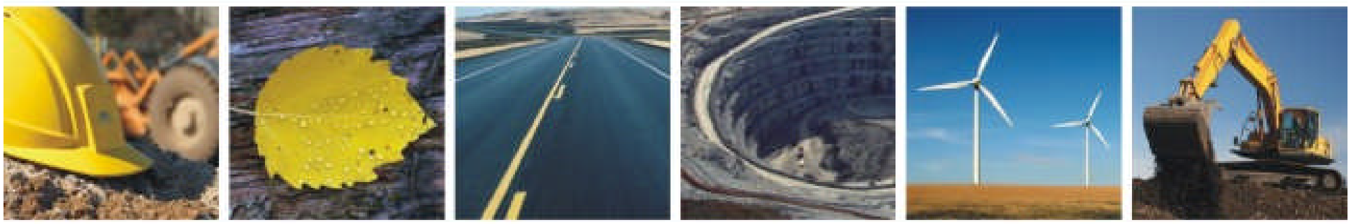
NORTH AMERICAN TUNGSTEN CORPORATION LTD.

RESPONSE TO REQUEST FOR SUPPLEMENTARY INFORMATION FOR THE MACTUNG PROJECT PROPOSAL (YESAB 2008-0304)



JULY 15, 2011
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1.0 INTRODUCTION

This document contains North American Tungsten Corporation's (NATC) response to the Yukon Environmental and Socio-Economic Assessment Board's (YESAB) information requests as set out in the document titled:

Request for Supplementary Information (seeking public comment complete / considering comments stage), Project Number 2008-0304, August 4, 2010

To help the reader follow the document, each of NATC's responses follows the text of each of YESAB's rationales and information requests, i.e., rationale-request-response. Also, YESAB's rationales and information requests have a grey background to clearly delineate them from NATC's responses.

2.0 SUPPLEMENTARY INFORMATION REQUIRED

2.1 Incorporation of New Hydrological and Meteorological Data Into the Water Balance Model

Reference: Section 2.1.2 (b), 2.1.3 (a), and 2.2 (a) of NATC's July 14, 2010, Response to YESAB's Request for Supplementary Information

In the January 13, 2010, Request for Supplementary Information, the Executive Committee requested that the proponent provide updated hydrological and meteorological information.

The proponent provided the results of ongoing baseline hydrology monitoring and updated the flood flow estimates for the Mactung Mine. The flood flow estimates were updated by including a regional hydrometric station operated by Yukon Water Resources Hydrometric Program (1975-1994). As indicated by the proponent, the updated flood flow estimates are within 5% of the original estimates in the project proposal. This additional baseline hydrology data and updated flood flow estimation provides the Executive Committee with increased confidence in the estimated annual hydrological regime for the Mactung Mine.

In order to support an accurate and defensible precipitation model, the proponent updated their model by including data from two additional climate stations from Environment Yukon's WeatherPro database. Mean monthly and mean annual precipitation was recalculated for the Mactung Mine. The proponent also used the ClimateBC model (Spittlehouse 2006) to estimate the mean annual precipitation as a check on the regional annual precipitation estimate. This updated and new information provides the Executive Committee with increased confidence in the precipitation model for the Mactung Mine.

While the new and updated information provides increased confidence, it is important to understand how this new information affects the proposed project with regards to water management.

Provide an updated water balance model by incorporating the new hydrological and meteorological data.

2.2 Approach to Revised Water Balance

To provide a response to the above request, updated information is provided below for precipitation, hydrology and runoff at the proposed Mactung mine site. The revised water balance is then discussed and the water balance Tables are provided. As requested by YESAB, the water balance Tables (2.5-1 to 2.5-9) are also provided in their original Excel digital format on compact disc (Appendix A).

2.3 Precipitation

The climate station installed at the Mactung Site does not measure precipitation. As a result, a regional precipitation analysis was conducted to assess the orographic effects on the precipitation in the region. Five climate stations with relatively long periods of record were selected within a 200 km radius of the site. The properties of the selected climate stations are listed in Table 2.3-1.

Table 2.3-1: Regional Climate Stations Used for the Mactung Precipitation Analysis

Station	Latitude	Longitude	Period	Elevation (m)	Mean Annual Precipitation (mm)
Ross River	61.98	-132.45	1994-2005	698	238
Tungsten	61.95	-128.25	1967-1990	1143	638
Faro	62.21	-133.38	1978-2007	716.6	313
MacPass	63.24	-130.05	2001-2007	1414	592
Mt. Sheldon	62.72	-131.03	2001-2007	920	499

The mean annual precipitation (MAP) was plotted against station elevation as shown in Figure 2.3-1. A fair correlation (R2 equal to 0.84) results from the plot. The regional analysis MAP for the Mactung site is estimated to be 815 mm from extrapolation to the site elevation of 1860 m using the equation shown in Figure 2.3-1.

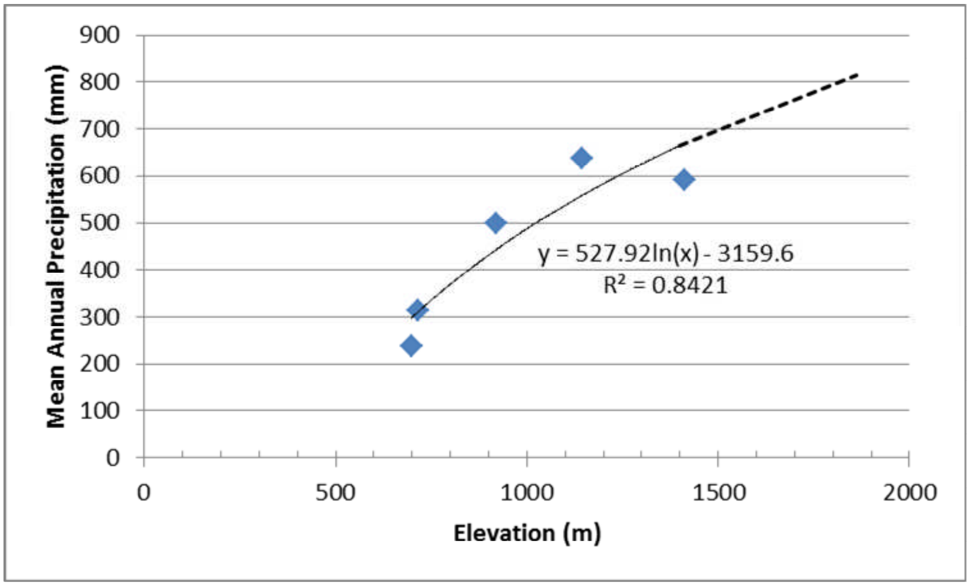


Figure 2.3-1: Mean Annual Precipitation versus Elevation for the Regional Climate Stations

A second method was applied to evaluate the MAP at the Mactung site as a check using ClimateBC (Spittlehouse, 2006). ClimateBC (http://www.genetics.forestry.ubc.ca/cfcg/climatemodels.html) offers high-resolution spatial climate estimation for ungauged areas in BC, Yukon Territories and part of Alberta. The program calculates seasonal and annual climate variables for the point of interest based on latitude, longitude and elevation. The MAP for the Mactung site using the Climate BC program was estimated as 724 mm using the reference "climate normal" for the period 1971-2000. The difference in the estimated precipitations using the two methods is 12%, which provides a reasonable level of confidence in the precipitation estimate using the regional precipitation analysis.

