

## **Appendix N: Correspondence**

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**From:** [Mark Valeriote](#)  
**To:** [Wade, Lowell](#); [Rykaart, Maritz](#)  
**Cc:** ["Nigel Goldup"](#); ["Kevin Mather"](#); ["Greg Blaylock"](#)  
**Subject:** North Dam - Quality Assurance Program  
**Date:** Thursday, January 20, 2011 8:37:38 AM  
**Attachments:** [Quality Assurance Plan.pdf](#)

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Wade,

When we met in Vancouver on Wednesday January 5<sup>th</sup>, and during the subsequent discussion of the Thursday (January 6<sup>th</sup>) conference call both SRK and Nuna were advised of the following:

- SRK's construction surveillance team will conduct all materials testing (Quality Assurance) required to support the project.
- Nuna will not be required to duplicate effort by conducting materials testing to support quality control.

The main purpose of the email message (dated January 7, 2011 @ 2:48 PM MST) was to document that Nuna is not required to duplicate effort and conduct material testing. However, they still have quality control activities that they must perform during construction. Nuna will construct and shall provide "Quality Control" during construction of the North Dam. Nuna shall conduct their activities to ensure quality construction. Quality control utilizes operation techniques and activities to fulfill the requirement for quality. It involves techniques that monitor a process and eliminate causes of unsatisfactory performance. It is Nuna's responsibility to perform these quality control checks

The SRK Consulting (SRK) construction surveillance will provide "Quality Assurance" during construction of North Dam as outlined in the "Technical Specifications". SRK will monitor the construction of the North Dam at the Doris North Project to ensure that the dam is constructed in accordance with the "Issued for Construction" specifications and drawings. The attached memorandum provides a general outline of the expectations related to quality assurance that the SRK construction surveillance team will provide. This outline should not be construed as being a total sum of quality assurance activities required during construction. The outline should be used as a minimum guideline to ensure that the dam is constructed, and all pertinent data is collected to document it is in accordance with the design intent

Regards,

Mark Valeriote  
Construction Manager  
JDS Energy & Mining Inc.

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## MEMORANDUM

To: Lowell Wade (SRK), Maritz Rykaart (SRK)

Cc: Nigel Goldup (EBA), Kevin Mather (JDS), Greg Blaylock (JDS)

Date: January 20, 2011

From: Mark Valeriote (JDS)

### **RE: North Dam – Quality Assurance Program**

The SRK Consulting (SRK) construction surveillance team will monitor the construction of the North Dam at the Doris North Project to ensure that the dam is constructed in accordance with the “Issued for Construction” specifications and drawings. SRK will provide “Quality Assurance” during construction of North Dam as outlined in the “Technical Specifications”. SRK will provide the following services:

- Ensure that the various zones and ancillary materials (i.e., geosynthetic clay liner, horizontal thermosyphon system and instrumentation) are constructed or installed at the intended location;
- Ensure that dam construction is in accordance with the design intent;
- Evaluate the impact of situations where adherence to the specifications is not possible and to advise the Owner’s Representative (JDS Energy & Mining Inc.) of potential consequences and alternative procedures;
- Interact with the Owner’s Representative (JDS Energy & Mining Inc.) and the contractor to review and approve work methodology or to suggest, review, and approve construction alternatives where they will benefit the project;
- Collect pertinent data and report on a regular basis to the Owner’s Representative (JDS Energy & Mining Inc.);
- Make observations and document construction details that will benefit design and construction of future frozen core dams required at the Hope Bay Project; and
- Prepare as-builts drawings and report.

SRK’s duties, responsibilities and objectives for this project relate directly to the objectives stated above. The primary function of SRK is to ensure that all plans, designs and specifications are implemented.

It is not the intent of the above to unreasonably restrict changes to the drawings and specifications where these will benefit the project. However, the implications of these changes must be fully considered and discussed with SRK and the Owner's Representative (JDS Energy & Mining Inc.). Appropriate documentation must be provided to properly document any changes.

The construction activities that will be monitored (presented in no particular order) are as follows:

1. Material preparation (Table 1.1);
2. Excavating and backfilling key trench (Table 1.2);
3. Installation of geosynthetic clay liner (Table 1.3);
4. Installation of horizontal thermosyphon system (Table 1.4);
5. Construct dam above key trench (Table 1.5); and
6. Installation of instrumentation (Table 1.6).

**Table 1.1**  
**CONSTRUCTION ACTIVITY-MATERIAL PREPARATION**

Criteria	Responsibility	
	Contractors (QC)	SRK (QA)
<b>STOCKPILE</b>	<b>CRUSHING OPERATION</b>	
<ul style="list-style-type: none"> <li>Construct core and transition material stockpiles in such a manner to avoid segregation.</li> </ul>	<ul style="list-style-type: none"> <li>Check wear on screens.</li> <li>Check crusher openings.</li> </ul>	<ul style="list-style-type: none"> <li>Witness crushing operation when on site.</li> </ul>
<b>CRUSHING OPERATION</b>	<b>STOCKPILE OF CRUSHED MATERIAL</b>	
<ul style="list-style-type: none"> <li>Core and transition materials to be produced by crushing and screening.</li> <li>Use adequate equipment and dumping techniques to avoid segregation.</li> <li>To excavate stockpile, use appropriate loading equipment to adequately mix materials.</li> <li>Use reasonable precaution to minimize incorporation of snow, ice and frozen material in stockpiles.</li> </ul>	<ul style="list-style-type: none"> <li>Regularly inspect stockpiles and observe stockpiling methods.</li> <li>Reject material contaminated or containing snow, ice or frozen materials.</li> <li>Identify each stockpile.</li> </ul>	<ul style="list-style-type: none"> <li>Inspect stockpile site and advise Contractor about deficiencies to be corrected.</li> <li>Witness construction of stockpiles.</li> <li>Review adequacy of equipment.</li> </ul>
	<b>TESTING</b>	
	<ul style="list-style-type: none"> <li>Fill material not meeting specification to be reprocessed or wasted.</li> <li>Perform routine gradation testing for core and transition materials until the time when SRK's QA is onsite to take over this activity.</li> </ul>	<ul style="list-style-type: none"> <li>Perform routine gradation testing for core and transition materials when ready to assume this responsibility from Contractor's QC subcontractor.</li> <li>Test results to be available within 24 hours after each test is completed.</li> <li>Perform additional testing, as appropriate.</li> <li>Advise Contractor about fill material not meeting specification.</li> <li>Check sampling and testing procedures.</li> </ul>
	<b>REPORTS</b>	
		<ul style="list-style-type: none"> <li>Submit weekly progress report of crushing/blending/stockpiling operations.</li> <li>Submit weekly laboratory test results.</li> <li>Submit final report and as-built drawings.</li> </ul>

**Table 1.2**  
**CONSTRUCTION ACTIVITY-EXCAVATING AND BACKFILLING KEY TRENCH**

Criteria	Responsibility	
	Contractors (QC)	SRK (QA)
<ul style="list-style-type: none"> <li>Set out excavation limits.</li> <li>Foundation preparation: -Key Trench Foundation Below core shall be excavated into perennially frozen soil to a depth deemed acceptable by SRK.</li> <li>Excavate key trench to lines, grades and dimensions indicated on drawings or as directed by SRK.</li> <li>Keep key trench excavation free of water.</li> <li>Dispose excavated material.</li> <li>Backfill key trench with material types shown on drawings.</li> <li>Prior to backfill, key trench shall be free of debris, snow, ice and water.</li> <li>Place backfill in layers of core material at 0.25m thickness.</li> <li>Compact backfill material as outlined in the specifications.</li> </ul>	<b>SUBMITTAL</b>	
	<ul style="list-style-type: none"> <li>As per specification requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Review and approve submittals.</li> <li>Conduct each type of testing at a frequency defined in the Technical Specifications.</li> </ul>
	<b>SURVEY</b>	
	<ul style="list-style-type: none"> <li>For survey activities, use appropriate survey control.</li> <li>Check limits of area to be excavated.</li> </ul>	<ul style="list-style-type: none"> <li>Provide horizontal and vertical survey data for layout..</li> <li>Define excavation depth.</li> <li>Review survey procedure.</li> <li>Witness survey activities.</li> <li>Review survey records.</li> <li>Review excavation depth.</li> </ul>
	<b>FOUNDATION PREPARATION</b>	
	<ul style="list-style-type: none"> <li>Visual inspection of foundations.</li> </ul>	<ul style="list-style-type: none"> <li>Establish definition of acceptable foundation.</li> <li>Witness foundation preparation and approve acceptable foundation.</li> </ul>
	<b>DEWATERING</b>	
	<ul style="list-style-type: none"> <li>Check adequate dewatering (if required).</li> </ul>	<ul style="list-style-type: none"> <li>Witness dewatering measures (if required).</li> </ul>
	<b>KEY TRENCH EXCAVATION</b>	
	<ul style="list-style-type: none"> <li>Check limits of key trench excavations.</li> <li>Penetrate key trench into frozen soil as determined by SRK.</li> <li>Inspect condition of key trench bottom.</li> </ul>	<ul style="list-style-type: none"> <li>Review survey records.</li> <li>Approve completed excavation.</li> </ul>

**Table 1.2 (Cont'd)**

<b>Criteria</b>	<b>Responsibility</b>	
	<b>Contractors (QC)</b>	<b>SRK (QA)</b>
	<b>BACKFILLING</b>	
	<ul style="list-style-type: none"> <li>• Visual inspection of materials, lift thickness and number of passes of compactor.</li> </ul>	<ul style="list-style-type: none"> <li>• Witness backfill activities.</li> <li>• Ensure correct interpretation of specifications concerning lift thickness and compaction.</li> <li>• Inspect site conditions prior to backfilling.</li> </ul>
	<b>REPORTS</b>	
		<ul style="list-style-type: none"> <li>• End of shift report covering observations and laboratory test results.</li> <li>• Weekly progress report.</li> <li>• As-built drawings and report.</li> </ul>

**Table 1.3**  
**CONSTRUCTION ACTIVITY-DAM GEOSYNTHETIC CLAY LINER**

Criteria	Responsibility	
	Contractors (QC)	SRK (QA)
<ul style="list-style-type: none"> <li>• Install geosynthetic clay liner (GCL)</li> <li>• Prepare uniform and smooth surfaces on which GCL is to be placed.</li> <li>• Place bedding on prepared surface, where required.</li> <li>• GCL to be placed in intimate contact with surface being covered and in a direction perpendicular to the dam centerline.</li> <li>• Overlap adjacent width of GCL by at least 500 mm.</li> <li>• Construction equipment not to travel directly on GCL.</li> <li>• After placement of GCL, cover with core material.</li> </ul>	<b>SUBMITTAL</b>	<ul style="list-style-type: none"> <li>• Review submittal.</li> </ul>
	<ul style="list-style-type: none"> <li>• As per specification.</li> </ul>	<ul style="list-style-type: none"> <li>• Witness and approve surface preparation.</li> </ul>
	<b>INSTALLATION</b>	<ul style="list-style-type: none"> <li>• Visual inspection.</li> <li>• Witness placement.</li> <li>• Approve correction measures of damaged sections.</li> </ul>
	<ul style="list-style-type: none"> <li>• Check surface preparation.</li> <li>• Check thickness of bedding and cover material.</li> <li>• Ensure that GCL placement conforms to specifications.</li> <li>• Ensure that sections of GCL are anchored.</li> <li>• Replace damaged sections during installation.</li> <li>• Check the 500 mm overlap between adjacent sections.</li> <li>• Ensure that core material covers the GCL.</li> </ul>	
	<b>REPORTS</b>	
	<ul style="list-style-type: none"> <li>• Submit as-built drawing related to GCL installation.</li> </ul>	<ul style="list-style-type: none"> <li>• Submit weekly progress reports.</li> <li>• Prepare final as-built report and drawings.</li> </ul>

