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GOVERNOR BILL WALKER

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# Field Monitoring Report
# APMA A20146118 Pebble Limited Partnership

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| **Inspection Date:** | July 22, 2015 |
| **Weather:** | Overcast, scattered showers, windy, sporadic fog |
| **Time of Inspection:** | Onsite 9:00 am to 3:30 pm |
| **Operator Contact:** | Tim Havey, Mike Heatwole |
| **Agency Personnel:** | ADNR – Ed Fogels, Kyle Moselle, Hollie Chalup, Carolyn Curley<br>ADEC – Elaine Busse Floyd, Robert Blankenburg, Kara Kusche<br>ADF&G – Sam Cotten |
| **Inspection Objectives:** | General Inspection of existing site conditions and remediation of hardrock exploration activities. |

Agency personnel traveled to Pebble Limited Partnership (PLP) headquarters at the Iliamna Airport. On site, PLP personnel presented a short safety briefing, a project update, and provided appropriate personnel protective equipment. The group was divided in two with group one composed of the agency managers (Ed Fogels, Elaine Busse-Floyd, Bob Blankenburg, and Sam Cotten) along with PLP's representative, Mike Heatwole and group two composed of inspection staff (Hollie Chalup and Carolyn Curley from ADNR - Mining, ADEC Compliance Inspector, Kara Kusche, and OPMP project coordinator, Kyle Moselle) with PLP representative Tim Havey.

While group one was in the field, group two discussed the inspection plan and areas of concern. As per Multi-Year 2014-2016 Miscellaneous Land Use Permit for Hardrock Exploration and Reclamation, Terms of Permit, Section 1.i, PLP notified the Department of Environmental Conservation regarding artesian conditions that were discussed during this site inspection. Additionally, the inspection would review the locations of surface structures, equipment, and drill sites, noting their existing condition. Drill holes (DH), geotechnical drill holes (GH), and diamond drill holes (DDH) were selected based upon current conditions noted by PLP that required consultation with agency personnel and sites of previous activity to document the effect of remediation and revegetation for general knowledge of site disturbance rehabilitation.

The attached photos, descriptors and narrative were gathered during the course of the inspection by group two. The sections for the inspection conclusion and the action items noted from this inspection follow the inspection narrative.

**Area Overview:** (12:15pm – 12:32pm). Photo 1 describes the topography and regional features of the East deposit. Photo 2 describes the topography and regional features of the West deposit. The Main Supply Depot can be seen in Photo 2.

Photo 1: East deposit boundary.

Photo 2: View west to deposit and main supply depot.

**Main Supply Depot:** (12:32pm – 1:04pm). The facility structures have been placed on tundra pads or elevated above the tundra. Photos following show the variety of items at this site. Drill hole GH12-320S located at the supply depot was inspected and found to be in acceptable condition. Photos 23 and 24 show that this hole is marked with painted yellow casing and a tall pole, indicative of the expected appearance of drill holes with casing extending above the ground. The PVC inner pipe is on a list to be cut down and recovered. Frost-jacking is an expected occurrence and requires visual inspection and maintenance of the holes that contain casing. Photos 25 and 26 note the location for DDH11-531 within the boundary of the Main Supply Depot.

Photo 3: Boxes for line heaters.

Photo 4: Spill response kits.

Photo 5: Wooden fly boxes.

Photo 6: Materials stored for future use with a view to the east.

Photo 7: Material is stored in this view to the southeast.

Photo 8: Drill platform stored on elevated pad.

Photo 9: Drill rods and casing stored in a rack.

Photo 10: Dunnage material for cribbing.

Photo 11: View of deposit outcrop from the Main Supply Depot.

Photo 12: Facility marker.

Photo 13: Aluminum fly boxes stored for future use.

Photo 14: Aluminum water boxes and materials stacked for future use.

Photo 15: Empty fuel tank.

Photo 16: Med ports and drill casings.

Photo 17: Elevated pathways on tundra.

Photo 18: Pathway between sheds.

Photo 19: Interior of Main Supply storage tent.

Photo 20: Signage on Main Supply Storage building.

Photo 21: Interior of Main Supply Storage building.

Photo 22: Wooden tundra pads and aluminum containment.

