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Tahera
Diamond Corporation

Long Lake Dewatering Plan
Jericho Diamond Mine
Nunavut
Water Licence **NWB01JER0410**

Submitted to:

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Toronto, Ontario

Submitted by:

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Burnaby, BC

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EXECUTIVE SUMMARY

This report presents dewatering plan for Long Lake located at Jericho Diamond Mine in Nunavut which includes a summary of fish salvage operations, the calculation of dewatering volume, the dewatering procedures and monitoring plan

The fish salvage operation will occur prior to and during the dewatering of Long Lake and the fish will be moved to Lake C3 and Carat Lake by an experienced fisheries consultant. The total volume to be pumped is a combination of a 2 m drawdown of Long Lake, direct precipitation on Long Lake during the pumping and runoff to Long Lake during pumping. Based on the license requirement the maximum pumping rate is the average spring freshet flows in stream C3. The average freshet flow is estimated at 0.034 m^3/s but the maximum recorded by the flow monitoring station is 0.045 m^3/s.

A 600 USGPM (0.038 m^3/s) diesel pump will be located on shore near the deepest point at the west end of Long Lake. A floating suction pipe will draw water from near the lake surface and will be positioned at a deep spot of the lake. Water will be pumped continuously at the maximum pumping capacity of the pump (approximately 90% manufacturer's rating).

Monitoring will involve inspection of the pumping discharge point and steam C3 before dewatering begins. To ensure these locations will be able to cope with the flow. These locations will also be monitored for erosion during pumping and if erosion is observed pumping will be ceased and erosion protection in the form of local rocks will be placed. Pumping will then recommence and monitoring continued with particular attention paid to the repaired locations.

1.0 INTRODUCTION

Long Lake will require fish salvage and partial dewatering (dewatering in this case refers to the lowering of lake water level, not complete dewatering) prior to construction of the frozen core dam on the west end of the lake basin as part of the PKCA development. This dewatering plan was developed pursuant to Jericho Water Licence **NWB01JER0410**, Part D, Item 13 and Schedule D, Item 13. Long Lake and the small ponds west and northwest of the lake (Figure 1.1) contain small populations of burbot and slimy sculpins. Fish salvage will take place prior to and co-incident with dewatering. Dewatering is currently scheduled for September 2005.

1.1 Fish Salvage

Small populations of burbot and slimy sculpins inhabit Long Lake and the small ponds. Fish will be live-trapped prior to and during dewatering and moved to Lake C3 and Carat Lake by an experienced fisheries consultant, pursuant to NWB acceptance of the salvage plan (Mainstream Aquatics 2005). Fish salvage is scheduled for July, August and September.