**Table 1.4**  
**CONSTRUCTION ACTIVITY-HORIZONTAL THERMOSYPHONS**

Criteria	Responsibility	
	Contractors (QC)	SRK (QA)
<ul style="list-style-type: none"> <li>Materials to meet minimum specification requirements.</li> <li>Installation procedures to be in accordance with manufacturer's recommendations and technical specifications.</li> <li>Surveys to be referenced to survey control monuments.</li> </ul>	<b>SUBMITTALS</b> <ul style="list-style-type: none"> <li>Submit detailed material lists, installation procedures and sequence.</li> </ul>	<ul style="list-style-type: none"> <li>Review and approve submittals.</li> </ul>
	<b>INSTALLATION</b> <ul style="list-style-type: none"> <li>Ensure that approval to proceed with installation has been obtained prior to commencing.</li> <li>Install as per manufacturer's procedures and specifications.</li> <li>Verify thermosyphons function properly prior to burial.</li> <li>Verify that locations of instruments are in accordance with drawings.</li> <li>Bury thermosyphons only after functional status has been checked and approval to proceed obtained.</li> <li>Bury thermosyphons as per specifications and approved routing.</li> </ul>	<ul style="list-style-type: none"> <li>Provide approval to proceed.</li> <li>Review survey records, check and approve.</li> <li>Witness installation.</li> <li>Review daily reports.</li> <li>Review survey data</li> <li>Jointly with QC check functional status of thermosyphon system.</li> <li>Approve prior to backfilling.</li> <li>Visual inspection.</li> <li>Prior to final acceptance, perform equipment check.</li> </ul>
	<b>REPORTS</b> <ul style="list-style-type: none"> <li>Submit as-built drawing reports, including details of installation.</li> </ul>	<ul style="list-style-type: none"> <li>Submit weekly progress reports.</li> <li>Submit final as-built report and drawings.</li> </ul>

**Table 1.5**  
**CONSTRUCTION ACTIVITY-EMBANKMENT FOR DAM ABOVE KEY TRENCH**

Criteria	Responsibility	
	Contractors (QC)	SRK (QA)
<ul style="list-style-type: none"> <li>Foundation preparation: - Core, transition and shell foundation Remove all snow, ice, deleterious material, surface vegetation, organic soils, from ground surface within limits indicated on drawings.</li> <li>Carry out placement on acceptable foundation.</li> <li>Fill material gradation to meet specifications.</li> <li>Control placement of zones to lines and grades.</li> <li>Final upstream and downstream slopes are shown on drawings.</li> <li>Minimize fill material segregation.</li> <li>Provide homogeneous, well-graded material.</li> <li>Commence placement in specified lift thickness before compaction as outlined in the specifications.</li> <li>Compact each lift of the various material as outlined in the specifications.</li> </ul>	<b>PRIOR TO EMBANKMENT PLACEMENT:</b> <ul style="list-style-type: none"> <li>Ensure that foundation and surface of previously placed lift has been approved prior to placement.</li> <li>Verify layout and marking of the dam alignment.</li> </ul>	<ul style="list-style-type: none"> <li>Review and approve submittals.</li> <li>Approve dam foundation and surface of previously placed lift prior to placement.</li> <li>Check survey records.</li> <li>Review and approve placement technique.</li> </ul>
	<b>EMBANKMENT PLACEMENT:</b> <ul style="list-style-type: none"> <li>Placement to be carried out according to approved or adjusted construction sequence.</li> <li>Check relative advance of various zones.</li> <li>Ensure that fill material is placed without segregation.</li> <li>Ensure oversize in ROQ material is pushed to outside slope.</li> <li>Survey outer slopes.</li> <li>Verify that vibratory roller meets the specification requirements.</li> <li>Control lift thickness and number of passes of vibratory roller.</li> <li>Control placement by survey control and visual inspection.</li> </ul>	<ul style="list-style-type: none"> <li>Review and approve construction sequence.</li> <li>Review survey records and request additional surveys if required.</li> <li>Review and check incidences of segregation.</li> <li>Witness fill and compaction activities.</li> <li>Review shift report and conduct additional survey controls, visual inspection, and gradation testing, as required.</li> </ul>
	<b>UNNACCEPTABLE CONDITIONS</b> <ul style="list-style-type: none"> <li>Check that following unacceptable conditions are not present: -Deviation from lines, grades, and material thickness. -Material gradation not meeting specification requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Review daily reports.</li> <li>Carry out routine visual inspection to ensure that unacceptable conditions are not present.</li> </ul>

**Table 1.5 (Cont'd)**

<b>Criteria</b>	<b>Responsibility</b>	
	<b>Contractors (QC)</b>	<b>SRK (QA)</b>
	<b>CORRECTIVE MEASURES</b>	
	<ul style="list-style-type: none"><li>• Verify that unacceptable materials listed above have been removed and replaced with materials conforming to specifications.</li></ul>	<ul style="list-style-type: none"><li>• Approve and witness corrective measures.</li></ul>
	<b>REPORTS</b>	
	<ul style="list-style-type: none"><li>• Submit as-built drawings.</li></ul>	<ul style="list-style-type: none"><li>• Submit following reports by end of shift:<ul style="list-style-type: none"><li>-Laboratory test results.</li><li>-Incidences of segregation of various material zones.</li><li>-Incidences of placement not conforming to lines and grades.</li><li>-Visual observations.</li></ul></li><li>• Submit weekly progress reports.</li><li>• Submit final as-built report and drawings.</li></ul>

**Table 1.6**  
**CONSTRUCTION ACTIVITY-INSTRUMENTATION**

Criteria	Responsibility	
	Contractors (QC)	SRK (QA)
<ul style="list-style-type: none"> <li>Types of instruments complete with related components to be installed: -Ground temperature cables. -Settlement monuments.</li> </ul>	<b>SUBMITTALS</b>	
	<ul style="list-style-type: none"> <li>Submit detailed material lists, installation procedures and sequence.</li> </ul>	<ul style="list-style-type: none"> <li>Review and approve submittals.</li> <li>Submit calibration data for ground temperature cables.</li> </ul>
<ul style="list-style-type: none"> <li>Instruments and materials to meet minimum specification requirements.</li> <li>Instruments and materials to be verified for proper operation upon receiving on site.</li> <li>Maximum allowable offset at hole collar to be 100 mm in any direction.</li> <li>Installation procedures to be in accordance with manufacturer's recommendations and technical specifications.</li> <li>Surveys to be referenced to survey control monuments.</li> </ul>	<b>INSTALLATION</b>	
	<ul style="list-style-type: none"> <li>Ensure that approval to proceed with installation has been obtained prior to commencing.</li> <li>Ensure that drilling is carried out so as to protect holes from wall caving, clogging or contamination at all times.</li> <li>Ensure that offset measured at the hole collars and hole orientation satisfy requirements.</li> <li>Install as per manufacturer's procedures and specifications.</li> <li>Verify that instruments function properly prior to installation and/or burial.</li> <li>Verify that locations of instruments are in accordance with drawings.</li> <li>Verify installation depths specified for each instrument as per drawings.</li> <li>Bury ground temperature cables only after functional status has been checked and approval to proceed obtained.</li> <li>Bury cables as per specifications and approved routing.</li> </ul>	<ul style="list-style-type: none"> <li>Provide approval to proceed.</li> <li>Witness drilling activities.</li> <li>Review, check and approve survey records.</li> <li>Witness installation.</li> <li>Review daily reports.</li> <li>Review survey data.</li> <li>Check installation depths.</li> <li>Approve installation prior to backfilling cables.</li> <li>Visual inspection.</li> <li>Prior to final acceptance, perform instrument readings and check equipment condition.</li> </ul>

**Table 1.6 (Cont'd)**

<b>Criteria</b>	<b>Responsibility</b>	
	<b>Contractors (QC)</b>	<b>SRK (QA)</b>
	<b>REPORTS</b>	
		<ul style="list-style-type: none"><li>• Submit weekly progress reports.</li><li>• Check data for consistency and response of adjacent instruments.</li><li>• Submit as-built reports, including details of installation for each instrument complete with survey data for instruments and cables, initial readings and other readings taken during various stages of construction.</li></ul>

**From:** [Mark Valeriote](#)  
**To:** [Rykaart, Maritz](#)  
**Cc:** [Wade, Lowell](#)  
**Subject:** Drill and Blast  
**Date:** Tuesday, February 01, 2011 8:43:56 AM

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Maritz,

I would like to do a trial blast (small area, limited number of holes, etc.) to assess what we may ultimately require for hole spacing, depth, load factor, etc. I acknowledge and appreciate the ultimate need to assess the percolation data; however, I personally do not believe we will see any surprises in the NE area of the dam. I am prepared to drill and blast a small area to what you now show as your design depth to start the process.

I don't feel that there is risk with this suggestion.

Ultimately, I hoping we may possibly reduce the current key trench depth based on the verbal information that I was given regarding the percolation testing.

Mark Valeriote  
Construction Manager  
JDS Energy & Mining Inc.

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**From:** [Mark Valeriote](#)  
**To:** ["Greg Blaylock"](#); [Rykaart, Maritz](#); [Wade, Lowell](#)  
**Subject:** FW: North Dam Key Trench Blast Design  
**Date:** Tuesday, February 01, 2011 6:45:39 AM  
**Attachments:** [ND-KT-001.pdf](#)  
[North Dam Blast Design.pdf](#)

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**From:** Mike Price [mailto:mikepr@nunalogistics.com]  
**Sent:** Tuesday, February 01, 2011 7:39 AM  
**To:** Mark Valeriote; Trevor Herd  
**Cc:** Doug Fielding  
**Subject:** FW: North Dam Key Trench Blast Design

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**From:** Mike Price  
**Sent:** Saturday, January 29, 2011 6:54 PM  
**To:** dougf@jdsmining.ca  
**Cc:** Gary Sodhi; Glen Stewart; Nick Stoneberger; Dave Sherlock; 'shanefreeman@mccawnorth.com'  
**Subject:** North Dam Key Trench Blast Design

All,

Attached is the blast design for the North Dam Key Trench  
Let me know if you have any questions.

Doug, could you pass this along to the members of JDS that require the information.

Thanks

**Mike Price**  
Site Engineer - Hope Bay Project  
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# North Dam

## Blast Design Parameters ( 115mm borehole ) Key Trench

January 28, 2011

### Notes:

- Bulk product used will be Anfo.
- All design work will be based on equilateral blast patterns.
- Borehole diameter 115mm.
- Original target powder factor -  $0.70 \text{ Kg/m}^3$
- Blast Holes will be matted.
- The need for further modifications will be assessed after initial blasts.

### Dimensions:

Spacing – 2.25m

Burden – 1.95m

Sub Drill – 0.5m

BCM per lineal meter drilled –  $4.40 \text{ m}^3$

**From:** [Rykaart, Maritz](#)  
**To:** [Greg Blaylock](#)  
**Cc:** [Mark Valeriote](#); [Wade, Lowell](#); [Nigel Goldup \(NGoldup@eba.ca\)](#); [Kurylo, John](#); [Miskolczi, Iozsef](#); [Bay, Hope](#)  
**Subject:** Perc Test Results and Key Trench Depth Determination  
**Date:** Thursday, February 03, 2011 4:46:51 PM  
**Attachments:** [DN-ND-29 Temp-Percolation Test Locations.pdf](#)  
[North Dam Percolation Test Results Final.xls](#)

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Greg

The percolation tests along the key trench footprint of the North Dam have been completed and the test data have been analyzed and reviewed. The test results are presented in the attached spreadsheet as well as the PDF drawing for your information.

Please note that all the drill logs are not yet complete, and will take another few days to be finished as the field lab is running at capacity, with the bottleneck being the moisture content determinations. None-the less, we believe that we have sufficient information to make a call on whether a design modification on the key trench is required.

In determining whether a design modification is required, the following design considerations were taken into consideration:

1. The evaporator pipes must have a constant slope along the base of the key trench and that slope cannot be less than 5% (1:20). The only slope change allowed is at the north and south end where the pipes turn towards the radiators, but still these slopes cannot be less than 5%.
2. The base of the key trench should be at least 1.0 m below the static level observed in the percolation tests in all upstream locations.
3. The inflection point between the north and south evaporator pipe sets must not change.
4. The bottom liner must be below original ground at any point along the dam alignment.

Taking these elements into consideration, and after taking into account the percolation test results, as well as the drill logs completed to date we conclude that NO CHANGE is justified to the current key trench design grades. We have discussed this with our colleagues at EBA and they are in agreement with our conclusion.

Notwithstanding this statement, it should be noted that additional excavation of the central section of the key trench will be required to remove organic material at depth (i.e. the "peat" zone identified on our drawings between chainage 0+90 and 1+05). Exact guidelines pertaining to the extent of this excavation will be provided in the coming days as we obtain the rest of the lab test data to complete the drill logs. In addition, there may be some additional excavation required between chainage 0+60 and 0+80 along the downstream side where the key trench is at its shallowest. A field determination as to the extent of additional excavation will be made once the initial excavation has been completed.