Photo 19-21. Lubricants are secured within enclosed structures. No spills or evidence of leaks were found.

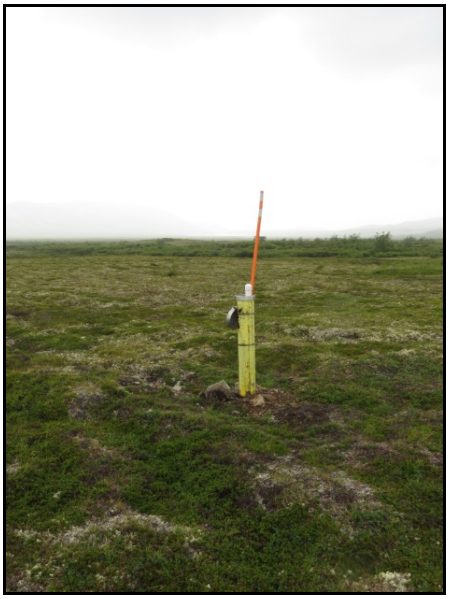

Photo 23: GH12-320S is painted and flagged.

Photo 24: GH12-320S showing frost-jacking of PVC inner pipe.

**DDH11-531:** The marker for DDH11-531 will need to be erected if the shed is removed or relocated.

Photo 25: Post marker for DDH11-531.

Photo 26: DDH11-531 located within Westbay 4.

**DDH-3101:** (1:17pm). The drill hole marker will require action to increase visibility and ensure casing is properly plugged.

Photo 27: Marker post for DDH-3101.

Photo 28: DDH-3101 casing and post.

**DH12-555:** (1:19pm). DH12-555 was reclaimed in 2013. The area appears stable with the native vegetation re-establishing itself on the site.

Photo 29: DH12-555 as seen in 2013.

Photo 30: DH12-555 as seen in 2015.

Photo 31: Vegetative mat replaced on disturbed soil.

Photo 32: View of reclamation efforts.

Photo 33: View of drill pad reclamation.

Photo 34: Vegetative mat replaced.

**DH 4223:** (1:29pm – 1:34pm). DH 4223 is located on a hillside with dense underbrush near a perennial stream. This hole was drilled by Northern Dynasty in 2004. The hole was drilled at a 30° S-SW angle for an approximate depth of 1300 to 1500 feet. Downstream from DH 4223, water flows through moss and over rocks before it enters the stream. The direct source has not been determined although the water is upwelling near the location of a surveyed drill hole. The area around the drill hole location is extremely wet and spongy. Lab tests conducted by PLP indicate that the chemical composition is similar to other nearby seeps in the surrounding area. The area appears stable and vegetation is flourishing.

**Update** from DEC on 9/25/2015. A third-party hydrologist conducted a hydrogeological regime study of the immediate and surrounding basin and ruled that the area is a natural seep and DH 4223 is not producing artesian flow. DEC ruled that no further action is warranted for this site.

Photo 35: Site surrounding DH 4223.

Photo 36: Post for DH 4223 on the ground.

Photo 37: Water upwelling at DH 4223.

Photo 38: Looking downstream from DH 4223.

Photo 39: Site surrounding DH 4223.

Photo 40: Moss growing on the rocks near DH 4223.

Photo 41: Close-up photo of water surfacing near the anticipated DH location

Photo 42: Discharge entering the stream.

**DDH 40:** (1:55pm). Water from DDH 40 created the surface staining with iron algae in a channel approximately 120 feet long.

Photo 43: DDH 40 channel with algae present.

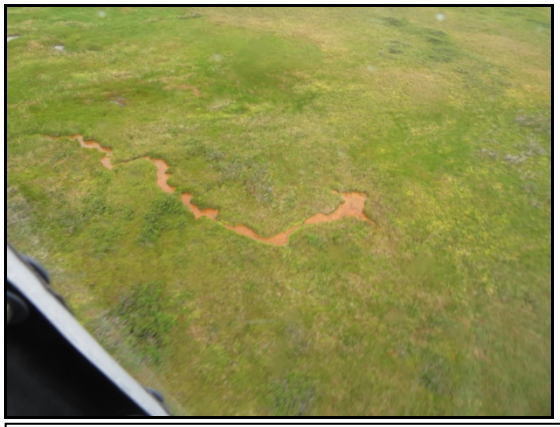

Photo 44: Approximately 120' channel flowing from DDH 40.

