

Appendix G: Photo Record



Approximate south view of the North Dam footprint before the start of construction, January 20, 2011



South-southeast view of the downstream slope of the North Dam nearing completion, April 27, 2012



Southwest-west view down the North Dam centerline, dam near completion, May 6, 2012



Approximate southwest view of the North Dam, after completion, May 6, 2012





Key Trench backfilled & shell developing, southwest-west view down centerline, January 25, 2012



Core nearly completed, ROQ placement continuing southwest view down centerline, March 14, 2012



Transition and ROQ material placement progressing over core, March 25, 2012

		North Dam As-Built Report		
		Overview of Dam Construction Activities		
Job No: 1CH008.058.430 Filename: Figure 1_Overview_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: JBK	Figure: 1



Daily Upstream Photo: Key Trench drilling and blasting, February 22, 2011



Daily Upstream Photo: ROQ placement and levelling course placement, April 20, 2011





Daily Upstream Photo: Seasonal suspension, thermal cover being placed, May 15, 2011

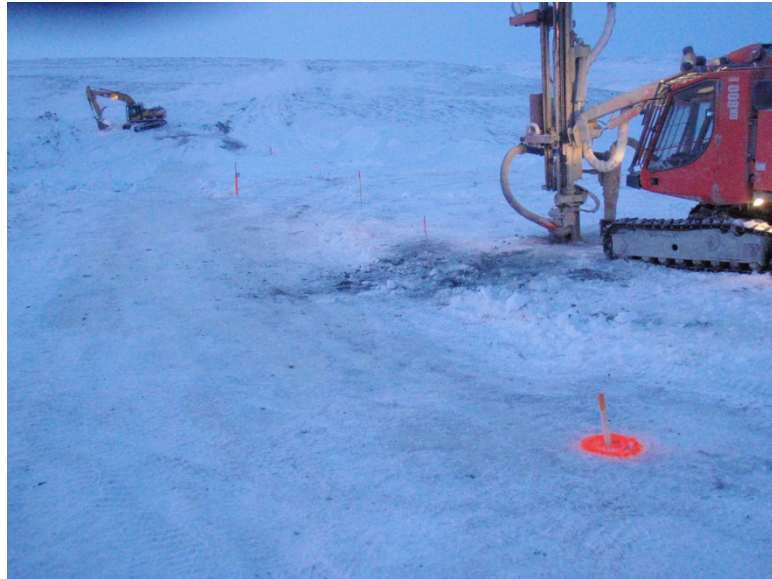


Daily Upstream Photo: Thermal cover removed, core construction, and ROQ placement, February 9, 2012



Daily Upstream Photo: North Dam nearing final stages, March 4, 2012

		North Dam As-Built Report		
		Overview of Dam Construction Activities		
Job No: 1CH008.058.430 Filename: Figure 2_Overview_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: JBK	Figure: 2



Sandvik DX-800 drill starting new percolation hole, January 23, 2011



Example of organic rich soil (peat) encountered at ~1.5 m depth in percolation hole P04 January 24, 2011



Drilling and collecting soil sampled from percolation hole P24, January 28, 2011



Initial attempt at completing percolation testing with hose from water truck, January 28, 2011



Pouring warmed water from Doris Lake into percolation hole, January 30, 2011





Approximate north-northeast view towards percolation testing. Note the heated cube truck in the center of the photo was used to hold testing equipment and maintain water temperatures around 10-20 °C, January 29, 2011



(Left) Checking water level drop in percolation hole, January 30, 2011



(Right) Rechecking drilled percolation hole depth before final stage of testing, February 1, 2011

		North Dam As-Built Report		
		Percolation Testing		
Job No: 1CH008.058.430 Filename: Figure 3_Perc.Testing_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: JBK	Figure: 3



