

## DAILY REPORT #79 – DORIS NORTH INFRASTRUCTURE/ NORTH DAM

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Reviewed by:		Project #:	1CH008.058.0320
Role	Company	Personnel – Position	On Site
Client	Hope Bay Mining Limited (HBML)	Angela Holzapfel – ESR Compliance Manager David Vokey – ESR Coordinator Don Ethelston – HSLP Advisor Dean Wold - Safety Jill Turk – ESR Coordinator Katsky Venter – ESR Manger Michelle Tanquay – ESR Site Manager Stirling Kelly – HSLP Advisor	No No Yes No Yes Yes No No
	JDS	Lloyd Jackson – Mechanical Superintendent Doug Fielding – Construction Manager Ishan Fechter – Construction Coordinator Jerry Graham – Construction Manager Kevin Whieldon – Project Coordinator Mark Valeriot – Construction Manager Calvin Goldschmidt – Construction Coordinator	No Yes No No No Yes Yes
Engineering Design Consultants	SRK Consulting (Canada) Inc.	John Kurylo – Site Engineer Megan Miller – Site Engineer Lawrence Borowski – Site Engineer Murray McGregor – Site Engineer Iozsef Miskolczi – Site Engineer Lowell Wade – Senior Engineer	Yes Yes No No No No
	EBA Engineering Consultants Ltd.	Jeff Orr – Project Manager Jennifer Stirling – Geologist Thomas Bradshaw – Junior Engineer Ernest Palczewski – Geologist	No No Yes Yes
Earthworks Contractor	Nuna Logistics	Doug Haverland – Area Superintendent Gary Sodhi – Field Engineer Georges Cornelissen – Survey Manager Jeff Roberts - Surveyor Jim Cardinal – Foreman Jordan Gunter – Foreman (Dayshift) Kevin Oakes – Project Engineer Kevin Kozdrowski – Foreman (Night shift) Kyle Kuntz – Project Engineer Margaret Caley – Surveyor Matt McKay – Civil Supervisor Mike MacMaster – Surveyor Mike Price – Field Engineer Nick Stoneberger – Superintendent Rick Peter – Foreman Ron MacMaster – Surveyor Simon Chipper – Civil Supervisor	No No Yes No Yes Yes Yes No No Yes No Yes Yes Yes No No Yes
External Distribution List:	SRK: Maritz Rykaart, Lowell Wade, Seema Kang, Silkie Wong EBA: Robert Zschuppe Nuna: Chris Petrovic JDS: Bob Prince-Wright, Calvin Goldschmidt HBML: Dave Power, Gerry Benson		
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**WEATHER (ROBERTS BAY)**

<http://www.wunderground.com/weatherstation/WXDailyHistory.asp?ID=INUNAVUT3>

Temperature/Wind Chill (°C)	6AM:-29	12PM: -24/-30	6 PM: -22/-31.5	12 AM: -21/-29
Precipitation (mm)	<b>Rain:</b> None		<b>Snow:</b> Trace	
Conditions	<b>Day Shift:</b> Sunny, light wind, cool.		<b>Night Shift:</b> Light to moderate wind, cool.	
Daily norms (°C)	24 hour high: -20		24 hour low: -29	

**HEALTH, SAFETY AND ENVIRONMENT**

- Megan Miller and Ernest Palczewski attended the dayshift Nuna toolbox meeting.
- John Kurylo and Thomas Bradshaw attended the nightly toolbox meeting.

**COMMENTS, CORRESPONDENCE AND ACTIVITIES****DAILY MEETING WITH NUNA AND HBML TEAM:**

- The daily meeting was attended by Nuna [Nick Stoneberger, Kevin Oakes, Trevor Sorken, Lucas Evans], Newmont Safety [Don Ethelston], ESR [Katsky Venter], JDS [Mark Valeriote, Doug Fielding, Calvin Goldschmidt], SRK [John Kurylo, Megan Miller]