**DH 9:** (1:57pm). DH 9 was drilled by Cominco in 1988. This site had been inspected in 2013. Due to wildlife in the area, it was not advised to land. Surface staining and impact on vegetation are evident from the aerial view.

Photo 45: Caribou on site.

Photo 46: Discharge from DH 9.

Photo 47: Aerial view of DH 9.

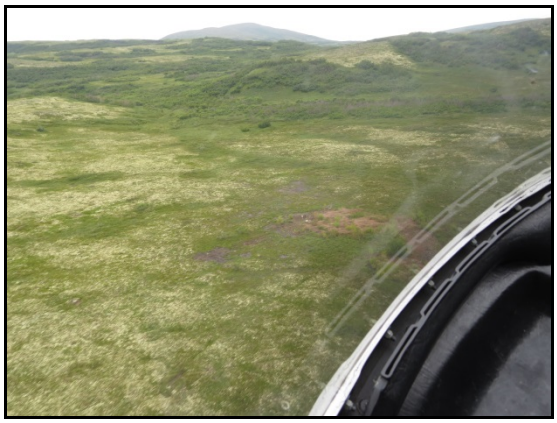

Photo 48: Aerial view of site surrounding DH 9462.

**DH 9462:** (2:00pm). Artesian flow was first noted in 2009. In 2013, the flow had ceased, although vegetation was impacted. On this inspection, vegetation was seen to be re-establishing itself in the previously impacted area.

Photo 49: DH 9462 viewed from the air.

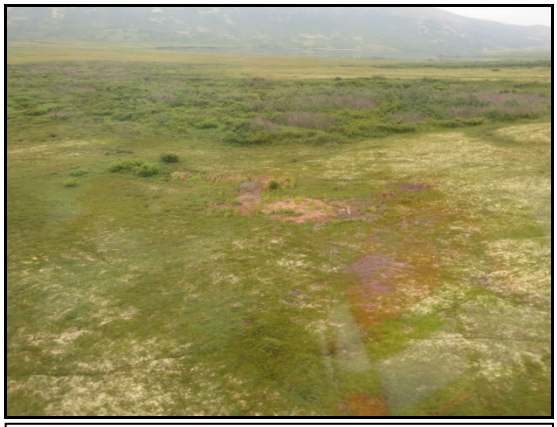

Photo 50: Area around DH 9462.

Photo 51: Vegetation re-establishing at DH 9462.

Photo 52: View of DH 9462 in 2013.

**Watershed:** (2:04pm). The buildings at the Watershed supply area are closed and secured. The facility structures are placed upon tundra pads to minimize disturbance of vegetation. No fuel is stored on site although the secondary containment and spill response kit remain accessible.

Photo 53: Watershed supply area.

Photo 54: Buildings at Watershed supply area on tundra pads.

Photo 55: Secondary containment and spill response kit.

Photo 56: Watershed supply area.

Photo 56: DH 5326 near Watershed building.

Photo 57: Barrel test in progress.

**Westbay 1 and Barrel Test Site:** (2:08pm). The barrel test is still in progress. A small storage shed on tundra pad remains at Westbay 1.

Photo 58: Support structures remaining in the field on tundra pads.

Photo 59: Barrel test structure remains in the field.

**DH 5330:** (2:14pm). The hole in the casing of DH 5330 was repaired this year after high pressure artesian flow was noted.

Photo 60: GH11-272S

Photo 61: DH 5330 experienced high pressure artisanal flow.

**DH 8423:** (2:15pm). The cap for DH 8423 was replaced.

Photo 62: DH 8432 after the cap was replaced.

Photo 63: DH 8432 and DH 6343 to the lower right.

Photo 64: DH 8432

Photo 65: Reclaimed fuel depot location on Wiggly Lake.

**Wiggly Lakes Heliport Site:** (2:21pm). The structures and infrastructure for the heliport site and fuel supply depot at Wiggly Lake have been removed. The removal of the tundra pads will allow vegetation to reestablish naturally.

Photo 66: Reclaimed heliport site (2015).

Photo 67: View of facility infrastructure in 2013.