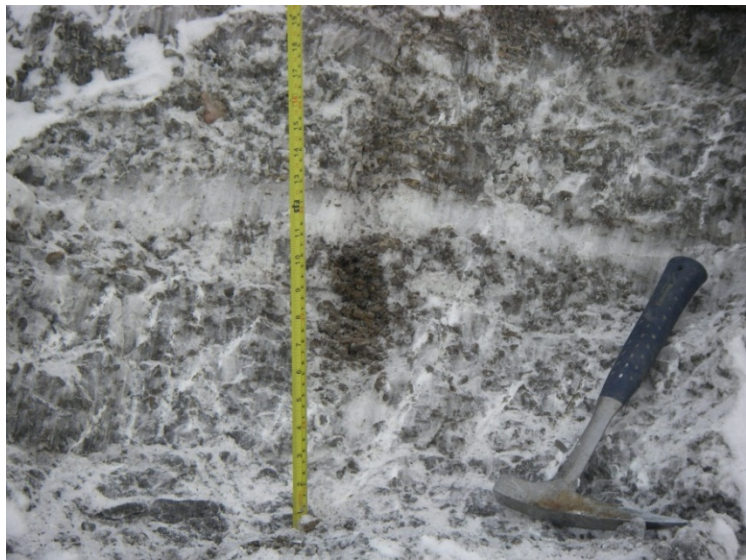
Removal of blast mats after Key Trench blast, photo looking northeast, February 5, 2011



Excavating Peat Zone, February 22, 2011



Drill on blasting pattern for dam, February 9, 2011



Ice lenses on exposed high wall of Key Trench, February 10, 2011



Excavating hyper-saline overburden in Soft Spot, March 22, 2011





Results of Key Trench blast, photo looking southwest, February 13, 2011



Closer look at ice from ice lenses, February 10, 2011



Drilling in Peat Zone, February 21, 2011

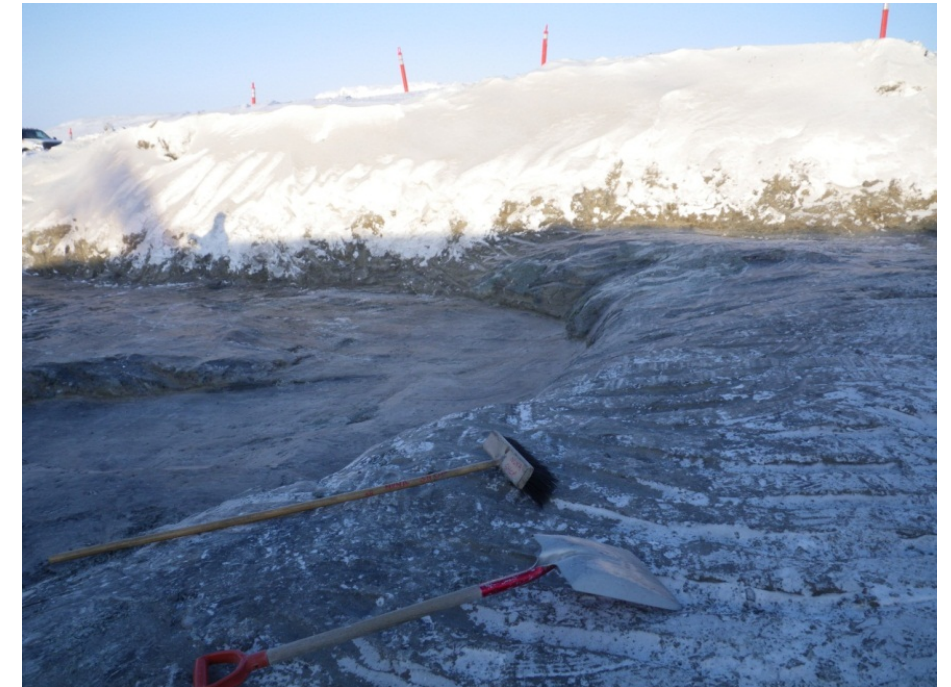
		North Dam As-Built Report		
		Drilling, Blasting, and Excavation of Key Trench		
Job No: 1CH008.058.430 Filename: Figure 4_DrillBlastExcavation_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 4