For the purpose of the revised water balance, the regional precipitation of 815 mm was used as mean annual direct precipitation as it was found to be the most conservative approach. This value is 20% smaller than the previously estimated 1020 mm annual precipitation used in the previous water balances in Section 5.4 of the "Response to YESAB's Adequacy Review Report" (EBA, July 2009).

A frequency analysis was undertaken for each climate station using the Hydrological Frequency Analysis Software package HYFRAN 1.1. Three different frequency analyses (Generalized Extreme Value Distribution, Three Parameter Lognormal Distribution and Log Pearson Type III Distribution) were applied to the long-term annual precipitation. The extreme precipitation years were plotted against the station elevation for each extreme condition as in the MAP analysis. The extreme annual precipitation under 100-year wet and 10-year dry conditions were estimated to be 1069 mm and 687 mm, respectively.

The monthly precipitation distribution at the MacPass station is considered the most representative for the Mactung site because of its comparable elevation of 1414 m. As shown in Table 2.3-2, the monthly precipitation distribution for Mactung was calculated using the measured MacPass Station precipitation distribution for the period of 2001 to 2007.

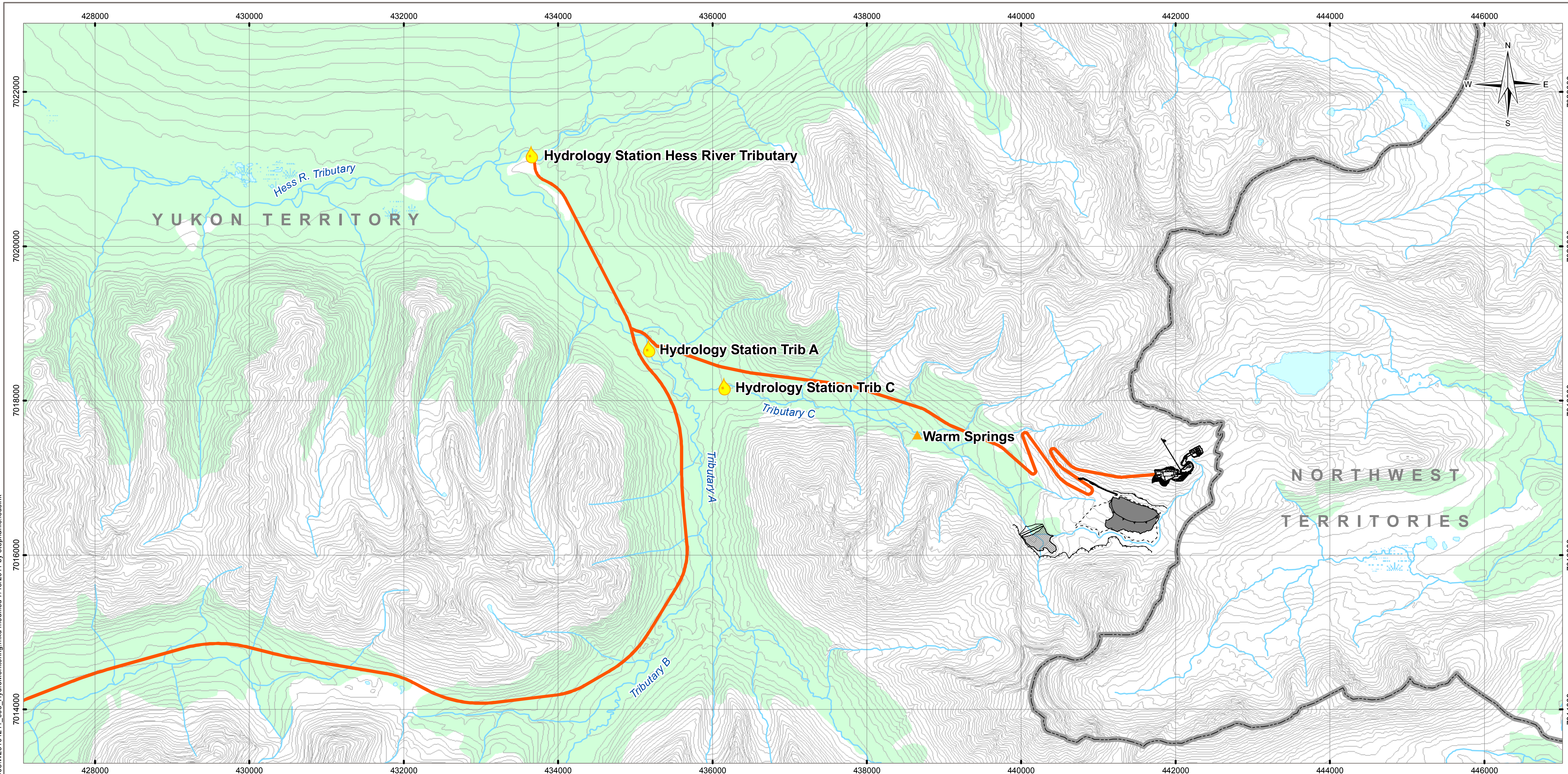
Table 2.3-2: Estimated Monthly Precipitation for Mactung for Average and Extreme Years (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Dist. %	3%	5%	6%	5%	5%	9%	14%	13%	14%	12%	8%	6%	100%
Mean	21	42	51	43	39	76	111	108	116	95	64	50	815
100-yr Wet	27	55	67	56	51	100	145	142	152	124	84	66	1069
10-yr Dry	18	35	43	36	33	64	93	91	98	80	54	43	687

2.4 Runoff

There are currently three local discharge stations near the Mactung project site at Tributary A, Tributary C and the Hess River Tributary (Figure 2.4-1). The Tributary A hydrometric station with an upstream area of 79.1 km2 was installed during the summer of 2006 at latitude 63° 17′ 22.6″ N, longitude 130° 17′ 19.0 ″ W. Spot manual discharges have been conducted on Tributary A and Tributary C since 2006. The discharges evaluated for Tributary C (24.2 km2) were derived from Tributary A by a ratio of discrete discharge measurements collected at similar times from both creeks. This method was validated as the discharge rate agreed with the basin area ratio. The Hess River Tributary hydrometric station with an upstream area of 340 km2 was installed during the summer of 2008 at latitude 63° 18′ 44.9″ N, longitude130° 19′ 38.5″ W.

The local discharge programs have included the collection of discrete seasonal data and continuous summer and fall data since 2006. A longer period of record is typically preferred to conduct a frequency analysis and year-round data is needed to evaluate a monthly runoff distribution for the water balance. As a result, a regional runoff analysis was conducted using regional hydrometric stations to estimate the runoff upstream of the proposed reservoir. The characteristics of the selected regional hydrometric stations for the Mactung runoff analysis are summarized in Table 2.4-1.