Should you require further explanation of our conclusions we would be happy to convene a conference call tomorrow to discuss the matter.

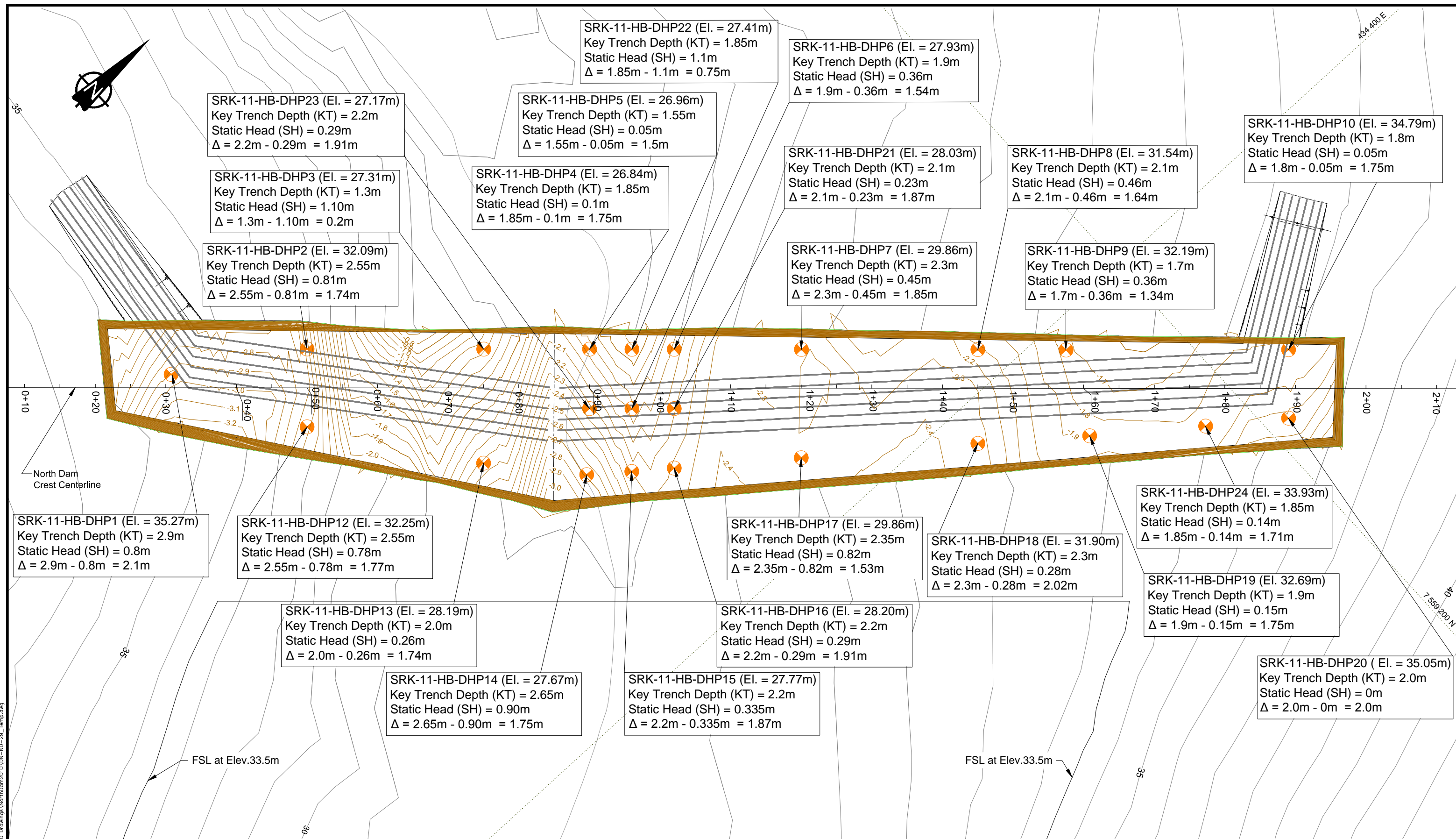
Regards

Maritz

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Maritz Rykaart, Ph.D., P.Eng.  
Principal  
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*SRK Consulting (Canada) Inc.  
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J:\01\_SITES\Hope Bay\ACAD\2010 Drawings\North Dam\DN-ND-29\_Temp.dwg

<div> SRK Consulting Engineers and Scientists Vancouver B.C.</div> <div>SRK JOB NO.: 1CH008.033 FILE NAME: DN-ND-29_Temp.dwg</div>		<div> NEWMONT NORTH AMERICA</div> <div>HOPE BAY MINING LTD.</div>	Doris North Project		
			North Dam Percolation Test Borehole Locations		
		DATE: Feb. 2011		APPROVED: EMR/LW	FIGURE: 1

BH #	Sta.	Northing (m)	Easting (m)	Ground Elev. (m)	Date of Reading	Time of Reading	Elapsed Time (min)	Water Drop (m)	
1	0+30	7,559,090.0	434,321.1	38.191	30-Jan-11	11:35	0	0.000	
					30-Jan-11	11:36	1	-0.200	
					30-Jan-11	11:37	2	-0.340	
					30-Jan-11	11:40	5	-0.600	
					30-Jan-11	11:45	10	-0.690	
					30-Jan-11	11:50	15	-0.720	
					30-Jan-11	12:05	30	-0.760	
					30-Jan-11	12:20	45	-0.800	
					30-Jan-11	12:35	60	-0.800	
					30-Jan-11	13:00	85	-0.810	
					30-Jan-11	14:58	203	-0.800	
					30-Jan-11	16:31	296	-0.800	
2	0+50	7,559,107.0	434,331.4	32.446	1-Feb-11	12:20	3225	ice	
					30-Jan-11	12:15	0	-0.200	
					30-Jan-11	12:14	1	-0.480	
					30-Jan-11	12:15	2	-0.560	
					30-Jan-11	12:18	5	-0.640	
					30-Jan-11	12:23	10	-0.720	
					30-Jan-11	12:34	21	-0.750	
					30-Jan-11	12:43	30	-0.780	
					30-Jan-11	13:05	52	-0.810	
					30-Jan-11	15:00	167	-0.810	
					30-Jan-11	16:10	237	-0.810	
					30-Jan-11	20:13	480	-0.810	
3	0+75	7,559,126.0	434,346.2	27.231	1-Feb-11	12:20	3187	-0.810	
					30-Jan-11	16:35	0	0.000	
					30-Jan-11	16:34	1	-0.520	
					30-Jan-11	16:35	2	-0.870	
					30-Jan-11	16:38	5	-0.930	
					30-Jan-11	16:43	10	-0.930	
					30-Jan-11	16:48	15	-0.930	
					30-Jan-11	17:03	30	-0.930	
					30-Jan-11	17:18	45	-0.930	
					30-Jan-11	17:31	58	-0.930	
					30-Jan-11	18:03	90	-0.930	
					30-Jan-11	18:48	135	-0.930	
4	0+90	7,559,137.0	434,356.2	26.773	1-Feb-11	12:20	2927	-1.100	
					30-Jan-11	16:52	0	0.000	
					30-Jan-11	16:58	1	-0.040	
					30-Jan-11	16:59	2	-0.060	
					30-Jan-11	17:02	5	-0.060	
					30-Jan-11	17:07	10	-0.070	
					30-Jan-11	17:18	21	-0.080	
					30-Jan-11	17:27	30	-0.100	
					30-Jan-11	18:01	64	-0.100	
					30-Jan-11	18:40	103	-0.100	
					1-Feb-11	17:20	2803	ice	
					30-Jan-11	17:47	0	0.000	
5	0+96	7,559,141.0	434,362.2	27.192	30-Jan-11	17:48	1	-0.010	
					30-Jan-11	17:49	2	-0.040	
					30-Jan-11	17:57	10	-0.050	
					1-Feb-11	17:20	2853.0	ice	
6	1+02	7,559,145.0	434,366.5	27.854	31-Jan-11	12:44	0	0.000	
					31-Jan-11	12:45	1	-0.090	
					31-Jan-11	12:46	2	-0.230	
					31-Jan-11	12:49	5	-0.300	
					31-Jan-11	12:54	10	-0.330	
					31-Jan-11	12:59	15	-0.360	
					31-Jan-11	14:05	81	-0.360	
					1-Feb-11	17:30	1726	ice	
7	1+20	7,559,159.0	434,376.6	30.134	1-Feb-11	12:05	0	0.000	
					1-Feb-11	12:06	1	-0.230	
					1-Feb-11	12:09	4	-0.300	
					1-Feb-11	12:19	14	-0.410	
					1-Feb-11	12:41	36	-0.440	
					1-Feb-11	13:15	70	-0.440	
					1-Feb-11	17:30	325	-0.450	
8	1+45	7,559,177.0	434,395.6	31.506	31-Jan-11	13:27	0	0.000	
					31-Jan-11	13:28	1	-0.300	
					31-Jan-11	13:29	2	-0.350	
					31-Jan-11	13:32	5	-0.380	
					31-Jan-11	13:37	10	-0.410	
					31-Jan-11	13:42	15	-0.450	
					31-Jan-11	14:09	42	-0.460	
					1-Feb-11	17:00	1653	ice	
9	1+65	7,559,186.0	434,404.0	32.069	31-Jan-11	13:48	0	0.000	
					31-Jan-11	13:49	1	-0.250	
					31-Jan-11	13:50	2	-0.300	
					31-Jan-11	13:57	9	-0.360	
					31-Jan-11	14:19	31	-0.360	
					1-Feb-11	16:58	1630	ice	
10	1+89	7,559,210.0	434,424.9	34.542	28-Jan-11	13:49	0	0.000	
					28-Jan-11	13:50	1	0.000	
					28-Jan-11	13:51	2	0.000	
					28-Jan-11	13:57	8	-0.050	
11	Not drilled								
12	0+50	7,559,100.0	434,339.6	32.559	30-Jan-11	10:56	0	-0.240	
					30-Jan-11	10:57	1	-0.440	
					30-Jan-11	10:59	3	-0.510	
					30-Jan-11	11:01	5	-0.570	
					30-Jan-11	11:07	11	-0.700	
					30-Jan-11	11:14	18	-0.750	
					30-Jan-11	11:26	30	-0.760	
					30-Jan-11	11:42	46	-0.770	
					30-Jan-11	11:56	60	-0.770	
					30-Jan-11	13:03	127	-0.780	
					30-Jan-11	14:52	236	-0.780	
					30-Jan-11	16:28	333	-0.780	
13	0+75	7,559,115.0	434,360.2	28.104	1-Feb-11	10:51	0	0.000	
					1-Feb-11	10:52	1	-0.140	
					1-Feb-11	10:53	2	-0.170	
					1-Feb-11	10:56	5	-0.200	
					1-Feb-11	11:01	10	-0.250	
					1-Feb-11	11:06	15	-0.250	
					1-Feb-11	11:26	35	-0.260	
					1-Feb-11	12:47	116	-0.260	
					1-Feb-11	13:19	148	-0.260	

**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Wade, Lowell](#); [Miskolczi, Iozsef](#); [Kurylo, John](#); [Greg Blaylock](#)  
**Subject:** North Dam "Soft" Spot in Key Trench  
**Date:** Tuesday, February 15, 2011 3:53:52 PM  
**Attachments:** [RE Doris North - North Dam Additional Key Trench Excavation.msg](#)

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Mark

As you know there has been some communication today related to an apparent "soft" spot within the base of the key trench. This email pertains to that communication trail, which we have attached as relevant background. Please note that this communication is no way changes the recommendations which we submitted to Document Control earlier today pertaining to removal of peat and ice rich zones in the key trench.

We would like to thank all parties for bringing the "soft" spot issue to our attention so fast and for keeping a level head to make sure we don't make rash decisions, while realizing that there may be some opportunities to save time and money if we react quickly.

We have reviewed all available factual and anecdotal data about this apparent soft material which includes:

1. The visual observations and descriptions provided by our field engineer, supported with photos from site.
2. Discussions between our site and office teams and discussions between our site staff and the Contractor.
3. Review of the drill logs, including both percolation test logs and original drill holes.
4. Review of photos taken during percolation test drilling.
5. Thermal ground temperature data (both historic and our site specific trial)

Based on this collective information we conclude that there is no reason to proceed with additional over-excavation of this "soft" spot area.

