



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

April 10, 2015

Mr. Mark Ioli
Vice President and General Manager
Kinross Gold Corporation
363 Fish Hatchery Road
Republic, WA 99166

RE: Echo Bay Minerals Company - State Waste Discharge Permit No. ST0008033
March 30, 2015 Site Inspection

Dear Mr. Ioli:

I have enclosed the inspection report from my site visit on March 30, 2015. This inspection fulfilled a quarterly inspection requirement of the Metals, Mining, and Milling Operations Act (Chapter 78.56 RCW).

During the visit, I recommended a means of verifying the absence or presence of flowing water from the 'new' underdrain collection system at the tailings impoundment. I understand your staff has already undertaken plans to address this issue.

I wish to thank your staff for their assistance during the inspection. Please review the inspection report, and contact me at (509) 329-3500 or phal461@ecy.wa.gov if you have any questions.

Sincerely,

Pat Hallinan
Water Quality Section

PH:jab

cc: Gina Myers, Kinross Gold Corporation
Shannon Daugherty, Kinross Gold Corporation
Kyle Hawkins, Kinross Gold Corporation



WASHINGTON STATE DEPARTMENT OF ECOLOGY WASTEWATER TREATMENT FACILITY SITE VISIT REPORT



Name of Entity	Echo Bay Minerals Company		
Permit No.:	ST0008033	Date of Visit:	3/30/2015
		Entry Time:	~10:20 am Exit Time: ~2:00 pm
City:	Republic	DOE Rep. #1:	Hallinan
County:	Ferry	DOE Rep. #2:	
Person Contacted:	Kyle Hawkins/Shannon Daugherty	Phone No.:	(509) 775-3157
Title:	Environmental Engineer		
Responsible Official:	Gina Myer	Phone No.:	(509) 775-3157
Title:	Environmental Manager		
Facility Type:	State To Ground	Discharges To:	Tailings Impoundment
Type of Visit:	Compliance Inspections-Without Sampling		

Operation Status	S = Satisfactory	U = Unsatisfactory	M = Marginal	NA = Non Applicable	N = Not Evaluated
Permit on Site:	N	Laboratory:	N	Self Monitoring Schedule:	S
Records/Reports:	N	Effluent/Receiving Water:	S	Operations & Maintenance:	S
Facility Site Review:	S	Pretreatment	NA	Sludge Disposal:	NA
Flow Measurement:	S	Compliance Schedule:	NA	Other:	

Announced ? Yes X No ☐ On ERO Inspection schedule ? Yes X No ☐

Inspectors Comments:

Permit: Ecology has reissued the State Waste Discharge Permit (ST0008033) to Echo Bay Minerals Company (Echo Bay) in late March/early April 2015 with an issuance date of March 31, 2015 and an effective date of May 1, 2015. This permit will cover discharges occurring at the presently active Key Mill site. Ecology plans to cover pollutants discharges at the inactive Key, K2, and Lamefoot mine sites under a separate permit(s). Echo Bay has submitted a State Waste Discharge Permit application (ST0501292) for the K2 and Lamefoot sites, and a National Pollutant Discharge Elimination System (NPDES) permit application (WA0991005) for the Key mine site.

Facility Site Review: Echo Bay operates gold and silver mining and milling operations, known as the Kettle River Operations, in northeast Washington. Currently, the facility obtains most all ore from their Buckhorn Mine, located 3.5 miles east of the community of Chesaw. Echo Bay may also receive custom ore batches from the United States and Canada. Echo Bay expects mining to end at the Buckhorn mine in the first quarter of 2016.

At the Key Mill site, Echo Bay receives and mills the mined ore. The milling process includes crushing, grinding, flotation, cyanide vat leaching and carbon absorption, followed by gold and silver recovery. The facility discharges mill tailings to a lined tailings impoundment which includes an ancillary double lined reclaim water pond. The site also includes administration offices, an equipment maintenance shop, and a fueling station.

During the inspection, I toured the underdrain water treatment system at the tailings disposal facility, the reclaim pond, and tailings disposal facility. At the tailings impoundment, two separate underdrain systems intercept any groundwater flows beneath the liner system. These are located beneath the east ('old') and west ('new') portions of the impoundment. Any collected groundwater flows to an underground tank, and then to an above ground biotreatment system.

Echo Bay had recently installed a continuous pH monitoring system at the underdrain water collection tank (the recently issued permit requires continuous conductivity monitoring at this location). The monitoring results are transmitted to the millsite via telemetry. An increase in the conductivity of the collected groundwater may indicate a possible leak in the liner system. In this case, Echo Bay returns the underdrain water into the tailings impoundment.