LEGEND

- Hydrology Station
- Warm Springs
- Proposed Access Road Route
- NWT-YT Border
- Contours (20 m)
- Watercourse
- Waterbody
- Wetland
- Vegetation

NOTES
Base data source: 1:50,000 NTS

STATUS
ISSUED FOR USE

MACTUNG

Hydrology Monitoring Locations

PROJECTION	DATUM	CLIENT
UTM Zone 9	NAD83	NORTH AMERICAN TUNGSTEN CORPORATION LTD

Scale: 1:50,000
1 0.5 0 1
Kilometres

FILE NO.
W23101211_003_HydroMonitoring.mxd

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PROJECT NO.	DWN	CKD	APVD	REV
W23101211.003	SL	GR	GR	0

OFFICE	DATE
EBA-VANC	July 13, 2011

Figure 2.4-1

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Table 2.4-1: Mactung Regional Hydrometric Stations

Station No.	Name	Lat.	Long.	Area (km^2)	Period
09DA001[1]	Hess River above Emerald Creek	63° 20' 10"	131° 30' 00"	4840	1977-1996
09BB001[1]	South Macmillan River at km 407 Canol Road	62° 55' 30"	130° 32' 30"	997	1975-1996
29BB001[2]	Boulder Creek at km 387 Canol Highway	62° 51' 50"	130° 49' 55"	84.1	1983-1991
29BA002[2]	180 Mile Creek at Km 295.8 North Canol Highway	62° 18'	131° 41'	83.1	1983-1993

[1] Data from Water Survey of Canada
[2] Data from Hydrometric Manual 2005, Yukon Environment, Government of Yukon

Mean monthly runoffs (m3/s) were normalized by converting each flow to a depth of runoff (mm) over the catchment area. Figure 2.4-2 shows the normalized runoff for the selected regional hydrometric station and local discharge programs. The plot indicates that the chosen regional stations best reflect the upper reaches of the Hess River Tributary basin.

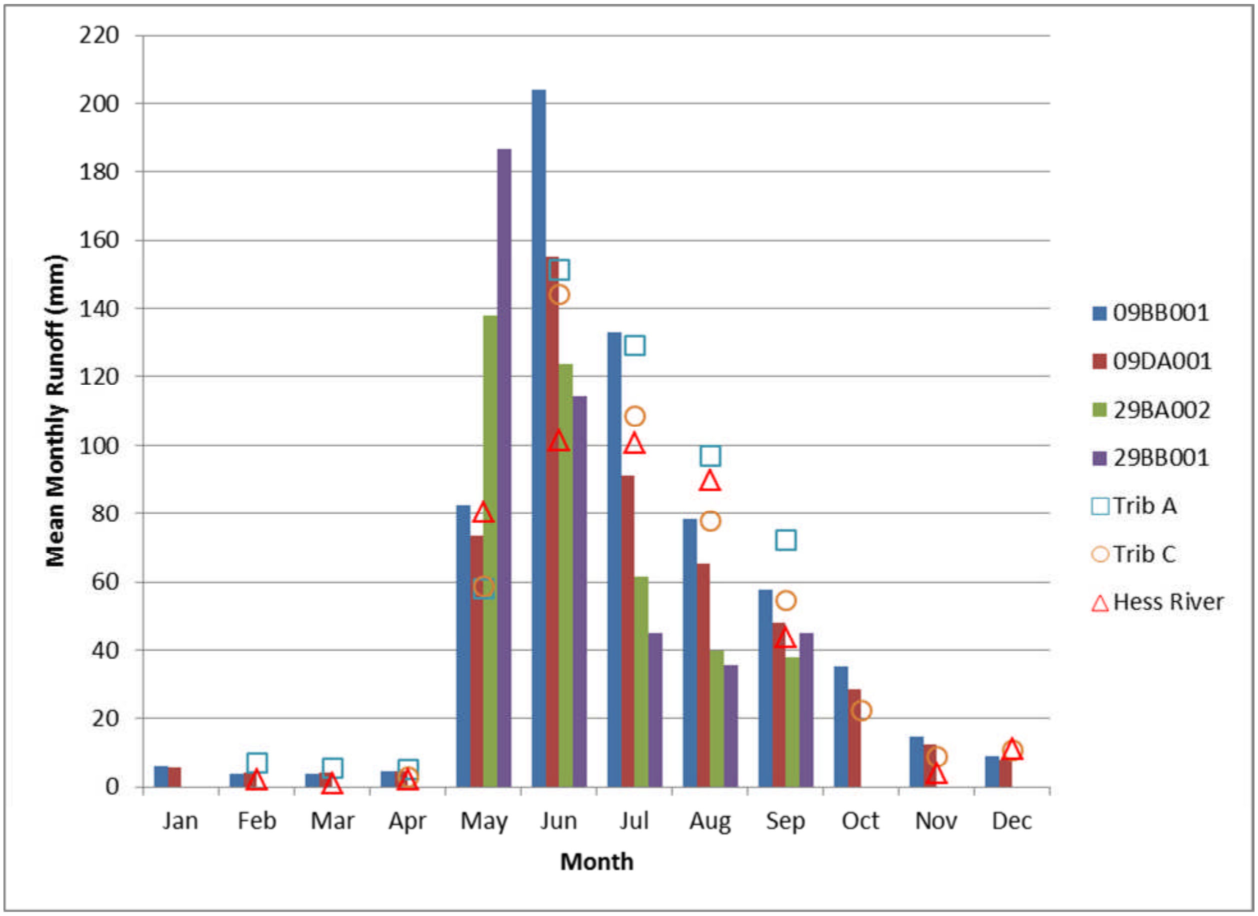


Figure 2.4-2: Mean Monthly Runoff Distribution

Only mean monthly runoff from May to September was available for the two Government of Yukon hydrometric stations. Hence, the regional runoff analysis was based on runoff for this period. Flood frequencies derived from the regional hydrometric stations were calculated by taking the average of the three frequency distributions using HYFRAN. Figure 2.4-3 illustrates the mean summer runoff for each station plotted against mean basin elevation. The mean and extreme summer runoffs at the site were determined by extrapolating the correlations using an estimated mean basin elevation of 1550 m. Table 2.4-2 illustrates the mean and extreme summer runoffs at the Mactung Site.

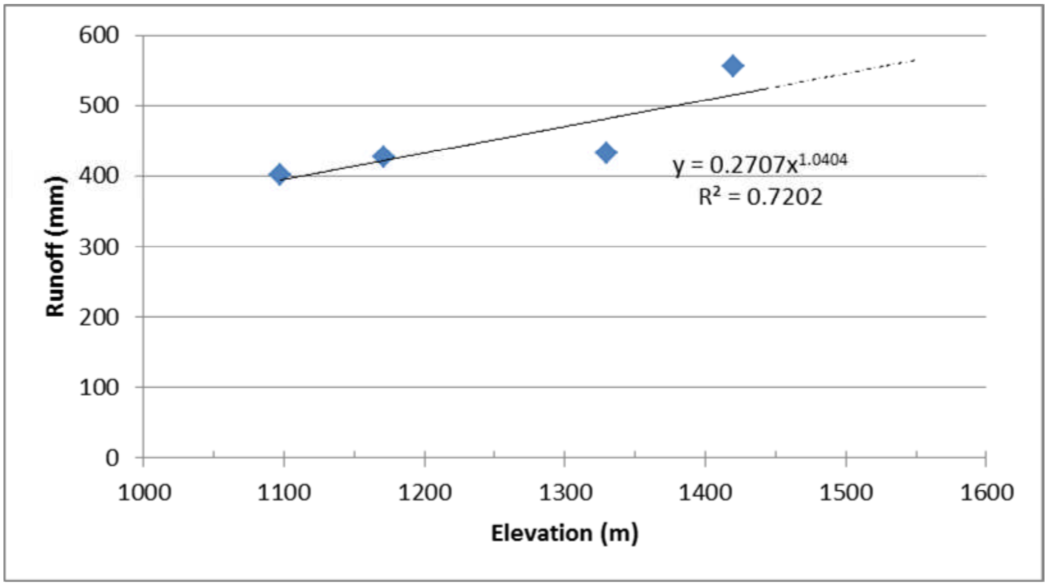


Figure 2.4-3: Mean May-Sept Runoff (mm) versus Mean Basin Elevation

Table 2.4-2: Average and Extreme May-Sept Runoff at Mactung

Station No.	Mean Basin Elev. (m)	May-September Runoff (mm)		
		Average	100-Yr Wet	10-Yr Dry
09BB001	1420	556	741	454
09DA001	1330	433	628	356
29BB001	1171	427	598	316
29BA002	1097	401	601	282
Mactung Site	1550	565	748	498

The two Water Survey of Canada Stations (09DA001 and 09BB001) have enough data throughout the year to evaluate a reasonable average of total annual runoff. Therefore a ratio was calculated for the average summer runoff to average annual runoff for the two stations. The average ratio for the two stations was estimated to be 0.87 (summer runoff/annual runoff). See Table 2.4-3 for the average and extreme annual runoff values at the site.