As a matter of due diligence, we will be doing some additional material sampling and testing, including salinity testing, of this zone to further characterize and understand the site conditions; however, these tests are not likely to result in us coming to a different conclusion.

To avoid confusion, and to ensure that proper protocol is followed in this matter we have submitted this communication only to you and trust that you will pass the information along to the Contractor as appropriate.

Please do not hesitate to give me a call should you have any questions.

Regards  
Maritz

---

Maritz Rykaart, Ph.D., P.Eng.  
Principal  
Geotechnical Engineering

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**From:** [Wade, Lowell](#)  
**To:** [Rykaart, Maritz](#); [Goldup, Nigel](#); [Horne, Bill](#); [Mark Valeriote](#); [Greg Blaylock](#)  
**Cc:** [Renata Klassen](#); [Orr, Jeff](#); [Miskolczi, Iozsef](#); [Kurylo, John](#); [Miller, Megan](#); [Bay, Hope](#)  
**Subject:** Doris North - North Dam  
**Date:** Saturday, March 05, 2011 11:58:47 AM

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Good Afternoon Everyone,

As discussed on the conference call yesterday, the core material has been observed to excessively "bleed" water both during moisture conditioning in the Frozen Core Plant and during placement. Test data has confirmed that the placed core material does not consistently meet specification with respect to moisture content and saturation.

It is our understanding that placement of core material has temporarily been stopped pending further investigation into the cause of the excess "bleed" water, and development of an appropriate action plan to ensure that placed core material will meet the specifications.

Sincerely,  
Lowell

**Lowell Wade, M.Sc., P.Eng.**  
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**From:** [Miller, Megan](#)  
**To:** [Rykaart, Maritz](#); [Mark Valeriote](#)  
**Cc:** [Wade, Lowell](#); [Renata Klassen](#); [bhorne@eba.ca](#); [Nigel Goldup \(NGoldup@eba.ca\)](#); [kevinm@jdsmining.ca](#); [Greg Blaylock](#); [Kurylo, John](#); [Miskolczi, Iozsef](#); [Bay, Hope](#); [Jeff Orr](#); [jjaramillo@eba.ca](#)  
**Subject:** Hope Bay North Dam - Conference Call Notes  
**Date:** Saturday, March 05, 2011 7:02:00 PM  
**Attachments:** [Notes on Conference Call.pdf](#)

---

Hello,

Please find attached notes from the conference call held yesterday March 4, 2011.

Regards,  
Megan

[Megan Miller, E.I.T.](#)

Staff Consultant

[SRK Consulting \(Canada\) Inc.](#)

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## **Notes on Conference Call: March 4, 2011**

**On Site:** Mark Valeriotte (JDS), Megan Kinsey (SRK), Renata Klassen (EBA), Jeff Orr (EBA), Lowell Wade (SRK), John Jaramillo (EBA), Gary Dang-Vuu (EBA), Nick Stoneberger (Nuna)

**On Line:** Greg Blaylock (JDS), Kevin Mather (JDS), Nigel Goldup (EBA), Bill Horne (EBA), Maritz Rykaart (SRK)

### **Issue #1: Core Material:**

The core material is “bleeding” water too fast resulting in inconsistent saturation and moisture content results for the placed core material. The core material used does fall within the specified design envelope.

### **Possible Cause:**

1. Hypothesis #1 - The core material is very angular and therefore it is not holding the water.
2. Hypothesis #2 – Although material meets spec, it is poorly graded falling rapidly from the upper envelope on the coarse end to the lower envelope on the fines end.

### **Possible Solutions (and associates challenges – cost is an issue for all options):**

1. Add a polymer or additive to the water to increase its viscosity:
  - a. This may require large quantities of product to be flown in. Newmont is not at the top of the Herc list this year so schedule could be an issue.
  - b. Actual mixing and residence time of some polymers may be an issue.
  - c. Exhaustive mixing and testing may be required to get the proper mix design.
  - d. Could be a permitting issue depending on type of polymer.
2. Blend in more crush fines to the core material:
  - a. Not enough product available without more crushing.
  - b. More crushing could affect schedule.
  - c. There might be insufficient ROQ material remaining in Quarry 2 to produce the quantity of fines needed as fines production is only 40% efficient.
  - d. Not sure if adding fines will resolve problem if we believe Hypothesis #1.
3. Blend in overburden soils (marine silts and clays) to the core material to counteract angularity and increase fines:
  - a. Material on overburden dump is solidly frozen and a consistent source of material is not available.
  - b. Mixing would be inconsistent with blending and clumping.
  - c. Even if material could be excavated and handled it could “cake” and form lumps in the FCP.
  - d. Salinity of the soils could compromise the design.
4. Place saturated material from frozen core plant (possibly with a lower water content) and water visibly dry areas with a water truck.

- a. Additional water could also drain out of the material or too much water could be added.
- b. Water could freeze on the surface before it enters the sample.
- c. Results would vary greatly depending on equipment operator.
- d. Not sure if adding water will resolve problem if we believe Hypothesis #1.

**Action Plan:**

1. Mark V. to talk to Newmont geology about polymer availability.
2. Nuna to evaluate what options there are for adding more fines to the core material.
3. SRK/EBA to conduct series of lab tests to check different blends of fines mixes vs. bleeding.
4. Core material samples will be sent to EBA for inspection by Bill/Nigel.
5. Possible full-scale test of “fines” though FCP to see how material behaves unconfined.
6. Group to revisit issue in near term once more information becomes available.

**Issue #2: “Soft Spot”:**

An area was identified during excavation of the key trench where the material was “softer” than the surrounding material. The area is about 15 m wide and extends across the entire width of the key trench.

**Possible Cause:**

Pocket of hyper-saline soil. This has been confirmed by the two samples tested from within the area at measured salinities of 85 and 90 ppm respectively.

**Possible Solutions:**

1. Worst case scenario – excavate the affected area and replace with saturated core material.
2. Best case scenario – no action required.

**Action Plan:**

1. Samples from the percolation test holes (SRK-11-HB-DHP16 and SRK-11-HB-DHP17) are being sent to EBA Edmonton for salinity testing. Testing will be done along entire profile of drill holes to determine the vertical extent of hyper-salinity.
2. Once these results are available SRK/EBA will provide recommendation on action plan.
3. Samples from 2 other percolation test holes (selected at random) are being sent to EBA Edmonton for salinity testing. This is normal due diligence as a part of construction activities and was planned at the outset.

**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Greg Blaylock](#); [Wade, Lowell](#); [Miller, Megan](#); [Bay, Hope](#); [Renata Klassen](#); [Orr, Jeff](#); ["Goldup, Nigel"](#); [bhorne@eba.ca](mailto:bhorne@eba.ca)  
**Subject:** Core Material Placement  
**Date:** Monday, March 07, 2011 10:35:50 AM  
**Attachments:** [2978\\_001.pdf](#)  
[Fines Content Trials Summary - 1 to 1 Blend.pdf](#)  
[Fines Content Trials Summary - Fines.pdf](#)  
[Compaction Testing - First Trial - Fillet.pdf](#)  
[Compaction Testing Summary.pdf](#)

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Mark

Based on our phone conversation this morning please find our formal statement for going forward:

Core material was placed in the North Dam key trench on March 3 and March 5. In-situ test data confirmed that the stated specification requirements for saturation and compaction could not consistently be met due to excessive bleeding of water from the placed material (see attached data sheets). Lab trials were conducted on March 4 and 5 to determine what could be done to overcome the bleeding problem. Two field trials were conducted on March 6 for the same purpose. The first field trial was done using only "fines" material and yielded results that fully meet specifications with no bleed water (see attached data sheet). The second field trial consisted of a 1:1 ratio of core material to "fines" by volume. This test did show signs of bleed water, and some of the results did not meet specification (see attached data sheet).

Review of the core material placed on March 1, confirms that the material placed north of station 1+20 meets specification, although right on the lower end) and can be left in place. Material to the south of this station must however be removed as it's degree of saturation is too low (see attached data sheet). Review of the core material placed on March 3, confirms that significant portions of the placed material does not meet the specified saturation or compaction limits (see attached data sheet). This material should therefore be removed in its entirety. The test pads placed on March 6 was however placed over portions of this compromised material and on closer review and in the essence of moving ahead expeditiously without compromising the integrity of the dam, SRK would be satisfied to leave a portion of this placed material in place provided a strip (at least 3 to 4 m wide) on the downstream side of the key trench is removed and replaced with core material that meets all specifications. The area in question is marked on the attached drawing. In addition, to ensure we have no possible short-circuiting of seepage, we will require the GCL to be extended to the back of the key trench in this area. At first glance we expect the additional GCL would be about 100 m<sup>2</sup>, although this would have to be confirmed.

Wrt the test pads constructed on March 6, all loads conducted with the "fines" met specifications and can be left in place. The first and final loads of the 1:1 mix of "fines" with core material did not meet specification. SRK will visually examine these areas and make a determination on whether it should be removed or may remain in place (these areas are also marked on the attached drawing)

On March 6 the Mark Valeriote requested if construction of the leveling course and core can proceed using "fines" material. SRK is in agreement with this provided compaction and saturation

specifications continue to be met. This material can be placed in any areas of the key trench where no core material has been placed, provided the key trench has been approved for placement. In addition, this material can be placed in any areas over core material that has been placed and reached the minimum freeze-back temperature, with the exception of those zones that have been demarcated for removal as discussed above. Once the compromised material has been removed, "fines" can be placed in those areas as well.

SRK understands that continuing dam construction with the "fines" would result in the constructed dam meeting specification; however, there is limited quantities of this material on site. SRK is therefore actively continuing looking at options that would allow less "fines" to be used in the construction. This includes evaluating alternate mixes of "fines" to core material and considering different "zones" in the core structure. We understand that SRK will work with the EPCM Manager and Contractor to execute further field trials in support of these optimization attempts.

Please advise if you have any questions.

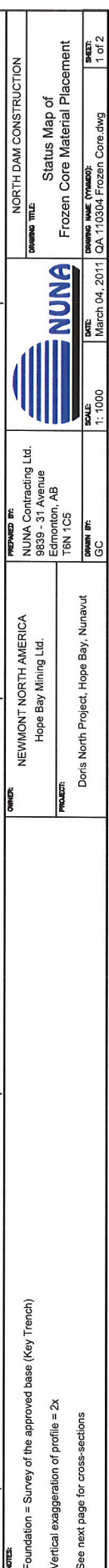
Regards  
Maritz

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Maritz Rykaart, Ph.D., P.Eng.  
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7 March 2011.



**COMPACTION TESTING SUMMARY -1:1 (CORE MATERIAL:FINES) BY VOLUME - LEVELLING COURSE**

Test Number	Date Tested	Load No.	Plant Dial Setting	Location	Elevation/Lift (approx.)	Wet Density (kg/m <sup>3</sup> )	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Degree Saturation (%)
15	2011-03-06	1	22	Key trench, north of "soft spot"	Levelling Course	2147	1920	11.8	83.8	66.7
16	2011-03-06	1	22	Key trench, north of "soft spot"	Levelling Course	2389	2120	12.7	92.6	99.6
17	2011-03-06	1	22	Key trench, north of "soft spot"	Levelling Course	2364	2081	13.6	90.9	99.6
18	2011-03-06	1	22	Key trench, north of "soft spot"	Levelling Course	2344	2129	10.1	93.0	80.5
19	2011-03-06	1	22	Key trench, north of "soft spot"	Levelling Course	2324	2075	12.0	90.6	87.4
20	2011-03-06	2	22	Key trench, north of "soft spot"	Levelling Course	2353	2128	10.6	92.9	84.0
21	2011-03-06	2	22	Key trench, north of "soft spot"	Levelling Course	2398	2160	11.1	94.3	93.0
22	2011-03-06	2	22	Key trench, north of "soft spot"	Levelling Course	2367	2140	10.6	93.4	85.9
23	2011-03-06	2	22	Key trench, north of "soft spot"	Levelling Course	2380	2142	11.1	93.5	90.5
24	2011-03-06	3	23	Key trench, north of "soft spot"	Levelling Course	2418	2193	10.3	95.8	91.8
25	2011-03-06	3	23	Key trench, north of "soft spot"	Levelling Course	2412	2161	11.6	94.4	98.0
26	2011-03-06	3	23	Key trench, north of "soft spot"	Levelling Course	2364	2157	9.6	94.2	80.2
27	2011-03-06	3	23	Key trench, north of "soft spot"	Levelling Course	2417	2192	10.3	95.7	91.5
28	2011-03-06	4	23	Key trench, north of "soft spot"	Levelling Course	2290	2095	9.3	91.5	69.6
29	2011-03-07	4	23	Key trench, north of "soft spot"	Levelling Course	2313	2114	9.4	92.3	72.9
30	2011-03-08	4	23	Key trench, north of "soft spot"	Levelling Course	2107	1940	8.6	84.7	50.3