**Geotechnical holes:** (2:24pm – 2:32pm). The majority of these geotechnical holes were drilled in 2013.

Photo 68: GH13-373

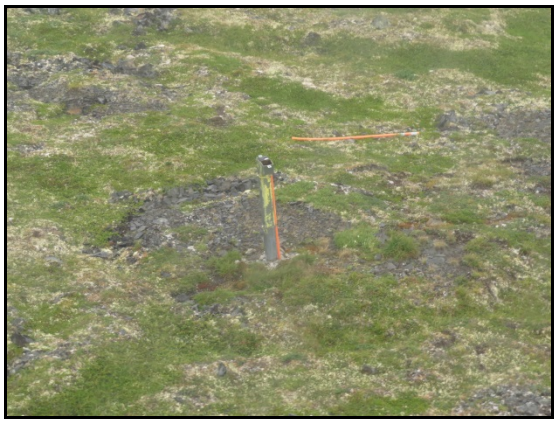

Photo 69: GH08-188

Photo 70: GH13-374

Photo 71: GH13-375

Photo 72: GH13-372

Photo 73: GH13-371

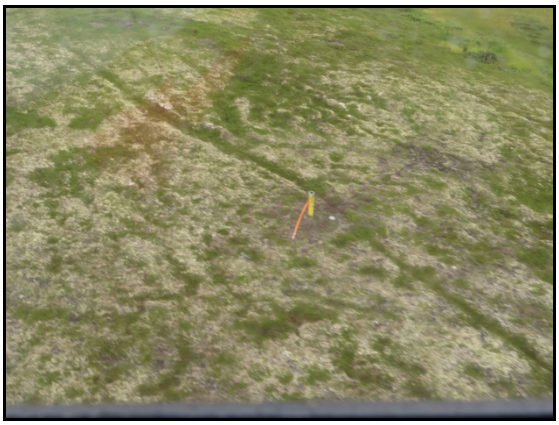

Photo 74: GH13-370

Photo 75: GH13-369

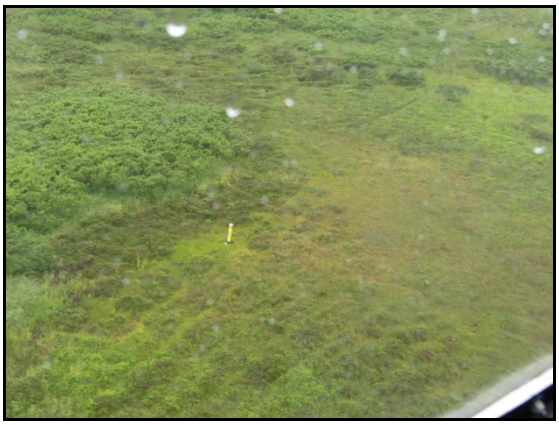

Photo 76: GH13-358

Photo 77: GH13-359

**Westbay 3:** (2:32pm). Westbay 3 is a small facility, secured and tied down, at the western extent of PLP operations. No fuel is stored there although secondary containment and a spill response kit were visible. Water will need to be pumped from the secondary containment.

Photo 78: Westbay 3.

Photo 79: Westbay 3

Agency personnel returned to at Iliamna airport, concluding the aerial inspection at 2:50pm.

**Conclusion:** The agency inspection covered the Main Supply Depot along with 3 other ancillary sites and the remediated Wiggly Lakes heliport. In addition, the agency personnel viewed conditions of 24 drill holes; a combination of geotechnical holes, drill holes, and diamond drill holes. As per Multi-Year 2014-2016 Miscellaneous Land Use Permit for Hardrock Exploration and Reclamation, PLP is working to remain operating in compliance with permit conditions.

**Action Items:**

- Field maintenance activities to eliminate surface water seepage and minor surface repairs to existing valves, caps or plugs at DH9, DH40, DH4224, DH5330, DH7382, DH8413, DH8423, and DH9475.
- Conduct additional field inspection for DH 4239 as per PLP Maintenance Fall 15 plan and provide follow up information to agency contacts.
- Complete catalog of drill holes and current site conditions for scheduling planned maintenance. Ensure drill holes do not pose a hazard to local land users by flagging or removing infrastructure.
- Encourage establishment of community outreach program and communication methods with PLP company employees for local community members.

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