1.2 Dewatering Constraints

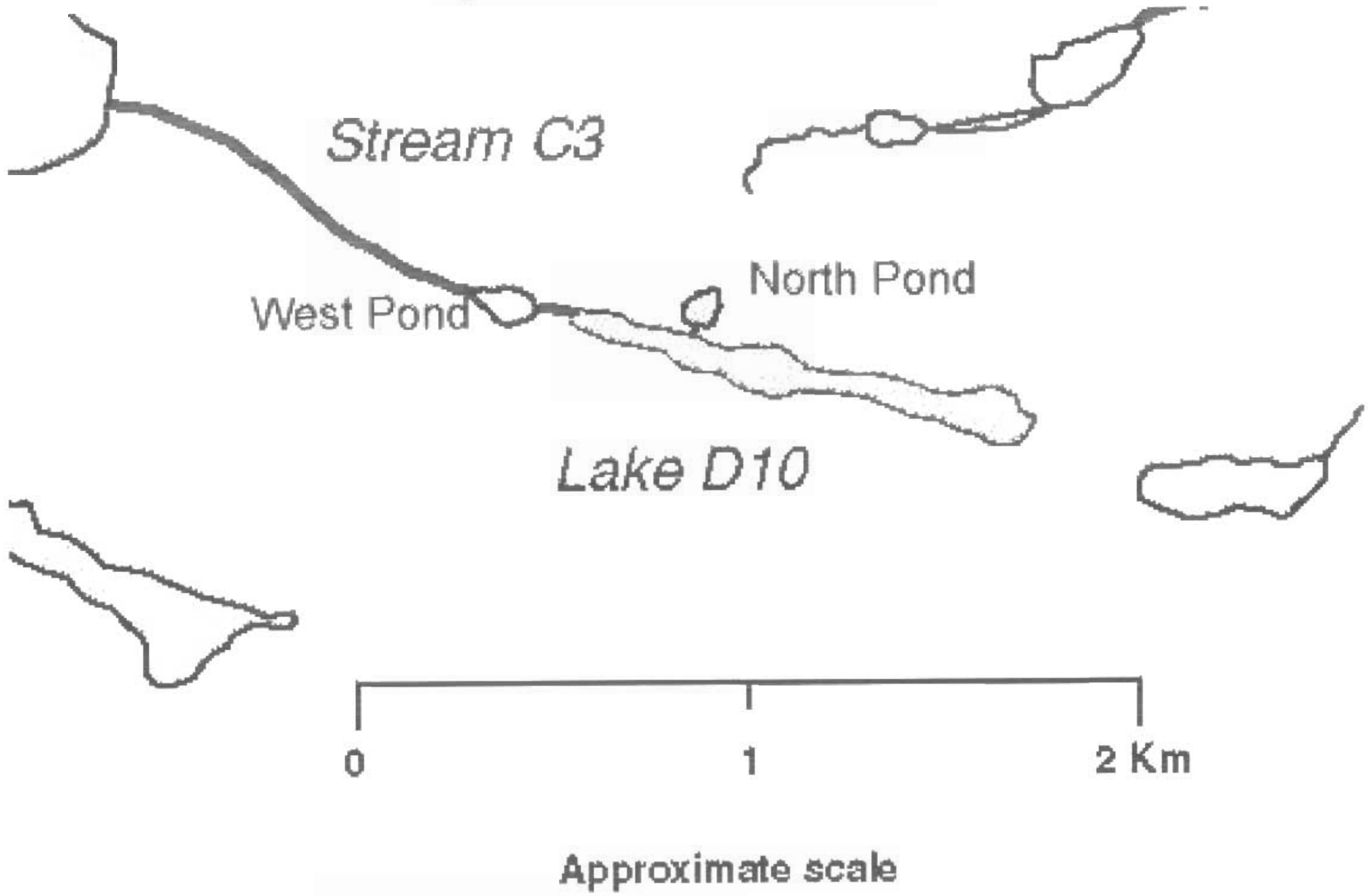
Dewatering is constrained by two licence requirements and one physical requirement:

- Suspended sediments in the discharge water must meet 15 mg/L average and 25 mg/L maximum concentrations.
- Discharge rate cannot exceed average freshet flows estimated for Stream C3.
- Approximately 148,300 m^3 will be discharged from Long Lake.

1.3 Purpose and Scope of Dewatering Plan

The purpose of this dewatering plan is to guide the partial dewatering of Long Lake so as to prevent, to the extent possible, impacts from physical erosion of the stream banks and bed of Stream C3, to provide guidance for monitoring dewatering and to outline mitigation measures to be taken should erosion occur so that negative impacts are minimized.

