Mackay (1997) contributes pore water expulsion into the talik underlying a remnant pond in the bottom of Lake Illisarvik as the reason why less than anticipated lake bottom heave was observed after drainage.

Indications of artesian pore pressures were observed in a number of boreholes drilled in the Surface Cell during the geotechnical investigations in 2002 and 2003. Standpipe and vibrating wire piezometers installed within the Surface Cell talik indicate pore pressures fluctuating throughout the year, decreasing during the summer months and increasing slightly during the winter months, as shown in Appendix VII. All but one piezometer are displaying artesian pressures.

It is anticipated that when the remaining pond in the Surface Cell is drained, pore pressures in the talik will further increase. The pressures will stabilize or decrease if the hydraulic connectivity is realized between the Surface Cell talik and the Reservoir. The expelled pore water from the Test Cell talik will report to the Reservoir through the foundation of the Test Cell dike and minimal pore pressure increase is anticipated.

The estimated volume of thawed tailings discussed in Section 5.2 was used to calculate the potential volume of pore water expelled from the Surface Cell and the Test Cell taliks. Using a volumetric water content of 40%, and the 9% expansion of unfrozen pore water, a total volume of 104,000 m^3 would be expelled from the two taliks. This volume amount has been assumed within the water balance done for the contaminant loading of the WTDA.

7.5 Cryoconcentration and Freezing Point Depression

When pore water in soil freezes, the solutes that are rejected from the growing ice crystals in the freezing zone tend to diffuse towards the unfrozen zone (Hallet 1978, Mahar et al. 1983 and Marion 1995). An increase in solute concentration results in an increase in the salinity of the pore water and the increased salinity results in a freezing point depression of the pore water.

MacKay (1997) states that the measured pore water salinities below the Illisarvik Lake bottom increased for at least the first four years (the period of monitoring with in situ cables) after draining of the lake was complete. At 17 years after drainage occurred, some of the pore water in the intrapermafrost zones remained unfrozen at a temperature of about -0.3°C. The increased solute concentrations were attributed to cryoconcentration effects.

Any expelled pore water currently within the Surface Cell talik can exit the system via the pond that remains on the Surface Cell. Samples of pore water collected from monitoring wells installed in May 2003 indicate marginally higher metals concentration when compared to the samples collected at the Surface Cell discharge location (NML 27).

A freezing point depression of -0.2°C was calculated for the pore water based on the conductivity of water samples collected from the monitoring wells in 2003. A comparison of observed zones of thawed tailings during drilling to the measured ground temperature in the same zones also indicates freezing point depression on the order of -0.5°C, close to the West Twin Dike and potentially colder than –1°C for the talik under the deep water storage pond. Based on an assessment of the pore pressures distributions in the Surface Cell, coupled with higher freezing point depression values farther from the dike, it appears that some level of cryoconcentration may already be occurring within the Surface Cell.

When the Surface Cell pond is drained, and permafrost aggradation begins over the entire surface, expelled pore water will be driven to the surface to perhaps form a pingo (if drainage is assumed to be closed), forced into a deeper cryopeg or towards the Reservoir area if hydraulic connection exists under the frozen dike foundation (the open system approach). Given that the hydraulic gradient driving seepage into the Reservoir area may be low, it is likely that pore pressures will be initially trapped by the overburden pressure resulting from rapid permafrost aggradation. Pressures may then have appropriate gradient to drive some seepage into the Reservoir in a longer term. In the short time, it is expected that a cryopeg will be trapped by the permafrost aggradation from the surface. As a result, solute concentrations would be expected to rise in response to the containment and some additional freezing point depression will occur. This could potentially result in accelerated permafrost aggradation, as noted in the drained lake bottoms by Mackay (1997). Geothermal information from BGC03-10, 03-11 and 03-13, located approximately 75 to 100 m upstream from the West Twin Dike, display finite zones at 10 to 12 m depth where significant subzero fluctuations are occurring. This may be indicative of subzero groundwater flow away from the dike towards the residual pond. As drainage is established to the Reservoir, solute concentrations would be expected to stabilize or potentially decrease.