Topic	Status
Health and Safety and Environment	<ul style="list-style-type: none"> <li>• No safety issues reported.</li> <li>• ESR asked about the Jetty thermistor. It was discussed that it may be best to install the thermistor after the Jetty is re-armoured.</li> </ul>
North Dam	<ul style="list-style-type: none"> <li>• SRK reported that 2 panels of GCL were placed on dayshift and the placement of transition material started. Nightshift placed overliner material on everything.</li> <li>• Nuna plans on placing additional GCL today.</li> </ul>
Water Management Structures	<ul style="list-style-type: none"> <li>• SRK reported that the Doris Diversion Berm is looking good.</li> <li>• The culvert crossing for the Doris Diversion berm was discussed. The two existing culverts crossing the overburden dump access road are 10' diameter, which is smaller than the diversion berm culverts. Nuna said that once the north dam is complete the access road would be pulled out, or a swale cut if needed.</li> <li>• Nuna plans on doing the road crossing for the diversion berm culverts on Sunday. They will make and post a traffic plan.</li> <li>• Nuna requested that everybody ask their crew to avoid driving along the north access road/diversion berm work area.</li> </ul>
General	<ul style="list-style-type: none"> <li>• Trevor Sorken and Lucas Evans were introduced. Trevor and Lucas will be taking over for Nick and Kevin respectively, starting Monday.</li> </ul>

**SURVEY:**

<b>Required</b>	<ul style="list-style-type: none"> <li>• Overliner FCM placed March 23, 2012 (3d face files)</li> <li>• To date as-builts of Doris Diversion Berm (ROQ, underliner crush, liner, overliner crush)</li> <li>• Recent multi-bead cable string pickups and crush cover over cables at 0+85, 1+30 and 1+75. Also need bedding and cover for cables at 0+60 and start of cable at 0+60.</li> </ul>
<b>Data Received</b>	<ul style="list-style-type: none"> <li>• Upper Liner (surface and linework); as of March 24, 2012</li> <li>• FCM placed March 23, 2012</li> <li>• Bedding, cover and cables at 0+40</li> <li>• Overliner FCM placed March 23, 2012 (surface files)</li> <li>• Overliner Transition Material to station 1+60</li> </ul>

	<ul style="list-style-type: none"> <li>Current surface (to be updated once cleaned on south side) of the frozen core material under the liner</li> </ul>
<b>Outstanding</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Upcoming</b>	<ul style="list-style-type: none"> <li>Diversion Berm material as placed</li> <li>Dam material (ongoing)</li> </ul>

## **NORTH DAM/FROZEN CORE PLANT PAD:**

### **Multi-bead Thermistors**

- Readings were taken of all multi-bead thermistors.
  - Thermistor String ND-HTS-085-33.5 remains non-functional.

### **Frozen Core Plant**

#### *Dayshift*

- No activity.
- No operator available.

#### *Nightshift*

- The FCP was started producing Overliner material (GCL cover) around 21:45.
  - The setting on the water pump dial at the plant was started and 40.9 and kept at this setting for the whole shift.
  - The belt speeds were ~20.9 on the belt dial.
  - Material was exiting the FCP chute around +28C
  - Around 5:15 the plant was stopped.
  - The plant ran for ~ 7.5 hours today.
- 32 loads of Overliner material were placed at the dam and ¼ of a load was sent to the reject stockpile (on the back / E side of the FCP pad).

### **Dam Shell**

#### *Dayshift*

- Transition material was placed over the GCL overliner material working south west up to station 1+30.
  - Transition material from station 1+60 north east was at grade at the end of dayshift.
  - The transition material was placed with the CAT D6 dozer and compacted with the 10T vibratory packer. The packer had some difficulties climbing the slope; but everything was packed.
- The overliner material placed on nightshift was still soft to the step until the early afternoon. The foreman was asked to avoid placing transition material on the newly placed material for as long as he could to give the area more time to firm up. Transition material was not placed on this material until late afternoon, at this time the overliner material was firmer.