Table 2.4-3: Estimated Average and Extreme Annual Runoff at Mactung

	Runoff from May-Sep (mm)	Annual Runoff (mm)
Average	565	648
100-Yr Wet	748	859
10-Yr Dry	498	572

The monthly distribution at the site was estimated using the annual runoff distribution of the South Macmillan River at km 407 Canol Road hydrometric station (09BB001), which has 21 years of discharge records and has the closest mean basin elevation to the Mactung site (Table 2.4-4).

Table 2.4-4: Mean and Extreme Runoff (mm) at the Mactung Site

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
% Dist.	1%	1%	1%	1%	13%	32%	21%	12%	9%	6%	2%	1%	100%
Mean	6	4	4	5	85	209	136	80	59	36	15	9	648
10-yr Wet	8	5	5	6	112	276	180	106	78	48	20	12	859
10-yr Dry	6	4	3	4	75	184	120	71	52	32	13	8	572

In general terms, the runoff estimated in Table 2.4-4 at the Mactung site is a little lower than the runoff previously estimated in 2008. The main explanation for this is that the current estimated precipitation values are lower than the previously estimated values (see Section 2.3).

2.5 Water Balance

A water balance model was developed to provide an estimate of discharge rate from the reservoir to Tributary C on a monthly basis.

Inflows considered in the water balance consist of:

- Upstream Runoff;
- Direct Precipitation;
- Mill Discharge;
- Wastewater Treatment Discharge;
- Dry-Stacked Tailings Facility (DSTF) Discharge;
- Underground Dewatering; and
- Seepage Return to the Reservoir

Outflows and losses consist of:

- Reclaim to the Mill;
- Seepage Outflow;
- Discharge to Tributary C; and
- Evaporation

The un-diverted area upstream of the dam was estimated to be approximately 2.51 km2. The reservoir footprint can reach a maximum surface area of approximately 0.084 km2 when flooded. Therefore, the runoff inflows into the reservoir for the mass balance are based on the upstream undiverted area of 2.43 km2. Figure 2.5-1 illustrates inputs and outputs from the infrastructure components that are part of the reservoir water balance.

The water balance tables are based on the assumption that groundwater seepage is directed into the reservoir. The approach of pumping the seepage back into the reservoir is the most conservative as it increases the inflows and volume into the reservoir. Groundwater seepage from the dam was estimated as 6.0 L/s for the first year of mine operation. This discharge rate was reduced to 3.0 L/s and 0 L/S for year 6 and 11 respectively to account for sedimentation. Underground dewatering was assumed at 1 L/s from year 6 to year 11.

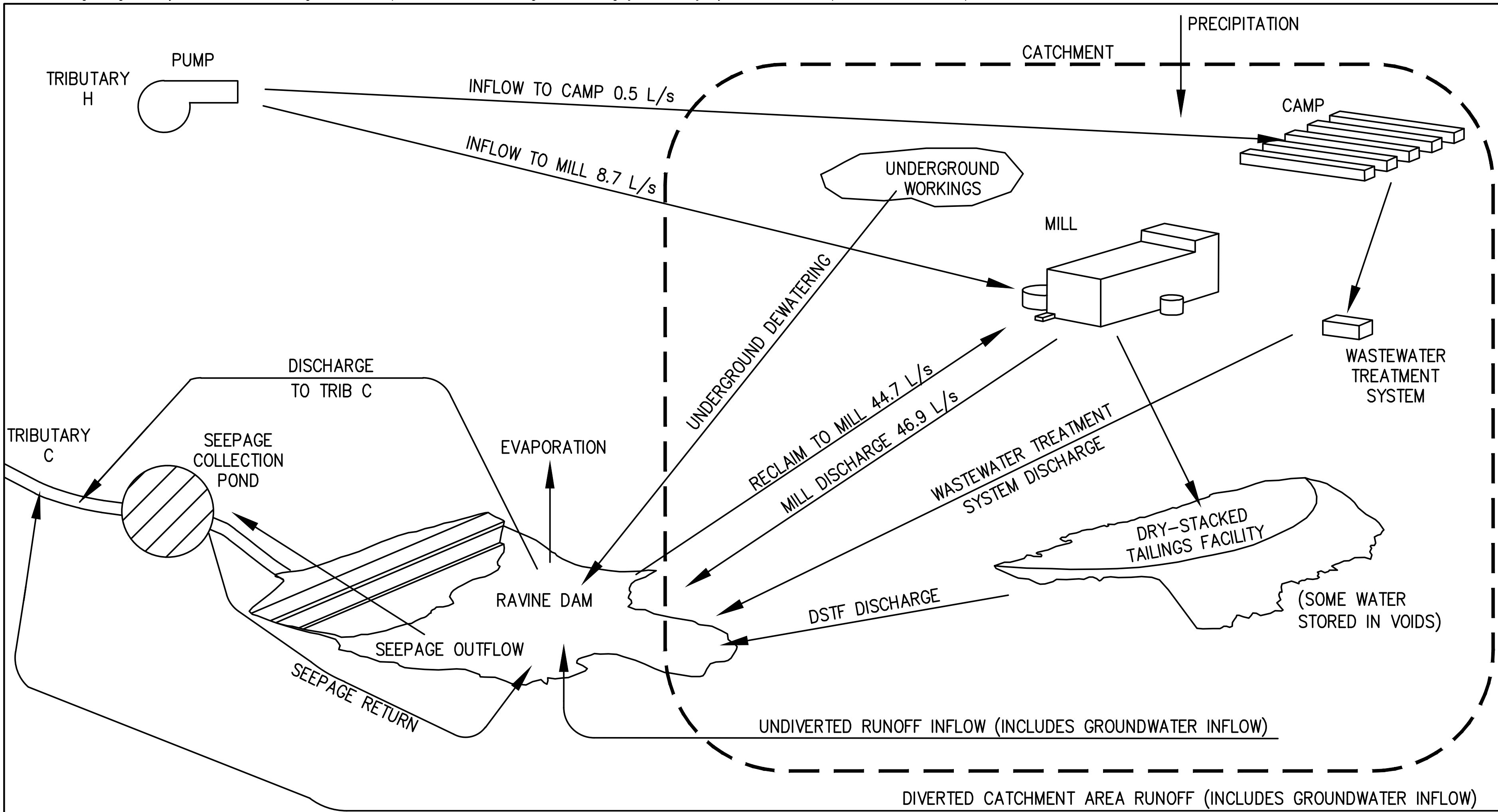
Seepage from the DSTF is expected to occur during the months of May to October, and is anticipated to be zero during other months due to freezing conditions. Seepage rates from the DSTF have been estimated based on the tailings properties and the moisture content of the materials during placement. The seasonal nature of the seepage from the DSTF has been incorporated into the water balance tables. The volume of seepage from the DSTF is not significant compared with other spring inflows to the reservoir and as a result DSTF seepage only has a minor effect on spring inflow to the reservoir.