Since a thawed zone exists beneath the Test Cell Dike, pore water expelled from the Test Cell talik will report to the Reservoir. Cryoconcentration may occur initially within the expelled pore water; however, it should disperse within the Reservoir.

7.6 Hydraulic Fracturing

Hydrofractures occur whenever the fluid pressure (within a sub-pingo water lens) exceeds the tensile strength of the enclosing frozen material plus the least compressive principal total stress (Mackay 1998). Hydraulic fracturing is considered to be the cause of growth of perennial and ephemeral frost mounds along the periphery of many pingos. Mackay (1998) states that most pingo hydrofractures appear to originate at the periphery of a sub-pingo water lens from where the fracture propagates both upward and outward towards the pingo periphery. Water is expelled from the sub-pingo water lens and a small frost mound forms near the edge of the pingo. Hydrofracturing of the near surface soil has also been used to explain the seasonal spring flow observed at the base of many pingos.

Hydraulic fracturing may occur in two areas during freezeback of the talik. One area is a hydraulic fracture propagating vertically from the talik to the surface of the Surface Cell. The second is at the toe of the West Twin Dike where the fracture could propagate upwards from the talik near the foundation of the dike to surface. Since the freezeback of the top 4 to 5 m of tailings is expected to occur rapidly during the first winter, the water pressure would have to exceed 110 to 135 kPa (the approximate overburden pressure) plus the tensile strength of the frozen tailings for the first scenario to occur. The overburden pressure in the area of the talik that underlies the dike is estimated to be approximately 400 kPa. For hydraulic fracture propagation to be initiated, this overburden pressure plus the tensile strength of the frozen tailings must be exceeded.

Considering the rapid permafrost aggradation rate into the talik, it is unlikely that extremely high pore pressures will develop during the initial freezing period. By the time the pore pressures build-up to the values required for fracturing, a frozen layer of sufficient thickness and of significant frozen density will likely be in place. Therefore, it is considered unlikely that hydraulic fracturing will occur.

7.7 Frost Heave

Pore water pressures created by expulsion from, or redistribution within, the freezing system may result in frost heave. As noted earlier, 9% heave of the volumetric water content would result from closed system freezing. Negligible heave would be observed if pore water is expelled outside the system (open system freezing). If segregated or intrusive ice forms within the tailings, variable frost heave amounts and extent would result. If pingo formation were to occur, the amount of heave would increase over time and would be centrally located over a remnant pond.

Lake bottom heave has been observed as an effect of permafrost aggradation into the bottom of drained Lake Illisarvik. The heave was measured along two perpendicular sections of the lake bottom. The measured heave increased with distance from shore to a maximum of about 40 cm at 50 m from shore. The measured heave decreased from this point to the centre of the lake where approximately 20 cm of heave was measured at 275 m from shore. Mackay (1997) explains the variability in the measured heave by the fact that pore water in the near shore sediments froze in place, resulting in approximate volumetric expansion of 9%. Some of the pore water in the sediments closer to the centre of the lake froze in-place, and some was expelled, resulting in less than expected heave.

For the Surface Cell talik, containing a maximum thickness of 24 m of thawed tailings, a maximum heave amount of 0.8 m would be forecast, assuming 9% expansion of the volumetric water content within the tailings. Since a totally closed system is not forecast, significantly less than 0.8 of heave would be anticipated for the Surface Cell. It should be noted that any heave occurring before placement of the cover is non-problematic. Additionally, any heave that does not interrupt drainage or cause cracking is also non-problematic.