#### *Nightshift*

- The upstream fillet area was noted to have been cleaned past the design limits of the required Overliner (over GCL) material. At the beginning of nightshift it was decided that some Transition material should be placed around 1+20 to 0+70 to allow for better truck access to the area and to limit overbuilt (save on material quantities) of the Overliner core material.
  - SRK and Nuna had discussions in the field about the upstream limits of the Overliner (GCL cover) material layer. It was noted that due to the 2011 close out measure of building up the fillet to elevation 29.8m (i.e. extended fillet area). There were areas around 1+35 to 0+50 where the GCL comes up and extends further to the downstream than in the original IFC design. It was noted that in areas the GCL was close to the limits originally laid out for the Overliner material placement by survey.
    - Nuna survey original layout was based on a constant offset (based on the IFCs) from the toe of the existing upstream slope.
    - SRK indicated to Nuna that they felt that a minimum ~1.5m offset from the end of the minimum GCL liner tie in (for the upper and lower GCL panels) should be maintained.
    - Upon further discussions and review of the IFC drawings SRK instructed that the layout for the upstream edge of the Overliner material in this area use the same x and y (or

northing and easting) as the IFC design for the Overliner on the fillet however, the elevations should all be brought up to meet the existing core elevation at any respective location.

- This will ensure that the Overliner material will have the same footprint (or slightly larger) than the original IFC design.
- Typically a 2m or greater offset from the IFC x, y coordinates for the fillet toe and the existing GCL were noted.
- See Photos 15 and 16 for additional details.
- A small / thin lift of Transition material was placed with the excavator and packed from ~ 1+40 to 0+70.

### **Key Trench/ Central Core**

#### *Dayshift*

- The core slope, crest and lower GCL from approximately 1+15 to 0+75 was cleaned with the air compressor and had brooms where required.
- The lower GCL was examined and patches were placed as required. Scraps of GCL were used to make the patches.
- GCL was placed from approximately station 1+15 to 0+80.
  - A total of 9 GCL panels were placed. An area was cleaned in preparation of placing one additional panel however this was not placed prior to the end of shift.
  - At approximately station 0+85 the direction of panel overlap as switched.
  - Prior to GCL placement scraps of GCL material were placed on any rough/sharp spots along the slope.
  - After the GCL was placed the entire area was walked and patches were placed over any visible holes or worn looking areas.
  - Placement of GCL started 3 panel widths south from the previously placed GCL. As the section of FCM placed on the crest of the dam nightshift March 23 had not yet achieved freezeback. Once this area achieved freezeback GCL was placed in the gap left.
  - One of the panels was jointed along the slope.
  - The CAT 345 excavator was used to place the GCL as it has a longer reach than the CAT 330.
- The FCM placed in the low SSE corner did not achieve freezeback by the end of dayshift. This corner was at 4.5°C at the end of dayshift.

#### *Nightshift*

- GCL was covered with the Overliner material ( $\frac{3}{4}$ " minus and 5 mm minus blend) between stations 0+92 and 1+20 during nightshift.
  - The 10 ton vibrator packer was noted to still be able to travel up the 2.5H:1V side sloped of the Overliner material. The packer could only fully make it up the slope after the base of the slope had been compacted to provide a solid base.
  - Around the base of the slope around 1+05 a few scrap pieces of GCL liner (e.g. cut off from the end of damaged rolls) were placed over an area that appeared to have been previously hydrated.
  - Around 1+15 on the top crest of the dam one haul truck drove directly onto the GCL liner. SRK immediately talked with Nuna to ensure that future instances of this did not result.
    - The excavator operator for the rest of the shift was diligent on ensuring that the truck did not back-up onto the liner.
    - In the area where the haul truck drove onto the liner a few small (~ 1cm to 4cm) holes were noted. A large patch was placed over the area where the haul truck tire tracks were noted on the liner before Overliner placement continued at this location.
- Grade control was a large focus of today's placement. Nuna survey placed grade stake to assist the excavator operator with spreading and cutting back of the Overliner material, to as close to the design lines as possible.
  - At the request of SRK grade stakes were only placed on the joints / seams of the GCL. This was done as this was seen as providing a little extra insurance against puncturing of the