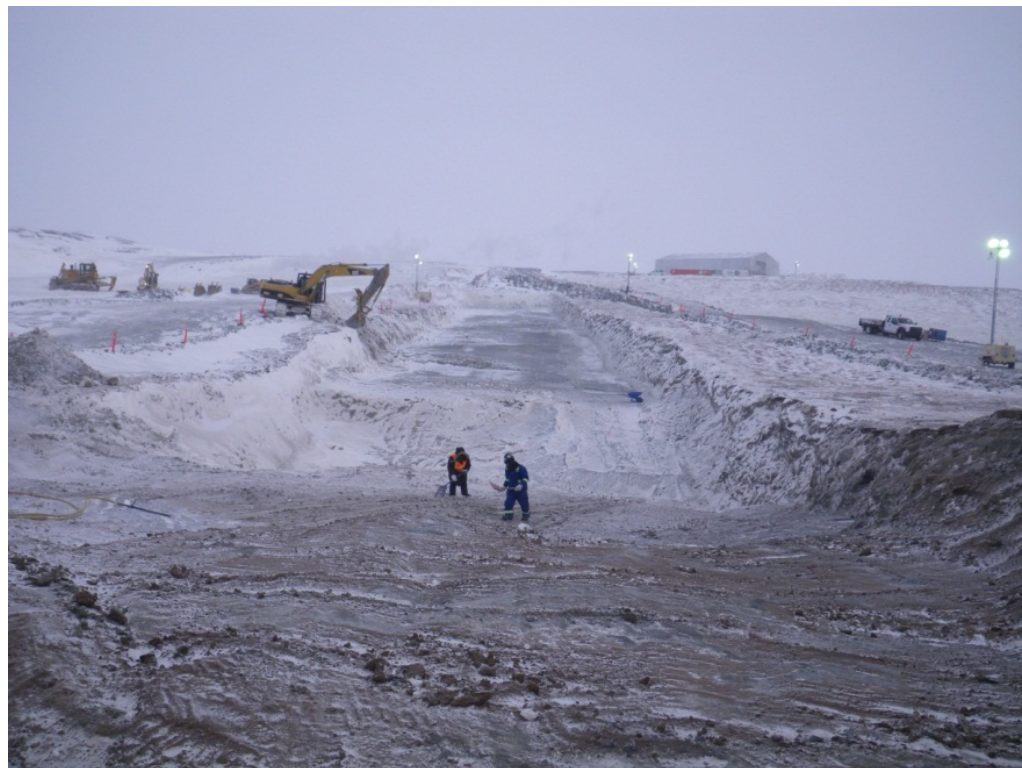
Labourers, excavator, and skid steer with broom attachment cleaning base of Key Trench north of inflection point, February 28, 2011



Labourer using air compressor to clean base of Key Trench, March 16, 2011



Base of Key Trench after being cleared of snow and debris (on the left) additional cleaning required on right, March 3, 2011





Labourers cleaning base of Key Trench south of inflection point, March 4, 2011



Cleaning of Key Trench after removal of non-spec. core material, March 12, 2011



Cleaning snow and debris from surface of frozen core prior to placement of next lift, January 31, 2012

 Job No: 1CH008.058.430 Filename: Figure 5_KeyTrenchCleaning_1CH008.058.pptx	 Hope Bay Mining Limited	North Dam As-Built Report		
		Final Cleaning of Key Trench and Cleaning Between Lifts Date: May 2012 Approved: MMM Figure: 5		



Placement of levelling course on south end of dam, March 18, 2011



'Test pads' of blended core material placed within the dam footprint, bleeding of water still occurring. Photo taken March 6, 2011



Labourers shoveling core material into holes at the base of the Key Trench, March 7, 2011



Placement of core material on the edge of the Peat Zone over-excavation, March 9, 2011





Excessive bleed water was noted during levelling course placement with the original (20 mm minus) core material. Photo taken March 3, 2011



Compaction of core material with a concrete vibrator in an area which could not be accessed by the roller compactor. Photo taken March 11, 2011



Vibratory compactor compacting core material placed in the low area created by the excavation of hyper-saline material in the Soft Spot, April 3, 2011

		North Dam As-Built Report		
		Levelling Course Placement		
Job No: 1CH008.058.430 Filename: Figure 6_Levelling_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 6



Welding piles for thermosyphon radiators, April 2, 2011



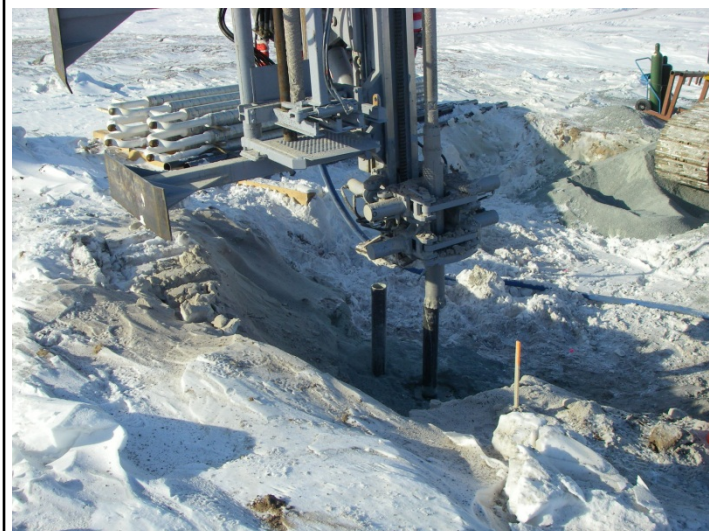
Covering thermosyphon pipes with core material, April 17, 2011