Figure 1.1 - Location of Lake and Ponds



2.0 DEWATERING

2.1 Volume of Discharge Water

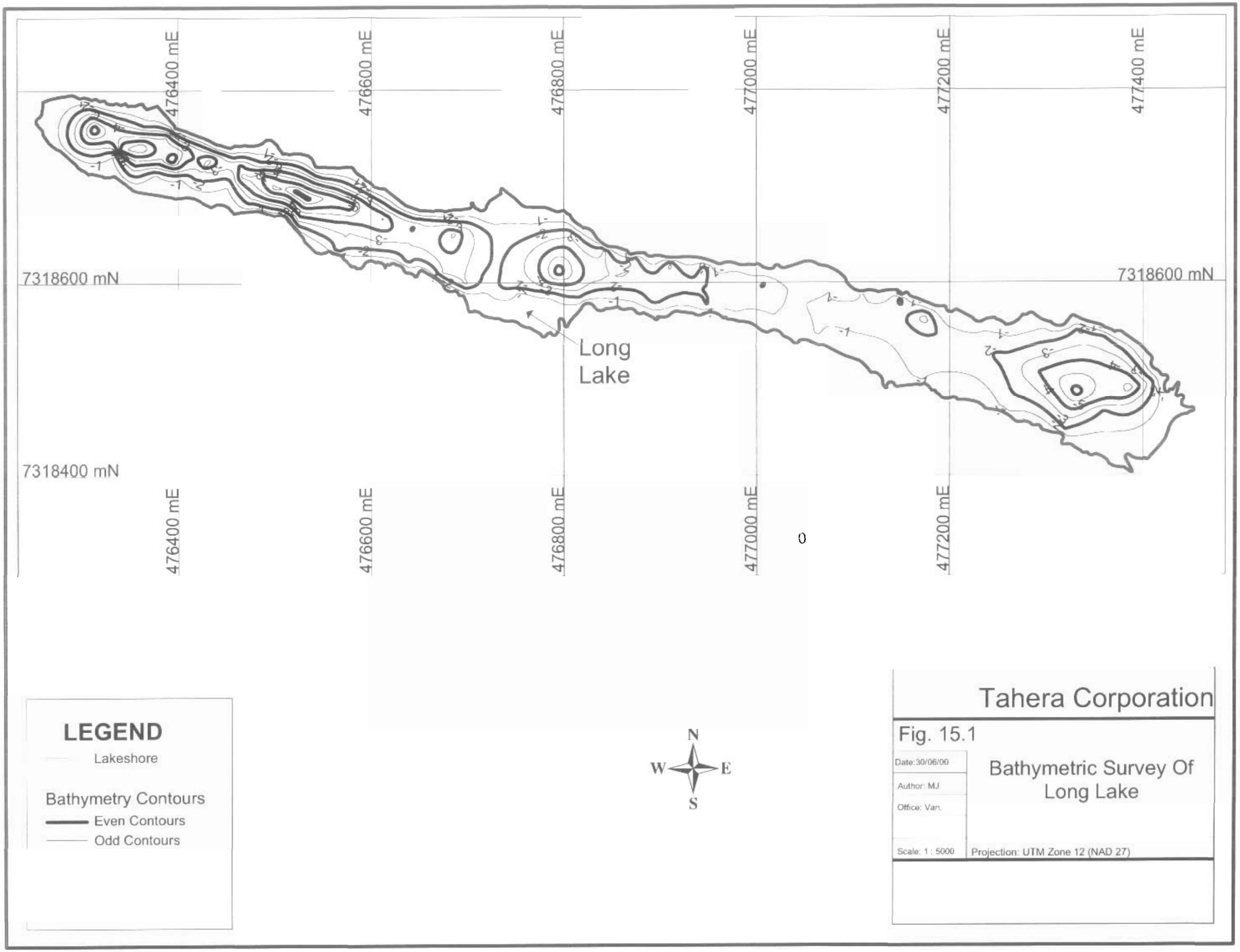
A bathymetric chart of Long Lake was prepared in 1999 and included in the Jericho Project Final Environmental Impact Statement as Figure 15.1, included on the next page. The water level in Long Lake must be reduced by approximately two meters to allow construction of the West Dam. The GIS version of the chart was used to calculate the volume of water that must be removed to allow construction of the West Dam in the dry.

The volume of water to be pumped will also include direct precipitation on Long Lake and runoff from the Long Lake watershed. This lake drawdown rate will vary with the pumping rate, the starting lake level and amount of precipitation. To be conservative and allow for drawdown rate adjustments a 50 day pumping period has been allowed for. The values for runoff and precipitation were taken from the SRK's 2003 Technical Memorandum C.