- liner, if the stakes are somehow driven or packed into the liner surface. This extra insurance is derived from the fact that two layers of GCL material exists at the joints / seams, thus both would have to be punctured to create a hole.
- Before an area was packed, the spread Overliner material was walked over on foot and any visible stakes were removed.
  - Small piles of Overliner material were hand shoveled over the seams then stakes were placed or material was pushed around the stakes to anchor them.
  - Overall the average lift thickness for Match 24<sup>th</sup> is expected to be on the order of 0.32 to 0.33m (less than +5cm variation from IFC lines / limits).
  - See Photos 17 and 18.
- As the stockpile of the Overliner material was rapidly depleting one haul truck started to haul Overliner material from Quarry #2 to the FCP pad as placement progressed.
  - A trial to take measurements and test the functionality of the South Thermosyphons was attempted.
    - Single bead thermistors were used to measure the ambient air temperature (before and after this trial).
    - A single bead thermistor was strapped to the base of the thermosyphon pipes (close to where the thermosyphon exits the existing fill). These single beads were then wrapped in insulation. See Photo 20.
    - The insulation used was designed for 3" pipe and was rather long. Due to the larger diameter of the thermosyphons and the limited amount of space available between the ground and the first thermosyphon radiator riser / support, gaps were noted between the pipe and the single bead.
    - Due to the poorly established insulation cover over the single beads this trial was abandoned after testing evaporator pipes (thermosyphons) TS-31 and TS-32.
    - Alternate insulation will be sourced out tomorrow for additional trials on testing the thermosyphons performance, hopefully with less environmental influences resulting on the single beads.

#### **Field Geotechnical Testing, Laboratory and Sampling**

##### **SINGLE BEAD THERMISTOR STATUS**

Installed Today			Active			Destroyed / Abandoned		
ID	Station	US/DS/Center	ID	Station	US/DS/Center	ID	Station	US/DS/Center
			SB7	1+10	D/S	SB11	0+54	CL

- A summary of today's material testing progress is presented in the tables below.

##### **PARTICLE SIZE DISTRIBUTION SUMMARY**

Collected	Testing In Progress	Completed
HB12-FCP-CORE-PSD77-QA-20120324	HB12-FCP-CORE-PSD77-QA-20120324	

##### **MOISTURE CONTENT SUMMARY**

Collected	Testing In Progress	Completed
HB12-FCP-COVER-MC391-20120324	HB12-FCP-COVER-MC391-20120324	
HB12-FCP-COVER-MC392-20120324	HB12-FCP-COVER-MC392-20120324	
HB12-FCP-COVER-MC393-20120324	HB12-FCP-COVER-MC393-20120324	
HB12-FCP-COVER-MC394-20120324	HB12-FCP-COVER-MC394-20120324	
HB12-ND-COVER-MC395-20120324	HB12-ND-COVER-MC395-20120324	
HB12-ND-COVER-MC396-20120324	HB12-ND-COVER-MC396-20120324	

##### **DRILLED CORE**

Collected	Testing In Progress	Completed
None		Up to date

**COMPACTION TESTING SUMMARY**

Number of Tests	Material	Tested By	Shift	Notes
0	N/A	EP	Day	No FCM Placed
2	GCL Cover	TB	Night	Tests Acceptable

- Compaction values over 90% were achieved.

**DORIS NORTH DIVERSION BERM:**

- The focus of the day's work was to complete everything in the area of the power cable crossing. The power cable was de-energized for approximately 4 hours to allow work in the area.
  - Lower geotextile, underliner crush, liner bentonite and crush were placed in the direct vicinity of the cable.
  - A small hole was cut in the liner on the top of the berm to allow the cable to pass through.
- Everything at the berm looked good.
- The overliner bentonite 'plug' was placed from station 200 to 160.
- Overliner crush was placed from 260 to 160.
- The CAT 308 excavator cleared snow from around the sewage effluent pipe at the Primary Road crossing.

**QUARRY #2:**

- One drill continues to drill on both day and nightshift.



PHOTOS:



**Photo 1:** Progress photo of North Dam from photo point 1. Looking south west.



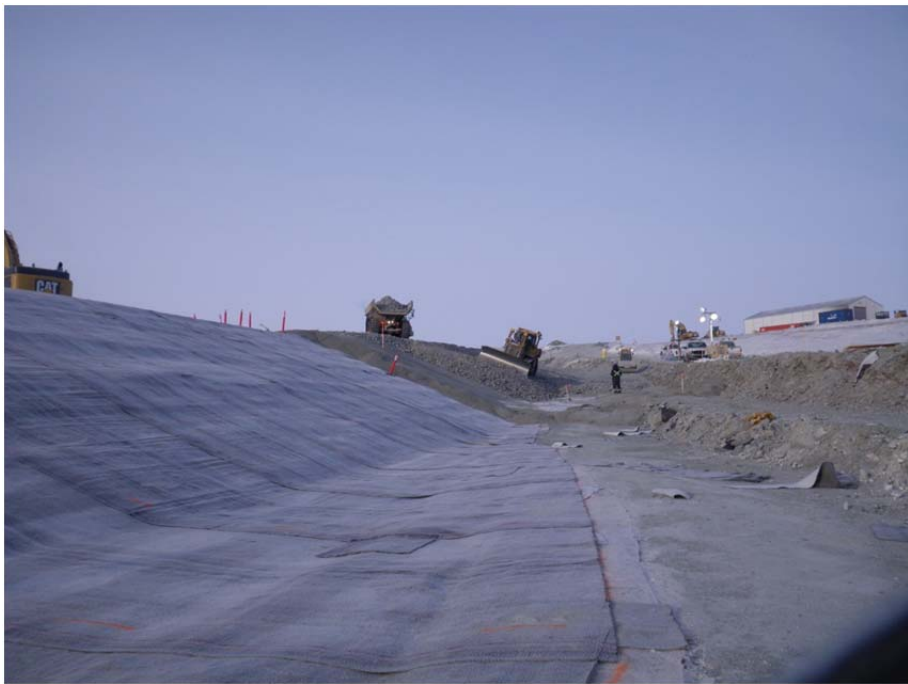
**Photo 2:** Progress photo of North Dam from photo point 2. Looking north west.



**Photo 3:** Progress photo of North Dam from photo point 3. Looking north east along the dam.



**Photo 4 (above):** Bentonite being placed along overlap between sections of GCL.



**Photo 5 (top right):** View of GCL and transition material placement, photo looking north east along dam.



**Photo 6 (right):** View of GCL after placement looking west. Labourer clearing additional section of slope, GCL did not get placed in that area prior to the end of dayshift.





**Photo 7:** Placement of GCL along the slope near station 1+05.



**Photo 8:** View of transition material placement. Photo looking south west along dam alignment.



**Photo 9:** Diversion berm. Hole in liner at crest of berm for power cable near station 160.



**Photo 10:** Diversion berm Overliner crush. Photo looking east.



**Photo 11:** Compacted crush and bentonite at base of diversion berm key trench and lower geotextile. Photo looking west from station 1+60.



**Photo 12:** Placement of bentonite in base of diversion berm trench.



**Photo 13 (above):** ~W view of the upstream slope of the North Dam. Photo taken near the start of nightshift.

**Photo 14 (right):** ~SWW view down North Dam alignment. Note the Transition material in the foreground that has been placed and compacted on the Overliner (above GCL) material.







**Photo 15:** ~SSW view of the core fillet area. Note the orange liner denoted the x and y (easting and northing) extents of the design IFC fillet limits.



**Photo 16:** ~NNE view of the core fillet area. Note the orange liner denoted the x and y (easting and northing) extents of the design IFC fillet limits.



**Photo 17:** View of survey stakes placed for grade control for today's material placement.



**Photo 18:** Note that the grade stakes were placed in some Overliner material after it had been hand shoveled onto the area around the GCL seams. Stakes were only placed around the seams as this area has a little more cushioning in case a stake was accidentally pushed through the Overliner fill towards the GCL surface.



**Photo 19:** Close-up view of bentonite in a discarded cut portion of GCL liner.



**Photo 20:** View of thermosyphon performance monitoring test trial. Note that 3" pipe diameter insulation was wrapped around the single bead that was attached to the base of the thermosyphon. Additional testing will result in the coming days



**Photo 21:** ~ NNE view down the upstream crest of the dam core towards Overliner placement activities. Taken from around the underbuilt SSE corner area.



**Photo 22:** ~ NNE view down the upstream dam core slope towards Overliner placement activities. Taken from around 0+70 on the upstream shell corner area.