**COMPACTION TESTING SUMMARY - FINES - CORE - LEVELLING COURSE**

Test Number	Date Tested	Load No.	Plant Dial Setting	Location	Elevation/Lift (approx.)	Wet Density (kg/m <sup>3</sup> )	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)	Compaction (%)	Degree Saturation (%)
1	2011-03-06	1	26.8	Key trench, north of "soft spot"	Levelling Course	2380	2138	11.3	99.7	93.4
2	2011-03-06	1	26.8	Key trench, north of "soft spot"	Levelling Course	2355	2097	12.3	97.8	94.9
3	2011-03-06	1	26.8	Key trench, north of "soft spot"	Levelling Course	2333	2068	12.8	96.4	94.0
4	2011-03-06	2	26.8	Key trench, north of "soft spot"	Levelling Course	2328	2071	12.4	96.6	91.1
5	2011-03-06	2	26.8	Key trench, north of "soft spot"	Levelling Course	2346	2072	13.3	96.6	97.5
6	2011-03-06	3	27.1	Key trench, north of "soft spot"	Levelling Course	2297	2018	13.8	94.1	93.0
7	2011-03-06	3	27.1	Key trench, north of "soft spot"	Levelling Course	2376	2111	12.5	98.4	98.9
8	2011-03-06	3	27.1	Key trench, north of "soft spot"	Levelling Course	2325	2056	13.1	95.9	93.7
9	2011-03-06	4	27.1	Key trench, north of "soft spot"	Levelling Course	2306	2037	13.2	95.0	91.8
10	2011-03-06	4	27.1	Key trench, north of "soft spot"	Levelling Course	2322	2033	14.3	94.8	98.3
11	2011-03-06	4	27.1	Key trench, north of "soft spot"	Levelling Course	2296	2027	13.3	94.5	90.6
12	2011-03-06	5	26.8	Key trench, north of "soft spot"	Levelling Course	2364	2122	11.4	98.9	91.6
13	2011-03-06	5	26.8	Key trench, north of "soft spot"	Levelling Course	2430	2205	10.2	102.8	95.7
14	2011-03-06	5	26.8	Key trench, north of "soft spot"	Levelling Course	2327	2040	14.1	95.1	98.3

COMPACTION TESTING SUMMARY - CORE MATERIAL - FILLET ZONE - LEVELLING COURSE										
Test Number	Date Tested	Location/Station	Elevation/Lift (approx.)	Wet Density (kg/m³)	Dry Density (kg/m³)	Moisture Content (%)			Compaction (%)	Degree Saturation (%)
						Field	Lab from Field	Lab from FCP		
1	2011-03-01	1+10	Levelling Course	2371	2146	10.3		8.1	96.2	85.0
2	2011-03-01	1+13	Levelling Course	2262	2103	7.6			94.3	58.2
3	2011-03-01	1+17	Levelling Course	2396	2144	11.8			96.1	97.0
4	2011-03-01	1+21	Levelling Course	2408	2130	13.1			95.5	105.1**
5	2011-03-01	1+25	Levelling Course	2379	2143	11.0			96.1	90.3
6	2011-03-01	1+25	Levelling Course	2348	2138	9.8			95.9	79.7
7	2011-03-01	1+30	Levelling Course	2417	2143	12.8			96.1	105.1**
8	2011-03-01	1+45	Levelling Course	2356	2124	10.9			95.2	86.5
9	2011-03-01	1+50	Levelling Course	2328	2110	10.3			94.6	79.8
10	2011-03-01	1+17	Levelling Course	2396	2144	11.8			96.1	97.0
11	2011-03-01	1+25	Levelling Course	2379	2143	11.0			96.1	90.3
12*	2011-03-01	1+25	Levelling Course	2348	2138	9.8	8.2		95.9	79.7
13	2011-03-01	1+45	Levelling Course	2356	2124	10.9			95.2	86.5
14*	2011-03-01	1+50	Levelling Course	2325	2110	10.3	7.1		94.6	79.8
15	2011-03-01	1+70	Levelling Course	2369	2097	13.0			94.0	98.5
Note: * Moisture content sample taken from compaction test location										

COMPACTION TESTING SUMMARY - CORE MATERIAL - CORE - LEVELLING COURSE										
Test Number	Date Tested	Location/ Station	Elevation/Lift (approx.)	Wet Density (kg/m <sup>3</sup> )	Dry Density (kg/m <sup>3</sup> )	Moisture Content (%)			Compaction (%)	Degree Saturation (%)
						Field from Density Test	Lab from Density Test	Lab from FCP**		
1***	2011-03-02	1+10	Levelling Course	2097	1834	14.3			82.2	71.5
2***	2011-03-02	1+10	Levelling Course	2070	1790	15.6			80.3	73.0
3	2011-03-03	1+15	Levelling Course	2357	2102	12.1			94.3	92.7
4	2011-03-03	1+15	Levelling Course	2133	1918	11.2			86.0	97.7
5	2011-03-03	1+15	Levelling Course	2339	2141	9.2			96.0	75.6
6	2011-03-03	1+15	Levelling Course	2402	2165	11.0			97.1	93.7
7	2011-03-03	1+25	Levelling Course	2371	2101	12.8			94.2	97.8
8	2011-03-03	1+30	Levelling Course	2306	2129	8.3			95.5	66.5
9	2011-03-03	1+35	Levelling Course	2323	2109	10.1			94.6	78.4
10	2011-03-03	1+40	Levelling Course	2373	2143	10.7			96.1	88.1
11	2011-03-03	1+45	Levelling Course	2313	2092	10.5			93.8	79.2
12	2011-03-03	1+40	Levelling Course	2343	2105	11.3			94.4	86.9
13	2011-03-03	1+45	Levelling Course	2368	2142	10.6			96.1	86.6
14	2011-03-03	1+60	Levelling Course	2137	1978	8.1			88.7	48.5
15	2011-03-03	1+60	Levelling Course	2323	2108	10.2			94.5	78.8

Note: \* Moisture content sample taken from compaction test location

\*\* Pending (samples frozen due loss of power to the lab)

\*\*\* Placement removed

**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** ["Greg Blaylock"](#); [Wade, Lowell](#); [Miller, Megan](#); [Bay, Hope](#); ["Renata Klassen"](#); ["Orr, Jeff"](#); ["Goldup, Nigel"](#); [bhorne@eba.ca](#); ["Kevin Mather"](#); [Doug Fielding](#); ["Jerry Graham"](#); [Calvin Goldschmidt](#)  
**Subject:** RE: Core Material Placement  
**Date:** Monday, March 07, 2011 2:08:53 PM

---

Mark

On February 28<sup>th</sup> we discussed with you a change to the specification as follows, and I quote from the original message:

*Unfortunately our current specification does not stipulate a compaction specification limit for placement of any core material. That is an omission on our part and has to change. Section 7.2.10, Statement #10 on Page 59 of Rev. F will be changed to read as follows (change highlighted in bold and underlined):*

*"The Core material shall be compacted with a smooth drum vibratory compactor weighing not less than 10 tonnes. The material shall be compacted with at least six passes (back and forth being two passes) to achieve the maximum density possible at the placed moisture content, **but not less than 90% of the maximum dry density**. The number of passes may be adjusted at the Engineer's discretion to suit varying conditions."*

You had responded to this as follows:

*The statement above has no indication regarding saturation; therefore, correct me if I'm wrong but I assume (and I hate to assume) that Clause 7.2.10 (8) does not change: "The placed Core material shall have a minimum degree of saturation of 85% with no result falling below 80%....." This is the first frozen core dam that I have been involved with that has a requirement for both saturation and compaction. Saturation of 85% can be provided; however, this will not result in 90% compaction. When we spoke yesterday afternoon I noted that the 90% compaction criteria was a concern. The data that I provided (copy attached) indicates that the density test results obtained by the Troxler gauge averaged 89%. In addition, I have attached a copy of the results from the frozen cores extracted from the same structure. I have trouble going forward knowing that this parameter is going to be a point of contention. It seems that acceptance is based and several "and/or" or "and/if" statements. There must be one parameter that SRK deems to be ultimate acceptance".*

We disagree that meeting a 90% compaction specification is a limiting or unduly constraining factor, and therefore we believe that imposing this is not only appropriate, but necessary and is consistent with the intent to achieve the maximum compaction at any given moisture content. As you can see from the compaction results on the "fines" and 1:1 blend, achieving this compaction has not been a concern.

As you know, at the time this correspondence ensued, we had planned to discuss this with you prior to releasing the revised specification. We had also sent you data from the Jericho dam where

this was achieved to demonstrate our case. Unfortunately due to the difficulties associated with the core material that came about after that we never did get to close the loop on this. Hopefully we can do so now, so we can move ahead with consistent expectations.

Wrt to the other comments in your email below:

1. Yes, the yellow shaded areas along the downstream wall of the key trench will be further evaluated (visual assessment) to determine whether the entire length must be removed.
2. Thanks for clarifying the bleed water observations of the "fines". We will discuss this further with our on site staff as you suggested.

Regards

Maritz

---

Maritz Rykaart, Ph.D., P.Eng.  
Principal  
Geotechnical Engineering

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Email: [mrykaart@srk.com](mailto:mrykaart@srk.com)*

---

**From:** Mark Valeriote [mailto:markv@jdsmining.ca]  
**Sent:** Monday, March 07, 2011 12:25 PM  
**To:** Rykaart, Maritz  
**Cc:** 'Greg Blaylock'; Wade, Lowell; Miller, Megan; Bay, Hope; 'Renata Klassen'; 'Orr, Jeff'; 'Goldup, Nigel'; bhorne@eba.ca; 'Kevin Mather'; Doug Fielding; 'Jerry Graham'; Calvin Goldschmidt  
**Subject:** RE: Core Material Placement

Maritz,

The specifications (Revision F) that I have in hand do not have a requirement for both compaction and saturation.

Please note that I did comment during this morning's discussion that I was verbally told that the material placed on March 1 and March 3 was deemed acceptable. The material placed on March 2<sup>nd</sup> was removed shortly after it was placed.

It is my understanding that the yellow shaded area along the downstream wall of the key trench will also be further evaluated (visual assessment) to determine whether the entire length must be removed.

The trials using all "fines" did result in some surface bleed water and also some isolated bleed water beyond the limit of material placed. This was identified and discussed with the SRK Team onsite as being acceptable and would not need to be removed prior to placing another lift of core

material. The attached photo illustrates both materials placed yesterday. The material to the right of the green line is all “fines” while the material on the left is the 1:1 blend. The blue circled areas are bleed water on surface. Please discuss with you staff onsite regarding this observation.

Please contact me should you wish to discuss.

Mark Valeriote  
Construction Manager  
JDS Energy & Mining Inc.

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---

**From:** Rykaart, Maritz [mailto:mrykaart@srk.com]  
**Sent:** Monday, March 07, 2011 11:36 AM  
**To:** Mark Valeriote  
**Cc:** Greg Blaylock; Wade, Lowell; Miller, Megan; Bay, Hope; Renata Klassen; Orr, Jeff; 'Goldup, Nigel'; bhorne@eba.ca  
**Subject:** Core Material Placement

Mark

Based on our phone conversation this morning please find our formal statement for going forward:

Core material was placed in the North Dam key trench on March 3 and March 5. In-situ test data confirmed that the stated specification requirements for saturation and compaction could not consistently be met due to excessive bleeding of water from the placed material (see attached data sheets). Lab trials were conducted on March 4 and 5 to determine what could be done to overcome the bleeding problem. Two field trials were conducted on March 6 for the same purpose. The first field trials was done using only “fines” material and yielded results that fully meet specifications with no bleed water (see attached data sheet). The second field trial consisted of a 1:1 ratio of core material to “fines” by volume. This test did show signs of bleed water, and some of the results did not meet specification (see attached data sheet).

