

STATE OF ALASKA

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISIONS OF WATER AND SOLID WASTE

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FIELD INSPECTION REPORT HECLA GREENS CREEK MINING COMPANY

Inspection Date: June 12, 2012, 8:30 AM - 3 PM

Report Date: June 27, 2012

Weather: Overcast, temperatures ~ 50F

HGCMC Personnel: Jennifer Saran, Environmental Affairs Manager (EM)

Agency Personnel: Kenwyn George, ADEC; Doug Buteyn, ADEC, Ed Emswiler, ADEC; Joe Manning, USFS

Purpose of visit: This was a routine inspection and an opportunity for Doug Buteyn, ADEC Northern and Southeast Solid Waste Program Coordinator to see the site for the first time. We were able to visit all of the permitted waste disposal sites as well as most of the inactive waste rock sites and quarries. Transportation to and from Greens Creek was provided by the USFS via chartered float plane. ADEC thanks the USFS for providing transportation. This was the first site visit for the season.

Concentrate storage area: Two new tanks have been installed to store excess storm water during high rainfall events when existing pumps would be unable to pump the storm water at peak flows to Pond 7. The tanks are located between the cannery and the concentrate building that enable storage of storm water from this area.



Stormwater Collection Tanks at Concentrate Building

Tailings Disposal Facility. The systems observed at the tailings disposal facility appeared to be in place and in good working order. The old “Pond 6”, where Wet Well A is located, has been filled with tailings. All tailings seepage water and ground water entering the under-drain system is pumped from Wet Well “A” to wastewater storage Pond 7. Tailings placement was actively taking place in the northwest Pit 5 expansion area. Tailings have not been placed in the East Ridge Expansion Area. A drain in the east expansion area that conducts contact water to Pond 9 was not operational. This will need to be repaired prior to placing tailings in this area.



Tailings placement in the distance on the Northwest Pit 5 expansion area (distance). Note, the inoperable drain in the East Ridge Expansion Area in the foreground where brownish/pinkish silt has settled out.



Northwest Pit 5 Area Looking Southeast. Note initial tailings placement lift and area on the right where the service layer is exposed.



Aerial View of the Tailings Disposal Facility Looking NE. Note eastern expansion area in distance and compliance monitoring drainage area in the foreground.

The EM reported there is approximately 3 years of remaining capacity at the existing facility without any additional expansion. Greens Creek awaits the outcome of an EIS process that will determine how much expansion will be possible at the existing tailings facility. Space conservation is practiced until then and co-disposal of waste rock from Site E and other places has been curtailed in favor of tailings from the mill.

We walked to the top of a pile of reclamation storage material at the southwestern end of the facility. This provided a good vantage point for viewing a potential expansion to the south of the existing tailings area into the Tributary Creek drainage. The vantage point was also a good place to view various other features and issues having to do with the existing tailings disposal facility. We discussed issues having to do with fugitive dust transmission and intrawell comparison and compliance monitoring of surface water.

The group went through the water treatment plant. The plant was sized appropriately to handle the volume of waste water from all of the various inputs to the system. Pond 7 was low at the time of this inspection. The EM reported they recirculate treated water back to Pond 7 during periods of low flow in order to keep a minimum flow through the water treatment plant and maintain a steady treatment process.

An area of the western portion of the landfill was armored and peat had been spread on the slopes. The EM reported this area will be hydroseeded in order to minimize fugitive dust from this area. Another area of the southern aspect of the landfill had a litter control fence in order to address fugitive dust as well.



Possible Southern Tailings Expansion Area (Tributary Creek drainage). Note wetlands and muskeg.

The Sulfate Reduction Monitoring Program (SRMP) was discussed at this inspection. The SRMP indicated the application of organic carbon (brewers grain) at a rate of 5% should support sulfate reduction over the long term. However various technical considerations should be addressed in order to proceed. A significant factor that must be addressed has to do with the application of organic carbon in such a way that does not create complications related to the solubility of arsenic and iron . According to a January 2012 Action Items Checklist HGCMC agreed to submit a letter by June 2012 as to their decision whether or not to proceed with carbon amendment to the tailings based upon previous reports and studies.