Continued next page

Inspectors Signature: _____

4/10/2015

The 'old' collection system flows year round while the 'new' system historically does not flow at all. At the collection tank, mill personnel can visually confirm flowing water from the outlet of 'old' system collection pipe, but not the 'new' one. Echo Bay plans to modify the piping so they can confirm the absence/presence of flowing water from the 'new' system.

The tailings impoundment underdrain water is treated through an above ground biotreatment system (biological reduction of nitrate). Treated water flows to two infiltration areas, located upgradient of monitoring wells TP-2A and TP-2, and upgradient of monitoring well TP-3. Echo Bay recently replaced a leaky inlet valve to the treatment system which required the draining of the first biotreatment tank.

At the inactive Key mine site, (see attached photolog) the southwest portion includes a reclaimed waste rock disposal area and a groundwater collection, treatment and disposal system. This area drains to an unnamed tributary to the North Fork of the Sanpoil River. The northwest portion of the site includes a mined open pit (Key West pit). The water level in the Key West pit varies from year to year, but not reached a level where overflows occur. This area drains to an unnamed tributary to Lambert Creek.

The Key mine site's treatment system consists of collection sump, propane generators, pumps, nutrient and carbon addition, three above ground concrete biotreatment tanks (biological reduction of nitrate and sulfate), and an infiltration gallery disposal system.

This year, Echo Bay placed a new infiltration gallery in service. The original infiltration system included three separate galleries where treated water flowed from gallery to gallery. The new system consists of a single infiltration area. During the inspection, Echo Bay was diverting all flow to the new infiltration area, and letting the old system rest. Echo Bay personnel have inspected the area downgradient of the new infiltration area and have not observed any seepage (indicating possible surfacing of the discharged water).



Echo Bay plans to install a new distribution box on the inlet to the new infiltration area. The new box includes a v-notch weir for flow measurement.

Water Quality Photolog

Facility: Echo Bay Minerals Company

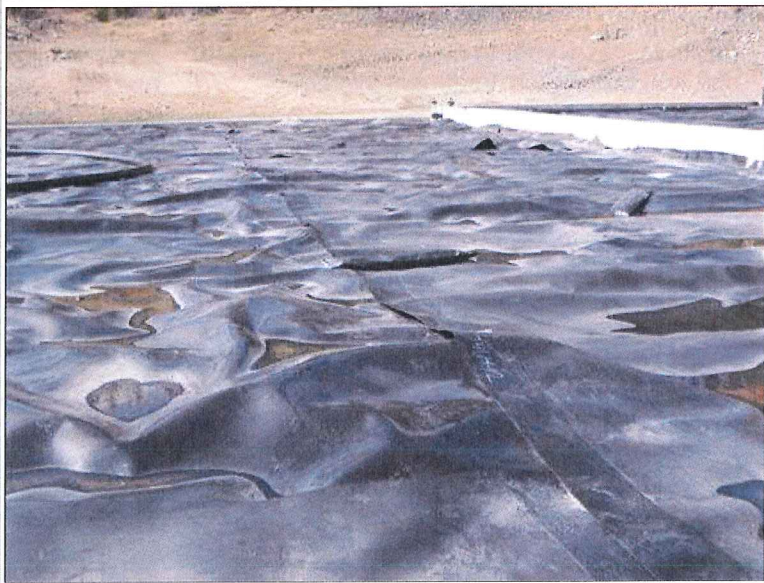
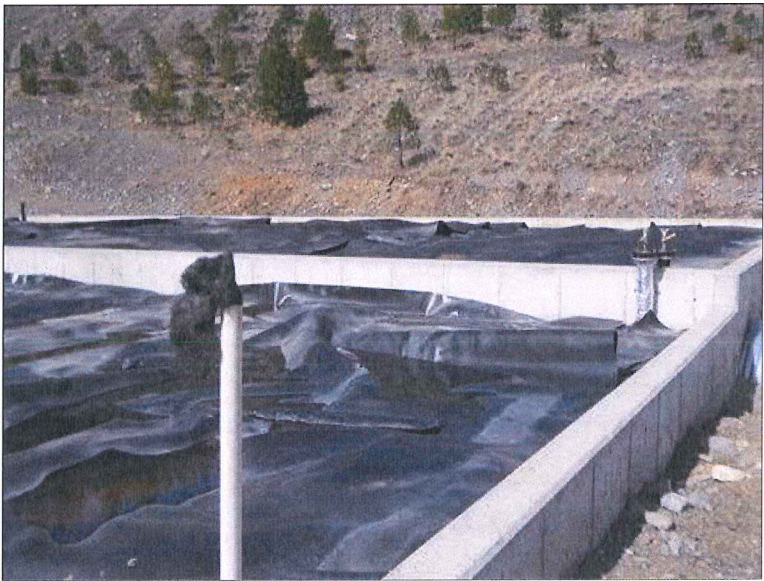
Location: Republic
Date Photos Taken: March 30, 2015

Permit No.: ST0008033
Photographer: Pat Hallinan

#	Description	Photographs
1	Distribution box with v-notch weir that Kinross plans to install prior to new infiltration galley at the Key Mine water treatment system.	
2	Groundwater collection trench along base of waste rock dump at Key Mine site.	