Review of the core material placed on March 1, confirms that the material placed north of station 1+20 meets specification, although right on the lower end) and can be left in place. Material to the south of this station must however be removed as it's degree of saturation is too low (see attached data sheet). Review of the core material placed on March 3, confirms that significant portions of the placed material does not meet the specified saturation or compaction limits (see attached data sheet). This material should therefore be removed in its entirety. The test pads placed on March 6

was however placed over portions of this compromised material and on closer review and in the essence of moving ahead expeditiously without compromising the integrity of the dam, SRK would be satisfied to leave a portion of this placed material in place provided a strip (at least 3 to 4 m wide) on the downstream side of the key trench is removed and replaced with core material that meets all specifications. The area in question is marked on the attached drawing. In addition, to ensure we have no possible short-circuiting of seepage, we will require the GCL to be extended to the back of the key trench in this area. At first glance we expect the additional GCL would be about 100 m<sup>2</sup>, although this would have to be confirmed.

Wrt the test pads constructed on March 6, all loads conducted with the “fines” met specifications and can be left in place. The first and final loads of the 1:1 mix of “fines” with core material did not meet specification. SRK will visually examine these areas and make a determination on whether it should be removed or may remain in place (these areas are also marked on the attached drawing)

On March 6 the Mark Valeriote requested if construction of the leveling course and core can proceed using “fines” material. SRK is in agreement with this provided compaction and saturation specifications continue to be met. This material can be placed in any areas of the key trench where no core material has been placed, provided the key trench has been approved for placement. In addition, this material can be placed in any areas over core material that has been placed and reached the minimum freeze-back temperature, with the exception of those zones that have been demarcated for removal as discussed above. Once the compromised material has been removed, “fines” can be placed in those areas as well.

SRK understands that continuing dam construction with the “fines” would result in the constructed dam meeting specification; however, there is limited quantities of this material on site. SRK is therefore actively continuing looking at options that would allow less “fines” to be used in the construction. This includes evaluating alternate mixes of “fines” to core material and considering different “zones” in the core structure. We understand that SRK will work with the EPCM Manager and Contractor to execute further field trials in support of these optimization attempts.

Please advise if you have any questions.

Regards  
Maritz

---

Maritz Rykaart, Ph.D., P.Eng.  
Principal  
Geotechnical Engineering

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Email: [mrykaart@srk.com](mailto:mrykaart@srk.com)*

**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Wade, Lowell](#); [Klassen, Renata](#); [Miller, Megan](#); [Bay, Hope](#); [Greg Blaylock](#); ["Kevin Mather"](#); [Calvin Goldschmidt](#); [Doug Fielding](#); ["Goldup, Nigel"](#); [bhorne@eba.ca](#); ["Jerry Graham"](#)  
**Subject:** Core Material - Acceptable Blend of Fines vs. Core Material  
**Date:** Thursday, March 10, 2011 9:56:46 AM

---

Mark

Here with please find our formal position wrt going forward with an acceptable Core material product for construction of the North Dam:

Due to excessive bleeding, the originally specified Core material is not allowing the dam to be constructed in accordance to the required saturation and compaction limits. As a result on-site trials were conducted to determine how the core material can be modified to allow construction to proceed in accordance with the original design intent. The conclusions of these trials can be summarized as follows:

1. Core material only: yielded unacceptable results (excessive bleeding resulting in poor and inconsistent saturation)
2. Fines only: yielded acceptable results
3. 1:1 Mix of Fines to Core Material: yielded unacceptable results (excessive bleeding resulting in poor and inconsistent saturation)
4. 1.5:1 Mix of Fines to Core Material: yielded acceptable results
5. 2:1 Mix of Fines to Core Material: yielded acceptable results

SRK therefore recommends that construction of the North Dam proceed using the 1.5:1 mix of Fines to Core material in all places where previously core material was specified.

Placement specifications wrt to saturation and compaction requirements remain unchanged.

Please advise if there are any questions.

Regards  
Maritz

---

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Email: [marykaart@srk.com](mailto:marykaart@srk.com)*

**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Greg Blaylock](#); [Wade, Lowell](#); [Miller, Megan](#); [Bay, Hope](#); [Klassen, Renata](#); [Orr, Jeff](#); [Nigel Goldup](#); [bhorne@eba.ca](#); ["Kevin Mather"](#); [Doug Fielding](#); ["Jerry Graham"](#); [Calvin Goldschmidt](#)  
**Subject:** Removal of non-spec core material in key trench  
**Date:** Thursday, March 10, 2011 9:30:24 AM  
**Attachments:** [RE Core Material Placement.msg](#)  
[Core Material Placement.msg](#)  
[3030\\_001.pdf](#)

---

Mark

Herewith please find our official statement with regard to removal of non-spec material placed in the key trench:

On March 7 SRK sent you a formal position statement on the core material that had been placed prior to this date in the North Dam key trench (see attached email). Some follow-up communication ensued which is also attached to this email.

In accordance with the agreed path forward, SRK subsequently conducted a visual assessment on March 7 of the areas of placed core material earmarked for removal with a view to identify any substantial areas that may in fact be left in place. The conclusion of that assessment was that all of the originally identified material to be removed should in fact be removed and that was communicated to yourself at the time by our site engineers.

In accordance with your request to our site engineer this morning, the attached sketch therefore confirms our final position statement on the non-spec material that has to be removed.

Please advise if you have any questions.

Regards  
Maritz

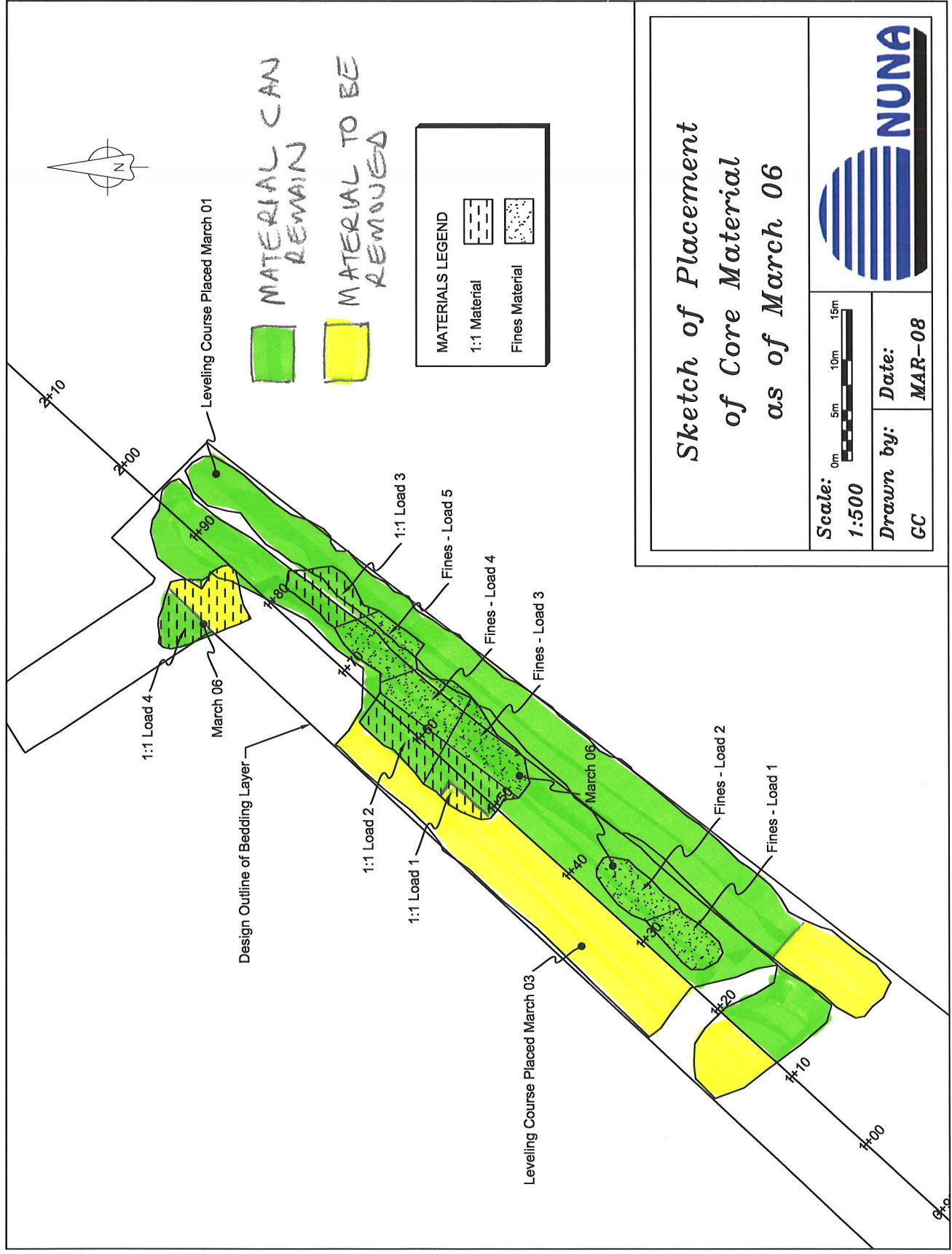
---

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OFFICIAL SRK POSITION 10/3/2011

Sublet.



**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Wade, Lowell](#); [Greg Blaylock](#); [Bay, Hope](#); [Miller, Megan](#); [Miskolczi, Iozsef](#); [Kurylo, John](#); [Klassen, Renata](#); [Goldup, Nigel](#); [Horne, Bill](#); ["Kevin Mather"](#); [Doug Fielding](#); [Calvin Goldschmidt](#); ["Jerry Graham"](#)  
**Subject:** Hypersaline Area in North Dam Key Trench  
**Date:** Friday, March 11, 2011 10:50:10 PM  
**Attachments:** [Salinity P16 rev1.pdf](#)  
[North Dam DN-ND-29 TPerCBHs+Soft Spot 20110304.pdf](#)  
[Soft Spot Salinity.msg](#)  
[RE Key trench.msg](#)

---

Mark

This email serves as our formal statement with regard to the hypersaline area (*aka* "soft" spot) that has been identified in the North Dam key trench:

1. Field observations by our site engineer present at the time this was first encountered concluded the following (see original email attached):
  - a. There were no signs of pooling water anywhere
  - b. It was possible with effort to dig a shallow hole into the zone (see attached photos) – the material was dense
  - c. Ice crystals could be observed
  - d. A thermistor cable was placed at the location and immediately covered with 1m of soil – temperatures in the affected zone after about 1 hr was -7.4 Celsius
  - e. Based on visual observation the possible extent of the area was demarcated with the aid of the surveyor (see attached drawing)
  - f. Two samples was collected from the area where the hole was dug for salinity and index property testing
2. Salinity testing of the two samples collected from the above hole yielded salinities of 85 and 90 ppt respectively (note these are really duplicate samples as opposed to spatially variable) (salinity results presented in attached email).
3. Salinity testing of drill hole P-16 samples located within the previously identified confines of the hypersaline area denotes salinities ranging from 22 to 38 ppt (see attached).
4. Salinity testing on drill hole P-17 samples located on the boundary of the previously identified confines of the hypersaline area are pending.
5. SRK will be conducting further salinity testing on samples collected from drill holes P-06, P-07 and P-21 if available, as they all lie on the boundary of the identified hypersaline area.

Based on the information at hand, as well as the original design of the dam we know the following:

1. The design of the dam assumed salinities in the foundation up to 50 ppt, which corresponds to a freezing point of about -2.9 Celsius.
2. The foundation beneath the dam, with the presence of evaporator pipes will remain colder than -8 Celsius at all times.
3. The freezing point for salinities of 85 to 90 ppt is about -5.2 to -5.5 Celsius.

We had considered conducting a further drilling and associated salinity test program to better delineate the extent and depth of the hypersaline area, and we had considered excavating the

hypersaline soil and backfilling the hole with saturated core material. However, based on the assessment of the potential impact of the hypersaline pocket of soil discussed earlier, we have concluded that no further action is required and construction can proceed across this area.

Please advise if you have any questions or concerns.