7.8 Pingo Formation

Pingos are intrapermafrost ice-cored hills, typically conical in shape, that grow and persist only in a permafrost environment (Mackay 1998). Many pingos form in the bottoms of old lakes that drained rapidly. There are two types of pingos; hydraulic (open) system pingos and hydrostatic (closed) system pingos. The types of pingos are differentiated by identifying the source of the water pressure that initiates and sustains their growth. Hydraulic system pingos derive their water from a topographic gradient. These types of pingos grow in areas of topographic relief such as on lower hill slopes or in the alluvium of valley bottoms where intrapermafrost groundwater flows downslope under hydraulic gradient. Hydrostatic system pingos derive their water pressure from pore water expulsion beneath aggrading permafrost in saturated sand. Hydrostatic pingos are discussed in more detail in the following paragraphs since it is most analogous to the conditions at the WTDA.

Based on the extensive research by Mackay and others reviewed in the preceding sections, there are several occurrences required to initiate the growth of a pingo, as summarized below from Mackay (1998):

1. A lake, sufficiently deep to form an underlying talik, must drain, allowing permafrost to aggrade into the underlying talik.
2. If there is at least one large and relatively deep residual pond without any permafrost directly beneath it, then expelled pore water can discharge into the unfrozen basin that underlies the residual pond and a pingo is unlikely to grow.
3. If at least one residual pond of sufficient size and critical depth exists so that the bottom sediments gradually freeze downward (emphasis by BGC), the pressure exerted by the groundwater flow from the large lake bottom area of aggrading permafrost acts like an hydraulic jack (Gasanov 1978) on the much smaller area of the frozen bottom of the residual pond to dome it up and so to initiate pingo growth.

As noted earlier and repeated here, not every residual pond results in the formation of a pingo. This feature results from a very delicate balance of gradual permafrost aggradation, pore water expulsion and resultant overburden heaving, in combination with the differential in conditions from the residual pond area to the perimeter lake bottom area. For the case of drained lakes that do not lead to the formation of a pingo, the expelled pore water must either report to the surficial pond (through some vertically oriented talik) or a cryopeg must form at depth below the frozen lake bottom.

In the winter of 1994/1995, a frost mound (small pingo) was observed in the middle of one of the residual ponds on the bottom of drained Lake Illisarvik. The mound was about 1 m in height and 30 m in diameter. The mound was drilled and a pressurized water lens was encountered beneath the ice. McKay (1997) states that the growth of the mound offers additional support for groundwater flow into the residual pond during winter.

In comparison to the pingos formed in the Mackenzie Delta area, the following differences are suggested with respect to the Surface Cell and Test Cell taliks:

1. Firstly, the remnant pond of the surface of the tailings will be completely removed so that no residual pond will be formed.
2. Since the pond will be completely removed, permafrost aggradation will be quite rapid as displayed in some of the geothermal monitoring to-date in the Surface Cell. The rapid aggradation may not allow for the development of high pore pressures as seen in drained lakes.
3. Since there will be no remnant pond, there is limited differential in the permafrost aggradation conditions from the previously existing pond area to the surrounding tailings surface.

As a result, instead of a pingo forming, it is likely that a cryopeg will form at depth in the Surface Cell. The trapped water may report to the Reservoir as physical conditions allow.

7.9 Summary

The preceding sections have provided factual information and interpretation regarding the various geotechnical issues that may occur in the Surface Cell and Test Cell taliks. The purpose of this section is to provide an assessment of the potential likelihood of occurrence for each of the noted phenomena.

Table 8 provides a summary of the considerations in the assessment and the resultant determinations. The following information is included in Table 8:

- Potential issues and root causes.
- Potential consequences of the occurrence.
- Information that supports the occurrence.
- Information that does not support the occurrence.
- Likelihood of the occurrence; and
- Potential mitigation and monitoring plans for the occurrence.

It should be noted that, given the number of potential variables involved with talik freezeback behaviour, two qualitative categories were chosen for the probability predictions. Predictions as to whether a specific identified phenomenon will occur are qualified as "likely: or "unlikely". However, given the inherent potential uncertainty with predicting these phenomena, mitigation and/or monitoring plans are provided for all events in Section 9.