Labourers spreading core material over the thermosyphon pipes prior to core material placement with bulldozer, April 17, 2011



Installation of South Thermosyphon Radiators, April 9, 2011



Drilling holes for thermosyphon radiator pile installation, April 3, 2011





Thermosyphon pipes laid out in Key Trench, photo looking northeast. Photo taken April 17, 2011



Connection between thermosyphon piles and radiators for South Thermosyphon Radiators, April 17, 2011



Thermosyphon pipes running to North Thermosyphon Radiators, April 19, 2011

		North Dam As-Built Report		
		Thermosyphon Installations		
Job No: 1CH008.058.430 Filename: Figure 7_Thermosyphon_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 7



Failed first attempt at mixing-in-place core placement in Peat Zone excavation, February 24, 2011



Device for setting slopes, labourers hand sloping the upstream face of the core, February 26, 2012



Compaction of core material, February 22, 2012



Labourers sloping the upstream side of the core, March 10, 2012



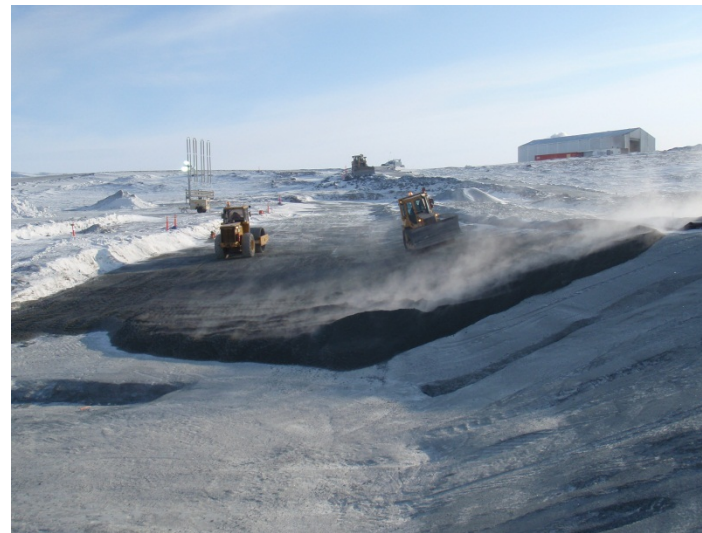
Core material placement with CAT D4 bulldozer, April 21, 2011



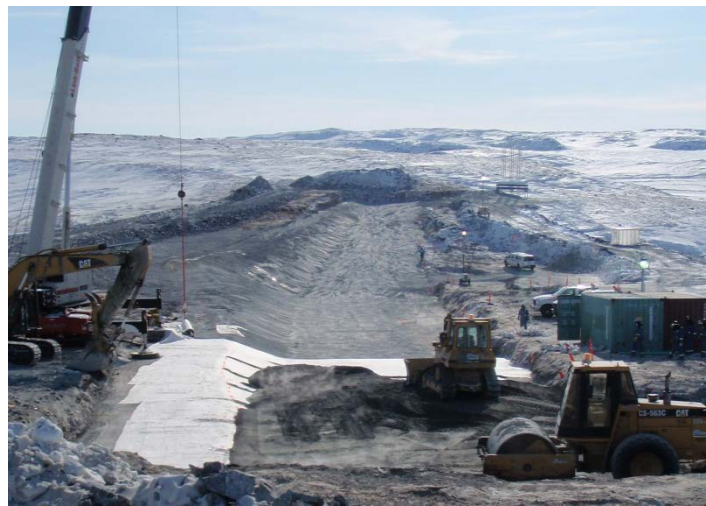
Placement of core material in Fillet Zone (pre liner), April 23, 2011





Placement of core material, photo facing south, March 8, 2012



Placement of core material in the Key Trench (post liner), May 2, 2011



Placement of core material over lower GCL, April 25, 2011

		North Dam As-Built Report		
		Core Material Placement		
Job No: 1CH008.058.430 Filename: Figure 8_CoreMaterial_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 8