Tables 2.5-1 to 2.5-9 illustrate the water balances for different flow scenarios (dry, average and wet) during different stages of the project (Year 1, 6 and 11). A positive water balance was established by regulating the discharge rate from the reservoir to ensure that there is enough water (120,000 m^3) to ensure proper operation of the facility and for the reaction of mill reagents. The water balance tables show that the discharges in early spring are greatest to allow excess water to be discharged from the reservoir during freshet.

As mentioned previously, the precipitation estimates in this analysis are lower than the precipitation estimates used in the previous water balances in the July 2010 response document (EBA 2010). This will result in a lower volume of runoff reporting to the reservoir.

Pumping back water from the proposed seepage pond to the reservoir is not anticipated to be required on a continuous basis. Returning seepage water from the seepage pond to the reservoir has been included in the water tables in order for calculations to be conservative and ensure the reservoir infrastructure is correctly sized. The seepage pumped back into the reservoir would be in the order of 208,138 m^3/year and 94,608 m^3/year for Year 1 and Year 6 respectively.

As mentioned in previous documents submitted to YESAB, the designed operating volume of the reservoir is 540,000 m^3. The maximum volume of water the reservoir can hold before over-topping the dam is 612,000 m^3. The maximum volume of water calculated in the water balance tables to be held in the reservoir at any one time during the proposed mine life is approximately 538,000 m^3 (July of year 1, wet year).



ISSUED FOR USE

NOTE:

NUMBERS SHOWN IN FIGURE REPRESENT FIXED VARIABLES.

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

EBA Engineering Consultants Ltd.

MACTUNG

CONCEPTUAL WATER BALANCE

PROJECT NO.	DWN	CKD	REV
W23101211.003	KJT	PLR	2
OFFICE: WHSE	DATE: June 9, 2011 - REVISED		

Figure 2.5-1

TABLE 2.5-1: Water Balance (1:10 Dry) - Year 1 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	5.09	3.52	2.99	3.77	67.63	172.33	108.88	64.18	48.78	28.82	12.54	7.48	Inflows
Precipitation	0.55	1.22	1.49	1.26	1.13	2.23	3.24	3.17	3.39	2.78	1.87	1.48	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Seepage Return to Reservoir	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	
Total Inflow to Reservoir	**59.64**	**58.74**	**58.48**	**59.03**	**123.07**	**228.86**	**166.42**	**121.65**	**106.46**	**85.90**	**68.41**	**62.96**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	Outflows
Seepage Outflow	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	
Discharge to Trib C	0.00	0.00	0.00	0.00	-80.00	-120.00	-110.00	-100.00	-90.00	-79.55	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-51.30**	**-51.30**	**-51.30**	**-51.30**	**-131.65**	**-171.97**	**-161.85**	**-151.78**	**-141.49**	**-130.85**	**-51.30**	**-51.30**	
Net Reservoir Inflow Monthly Volume (m^3)	22,345	17,994	19,228	20,035	-23,004	147,449	12,261	-80,705	-90,785	-120,405	44,357	31,232	
Beginning of Month Reservoir Volume (m^3)	195,588	217,933	235,927	255,155	275,190	252,186	399,635	411,895	331,190	240,405	120,000	164,357	
End of Month Reservoir Volume (m^3)	217,933	235,927	255,155	275,190	252,186	399,635	411,895	331,190	240,405	120,000	164,357	195,588	
End of Month Reservoir Elevation (m)	1,508.4	1,508.9	1,509.1	1,509.4	1,509.0	1,511.4	1,511.5	1,510.4	1,508.9	1,506.2	1,507.4	1,508.0	

Notes: Current scenario assumes seepage is pumped back to reservoir.

TABLE 2.5-2: Water Balance (Average) - Year 1 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	5.77	3.98	3.39	4.27	76.61	195.22	123.34	72.70	55.25	32.65	14.21	8.48	Inflows
Precipitation	0.65	1.45	1.59	1.39	1.21	2.47	3.47	3.39	3.75	2.97	2.07	1.58	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Seepage Return to Reservoir	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	
Total Inflow to Reservoir	**60.42**	**59.43**	**58.98**	**59.66**	**132.13**	**251.98**	**181.11**	**130.40**	**113.30**	**89.92**	**70.28**	**64.06**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	Outflows
Seepage Outflow	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	
Discharge to Trib C	0.00	0.00	0.00	0.00	-100.00	-150.00	-120.00	-110.00	-100.00	-71.78	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-51.30**	**-51.30**	**-51.30**	**-51.30**	**-151.65**	**-201.97**	**-171.85**	**-161.78**	**-151.49**	**-123.08**	**-51.30**	**-51.30**	
Net Reservoir Inflow Monthly Volume (m3)	24,430	19,671	20,573	21,679	-52,303	129,620	24,816	-84,062	-98,984	-88,803	49,189	34,173	
Beginning of Month Reservoir Volume (m3)	203,362	227,791	247,462	268,035	289,715	237,412	367,032	391,849	307,786	208,803	120,000	169,189	
End of Month Reservoir Volume (m3)	227,791	247,462	268,035	289,715	237,412	367,032	391,849	307,786	208,803	120,000	169,189	203,362	
End of Month Reservoir Elevation (m)	1,508.6	1,508.9	1,509.4	1,509.7	1,508.9	1,510.9	1,511.3	1,509.9	1,508.4	1,506.2	1,507.4	1,508.1	

Notes: Current scenario assumes seepage is pumped back to reservoir.

TABLE 2.5-3: Water Balance (1:100 Wet) - Year 1 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	7.64	5.28	4.49	5.66	101.54	258.73	163.47	96.36	73.23	43.27	18.83	11.24	Inflows
Precipitation	0.86	1.90	2.09	1.83	1.59	3.24	4.56	4.46	4.92	3.90	2.72	2.07	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Seepage Return to Reservoir	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	
Total Inflow to Reservoir	**62.50**	**61.18**	**60.58**	**61.49**	**157.43**	**316.27**	**222.33**	**155.11**	**132.45**	**101.47**	**75.55**	**67.31**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	Outflows
Seepage Outflow	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	-6.60	
Discharge to Trib C	0.00	0.00	0.00	0.00	-140.00	-160.00	-160.00	-140.00	-130.00	-121.98	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-51.30**	**-51.30**	**-51.30**	**-51.30**	**-191.65**	**-211.97**	**-211.85**	**-191.78**	**-181.49**	**-173.28**	**-51.30**	**-51.30**	
Net Reservoir Inflow Monthly Volume (m3)	30,003	23,901	24,859	26,410	-91,657	270,336	28,073	-98,214	-127,111	-192,330	62,847	42,884	
Beginning of Month Reservoir Volume (m3)	225,731	255,734	279,634	304,493	330,903	239,246	509,582	537,655	439,441	312,330	120,000	182,847	
End of Month Reservoir Volume (m3)	255,734	279,634	304,493	330,903	239,246	509,582	537,655	439,441	312,330	120,000	182,847	225,731	
End of Month Reservoir Elevation (m)	1,509.1	1,509.5	1,509.9	1,510.4	1,508.9	1,512.8	1,512.9	1,511.9	1,510.0	1,506.2	1,507.8	1,508.5	

Notes: Current scenario assumes seepage is pumped back to reservoir.