8.0 PERFORMANCE MONITORING

A performance monitoring program has been developed to provide a means of assessing the freezeback of the taliks and potential impacts that may occur. The program has been developed utilizing the "Guidelines for Abandonment and Restoration of Mines in the NWT" as a reference. The program is fully detailed in the Nanisivik Mine Reclamation Performance Monitoring Plan which as been submitted under separate cover (Part G, Item 9 on the Water License).

In general, the monitoring program provides for freezeback monitoring during the 2 year Reclamation Period and for a subsequent 5 year Closure Period. During the Reclamation Period, worker presence at the mine site is anticipated for construction, monitoring and maintenance purposes. This presence will enable the proposed monitoring programs to be carried out by the on-site personnel under the direction of an Environmental Coordinator, in consultation with a professional geotechnical engineer. During the Closure Period, monitoring will be continued to assess the freezeback progress. Continuous worker presence at the mine site is not planned during the Closure Period. Therefore, monitoring programs will be carried out using dataloggers and/or remote data acquisition systems and during site visits, possibly utilizing local field assistants and by staff hired from nearby Arctic Bay.

Table 9 provides a summary of the potential issues that may occur during freezeback of the tailings, the potential consequences and the recommended monitoring methods for each issue. As with the monitoring program for the surface covers, the monitoring methods will include visual observations, survey data collection and various installed instrumentation. Some existing instrumentation will be used and new installations will be required, especially in the Test Cell talik where few instruments are currently installed.

8.1 Reclamation Period Monitoring

The proposed monitoring frequency during the Reclamation period is summarized in Table 10. Monitoring will be conducted regularly, following the timely installation of the instruments, during the Reclamation period to observe how the taliks are freezing back. The results will be compared with the anticipated freezeback of the talik discussed in Section 6.0 and an assessment of the impacts on dike stability, pingo formation, cover performance and water quality will be completed.

8.2 Closure Period Monitoring

Monitoring during the Closure Period will collect necessary information to evaluate the continued freezeback of the Surface Cell and Test Cell taliks and the effect of freezeback on the Reservoir water quality. This will include the collection of ground temperature and piezometric data, water quality information, as well as observing the physical condition of the West Twin Dike and reclamation covers and survey of selected points in the cells.

The monitoring schedule for the Closure Period is detailed in Table 11. The monitoring schedule is planned to be reduced through the Closure Period in anticipation of the data verifying the anticipated freezeback of the taliks. Quarterly monitoring of ground temperatures and piezometric pressures will take place for the entire period. Monitoring wells will be sampled once per summer period. A geotechnical inspection of the West Twin Dike and reclamation covers will be performed twice per year, once in the spring and once in the late summer, in year 1. These visits will be reduced to once per year for years 2 and 5, pending verification of suitable performance. During the geotechnical inspection, visual observations of deformation and surface observations will be recorded. The results of the performance monitoring program will be documented and submitted to the Nunavut Water Board as a component of the annual environmental report.

Also, implicit in the performance monitoring program is the requirement to have climatic data recorded at the Nanisivik AES Station. Yearly records of temperature and precipitation values will be required as context for evaluating the freezeback of the taliks.

9.0 CONTINGENCY PLANS

Several contingency plans have been developed in order to address performance issues that may be identified during the reclamation and post-closure monitoring periods. The potential issues include slower than anticipated freezeback of the taliks, elevated pore pressures in the taliks, poor Reservoir water quality, formation of pingos or frost mounds and dike instability. The consequences of each issue and suggested mitigation approach are identified in Table 12. Common to all suggested mitigation measures is identification of the root cause and appropriate reaction to limit the environmental consequences of each issue. It should be noted that the assessment of the talik freezeback will require an integrated evaluation of the geothermal, water quality, pore pressures and other physical conditions to understand the response of the taliks.

10.0 CLOSURE

This report has been developed to satisfy requirement Part G Item 5 in the current water license for Nanisivik Mine. We trust that this report meets the requirements of Nanisivik Mine and the water license.

