 2015 inspection when the toe of the pile had just started encroaching on the pond’s liner. The liner was pointed out to Kevin during the 4/1/15 inspection, and he was informed that the liner must be removed to remain in compliance with the approved Plan of Operations and Reclamation Plan. That same information was included in the ensuing report for that inspection as an action item, as well as photo documentation, and as text in the body of the report stating that the liner must be removed. During the 6/17/15 inspection, the toe of the wasterock pile had moved to cover about half of the settling pond and liner. The liner must be immediately removed or follow-up action may be taken by the regulatory agencies<sup>5</sup>.



Figure 11 Geotechnical drill rig

<sup>4</sup> Pebble reject is ore slightly larger than pea gravel that is rejected from the ball mill. About 10% of the pebble reject has economic value, and is being stored in two main piles until it can be sorted and re-milled. One pile is on the Mill Bench, and the other is at Pit 4

<sup>5</sup> By the time this report was written, the liner had been removed and no follow-up action was required.

After breaking for a short lunch, the team traveled to the Tailings Treatment Facility (TTF). Golder Associates (Golder) has been contracted to design Stage III of the TTF dam, and the consultant had a geotechnical drill rig on site, but it was not working (Figure 11). The drill will be used to further delineate the type and strength of the bedrock in the area of the dam. Stage III will be the final design of the dam and much work is to be done before a design is chosen. The geotechnical drilling is mainly performed beneath the footprint of the future development of Stage III, but may also be used to investigate different options for the spillway. The design and placement of the spillway is important due to the potentially acid generating graphitic phyllite bedrock that underlies parts of the dam and both of its abutments.



Figure 11 Tailings daylighting from the water at the TTF

Near the upstream face of the dam, two piles of tailings were protruding above the water's surface (Figure 12), and more tailings were seen just below the surface (Figure 13). During operations, the approved Plan of Operations (POO) and Reclamation Plan require at least 9 feet of water cover over the tailings as an interim reclamation measure. During the October 1, 2014 inspection, the shallow water cover was noticed for the first time by the agencies. The resulting ADNR Inspection Report stated "it [was] estimated that a cover of 4-6 feet of water was atop the tailings at the time of [the] inspection". The water cover limits oxidation of the tailings, inhibits terrestrial animals from accessing the tailings, and prevents wind blown tailings from leaving the facility.



Figure 12 Exposed tailings with shallow cover over other piles. The crest of Stage I is visible under the water's surface

Coeur has been steadily drawing down the water level in the TTF after an unusually warm winter with very low snowpack. Due to the abnormally low snow accumulation during the winter of 2014-15, the typical high flow of water into the TTF during the spring breakup did not occur. The TTF Water Treatment Plant has

been treating and discharging more water than the TTF has been receiving, and the freeboard has been continually increasing (the TTF water level is decreasing). “Freeboard” as used in this report is the difference in elevation between the TTF’s water surface and the bottom of the emergency spillway, just below the crest of the dam. According to the 2014 Periodic Safety Inspection Report, the bottom of the spillway is located at about 709 feet, and the crest of the dam is at about 715 feet. Coeur must maintain enough freeboard to account for sudden rise in water due to a 200 year storm event. Therefore, the maximum safe operating water level during Stage II is 697.3 feet, and the maximum tailings level is 688.3 feet.

At the time this report was written, the peak elevation of the tailings was unknown. However, as seen in Figure 13, the tailings are piled higher than the crest of the Stage I dam (the crest of Stage I can be seen below the water’s surface running parallel to the crest of Stage II). The crest elevation of Stage I is about 690 feet. It is very important that the tailings remain underwater, and immediate measures must be taken to ensure that 9 feet of water cover is reestablished. Until the cover is restored, Coeur is out of compliance with the approved Reclamation Plan and Plan of Operations and further action may be taken by the Agencies.



Figure 13 Staining at the toe of the pile.

The team moved to the north end of the TTF and checked the area where the graphitic phyllite was mistakenly placed during the construction of the Stage II dam raise. Visible staining lingers at the base of the stockpile embankment (Figure 14), and water continues to be collected,



Figure 14 Barrels containing graphitic phyllite

pumped, and hauled to the treatment plant at the opposite end of the TTF where it is treated and discharged into an infiltration gallery. The Barrel Tests continue to run, and appeared to be in good condition (Figure 15). The second barrel from the left end, as seen in Figure 15, is leaning awkwardly, but does not appear to be in danger of tipping over. Samples were collected throughout the winter months because the mild temperatures did not freeze the water in the collection containers

as it had in past winters.

The team loaded back into the pickup, and traveled back to the Marine Facility for a short wait until the floatplane arrived. The inspectors then loaded onto the plane from the beach for the 30 minute return flight to Juneau International Airport.

The Alaska Department of Natural Resources – Mining Section would like to thank the United States Forest Service for arranging floatplane travel to and from the mine, Kevin Eppers for providing a safe and informative inspection, and Coeur Alaska for accommodating the team and catering lunch.