Regards  
Maritz

---

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## Determination of the Soluble Salt Content of Soils by Refractometer

ASTM D4542

**Project No:** E14101112

**Project:** Doris North - North Dam, Hope Bay, NU

**Client:** SRK Consulting ( Canada ) Inc.

**Attention:** \_\_\_\_\_

**Fax:** \_\_\_\_\_

**Ph:** \_\_\_\_\_

**Sample No.:** PH - P16

**Date Sampled:** 7-Mar-11

**Sampled By:** Garry D

**Date Tested:** 8-Mar-11

**Tested By:** KP

**Office:** Edmonton

Borehole Number	Location	Depth (m)	Soil Type	Salinity (ppt)
PH - P16		0.5 - 1.0		N/A
PH - P16		1.0 - 1.5		22.0
PH - P16		1.5 - 2.0		38.0
PH - P16		2.0 - 3.0		29.0
PH - P16		3.0 - 4.0		28.0
PH - P16		4.0 - 5.0		23.0
PH - P16		5.0 - 6.0		37.0
PH - P16		6.0 - 7.0		41.0
PH - P16		7.0 - 8.0		38.0
PH - P16		8.0 - 9.0		39.0

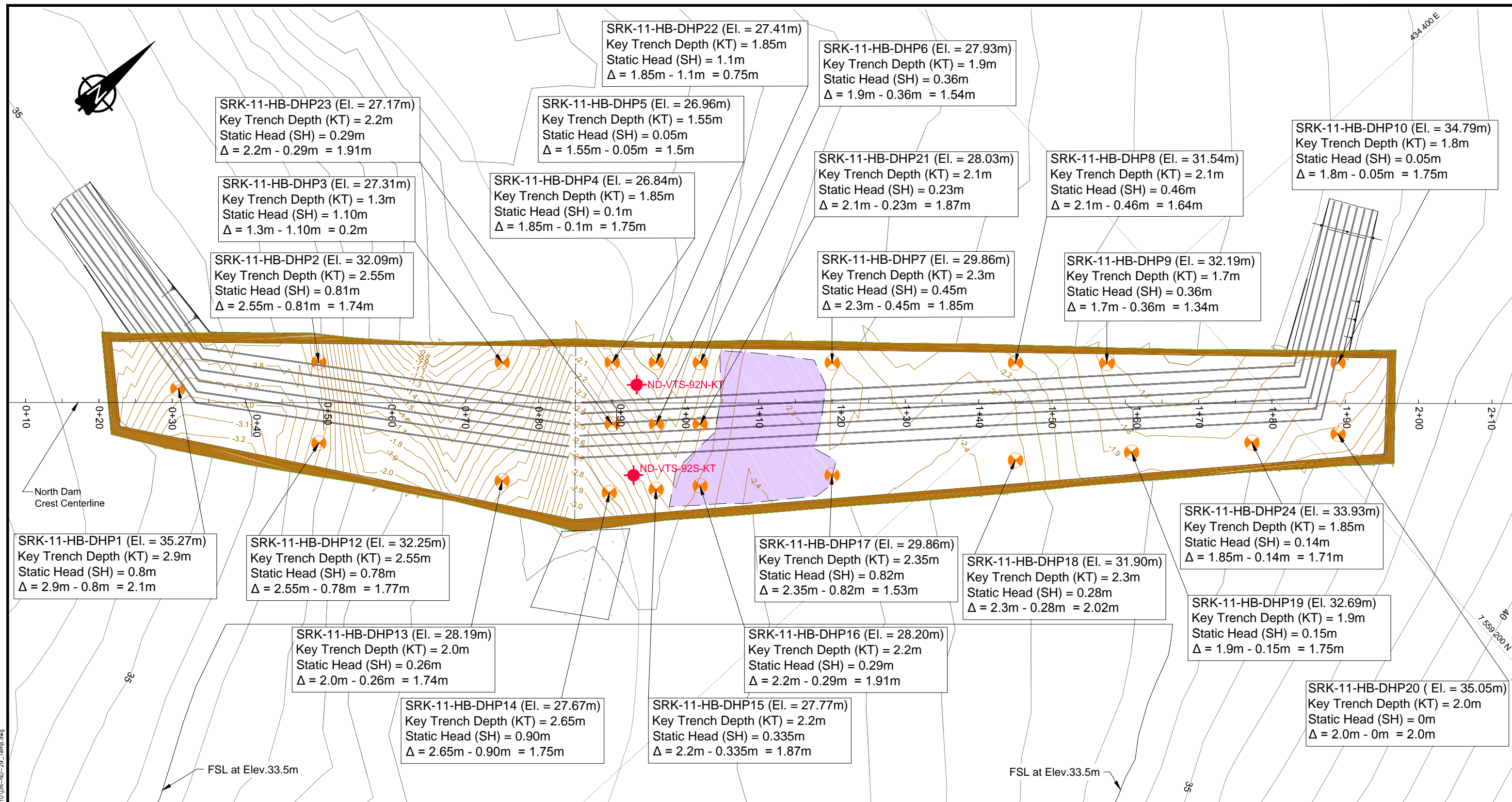
Remarks:

**Reviewed By:** \_\_\_\_\_

Data presented hereon is for the sole use of the stipulated client. EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA. The testing services reported herein have been performed by an EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

EBA Engineering  
Consultants Ltd.





GROUND TEMPERATURE CABLE DETAILS															
STRING #	STRING NAME	SERIES #	STRING TYPE	CHAINGE (m)	ELEVATION (m)	OVERALL CABLE LENGTH (m)	CABLE LOCATION	BEAD LOCATION IN METERS (MEASURED FROM END)							
								#1	#2	#3	#4	#5	#6	#7	#8
25	ND-VTS-92N-KT	H	Vertical	92	n/a	128	Additional Keytrench Excavation	0	2.5	3.5	4	4.5	5	5.6	-
26	ND-VTS-92S-KT	H	Vertical	92	n/a	128	Additional Keytrench Excavation	0	2.5	3.5	4	4.5	5	5.6	-

ADDITIONAL VERTICAL GROUND TEMPERATURE CABLE STRING STAKE OUT POINTS		
ID	NORTHING	EASTING
ND-VTS-92N-KT	7559137.11	434362.88
ND-VTS-92S-KT	7559128.50	434371.70

'SOFT SPOT AREA' (Based on February 16th, 2011 Field Survey)



SRK JOB NO.: 1CH008.033  
FILE NAME: DN-ND-29\_Temp.dwg



HOPE BAY MINING LTD.

Doris North Project

North Dam  
Percolation Boreholes and  
'Soft Spot' Location

DATE: March, 2011  
APPROVED: EMR/LW/JK  
FIGURE: 1

**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Wade, Lowell](#); [Bay, Hope](#); [Kurylo, John](#); [Miskolczi, Iozsef](#); [Miller, Megan](#); [Greg Blaylock](#); [Klassen, Renata](#); [Goldup, Nigel](#)  
**Subject:** One-Time Exception for meeting Freeze-Back Temperature  
**Date:** Monday, March 28, 2011 10:54:20 AM

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Mark

This note refers as official record of the **ONE-TIME** exception that SRK granted for placing core material in the peat zone during the night-shift of March 24 prior to achieving the specified freeze-back temperature of -2C. This exception was granted after careful evaluation of the progress of the freeze-back temperature of the preceding lift placed, taking into consideration the unseasonal ambient conditions. This in no way implies a general relaxation of the freeze-back temperature of -2C.

Regards

Maritz

---

Maritz Rykaart, Ph.D., P.Eng.  
Principal  
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Email: [mrykaart@srk.com](mailto:mrykaart@srk.com)*

**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Greg Blaylock \(Greg.Blaylock@Newmont.com\)](#); [Wade, Lowell](#); [Bay, Hope](#)  
**Subject:** North Dam - Excavation of Hypersaline Area  
**Date:** Tuesday, March 29, 2011 3:06:28 PM

---

Mark

As discussed, this email serves as official record for over-excavating the zone within the key trench where hypersaline soil was encountered.

During excavation of the key trench a "soft-spot" was identified between station 1+00 and 1+20. Sampling and testing, including samples from nearby percolation drill holes, confirmed the presence of hypersaline soil; however, the exact extent of the zone was not clear based on the available characterization data. A subsequent drill and sampling program (6 drill holes, each 3 m deep) was conducted which confirmed that the bulk of the hypersaline material was between station 1+05 and 1+20 extending about 2/3 rds from the downstream edge of the key trench, down to a depth of about 1.5 m below the key trench invert level. This hypersaline zone has salinities ranging between 50 and 90 ppt.

The North Dam design was conducted with an understanding that the foundation soils had increased salinity and a design parameter of 45 ppt salinity was selected for the creep analysis, which was conducted by EBA Engineering on behalf of SRK. This number was selected based on the geotechnical test data collected during the design phase of the dam. Don Hayley from EBA was contracted by HBML in December 2010 to conduct a final review of the design of the North Dam and as part of this review Mr. Hayley has concluded that the extrapolation used to estimate the "B" parameter to estimate creep deformation of the dam, more closely represented a salinity of 40 ppt. Furthermore, extrapolation of this parameter based on available test data in the literature (at a maximum salinity of 35 ppt), suggest that at salinities of 50 ppt and higher the creep deformation may very well significantly exceed what was predicted for the North Dam during the design stage. As a result, Mr. Hayley has concluded that within this hypersaline zone, the analysis would not be conservative, and strains may exceed the design strains within the core which may result in cracking of the core. It was acknowledged that this conclusion is based on very limited data and whether or not this may in fact occur cannot be definitively stated; however, the most prudent thing to do would be to excavate known hypersaline soil from the key trench and backfill that material with saturated core material.

SRK explained this situation to HBML representatives, Mark Valeriote, Kevin Mather and Greg Blaylock on March 14 and commented that if the construction schedule of the North Dam would not be adversely impacted, the hypersaline zone identified from drilling should be excavated. If the schedule were to be significantly adversely impacted then the hypersaline soils could be left in place; however, HBML would have to accept the unknown and unquantifiable risk associated with that decision. The conclusion was that HBML agreed to excavate the hypersaline zone.

SRK did not anticipate intercepting hypersaline soils during construction and therefore contingencies against this was not provided.

Regards

Maritz

---

Maritz Rykaart, Ph.D., P.Eng.  
Principal  
Geotechnical Engineering

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**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Greg Blaylock \(Greg.Blaylock@Newmont.com\)](#); [Goldup, Nigel](#); [Horne, Bill](#); [Klassen, Renata](#); [Miller, Megan](#); [Bay, Hope](#); [Miskolczi, Iozsef](#); [Kurylo, John](#); [Wade, Lowell](#)  
**Subject:** Fillet Zone Construction - Approved Variance  
**Date:** Wednesday, March 30, 2011 12:33:27 PM  
**Attachments:** [Fillet Zone Variance.pdf](#)

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Mark

Further to our discussion on site last week during which you requested that SRK consider a variance to facilitate construction of the fillet zone we have evaluated your request and would be willing to accept the following variance (also illustrated on the attached sketch):

1. For the first two lifts (or a minimum thickness of 500 mm) above the GCL base elevation - no variance
2. Thereafter:
  - a. Use blended core material as per rest of core, i.e. no variance on material type
  - b. Ensure 95% Standard Proctor Density
  - c. Moisture content no less than optimum Moisture Content (OMC), but no requirement to meet the 85% saturation
  - d. No freeze back wait period between lifts

Please advise if you have any questions.