We would like to thank you for the opportunity to work on this challenging and unique assignment and look forward to providing continued service to Nanisivik Mine throughout the closure phase of the mine.

Respectively submitted,

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PERMIT TO PRACTICE
BGC ENGINEERING INC.
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The Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories

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TABLES

Table 1: Summary of Component Closure Plan Reports

Water License Reference	Report
Part G, Item 3	Final Closure and Reclamation Plan
Part G, Item 4	Reclamation Cover Designs
Part G, Item 5	West Twin Disposal Area Talik Investigation
Part G, Item 6	Borrow Areas Development and Closure Plan
Part G, Item 7	West Twin Disposal Area Surface Cell Spillway Design
Part G, Item 8	Waste Rock and Open Pit Closure Plan
Part G, Item 9	Reclamation and Closure Monitoring Plan
Part G, Item 12	Annual Review of Reports G3 to G9 and Submission, for Approval, of Proposed Modifications
Part G, Item 13	Report on Environmental Site Assessment (ESA) Program
Part G, Item 14	Human Health and Ecological Risk Assessment (HHERA)
Part G, Item 15	West Twin Disposal Area Closure Plan
Part G, Item 16	Underground Mine Solid Waste Disposal Plan
Part G, Item 17	Landfill Closure Plan
Part G, Item 20	Annual Review of Reports G15 to G17 and Submission, for Approval, of Proposed Modifications
Part G, Item 21	Annual Reclamation Liability Cost Update
Part G, Item 22	2007 Terms of Reference for Comprehensive Assessment of Mine Site Remediation

Table 2: Summary of Nanisivik Climate Data

Climate Variable	Parameter	Value	Source of Data
Air Temperature	Mean Annual Air Temperature (MAAT)	-15.1 °C	Nanisivik AES
	Highest Recorded MAAT	-13.9 °C	Nanisivik AES
	Lowest Recorded MAAT	-16.8 °C	Nanisivik AES
	Mean Air Freezing Index (AFI)	5824 °C-days	Nanisivik AES
	Mean Air Thawing Index (ATI)	275 °C-days	Nanisivik AES
	1:100 Warm Annual Air Temperature	-13.3 °C	Estimated by BGC Based on Nanisivik AES
Precipitation	Total Annual Precipitation	240 mm/year	Nanisivik AES
	Extreme Annual Precipitation (1:100 Return Period)	*380 mm	Estimated (Golder 1998)
	Short Duration Extreme Rainfall (24 Hour 1:100 Year Precipitation Event)	*36 mm	Estimated (Golder 1998)
	Probable Maximum Precipitation	*140 mm to 210 mm (Approx.)	Estimated (Golder 1998)
Evaporation	Mean Annual Evaporation	~ 200 mm/year	DIAND (WTDA Monitoring Station)
Global Warming	Best Estimate MAAT Increase to Year 2100	2.8 °C	Estimated by BGC Based on EC (1998)
	High Sensitivity MAAT Increase to Year 2100	5.0 °C	Estimated by BGC Based on EC (1998)