Using the above assumptions, the total volume of water to be removed from Long Lake is 148,300 m^3 and the breakdown is summarized in Table 2.1. The total assumed dewatering volume consists of the following lake and inflow volumes:

Table 2.1 - Breakdown of Pumping Volumes

Source	Flow Rate (m^3/s)	Total Volume (m^3)
Long Lake to -2.0 m	N/A	135,000
Catchment Runoff	0.006	5,200
Direct Precipitation	N/A	8,100
Total	N/A	148,300


476400 mE
476600 mE
476800 mE
477000 mE
477200 mE
477400 mE
7318600 mN
7318400 mN
Long Lake
N
W
E
S
LEGEND
Lakeshore
Bathymetry Contours
Even Contours
Odd Contours
Tahera Corporation
Fig. 15.1
Date:30/06/00
Author: MJ
Office: Van.
Scale: 1 : 5000
Bathymetric Survey Of Long Lake
Projection: UTM Zone 12 (NAD 27)

2.2 Dewatering Discharge Rate

Dewatering will not exceed freshet flows of Stream C3. A hydrological analysis was conducted by SRK (2003) and submitted as a supplemental report to the Jericho Project Final Environmental Impact Statement as Technical Memorandum C. The Stream C3 flow analysis was illustrated on Figure C.16 (attached on the following page). The plot suggests an average monthly freshet flow, based on the most representative regional analysis, of 0.034 m^3/s. The maximum freshet recorded on site was 0.045 m^3/s. The maximum dewatering discharge should therefore not exceed 0.045 m^3/s. Using the lower discharge rate, dewatering will require 56 days. Using the higher rate, dewatering will require 42 days. Given that normal freshet flows have not caused erosion, the upper limit should be a safe maximum to use. Dewatering rate tables are provided in Appendix A.

2.3 Characteristics of Stream C3

Water from Long Lake flows through a rocky bed to West Pond (Photos 1 and 2)[1]. The outlet of West Pond is similar (Photo 3). From there Stream C3 flows initially gently and then more steeply through a combination of rocky beds (Photos 4 and 5) and muskeg (Photos 6 and 7) to Lake C3 for 1.1 km, assuming a linear distance. The channel is at least 30% greater due to the winding course of the stream. The stream drops 47 m in elevation over the entire reach. In muskeg areas, which are nearly flat, the stream forms multiple branches (as shown on Photos 6 and 7), the velocity and volume of water in each branch is reduced. Stream bed substrates throughout are either rock (Photo 8) or grass (Photo 9), neither of which are prone to erosion under naturally occurring flow regimes. As can be seen in Photo 9, the grassy bed areas contain boulders.

2.4 Dewatering Procedures

A 600 USGPM (0.038 m^3/s) diesel pump will be located near the shoreline of the west end of the lake with the suction hose placed in a deep spot of the west end of Long Lake. Water will be pumped to rocky shoreline of the west pond which will operate as an energy dissipation basin, and then overflow naturally into Stream C3. Water will be pumped continuously at the actual maximum pumping rate of the pump (approximately 90% of the manufacturer's rating) until the required Long Lake water level has been reached. Should water quality in Long Lake begin to approach discharge limits, pumping will cease.

A series of silt fences may be placed downstream of the rocky area at the outlet of West Pond in Stream C3 as a precautionary measure to capture any excess sediment that may be suspended during the dewatering stage.

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[1] All photos are in Appendix B.

3.0 MONITORING

3.1 Pre-Drawdown

Prior to commencement of pumping, a hydrologist will inspect the full length of Stream C3 to confirm that the proposed pumping rate will not appreciably cause erosion. Should the hydrologist consider the pumping rate to be potentially too high, the rate will be adjusted according to recommendations made after the site inspection.

3.2 During Drawdown

A hydrologist will provide oversight for the dewatering. Mine environmental personnel will inspect Stream C3 and the rocky stream bed between Long Lake and West pond daily for signs of erosion. Should any erosion be evident, pumping will cease and rock armouring will be placed in the area where erosion occurs. Rock armouring will be taken from the surrounding rocky tundra where material is readily available, so heavy equipment will not be required to traverse along Stream C3.

Silt fences will be placed downstream of the erosion point and pumping can recommence. During re-start up, environmental staff will monitor for the presence of erosion and will halt pumping for additional repairs should erosion reinitiate. At this point, the pumping rate may be reduced by an amount determined by site staff in consultation with the hydrologist. During each re-start up, environmental staff will monitor the discharge sites for erosion and repeat the above process if necessary.