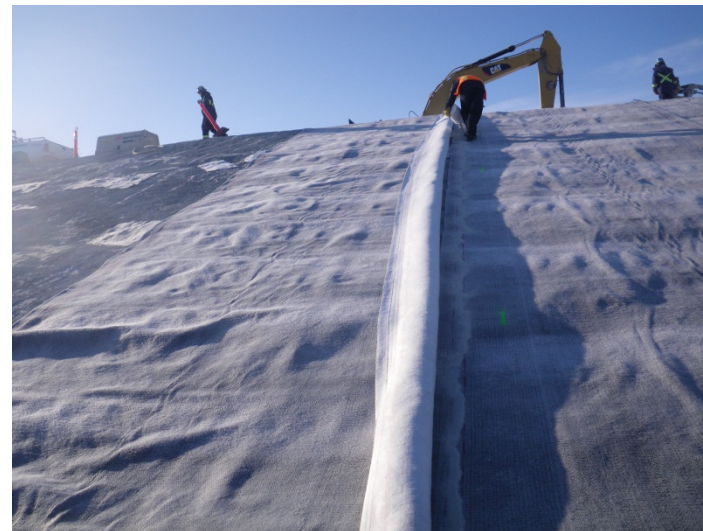
Lower GCL placement, April 26, 2011



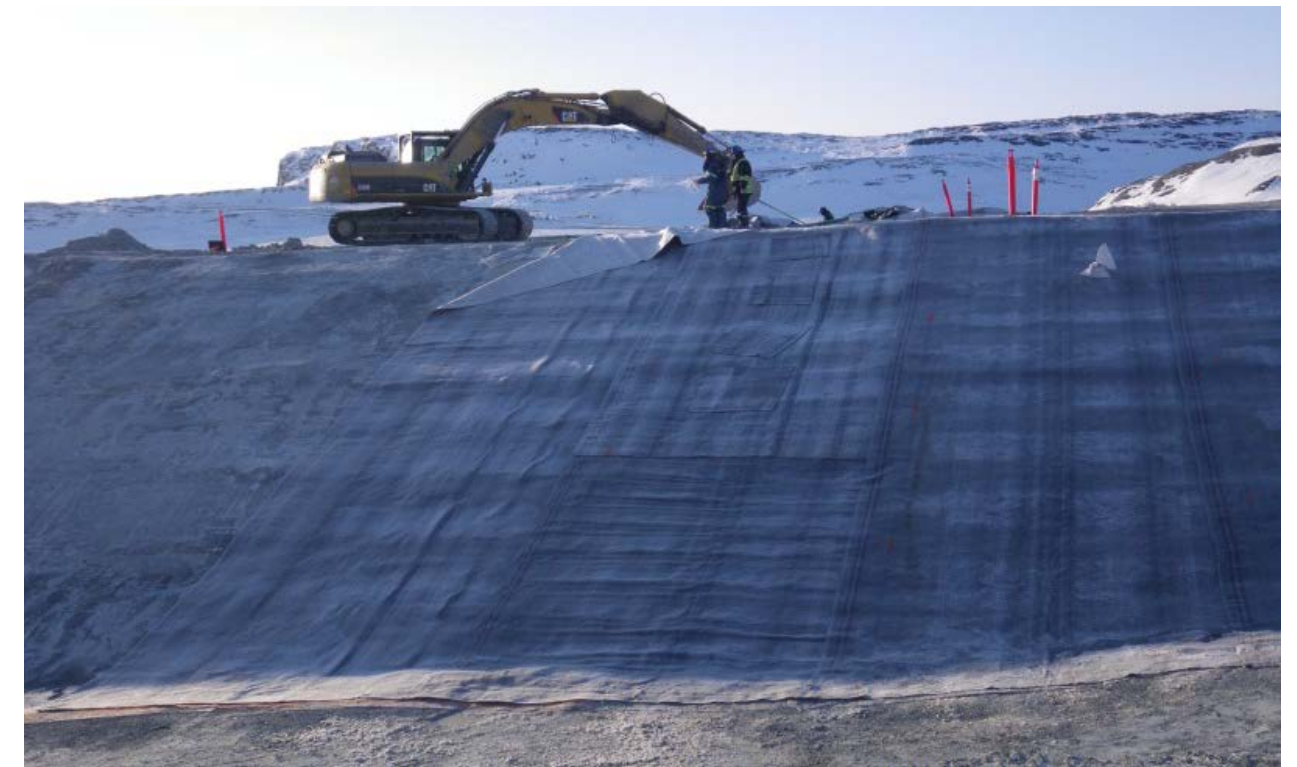
Cleaning debris off upstream slope of frozen core prior to GCL placement, March 30, 2012