Table 3: Summary of Borehole Information

Borehole #	Elevation	Surveyed (Y or N)	Location	Depth of Borehole (m)	Instrumentation Installed
BH10 (TC37)	387.5	Y	Surface Cell	30.5	Thermocouple
BGC02-01	386.9	Y	Surface Cell	19.2	Thermistor
BGC02-02	386.7	Y	Surface Cell	19.2	Thermistor
BGC02-03	386.4	Y	Surface Cell	19.2	Thermistor
BGC02-04	386.8	Y	Surface Cell	13.7	Monitoring Well
BGC02-05	386.5	Y	Surface Cell	12.2	Monitoring Well
BGC02-06	386.7	Y	Surface Cell	18.0	Thermistor
BGC02-07	386.5	Y	Surface Cell	24.7	None
BGC02-08	372.8	Y	Toe of West Twin Dike	7.9	Thermocouple
BGC02-09	375.9	Y	Test Cell Dike	30.0	Thermistor
BGC02-10	374.3	Y	Toe of West Twin Dike	8.7	Thermocouple
BGC02-11	386.5	Y	Surface Cell	26.8	Thermocouple
BGC02-12	386.3	Y	Surface Cell	25.3	Thermocouple
BGC02-13	387.3	Y	Surface Cell	30.0	Thermocouple
BGC03-01	386.5	N	Surface Cell	10.1	None
BGC03-02	386.5	N	Surface Cell	16.2	None
BGC03-03			Surface Cell		Thermocouple
BGC03-07	387.3	Y	Surface Cell	25.6	Thermistor
BGC03-08	387	N	Surface Cell	7.6	None
BGC03-09	387.2	Y	Surface Cell	27.4	Thermistor
BGC03-10	386.9	Y	Surface Cell	28.4	Thermistor
BGC03-11	386.0	Y	Surface Cell	24.5	Thermistor
BGC03-12	386.7	Y	Surface Cell	19.2	Monitoring Well/ VW Piezometer
BGC03-13	386.2	Y	Surface Cell	17.7	Thermistor
BGC03-14	386.7	Y	Surface Cell	11.9	Monitoring Well/ VW Piezometer
BGC03-15	387.3	Y	Surface Cell	16.8	Thermistor
BGC03-18	373	N	Toe of West Twin Dike	8.5	Thermocouple
BGC03-19	373	N	Toe of West Twin Dike	9.8	Thermistor
BGC03-20	388.2	Y	Surface Cell	20.1	Thermistor
BGC03-21	388.9	Y	Surface Cell	16.2	Thermistor
BGC03-22	374.5	N	Test Cell Dike	27.4	Thermistor
BGC03-31	387.6	Y	Surface Cell	21.3	VW Piezometer
BGC03-32	387.2	Y	Surface Cell	22.3	VW Piezometer
BGC03-33	387.5	Y	Surface Cell	22.9	Thermistor
BGC03-34	387.5	Y	Surface Cell	13.7	Thermistor
BGC03-35	386.8	Y	Surface Cell	14.6	VW Piezometer
BGC03-36	386.8	Y	Surface Cell	14.5	Thermocouple
BGC03-37	388.8	Y	Surface Cell	7.3	Thermistor
BGC03-38	387.7	Y	Surface Cell	15.1	Thermocouple
BGC03-39	386.5	Y	Surface Cell	10.6	Thermocouple