Location: Republic
Date Photos Taken: March 30, 2015



Permit No.: ST0008033
Photographer: Pat Hallinan

#	Description	Photographs
3	Top of concrete biotreatment basins at the Key Mine water treatment system. The Permittee had used HDPE liner to cover the insulation material that lie on the water surface of the basins.	
4	Concrete biotreatment basins at the Key Mine water treatment system.	

Water Quality Photolog**Facility: Echo Bay Minerals Company**



Location: Republic
Date Photos Taken: March 30, 2015

Permit No.: ST0008033
Photographer: Pat Hallinan

#	Description	Photographs
5	Plastic media in the first biotreatment tank at the Key Mine water treatment system.	 A close-up photograph showing white, cylindrical plastic media with a grid-like pattern, partially submerged in water within a concrete-lined tank. The media is clustered together, and the water surface is visible on the right side of the frame.
6	Monitoring well KW1-A (yellow casing) downgradient of the waste rock dump at the Key Mine site.	 A photograph of a monitoring well KW1-A at the Key Mine site. The well is a black metal pipe with a yellow casing, standing in a dry, rocky, and sparsely vegetated area. In the background, a large, light-colored waste rock dump is visible on a hillside.

Location: Republic
Date Photos Taken: March 30, 2015



Permit No.: ST0008033
Photographer: Pat Hallinan

#	Description	Photographs
7	Headwaters of unnamed tributary to the North Fork of the Sanpoil River at the Key Mine site.	
8	Area to the south of the biotreatment basins. An erosion area due to a natural drainage can be seen in the hillside.	

Water Quality Photolog**Facility: Echo Bay Minerals Company**



Location: Republic
Date Photos Taken: March 30, 2015

Permit No.: ST0008033
Photographer: Pat Hallinan

#	Description	Photographs
9	Monitoring location SW-16 on the unnamed tributary to the North Fork of the Sanpoil River, downgradient of the wasterock dump and water treatment system at the Key Mine site.	
10	The unnamed creek below the Key Mine site disappears beneath the ground before resurfacing further downstream.	



Location: Republic
Date Photos Taken: March 30, 2015

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Photographer: Pat Hallinan

#	Description	Photographs
11	From the stream channel, looking toward the area of the older, last infiltration gallery for the Key Mine water treatment system.	
12	Approximate area where unnamed creek resurfaces below Key Mine site.	



Location: Republic
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#	Description	Photographs
13	Looking down the stream channel for the unnamed tributary to the North Fork of the Sanpoil River. The property boundary (USFS land) runs left to right in the background.	
14	From the stream channel, looking up toward location of new infiltration galley for the Key Mine water treatment system.	

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#	Description	Photographs
15	Risers (cleanout and observation port) donating the area of the new infiltraiton gallery for the Key Mine water treatment system. A settlement stake lies in the foreground.	
16	Piezometer KPI-03 at the new infiltration gallery for the Key Mine water treatment system.	

Water Quality Photolog

Facility: Echo Bay Minerals Company


Location: Republic
Date Photos Taken: March 30, 2015

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#	Description	Photographs
17	Piezometer KPI-04 at the new infiltration gallery for the Key Mine water treatment system.	 A photograph showing a forest floor with several yellow survey stakes driven into the ground. The stakes are arranged in a line, marking the location of piezometer KPI-04. The ground is covered with dry leaves, twigs, and some rocks. Trees are visible in the background.
18	Above ground HDPE pipeline for the new infiltration gallery at the Key Mine water treatment system.	 A photograph of a large, black, flexible HDPE pipeline running along the ground. The pipe is surrounded by dry grass, twigs, and some small shrubs. The ground appears to be a mix of dirt and organic matter.

Location: Republic
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#	Description	Photographs
19	Observation ports and settlement stakes at the new infiltration gallery for the Key Mine water treatment system.	
20	Looking toward unnamed creek below the new infiltration gallery at the Key Mine water treatment system.	