Site E: Approximately 365,000 cy of waste rock was disposed at this site of which about 200,000 cy was acid generating and metals leaching. This will eventually be moved to the tailings facility. Approximately 85,000 cy have been removed so far at around 40,000 cy a year. However, until there is an approval for the tailings expansion the amount of material removed from the site will be minimal in order to give preference to tailings from mill operations. We walked around to the north end of the site where a large sedimentation pond was constructed. The pond helped to catch storm water run-off and pipe it to the water line from the mill to Pond 7 and the water treatment plant at the tailings disposal facility. There were separate clean road and dirty road systems set up at Site E to cut down on contaminants being tracked off site. The contact water sump was nearly empty and appeared to be functional.



Site E Southern Aspect. Note clean road on left.



Site E surface drainage collection pond.

Site 23: All of the systems at the Site 23 Waste Rock Disposal Facility appeared to be in place and in good working order. Approximately 2,500 cubic yards of waste rock had been disposed during 2011. Projected remaining capacity is approximately 544,000 cubic yards according to the design. Waste had been placed according to approved plan.

The temporary storage area is presently full of ARD and metals leaching waste rock from Site 1350, awaiting disposal underground. Until underground disposal capacity for this waste can be found there will be no more excavation at Site 1350.



Site 1350 Waste Rock Stored At Contained Area of Site 23

Inclinometer IN-23-05-01 was installed at the end of 2005 to aid with stability monitoring at Site 23/D. The inclinometer, located at the center of the site, has been monitored since 2006. There is incremental displacement in this inclinometer at about 79.3 feet below ground level where the

waste intersects with colluvium. The incremental displacement view shows the amount of movement has been approximately 12.2 mm since 2006, with 2.0 mm movement from November 2010 to December 2011. The EM reported that several other inclinometers have been installed on and off the site and there is indication of movement of the entire colluvial surface. According to a January 2012 Action Items Checklist Greens Creek must conduct further geotechnical analysis of the pile (factor of safety and magnitude of failure during earthquake events) given this new information. ADEC understands that a full report of the analysis will be submitted to ADEC during the summer of 2012. ADEC believes this will be an on-going issue that will need to be studied and reported on in future annual reports.

We are tracking an issue related to Site 23 having to do with Site D that is adjacent to and below this site. Site D is projected to fail under a significant earthquake. According to geotechnical analysis Site D was found to be potentially liquifiable under a design basis earthquake. Liquefaction of this fill would impact the stability of Site D but would not reduce the stability of Site 23. Site D should be placed on a higher priority for waste re-location when additional disposal capacity is permitted at the tailings disposal site and after Site E waste rock has been taken to tailings.

HGCMC has requested and DEC would like to see a new monitoring station downstream of Site 54 below the confluence of Gallagher Creek. The station should be carefully selected and approved by ADEC in order to ensure that it is effective in catching seepage from both Sites D and 23. Beginning in the summer of 2011 Greens Creek started a 3-part survey the purpose of which is to find a suitable location for this new FWMP and compliance monitoring station. The surveys will sample the water in the area of Site 23/D in Greens Creek along a 1.25 mile reach of the river with stations about 300-500 feet apart. The water will be sampled for pH, conductivity, and temperature. The final survey will take place in the spring of 2012. The results of this study are due July 31, 2012. The selection of the water monitoring station will be around that time.

Pond C: HGCMC relies heavily on the pumping system to control water from leaving this site since the berm that holds back water is permeable. This pumpback system has been improved with a new sump with a higher capacity pump above the Pond C sump. Water was drawn down quite well at the Pond C sump and the pumping system appears effective. It would be good to see this during a time of high flow.

Mill – 920 area: In the materials storage area to the east of the mill there is a temporary storage area for unloaded supplies; there were six containers with solutions such as naphthalene sulfonate (Daracem 19), a concrete superplasticiser. In this area a container had previously been punctured by a forklift truck. This area should have a secondary containment structure in case of leakage or spills. Beyond the building structure there were drums of oil in a steel shipping container without secondary containment. There was also an unmarked blue drum and a number of High Performance Backing Material drums, for which the MSDS says “Avoid runoff into storm water and ditches that lead to natural waterways” on a superstructure in the storage area. This area, or the containers, should also have secondary containment.