Damage to lower GCL due to the removal of thermal cover material, March 23, 2012



Applying bentonite along GCL seam. Photo taken March 30, 2012





GCL placed on the upstream slope of the frozen core, March 23, 2012. Note the horizontal seam on the slope. Horizontal seams on slopes were avoided when possible, only apparent in a few areas



Placement of lower GCL, April 27, 2011



GCL on the upstream slope of the core, March 31, 2012

		North Dam As-Built Report		
		GCL Placement		
Job No: 1CH008.058.430 Filename: Figure 9_GCL_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 9



Compaction of GCL cover material, March 31, 2012. Note the survey grade marks in the foreground



Placement of GCL cover material with CAT 330 excavator, March 31, 2012



Placement of GCL cover material on the upstream slope of the core, March 31, 2012





Placement of GCL cover material along toe of upstream slope, March 20, 2012



GCL cover material placement completed, March 31, 2012



Compaction of GCL cover material along the slope of the core, March 20, 2012

		North Dam As-Built Report		
		GCL Cover Material Placement		
Job No: 1CH008.058.430 Filename: Figure 10_Over GCL_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 10



Placement of transition material to form access ramp on downstream side of core, February 1, 2012



Compacting transition material along upstream slope of core, March 27, 2012



Placement of transition material along downstream side of core, March 3, 2012



Placement of transition material along the crest of the dam, March 25, 2012





Staged construction; lift of transition material over GCL cover material, March 29, 2012



CAT 345 excavator placing lift of transition material along upstream slope of core, March 26, 2012



Placement of transition material on downstream side of core, February 9, 2012

		North Dam As-Built Report	
		Transition Material Placement	
Job No: 1CH008.058.430		Date: May 2012	Approved: MMM
Filename: Figure 11_Transition_1CH008.058.pptx		Hope Bay Mining Limited	Figure: 11



Placing first lift of ROQ, January 25, 2011



ROQ placement, January 24, 2011



Staged ROQ construction, photo looking northeast along dam alignment, April 2, 2012



Staged ROQ placement along upstream side of dam, April 1, 2012





Compactor packing downstream slope of dam, March 12, 2012



Excavator sloping ROQ on downstream side and packer running on upstream side, April 8, 2012



ROQ placement, March 12, 2012

		North Dam As-Built Report		
		Run-of-Quarry Material Placement		
Job No: 1CH008.058.430 Filename: Figure 12_ROQ_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 12



Splicing damaged GTC, April 29, 2011



Vertical GTC installation, March 30, 2011



Drilling for installation of vertical Key Trench GTC, April 29, 2011



Taking GTC reading, May 1, 2011



Bedding of cable cluster at station 0+40 along the downstream side of the dam, April 19, 2012





Laying out GTC cluster towards the downstream at station 0+85, preparation for covering, March 15, 2012



Installation of horizontal GTC in small trench, February 9, 2012



Placement of horizontal GTC on surface of lower GCL, April 25, 2011

		North Dam As-Built Report		
		Ground Temperature Cable Installation and Repair		
Job No: 1CH008.058.430 Filename: Figure 13_Thermistor_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 13



Installation of the inner rod of crest survey monument point on downstream side, April 18, 2012



Compaction of crush material over steel plate of crest survey monument, April 15, 2012



Compaction of first lift of material around crest survey monument pipe, April 17, 2012



Compaction of last lift around crest survey monument pipe, April 16, 2012



Installation of pin for surficial survey point, May 6, 2012





Completed deep settlement point installation, May 6, 2012



Installation of deep settlement point pipe, May 5, 2012



Survey monitoring points installed along upstream crest of dam, April 16, 2012

		North Dam As-Built Report	
		Survey Monitoring Point Installation	
Job No: 1CH008.058.430	 Hope Bay Mining Limited	Date: May 2012	Approved: MMM
Filename: Figure 14_SurveyPoints_1CH008.058.pptx		Figure:	14



Cable trench excavated for thermosyphon status thermistors lead cables. Photo taken from south Thermosyphons looking east toward ISP 040.