TABLE 2.5-4: Water Balance (1:10 Dry) - Year 6 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	5.09	3.52	2.99	3.77	67.63	172.33	108.88	64.18	48.78	28.82	12.54	7.48	Inflows
Precipitation	0.55	1.22	1.49	1.26	1.13	2.23	3.24	3.17	3.39	2.78	1.87	1.48	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Seepage Return to Reservoir	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	
Total Inflow to Reservoir	**57.04**	**56.14**	**55.88**	**56.43**	**120.47**	**226.26**	**163.82**	**119.05**	**103.86**	**83.30**	**65.81**	**60.36**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	Outflows
Seepage Outflow	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	
Discharge to Trib C	0.00	0.00	0.00	0.00	-90.00	-140.00	-110.00	-100.00	-80.00	-71.65	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-47.70**	**-47.70**	**-47.70**	**-47.70**	**-138.05**	**-188.37**	**-158.25**	**-148.18**	**-127.89**	**-119.35**	**-47.70**	**-47.70**	
Net Reservoir Inflow Monthly Volume (m3)	25,023	20,413	21,906	22,627	-47,110	98,201	14,939	-78,027	-62,273	-96,558	46,949	33,910	
Beginning of Month Reservoir Volume (m3)	200,859	225,882	246,295	268,201	290,828	243,719	341,919	356,858	278,832	216,558	120,000	166,949	
End of Month Reservoir Volume (m3)	225,882	246,295	268,201	290,828	243,719	341,919	356,858	278,832	216,558	120,000	166,949	200,859	
End of Month Reservoir Elevation (m)	1,508.5	1,508.9	1,509.4	1,509.7	1,508.9	1,510.5	1,510.8	1,509.5	1,508.4	1,506.2	1,507.4	1,508.1	

Notes: Current scenario assumes seepage is pumped back to reservoir.
Yr 6 scenario includes underground dewatering and reduction in groundwater seepage from 6.6 L/s to 3 L/s to reflect sedimentation

TABLE 2.5-5: Water Balance (Average) - Year 6 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	5.77	3.98	3.39	4.27	76.61	195.22	123.34	72.70	55.25	32.65	14.21	8.48	**Inflows**
Precipitation	0.65	1.45	1.59	1.39	1.21	2.47	3.47	3.39	3.75	2.97	2.07	1.58	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Seepage Return to Reservoir	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	
Total Inflow to Reservoir	**57.82**	**56.83**	**56.38**	**57.06**	**129.53**	**249.38**	**178.51**	**127.80**	**110.70**	**87.32**	**67.68**	**61.46**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	**Outflows**
Seepage Outflow	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	
Discharge to Trib C	0.00	0.00	0.00	0.00	-110.00	-150.00	-130.00	-110.00	-90.00	-73.23	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-47.70**	**-47.70**	**-47.70**	**-47.70**	**-158.05**	**-198.37**	**-178.25**	**-158.18**	**-137.89**	**-120.93**	**-47.70**	**-47.70**	
Net Reservoir Inflow Monthly Volume (m3)	27,108	22,090	23,251	24,271	-76,408	132,212	711	-81,384	-70,472	-90,012	51,781	36,851	
Beginning of Month Reservoir Volume (m3)	208,632	235,740	257,830	281,082	305,353	228,945	361,157	361,868	280,484	210,012	120,000	171,781	
End of Month Reservoir Volume (m3)	235,740	257,830	281,082	305,353	228,945	361,157	361,868	280,484	210,012	120,000	171,781	208,632	
End of Month Reservoir Elevation (m)	1,508.9	1,509.1	1,509.5	1,509.9	1,508.6	1,510.9	1,510.9	1,509.5	1,508.4	1,506.2	1,507.5	1,508.4	

Notes: Current scenario assumes seepage is pumped back to reservoir.
Yr 6 scenario includes underground dewatering and reduction in groundwater seepage from 6.6 L/s to 3 L/s to reflect sedimentation

TABLE 2.5-6: Water Balance (1:100 Wet) - Year 6 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	7.64	5.28	4.49	5.66	101.54	258.73	163.47	96.36	73.23	43.27	18.83	11.24	Inflows
Precipitation	0.86	1.90	2.09	1.83	1.59	3.24	4.56	4.46	4.92	3.90	2.72	2.07	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Seepage Return to Reservoir	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	
Total Inflow to Reservoir	**59.90**	**58.58**	**57.98**	**58.89**	**154.83**	**313.67**	**219.73**	**152.51**	**129.85**	**98.87**	**72.95**	**64.71**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	Outflows
Seepage Outflow	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	-3.00	
Discharge to Trib C	0.00	0.00	0.00	0.00	-160.00	-165.00	-160.00	-160.00	-120.00	-98.59	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-47.70**	**-47.70**	**-47.70**	**-47.70**	**-208.05**	**-213.37**	**-208.25**	**-208.18**	**-167.89**	**-146.29**	**-47.70**	**-47.70**	
Net Reservoir Inflow Monthly Volume (m3)	32,681	26,320	27,537	29,002	-142,546	259,968	30,751	-149,104	-98,599	-127,012	65,439	45,562	
Beginning of Month Reservoir Volume (m3)	231,001	263,682	290,002	317,540	346,541	203,995	463,963	494,714	345,610	247,012	120,000	185,439	
End of Month Reservoir Volume (m3)	263,682	290,002	317,540	346,541	203,995	463,963	494,714	345,610	247,012	120,000	185,439	231,001	
End of Month Reservoir Elevation (m)	1,509.4	1,509.7	1,510.1	1,510.5	1,508.2	1,512.3	1,512.5	1,510.5	1,508.9	1,506.2	1,507.9	1,508.7	

Notes: Current scenario assumes seepage is pumped back to reservoir.
Yr 6 scenario includes underground dewatering and reduction in groundwater seepage from 6.6 L/s to 3 L/s to reflect sedimentation

TABLE 2.5-7: Water Balance (1:10 Dry) - Year 11 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	5.09	3.52	2.99	3.77	67.63	172.33	108.88	64.18	48.78	28.82	12.54	7.48	Inflows
Precipitation	0.55	1.22	1.49	1.26	1.13	2.23	3.24	3.17	3.39	2.78	1.87	1.48	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Seepage Return to Reservoir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Inflow to Reservoir	**54.04**	**53.14**	**52.88**	**53.43**	**117.47**	**223.26**	**160.82**	**116.05**	**100.86**	**80.30**	**62.81**	**57.36**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	Outflows
Seepage Outflow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Discharge to Trib C	0.00	0.00	0.00	0.00	-100.00	-140.00	-110.00	-100.00	-80.00	-61.65	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-44.70**	**-44.70**	**-44.70**	**-44.70**	**-145.05**	**-185.37**	**-155.25**	**-145.18**	**-124.89**	**-106.35**	**-44.70**	**-44.70**	
Net Reservoir Inflow Monthly Volume (m3)	25,023	20,413	21,906	22,627	-73,894	98,201	14,939	-78,027	-62,273	-69,774	46,949	33,910	
Beginning of Month Reservoir Volume (m3)	200,859	225,882	246,295	268,201	290,828	216,935	315,135	330,074	252,048	189,774	120,000	166,949	
End of Month Reservoir Volume (m3)	225,882	246,295	268,201	290,828	216,935	315,135	330,074	252,048	189,774	120,000	166,949	200,859	
End of Month Reservoir Elevation (m)	1,508.5	1,508.9	1,509.4	1,509.7	1,508.4	1,510.0	1,510.4	1,509.0	1,507.9	1,506.2	1,507.4	1,508.1	

Notes: Current scenario assumes seepage is pumped back to reservoir.
Yr 11 scenario is for fully sealed reservoir with no groundwater seepage.