Turbidity of the water exiting West Pond and at Stream C3 mouth will be monitored daily and total suspended solids samples will be sent to an assay lab for analysis on a weekly basis. The first sample will be sent for TSS analysis on the first day of pumping and at seven-day intervals thereafter[2].

[2] Laboratory analyses of TSS have a minimum turn around of one week.

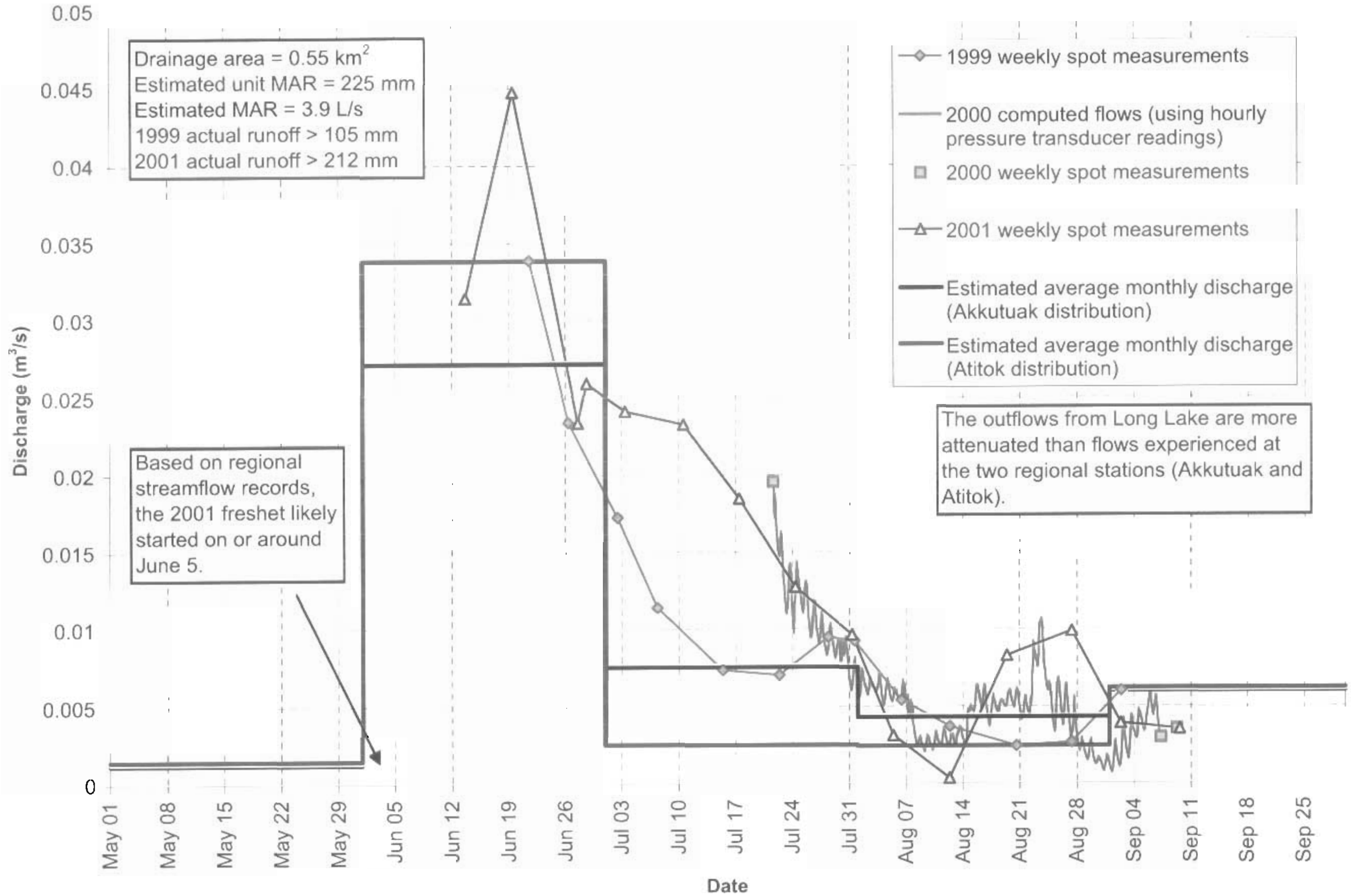

Figure C.16: Comparison of Estimated and Observed Flows at Outlet of Long Lake

4.0 CLOSURE

This report has been prepared for the exclusive use of Tahera Diamond Corporation. for specific application to the area within this report. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. AMEC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. It has been prepared in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

Respectfully submitted,

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SRK. 2003. Technical Memorandum C. Supplemental Climate and Hydrology Jericho Project, Nunavut. Report prepared for Tahera Diamond Corporation.