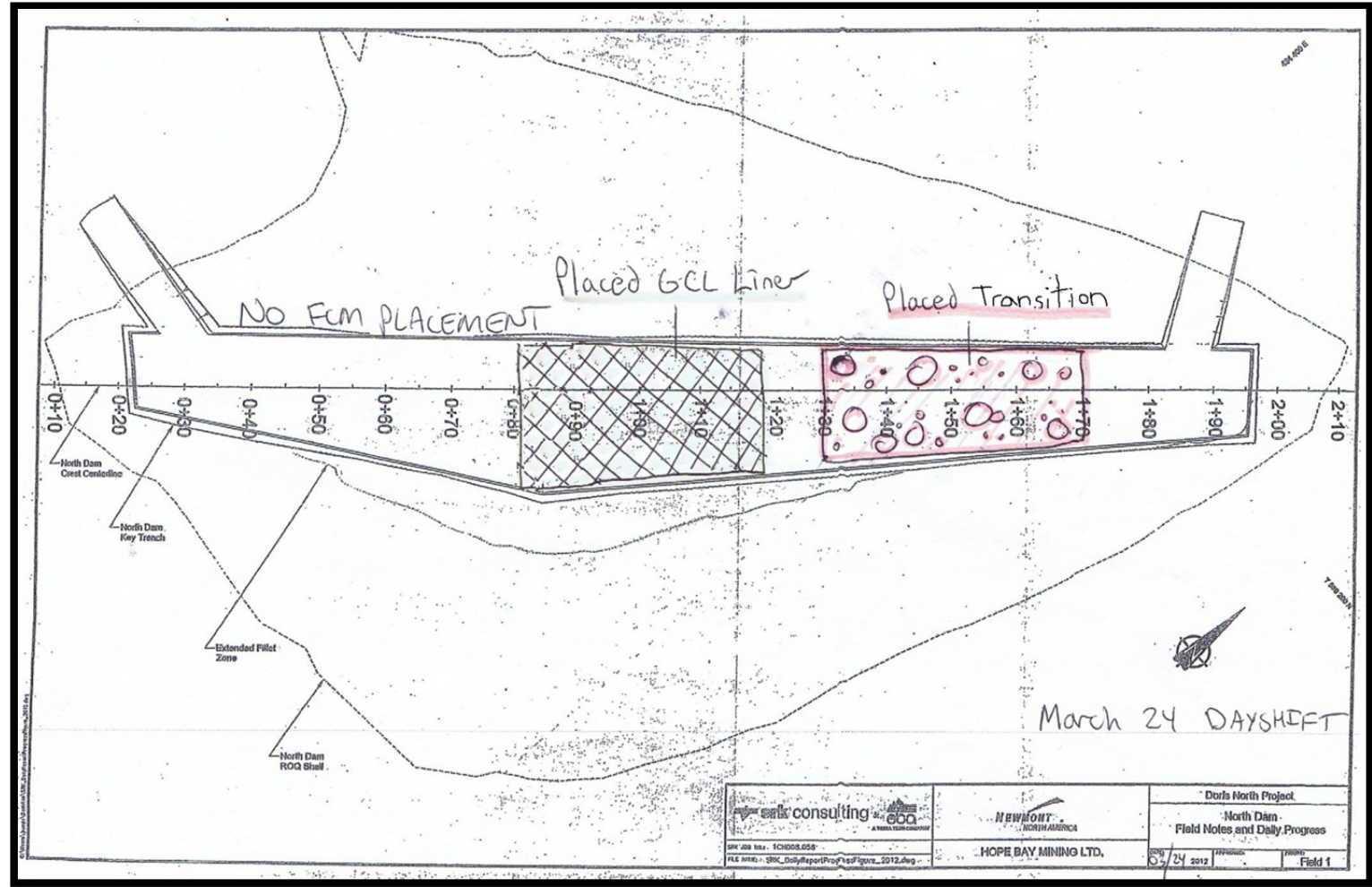
**Photo 23:** ~NWN view of Overliner material placement progress. Note that the survey stakes were attempted to be removed from a given area before the packer traveled over the Overliner material surface.



**Photo 24:** ~ NE view of the end of today's Overliner placement. Note ~15m of CL still remained exposed at the end of the shift.

**FIGURES:**

**Figure 1:** Dayshift North Dam Progress Figure



**Figure 2:** Nightshift North Dam Progress Figure