TABLE 2.5-8: Water Balance (Average) - Year 11 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	5.77	3.98	3.39	4.27	76.61	195.22	123.34	72.70	55.25	32.65	14.21	8.48	Inflows
Precipitation	0.65	1.45	1.59	1.39	1.21	2.47	3.47	3.39	3.75	2.97	2.07	1.58	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Seepage Return to Reservoir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Inflow to Reservoir	**54.82**	**53.83**	**53.38**	**54.06**	**126.53**	**246.38**	**175.51**	**124.80**	**107.70**	**84.32**	**64.68**	**58.46**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	Outflows
Seepage Outflow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Discharge to Trib C	0.00	0.00	0.00	0.00	-120.00	-150.00	-130.00	-120.00	-100.00	-43.55	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-44.70**	**-44.70**	**-44.70**	**-44.70**	**-165.05**	**-195.37**	**-175.25**	**-165.18**	**-144.89**	**-88.25**	**-44.70**	**-44.70**	
Net Reservoir Inflow Monthly Volume (m3)	27,108	22,090	23,251	24,271	-103,192	132,212	711	-108,168	-96,392	-10,524	51,781	36,851	
Beginning of Month Reservoir Volume (m3)	208,632	235,740	257,830	281,082	305,353	202,161	334,373	335,084	226,916	130,524	120,000	171,781	
End of Month Reservoir Volume (m3)	235,740	257,830	281,082	305,353	202,161	334,373	335,084	226,916	130,524	120,000	171,781	208,632	
End of Month Reservoir Elevation (m)	1,508.9	1,509.1	1,509.5	1,509.9	1,508.1	1,510.4	1,510.4	1,508.6	1,506.4	1,506.2	1,507.5	1,508.4	

Notes: Current scenario assumes seepage is pumped back to reservoir.
Yr 11 scenario is for fully sealed reservoir with no groundwater seepage.

TABLE 2.5-9: Water Balance (1:100 Wet) - Year 11 (L/s)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Days	31	28	31	30	31	30	31	31	30	31	30	31	
Undiverted Runoff Inflow	7.64	5.28	4.49	5.66	101.54	258.73	163.47	96.36	73.23	43.27	18.83	11.24	**Inflows**
Precipitation	0.86	1.90	2.09	1.83	1.59	3.24	4.56	4.46	4.92	3.90	2.72	2.07	
Mill Discharge	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	46.90	
Wastewater Treatment Discharge	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
DSTF Discharge	0.00	0.00	0.00	0.00	0.30	0.30	0.30	0.30	0.30	0.30	0.00	0.00	
Underground Dewatering	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Seepage Return to Reservoir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Inflow to Reservoir	**56.90**	**55.58**	**54.98**	**55.89**	**151.83**	**310.67**	**216.73**	**149.51**	**126.85**	**95.87**	**69.95**	**61.71**	
Reclaim to the Mill	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	-44.70	**Outflows**
Seepage Outflow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Discharge to Trib C	0.00	0.00	0.00	0.00	-150.00	-170.00	-160.00	-150.00	-130.00	-104.08	0.00	0.00	
Evaporation	0.00	0.00	0.00	0.00	-0.35	-0.67	-0.55	-0.48	-0.19	0.00	0.00	0.00	
Total Outflow from Reservoir	**-44.70**	**-44.70**	**-44.70**	**-44.70**	**-195.05**	**-215.37**	**-205.25**	**-195.18**	**-174.89**	**-148.78**	**-44.70**	**-44.70**	
Net Reservoir Inflow Monthly Volume (m3)	32,681	26,320	27,537	29,002	-115,762	247,008	30,751	-122,320	-124,519	-141,700	65,439	45,562	
Beginning of Month Reservoir Volume (m3)	231,001	263,682	290,002	317,540	346,541	230,779	477,787	508,538	386,218	261,700	120,000	185,439	
End of Month Reservoir Volume (m3)	263,682	290,002	317,540	346,541	230,779	477,787	508,538	386,218	261,700	120,000	185,439	231,001	
End of Month Reservoir Elevation (m)	1,509.4	1,509.7	1,510.1	1,510.5	1,508.7	1,512.4	1,512.8	1,511.1	1,509.3	1,506.2	1,507.9	1,508.7	

Notes: Current scenario assumes seepage is pumped back to reservoir.
Yr 11 scenario is for fully sealed reservoir with no groundwater seepage.

R1. Provide a discussion on if and how the updated water balance model affects the design and operation of the proposed project. The discussion should include but is not limited to:

- design and size of water management infrastructure, and;
- plan and management of flows.

2.6 Mine Infrastructure and the Revised Water Balance

Sections 2.2 to 2.4 above provide the details on the estimated precipitation for Mactung, and the updated run-off volumes. These values were then used to create revised water balance tables in Section 2.5 for the proposed Mactung mine. The revised water balance tables indicate that the existing water management infrastructure, and in particular, the reservoir, has been designed to hold the maximum volume of water calculated to be in the reservoir during the 11-year mine life.

The water balance tables presented in Section 2.5 provide different scenarios for the water balance for wet, dry and average years at different stages of the mine life (years 1, 6 and 11). As the current precipitation and runoff volumes for the proposed mine site are lower than previously estimated and other inputs and outputs remain the same, no changes to the water management systems or infrastructure for the mine site are anticipated. In addition, there is flexibility in the water management system to allow for inputs and discharges to be increased and decreased according to the conditions at the time. Maintaining a minimum volume of 120,000 m^3 of water in the reservoir and enough reservoir free board in the fall to allow for the following year's freshet have been incorporated into the water balance tables.

3.0 GEOCHEMICAL COMPARISON BETWEEN MACTUNG AND CANTUNG DEPOSITS

Reference: Section 3.1.2 of NATC's July 14, 2010, Response to YESAB's Request for Supplementary Information

In the project proposal for the Mactung Mine, NATC provides a comparison between Mactung and Cantung deposits. Information from this comparison and operations at the Cantung Mine are used to predict Mactung Mine project inputs into the reservoir and resulting water quality upon discharge. NATC also stated that this information could be used in lieu of some of the geochemical characterization usually required to understand the potential effects of the Mactung Mine, in particular risks associated with acid rock drainage/metal leaching (ARD/ML).

In the January 13, 2010 Request for Supplementary Information the Executive Committee requested that the proponent provide additional support to their assertion that the geochemical comparison between Mactung and Cantung deposits is appropriate for the purposes of the assessment. In response, the proponent indicated that the geochemical comparison between the two deposits was intended to "give an indication of the potential impact from the Mactung operation prior to having any test samples for Mactung" (p. 52 of Supplementary Information Response of July 14, 2010). Furthermore, the proponent did not intend for the comparison to replace the need to geochemical testwork at the Mactung site. NATC's conclusion is that a "detailed comparison is no longer required for the ongoing assessment of the proposed Mactung Mine due to the availability of the Mactung tailings samples" (p. 52 of Supplementary Information Response of July 14, 2010).

Reservoir Water Quality Predictive Modeling

The Mactung Mine proposes direct surface water discharge from the seepage water reservoir and/or the ravine dam reservoir into Tributary C. Based on the water quality predictive modeling, the proponent expects that discharge water quality will meet the federal Metal Mining Effluent Regulations (MMER) discharge criteria and is not proposing any water treatment.