Excavating cable trench between ISP 085 and ISP 130. Photo looking north-east along the dam crest. Note the settlement monument (mid-was avoided when excavating the trench.



Thermosyphon status thermistors were heat-insulated using expanding spray foam.



Thermosyphon status thermistors were attached to thermosyphon risers using epoxy resin and zip-ties.



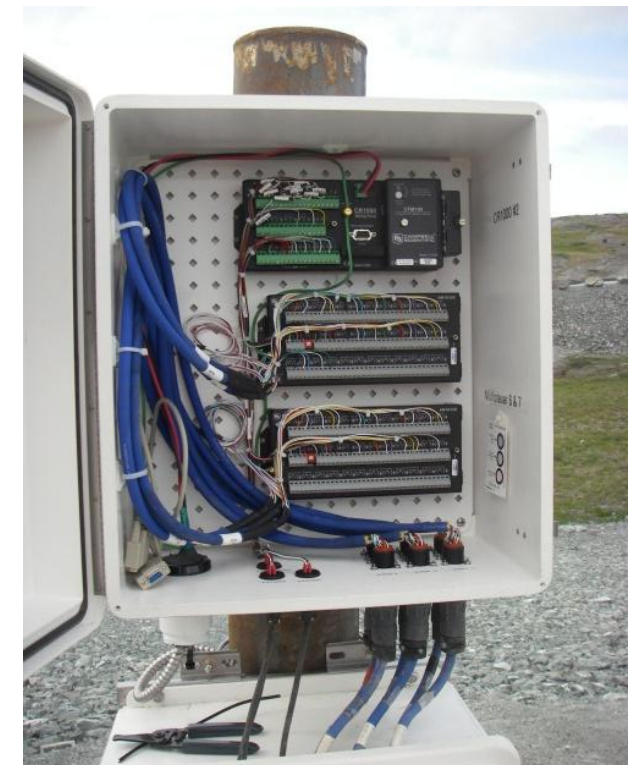
Excess cable was coiled up and buried at the base of the instrument support post. Photo taken from ISP 085 looking north-east along the crest of the dam.





Lead cables were coiled up and placed into the cable management boxes immediately below the instrument housing.



Typical instrument support post setup. The instrumentation housing on top, the cable management box underneath, and the battery on the back side.

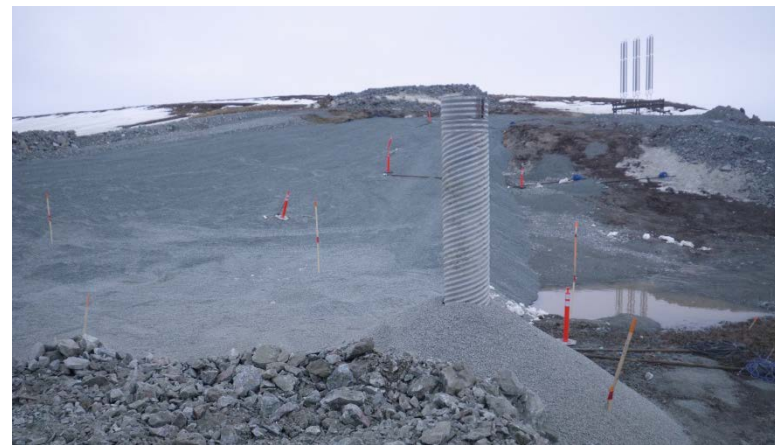


Typical setup inside the instrumentation boxes.