Table 4: Summary of Lab Test Results - Surface Cell

				Nanisivik Mine Lab				Almor Laboratory Testing							
Borehole	Location	Depth Below Grade (m)	Soil Type	Bulk Density (kg/m³)	Moisture Content (%)	% Sand and Gravel	% Silt and Clay	Moisture Content (%)	% Gravel	% Sand	% Silt	% Clay	Gs	$Is_{(50)}$ Diametral/ Axial (MPa)	Atterberg Limits
BGC02-01	Surface Cell	10.0	Tailings		19.6	39.0	61.0		0.0	9.3	90.7	0.0	4.02		
		11.3	Tailings		20.1	44.5	55.5								
		15.2	Tailings		23.8	9.8	90.2								
BGC02-02		13.1	Tailings		17.8	78.7	21.3		0.0	13.5	86.5	0.0	4.02		
		14.6	Tailings		16.1	29.3	70.7								
		15.2	Lake Bed Sediments		16.3	92.4	7.6								
		15.8	Dolostone											5.2/ 9.9	
BGC02-03		16.2	Tailings		22.0	28.3	71.7								
		16.5	Dolostone											4.9/ 9.2	
BGC02-06		3.8	Tailings	2675	24.7	14.6	85.4								
		4.0	Tailings	2525	20.8	48.2	51.8								
		14.6	Tailings	2542	19.5	8.0	92.0		0.0	4.3	95.7	0.0	4.10		
		17.4	Dolostone											4.6/ 9.5	
BGC02-07		24.4	Lake Bed Sediments		20.7	93.0	7.0								
BGC02-11		2.1	Tailings	2795	18.5	41.1	58.9								
		6.1	Tailings	2887	18.9	25.9	74.1		0.0	30.1	69.9	0.0	4.15		
		7.9	Tailings	3224	16.0	83.3	16.7								
		9.4	Tailings	2861	19.6	13.4	86.6		0.0	6.6	90.4	3.0	3.99		
		24.7	Dolostone											5.7/ 8.6	
BGC02-12		24.1	Lake Bed Sediments		23.8	87.7	12.3		0.0	64.8	28.1	7.1	2.69		
		24.7	Dolostone											5.4/ 10.4	
BGC02-13		1.8	Tailings	3526	19.6	42.0	58.0								
		4.0	Tailings	3208	17.8	72.7	27.3		0.0	74.6	25.4	0.0	4.46		
		6.4	Tailings	2673	17.5	65.8	34.2								
		26.0	Tailings		13.2	91.4	8.6								
BGC03-01		2.3	Tailings		17.5										
		6.9	Tailings		17.2										
		9.9	Tailings		20.0										
BGC03-02		0.8	Tailings		13.7	91.9	8.1								
		1.1	Tailings		12.4	84.1	15.9								
		3.8	Tailings		14.4	77.6	22.4								
		5.0	Tailings		16.4	76.3	23.7								
		5.3	Tailings		13.4	85.0	15.1								
		8.4	Tailings		13.3	68.3	31.7								
BGC03-07		1.4	Tailings		11.6	84.3	15.7								
		2.9	Tailings		15.2	59.1	40.9								
		3.2	Tailings		19.7	86.8	13.2								
		5.9	Tailings	2558	26.1	35.5	64.5								
		9.0	Tailings		38.7	96.7	3.4								
		11.7	Tailings		32.7	61.6	38.4								
		13.3	Tailings		20.2	75.7	24.3								
		16.4	Tailings	2337	21.1	58.5	41.5								
		17.5	Tailings	2724	21.4	33.3	66.7								
		23.9	Lake Bed Sediments					10.3	18.9	57.2	19.8	4.1	2.83		
		24.5	FSB												
BGC03-08		1.3	Tailings		14.2	79.8	20.2								
		2.9	Tailings		16.5	78.3	21.8								
		3.6	Tailings		18.2	49.8	50.2								
		5.6	Tailings		15.6	81.9	18.1								
BGC03-09		1.4	Tailings		14.0	86.6	13.4								
		2.3	Tailings		15.8	77.3	22.7								
		4.4	Tailings		18.3	81.2	18.8								
		5.9	Tailings		17.4	30.3	69.7								
		8.1	Tailings		19.8	33.8	66.3								
		10.5	Tailings		19.2	45.7	54.3								
BGC03-10		1.7	Tailings	2849	13.4	57.2	42.9								
		3.2	Tailings	2581	15.6	32.2	67.8								
		4.4	Tailings	3075	14.8	73.4	26.6								
		27.6	Tailings		12.3	82.3	17.7								
		28.2	Tailings		11.7	68.7	31.3								
BGC03-11		1.7	Tailings		11.2	92.5	7.5								
		2.8	Tailings		12.8	67.2	32.8								
		4.1	Tailings		15.5	83.7	16.3								
		19.7	Tailings		8.0	87.4	12.6								
		20.6	Tailings		13.4	92.4	7.6								
		20.6	Tailings		11.8	92.0	8.0								
		24.4	Bedrock												
BGC03-12		0.7	Tailings		4.9	80.0	20.0								
		4.4	Tailings	2743	17.2	72.0	28.0								
		5.0	Tailings		15.7	57.0	43.0								
		5.9	Tailings	2823	17.3	60.5	39.6								
		8.2	Tailings		17.0	43.7	56.3								
		10.2	Tailings	2809	14.1	75.4	24.6								
		12.0	Tailings	2790	15.8	28.8	71.2								