The project proposal indicates that data from the Cantung Mine were used to develop a reservoir water quality predictive model for the Mactung Mine. The goal of the model was to predict how various mine and processing effluents would interact within the reservoir and provide predictions of water quality upon discharge. The model relied on the input of data taken from the Cantung Mine specifically: process water from one sample for Tailings Pond #3 at the Cantung Mine was used in place of Mactung Mine process water, and; potential metal loading rates from tailings were represented by humidity cell data from the Cantung Mine.

The proponent indicated that "the model will be updated as results from the Mactung metallurgical testing program become available" (p. 556 of the project proposal). While the model may be updated with humidity cell data from the Mactung Mine kinetic test program, this may not provide sufficient confidence in the reservoir water quality predictive model. Particularly as the proponent indicated in their July 14, 2010, Supplementary Information Response that the supernatant produced from the Mactung Mine humidity cells is not expected to be representative of the effluent that will be produced at the mine site during operation (p. 50).

Without defensible predictions of the Mactung Mine inputs into the water in the reservoir, the Executive Committee does not have confidence in the predicted water quality at discharge. Several options may be available to NATC to provide this information into the screening. A detailed geochemical comparison between the Mactung and Cantung deposits is one option for the Executive Committee to have reasonable confidence in the predicted water quality for the site. This will allow the Executive Committee to predict the potential effects of discharge water on the receiving water environment and further indentify any necessary mitigation measures.

The Executive Committee has determined that additional information is required in order to prepare the Draft Screening Report. A detailed comparison between the Mactung and Cantung deposits is still relevant to the assessment to provide reasonable confidence in the Mactung Mine water quality predictive model developed for the reservoir. Therefore, please provide the following information.

R2. Provide and validate a reservoir water quality predictive model for the Mactung Mine taking into account:

- the updated precipitation data and the updated water balance model referenced above in section 2.1, R1 and R2; and

- defensible predictions of mine effluent inputs into the reservoir based on a detailed geochemical comparison between Mactung and Cantung deposits and predicted effluent quality from the Mactung Mine.

Information on the updated water balance model is provided in Section 2 above. The outputs from the updated water balance have been incorporated into the predictive water quality model in the attached Geochemical Characterization and Predictive Water Quality Report (Appendix B) to determine mixing ratios for leachate and other background runoff and ultimately, the predicted water quality of the reservoir.

The purpose of completing a comparison between Mactung and Cantung deposits was to facilitate the use of Cantung geochemical data in lieu of Mactung site specific data. As of June 2011, sufficient geochemical sampling and analyses have been performed on Mactung waste rock samples, meeting both the MEND and YESAB guidelines for sample count and spatial representation. According to the predicted waste rock volumes, a total of 13 samples from Unit 1 and 34 samples from Unit 3C were recommended to fully characterize the data. Analytical results from samples collected in May 2011 and analyzed in June 2011, combined with results from submitted previously samples, bring the total sample counts for Units 1 and 3C to 27 and 39, respectively. This information provides site specific geochemical data for the Mactung property which provides a more thorough assessment of the Mactung geochemical characterization than a comparison with Cantung data.

Results of the acid-base accounting (ABA), neutral shake flask metals leaching, and acidic shake flask metal leaching have been compiled for Units 1 and 3C waste rock, providing for defensible mine effluent predictions into the fresh water reservoir. All geochemical analyses and predictive modeling results have been compiled and submitted in the Geochemical Characterization and Predictive Water Quality Modeling Report (Appendix B). YESAB is directed to review the referenced report, which addresses the information requests listed above.

NATC would like to emphasize that the geochemical and predictive water quality study presents different scenarios that take into account ranges in on-site precipitation volumes, and allow for the waste rock and dry-stacked tailings to become acid generating. The attached report (Appendix B) therefore presents a worst-case scenario and assumes the dry-stacked tailings and waste rock become acid generating and that no mitigation measures are applied. The model results indicate that if acid generating conditions were allowed to prevail without mitigation measures then the reservoir water quality will not be greatly affected. In addition, NATC will apply operational and closure mitigations that will minimize the potential for acid generating conditions to exist. The waste rock and tailings operational plan includes mitigations for ARD and is discussed in Section 3 of the attached report (Appendix B).

Mactung Mine Kinetic Test Program

In the initial adequacy review report issued on March 30, 2009, the Executive Committee requested that NATC predict the ARD/ML potential through appropriate lab testing as outlined in the *Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Minesites in British Columbia* (Price, 1997) [BC Guidelines]. The BC Guidelines indicate that samples for kinetic testing must include all the different types of materials that will be excavated or exposed. This includes all materials such as ore, waste rock, host rock, etc. Furthermore, the BC Guidelines indicate that kinetic test samples should not be created using composites of widely spaced samples.

In response to the initial adequacy review report, the proponent initiated a kinetic testing program for the Mactung Mine. This program established two humidity cells using samples from the 2008 and 2005 exploration program drill cores. The 2005 sample is a composite of 53 drill core samples taken from ore grade material, while the 2008 sample is a composite taken from both ore grade and sub-ore grade materials. Ore grade material is found in Mactung Mine Rock Unit 2B which is made up of different lithologies. It is uncertain what lithologies form the material found in the composite samples. The proponent did not initiate humidity cells using samples produced from other rock types (e.g., waste rock and host rock) that may be disturbed or exposed during mining operations. Rather, the proponent indicated that the composite samples produced will be representative of a worst-case scenario because Rock Unit 2B has higher mineralization than waste rock and the tailings produced from this rock unit will have higher metal leaching potential.

Given the Mactung Mine kinetic test program is not consistent with the BC Guidelines a detailed geochemical comparison between the Mactung and Cantung deposits is still relevant to the screening of the Mactung Mine. It is critical for the Executive Committee to understand and have reasonable confidence in the ARD/ML predictions for the Mactung Mine. These predictions will provide an estimate of the time to onset of ARD and potential ML from tailings and waste rock. This information is also needed to determine appropriate mitigation measures for dealing with potentially acid generating waste rock and tailings and long term closure of the site. If waste rock stockpiled on the surface were to become acid generating, or if tailings were to become acid generating before they could be flooded, it may compromise the success of underground disposal, or result in higher effects from the outset. The time to onset for ARD may also affect the length of post mining monitoring required or considerations for temporary closure.

The Executive Committee has determined that additional information is required in order to prepare the Draft Screening Report. A detailed comparison between the Mactung and Cantung deposits is still relevant to the assessment to provide reasonable confidence in the Mactung Mine kinetic testing program. Therefore, please provide the following information.

R3. Provide and validate the acid rock drainage and metal leaching potential at the Mactung Mine through:

- a detailed geochemical comparison between Mactung and Cantung deposits in order to support the kinetic test program; and
- sufficient and appropriate geochemical characterization of the Mactung Mine (as outlined in the BC Guidelines).

The attached Geochemical Characterization and Predictive Water Quality Modeling Report (Appendix B) provides information on the acid rock drainage and metal leaching potential at Mactung. YESAB is directed to review the report in light of the information requested above. The report presents the geochemical characterization of the Mactung waste rock and tailings. No direct comparisons between Mactung and

Cantung are provided as, since June 2011, sufficient data for characterization of the Mactung deposit has been completed that meets the MEND (2009) guidelines.

REFERENCES

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TABLES

FIGURES

APPENDIX A

APPENDIX A DIGITAL COPY OF THE RESPONSE DOCUMENT AND MACTUNG GEOCHEMICAL CHARACTERIZATION AND PREDICTIVE WATER QUALITY REPORT

APPENDIX B

APPENDIX B MACTUNG GEOCHEMICAL CHARACTERIZATION AND PREDICTIVE WATER QUALITY REPORT