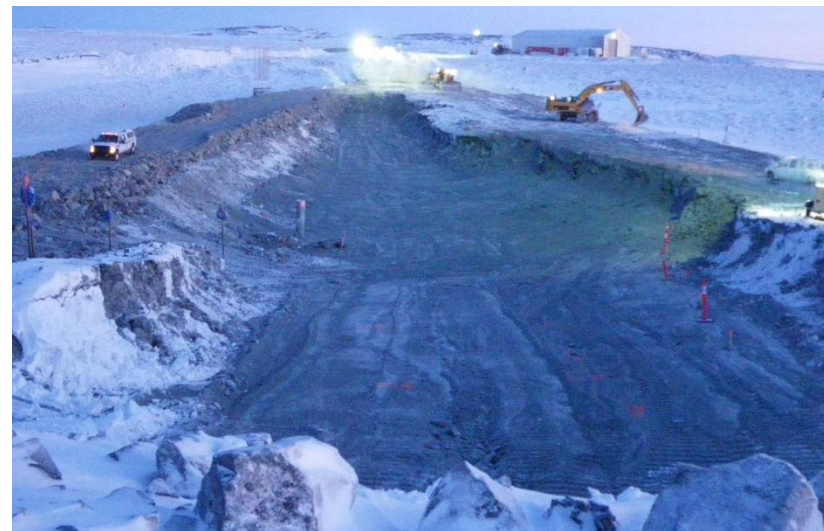
		North Dam As-Built Report		
		Instrumentation Installation		
Job No: 1CH008.058.430 Filename: Figure 16_Instrumentation2_1CH008.058.pptx	Hope Bay Mining Limited	Date: Sept 2012	Approved: MMM	Figure: 16



Thermal cover placement: placement of ROQ material for thermal cover, thermistor strings protected with steel pipes, May 14, 2011



Thermal cover placement: sump (corrugated steel pipe) installed at low point, May 12, 2011



Thermal cover removal: Key Trench with ROQ cover partially removed, January 9 2012



Removal of thermal cover: excavator scraping frozen 16 mm clear material from frozen core material surface, January 25, 2012



Thermal cover removal: labourers using a small jackhammer to remove frozen 16 mm clear material from above the lower GCL





Thermal cover placement: HDPE liner covered with 16 mm clear material overlying exposed lower GCL, April 30, 2011



Thermal cover placement: placement of 16 mm clear indicator material complete; placement of ROQ started, May 6, 2011



North Dam with thermal cover, June 17, 2011

		North Dam As-Built Report		
		Seasonal Suspension and Cover Placement		
Job No: 1CH008.058.430 Filename: Figure 17_SeasonalSuspension_1CH008.058.pptx	Hope Bay Mining Limited	Date: May 2012	Approved: MMM	Figure: 17



Construction of the Frozen Core Plant building, January 27, 2011



Frame of Frozen Core Plant erected, January 29, 2011



Hopper and feeder belt of Frozen Core Plant, February 11, 2011



Drum in which the dry core material is heated and mixed with water to form the moisture-conditioned core material, March 9, 2011



Moisture-conditioned core material exiting the chute, March 23, 2011



Frozen Core Plant chute and conveyor belt in foreground, surge bin and loaded truck in background, photo taken March 31, 2011



The flame at the top end of the drum heats the dry core material, May 2, 2011



Loader loading dry core material into Frozen Core Plant hopper, January 21, 2012



Sample collection in Frozen Core Plant, February 26, 2011



Percolation testing samples drying in oven, February 1, 2011



In-situ density testing of freshly placed core material with Troxler Gauge, February 27, 2011



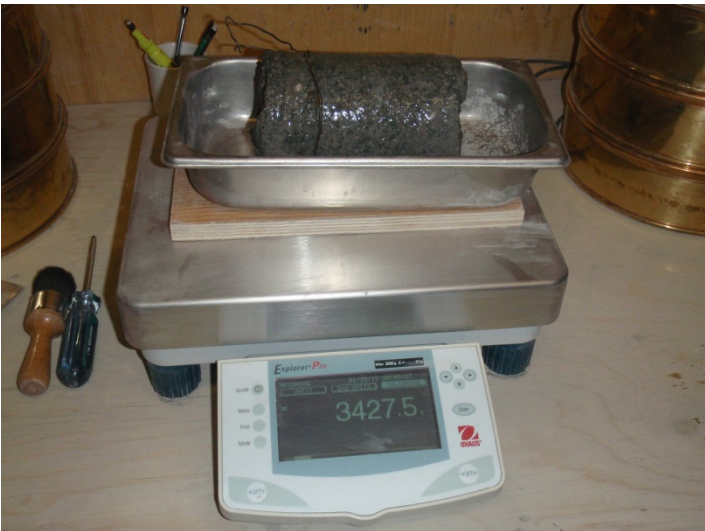
Collection of drilled core sample, April 22, 2011



Collection of core material sample from crusher belt, March 13, 2011



Standard Proctor testing, March 5, 2011



Ice saturation testing: weighing drilled core in air after weighing in ice bath, January 25, 2012



Sample collection from chute of Frozen Core Plant, March 19, 2011