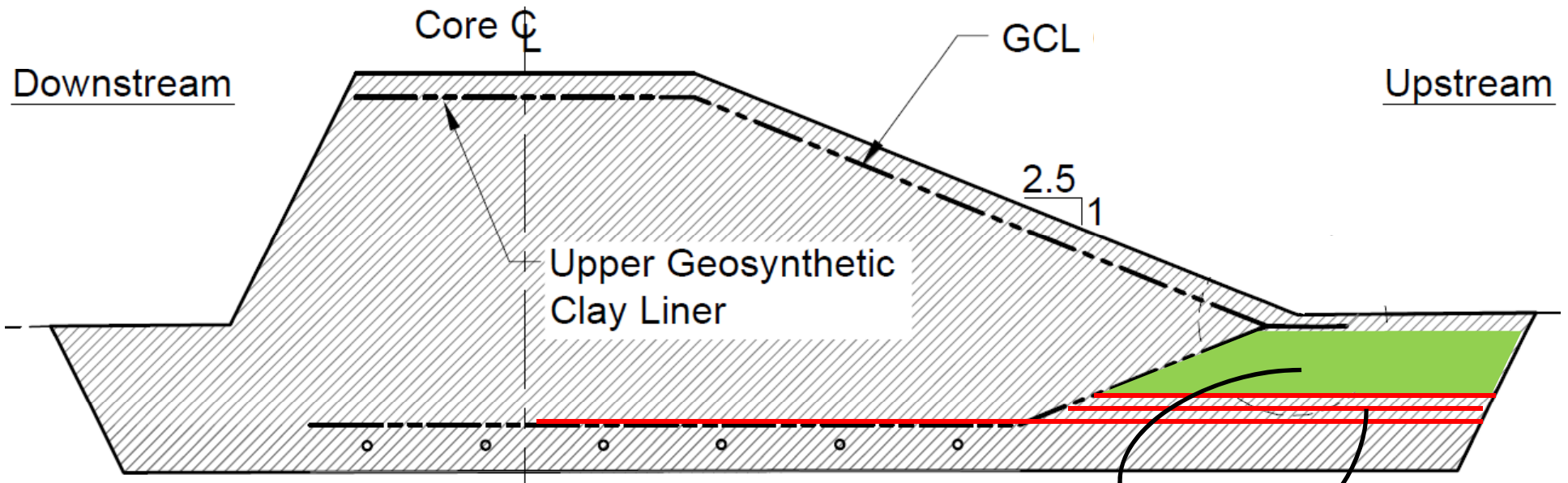
Regards  
Maritz

---

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## Fillet Zone Variance



Thereafter:

- Use blended core material as per rest of core, i.e. no variance on material type
- Ensure 95% Standard Proctor Density
- Moisture content no less than optimum Moisture Content (OMC), but no requirement to meet the 85% saturation
- No freeze back wait period between lifts

For the first two lifts (or a minimum thickness of 500 mm) above the GCL base elevation - no variance

**RE: Location of Additional GTC**

Mark Valeriote [markv@jdsmining.ca]

**Sent:** Thursday, March 31, 2011 8:46 AM**To:** Rykaart, Maritz**Cc:** Greg Blaylock [Greg.Blaylock@Newmont.com]; Wade, Lowell; Kurylo, John; Miskolczi, Iozsef; Bay, Hope

---


Maritz,

Please be advised that HBML has elected to go forward with your Option #1, *"HBML can forego installing the new GTC altogether."*

I would ask that the ground temperature cable extension cable be stored for potential use at another location. Should we find that it is not of use it could be sent back to RST at a later date and used to manufacture ground temperature cables for the South Dam or another structure at Hope Bay.

Should you wish to discuss this matter please contact me at your convenience.

Mark Valeriote  
Construction Manager  
JDS Energy & Mining Inc.

 [markv@jdsmining.ca](mailto:markv@jdsmining.ca) [www.jdsmining.ca](http://www.jdsmining.ca) Cell (250) 801-7873 Kelowna Office (250) 763-6369 Kelowna Fax (250) 763-6302

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**From:** Rykaart, Maritz [mailto:mrykaart@srk.com]**Sent:** Thursday, March 31, 2011 9:19 AM**To:** Mark Valeriote**Cc:** Greg Blaylock (Greg.Blaylock@Newmont.com); Wade, Lowell; Kurylo, John; Miskolczi, Iozsef; Bay, Hope**Subject:** Location of Additional GTC

Mark

This serves as the official notice pertaining to a final location for the additional GTC to be installed in the key trench. The following prior correspondence applies:

1. SRK memo dated February 15, 2011: Subject: Hope Bay Project – North Dam Additional Key Trench Excavation in Peat Zone (additional ground temperature cables including cable extensions).
2. Doris North Project: Site Instruction NMCHOP-JDS-002 dated February 18, 2011: Subject: Additional Vertical Ground Temperature Instrumentation
3. SRK memo dated February 21, 2011: Subject: Doris North Project – Site Instruction NMCHOP-JDS-002
4. Doris North Project: Site Instruction NMCHOP-JDS-002(1) dated March 16, 2011: Subject: Additional Vertical Ground Temperature Instrumentation

Following a review of the as-built survey for the key trench we have concluded that GTC ND-VTS-085-KT will in fact be installed within the zone of maximum engineered fill thickness in the key trench due to the extended key trench excavation to remove peat material which was not known at the time of Feb 21 correspondence. Therefore installing the new GTC at station 0+95 would not have the intended functionality at the time it was requested.

SRK therefore sees two options for going forward, both of which would be acceptable to SRK:

1. HBML can forego installing the new GTC altogether.
2. Since the GTC extension has been ordered, the GTC can be installed at station 1+15 which is in the middle of the hypersaline zone. Under this scenario the cable would be installed at the following coordinates (Northing - 7,559,152.80; Easting - 434,377.82) with the top bead at elevation 27.032m, which is 300mm below the leveling course elevation. The cable will be directed towards the station 1+30 GTC corridor. This would be an opportunistic data set, but is not required should HBML choose to go with option 1 above.

Please advise how you would like to proceed, or if you have any questions.

Regards

Maritz

---

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Email: [mrykaart@srk.com](mailto:mrykaart@srk.com)*

**From:** [Mark Valeriote](#)  
**To:** [Miskolczi, Iozsef](#)  
**Cc:** [Bay, Hope](#); [Rykaart, Maritz](#); [Wade, Lowell](#); [Borowski, Lawrence](#)  
**Subject:** RE: placement of saturated core - 20110413  
**Date:** Wednesday, April 13, 2011 10:29:33 AM  
**Attachments:** [image001.gif](#)

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Thanks Iozsef.....

---

**From:** Miskolczi, Iozsef [mailto:imiskolczi@srk.com]  
**Sent:** Wednesday, April 13, 2011 10:37 AM  
**To:** Mark Valeriote  
**Cc:** Bay, Hope; Rykaart, Maritz; Wade, Lowell; Borowski, Lawrence  
**Subject:** placement of saturated core - 20110413

Mark,

This is to summarize our earlier discussion regarding proceeding with frozen core material placement in the 1. Fillet and 2. "fish pond" areas.

1. As of 9 AM today, freeze-back in the upstream fringe area of the fillet between Sta. 0+75 and 0+90 was not yet reached (-0.33 degrees C at 9 AM). Nevertheless, the temperature measured by SB 10 (installed within the fillet about 3 m from the key trench wall) was well below the specified freeze-back condition. Conditional on making sure that no trucks or heavy machinery (with the exception of the compactor) will be travelling on the fillet zone within 3 meters from the upstream key trench wall, SRK authorizes the Contractor to proceed with placement of a new lift of frozen core material.
2. The single bead thermistor installed subsequent to placement of the most recent lift of saturated core material in the "soft spot" and partially in the "peat hole" (collectively known as the "fish pond") was damaged during snow clearing on the night shift and no readings could be taken. Our last reading around 5 PM on April 12 showed temperature of the core material reaching -0.5 degrees C. Based on previous experience with freeze-back of similar thickness lifts in similar ambient temperature conditions, we assume the specified freeze-back condition was achieved by now. Due to the insulation effect of the snow drifts accumulated along the downstream wall of the key trench, lack of freeze-back was expected and confirmed, similarly to the upstream fringe of the fillet zone. Conditional on keeping haul trucks and heavy equipment (with the exception of the compactor) at least on truck width away from the wall of the key trench, SRK authorizes the Contractor to proceed with the placement of a new lift of saturated core material.

The authorization to proceed with placement was given only for placement of one single lift of core material, based on specific conditions observed today, April 13, 2011, and by no means is it extended to any future core material placement events.

Regards,

**Iozsef Miskolczi**  
Consultant



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**From:** [Rykaart, Maritz](#)  
**To:** [Mark Valeriote](#)  
**Cc:** [Wade, Lowell](#); ["Jerry Graham"](#); [Kurylo, John](#); [Miller, Megan](#); [Bay, Hope](#)  
**Subject:** RE: Thermal Cover  
**Date:** Monday, May 09, 2011 7:00:32 AM  
**Attachments:** [image001.gif](#)

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Mark

We have revisited the original design assumptions and all factors used to assess the 2011 close-out recommendations and can confirm that reducing the thermal cover from 3m to 2.5m overall (i.e. 0.5m 5/8" reject material followed by 2m ROQ would be acceptable.

This email serves as official record of this agreed change.

Regards  
Maritz

**Maritz Rykaart** *Ph.D., P.Eng.*  
Principal Consultant



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**From:** Mark Valeriote [<mailto:markv@jdsmining.ca>]  
**Sent:** Sunday, May 08, 2011 9:36 AM  
**To:** Rykaart, Maritz  
**Cc:** Wade, Lowell; 'Jerry Graham'  
**Subject:** Thermal Cover

Hello Maritz,

I just did another read through the thermal analysis and reviewed the predicted temperature distribution plots.

The executive summary of the EBA report suggests, ".....Two consecutive extreme warm years were also evaluated as an upset condition. The results indicate that the core and underlying

*foundation remain well-frozen even under this upset condition.....”*

*Page 20 Section 4.8.1 North Dam*

*“.....Figure 15 shows the predicted early-October temperature distribution the year following initial impoundment. October is the time of year when the temperature near the top of the frozen core are warmest. Figure 15 shows that the frozen core is colder than – 1 °C. This indicates that the 2.5 m rockfill cover over the core crest provides sufficient thermal insulation to maintain the core perennially frozen even under extreme temperatures.....”*


Please assess the requirement to provide 3 m of thermal cover for summer 2011 at the North Dam. I respect the fact that construction has not been completed and the cover is a temporary measure. However, there are a number of factors that lead me to request that you assess the need to place 3 m of cover this summer.

Should you wish to discuss this matter please contact me at your convenience.

Mark Valeriote  
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**Re: Hope Bay - Tail Lake Discharge Pipe**

Jerry Graham [jerryg@jdsmining.ca]

**Sent:** Monday, August 01, 2011 3:44 PM**To:** Miskolczi, Iozsef**Cc:** Bay, Hope; Wade, Lowell; Rykaart, Maritz; Borowski, Lawrence; Nick Stoneberger [nicks@nunalogistics.com]; Ishan Fechter [Ishanf@jdsmining.ca]; Kevin Mather [kevinm@jdsmining.ca]; Doug Fieldings [dougf@jdsmining.ca]; Pat Dillon [patrickd@jdsmining.ca]

---

Understood. We will be monitoring the line constantly while pumping. Jerry

Jerry Graham  
JDS Energy & Mining Inc.

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**From:** [Miskolczi, Iozsef](#)

**Sent:** Monday, August 01, 2011 4:14 PM

**To:** [Jerry Graham](#)

**Cc:** [Bay, Hope](#) ; [Wade, Lowell](#) ; [Rykaart, Maritz](#) ; [Borowski, Lawrence](#)

**Subject:** Hope Bay - Tail Lake Discharge Pipe

Jerry,

Based on our observations and discussions with the Contractor, the pipeline constructed to discharge water from Tail Lake into Doris Creek is routed over the North Dam and along the Secondary Road. The yellow line on the attached figure shows the approximate alignment of the pipeline as understood by SRK.

SRK wishes to express its concerns regarding the possibility of a leak from the Victaulic pipe joints located within the dam footprint. An uncontrolled supply of water to the frozen core could induce localised thawing and degradation of the core material. Any degradation will have to be remediated before the raise of the core to its final elevation can resume this coming winter.

To ensure that any leaks are detected in a timely manner, continuous monitoring of the pipeline should be implemented during pumping. If a leak occurs, pumping shall be stopped immediately and the source of the leak eliminated before pumping can resume.

No excavation into the ROQ cover protecting the frozen core shall be made without the approval of the SRK Site Engineer.

Regards,

Iozsef Miskolczi

Consultant



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Please consider the environment before printing this e-mail.

Hello Mike,

As discussed in today's morning meeting SRK is okay with the use of transition material rather than overliner material to bring the section in the south end up to key trench elevation.

Regards,  
Megan

**Megan Miller** *E.I.T.*

Staff Consultant



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## Kinsey, Megan

---

**From:** Mark Valeriote <Markv@jdsmining.ca>  
**Sent:** Tuesday, April 03, 2012 7:01 AM  
**To:** Gary Sodhi  
**Cc:** Trevor Sorken; Mike Price; Lucas Evans; Doug Haverland; Miller, Megan  
**Subject:** RE: Survey monitoring point detail and discussion

Gary,

Megan Miller (SRK) spoke to me this morning regarding the proposed survey monitoring point that includes gussets, centralizer, and a top plate.

Please do not fabricate survey monitoring instruments as we had discussed. If you have already begun fabricating gussets, centralizers, and top plates to the instruments prepared last fall please have these removed.

***The survey monitoring instrument will be fabricated and installed as per the SRK drawing.***

Mark Valeriote  
Construction Manager  
JDS Energy & Mining Inc.

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