Oil drums in container



Blue drum and Backing Material drums

A new unit was in the process of being installed that will enable the removal of large material from grit chambers and ditches for re-use, with the remaining fine material going to the mill. The unit is on a concrete pad adjacent to the road from the mill to the mine portal and is immediately above Pond A. (At the right side of the photograph below).



Concrete Pad Above Pond A

On a July 22, 2011 ADNR/ADF&G inspected the Pond A area and noted a pool of discolored water that appeared to be leaching in the area downstream of the removed Pond B in the 920 mill/concentrator area. Greens Creek has sampled this and we are awaiting the sample results.

Site 1350: No excavation in this area has taken place this season due to the lack of disposal space underground. There is still about 10-15,000 cy of acid generating material to be removed, possibly this year, depending on stope space underground. We are aware of two exceedances of sulfate at Site 13 that are slightly above AWQS at Site 13 (below the East Lobe of Site 1350). Operational techniques and Best Management Practices (BMP's) should be carefully employed to ensure releases do not cause water quality exceedances during the time waste rock is removed in the Site 13 drainage. This should be observed during site inspections.



East Lobe of Site 1350 Awaiting Excavation and Placement Underground

Site 960. We stopped briefly at Site 960. The waste rock from Site 960 had been excavated and placed underground approximately 2 years ago. The site appeared to be revegetating quickly. There was no obvious indication of ARD or contaminant loading from this area.

Action items:

1. A drain in the east ridge tailings expansion area that conducts contact water to Pond 9 was not operational. This will need to be repaired prior to placing tailings in this area.
2. According to a January 2012 Action Items Checklist HGCMC agreed to submit a letter by June 2012 as to their decision whether or not to proceed with carbon amendment to the tailings based upon previous SRMP reports and studies.
3. According to a January 2012 Action Items Checklist Greens Creek is to conduct further geotechnical analysis of Site 23 (factor of safety and magnitude of failure during earthquake events). ADEC understands that a full report of the analysis will be submitted to ADEC during the summer of 2012.
4. A plan is required for the removal of Site D material for either before or after the termination of mining. Site D should be placed on a higher priority for materials re-location when additional disposal capacity is permitted at the tailings disposal site and after Site E material has been taken to tailings.
5. HGCMC has requested, and DEC would like to see a new monitoring station downstream of Site 54 below the confluence of Gallagher Creek. The station should be carefully selected and approved by ADEC in order to ensure that it is effective in catching a release from Site 23/D. Beginning in the summer of 2011 Greens Creek started a 3-part survey,

the purpose of which is to find a suitable location for this new FWMP and compliance monitoring station. The surveys will sample the water in the area of Site 23/D in Greens Creek along a 1.25 mile reach of the river with stations about 300-500 feet apart. The water will be sampled for pH, conductivity, and temperature. The final survey will take place in the spring of 2012. The results of this study are due July 31, 2012. The selection of the water monitoring station will be around that time.

6. Operational techniques and Best Management Practices (BMP's) should be carefully employed to ensure releases do not cause water quality exceedances during the time waste rock is removed from the East Lobe of Site 1350 in the Site 13 drainage. This should be observed during site inspections.
7. On July 22, 2011 ADNR/ADF&G inspected the Pond A area and noted a pool of discolored water that appeared to be leaching in the area downstream of the removed Pond B in the 920 mill/concentrator area. Greens Creek has sampled this and we are awaiting the sample results. Please submit the results along with your thoughts on the reason for the discoloration as soon as they are available.
8. The Site C pump-back system has been improved with a new sump with a higher capacity pump above the Pond C sump. DEC would like HGCMC to report whether there is water ponding in Pond C at high flows or seeps observed below the berm.
9. Provide secondary containment or move liquids to secondary containment as previously described in this report.

Additional Comment:

The Alaska Department of Environmental Conservation appreciates the continuing cooperation of the Hecla Greens Creek Mining Company with the ADEC Solid Waste and Water Programs.

* * * *End of Report* * * *