APPENDIX A

Stream C3 Dewatering Schedule

Long Lake Dewatering Schedule (0.045 m³/s)

Day	Daily Volume Discharged (m^3)	Daily Volume Discharged (USG)	Cumulative Volume (m^3)	Cumulative Volume (USG)	Rate (m^3/s)	Rate (USGPM)
0	0	0	0	0	0.045	713
1	3,888	1,027,101	3,888	1,027,101	Comments	
2	3,888	1,027,101	7,776	2,054,202	Rate based on	
3	3,888	1,027,101	11,664	3,081,303	freshet maximum	
4	3,888	1,027,101	15,552	4,108,404	(See Tech Memo C).	
5	3,888	1,027,101	19,440	5,135,506		
6	3,888	1,027,101	23,328	6,162,607		
7	3,888	1,027,101	27,216	7,189,708		
8	3,888	1,027,101	31,104	8,216,809		
9	3,888	1,027,101	34,992	9,243,910		
10	3,888	1,027,101	38,880	10,271,011		
11	3,888	1,027,101	42,768	11,298,112		
12	3,888	1,027,101	46,656	12,325,213		
13	3,888	1,027,101	50,544	13,352,315		
14	3,888	1,027,101	54,432	14,379,416		
15	3,888	1,027,101	58,320	15,406,517		
16	3,888	1,027,101	62,208	16,433,618		
17	3,888	1,027,101	66,096	17,460,719		
18	3,888	1,027,101	69,984	18,487,820		
19	3,888	1,027,101	73,872	19,514,921		
20	3,888	1,027,101	77,760	20,542,022		
21	3,888	1,027,101	81,648	21,569,124		
22	3,888	1,027,101	85,536	22,596,225		
23	3,888	1,027,101	89,424	23,623,326		
24	3,888	1,027,101	93,312	24,650,427		
25	3,888	1,027,101	97,200	25,677,528		
26	3,888	1,027,101	101,088	26,704,629		
27	3,888	1,027,101	104,976	27,731,730		
28	3,888	1,027,101	108,864	28,758,831		
29	3,888	1,027,101	112,752	29,785,933		
30	3,888	1,027,101	116,640	30,813,034		
31	3,888	1,027,101	120,528	31,840,135		
32	3,888	1,027,101	124,416	32,867,236		
33	3,888	1,027,101	128,304	33,894,337		
34	3,888	1,027,101	132,192	34,921,438		
35	3,888	1,027,101	136,080	35,948,539		
36	3,888	1,027,101	139,968	36,975,640		
37	3,888	1,027,101	143,856	38,002,742		
38	3,888	1,027,101	147,744	39,029,843		
39	3,888	1,027,101	151,632	40,056,944		
40	3,888	1,027,101	155,520	41,084,045		
41	3,888	1,027,101	159,408	42,111,146		
42	3,888	1,027,101	163,296	43,138,247		
43	3,888	1,027,101	167,184	44,165,348		
44	3,888	1,027,101	171,072	45,192,449		
45	3,888	1,027,101	174,960	46,219,551		
46	3,888	1,027,101	178,848	47,246,652		
47	3,888	1,027,101	182,736	48,273,753		
48	3,888	1,027,101	186,624	49,300,854		
49	3,888	1,027,101	190,512	50,327,955		
50	3,888	1,027,101	194,400	51,355,056		

Long Lake Dewatering Schedule (0.034 m³/s)

Day	Daily Volume Discharged (m^3)	Daily Volume Discharged (USG)	Cumulative Volume (m^3)	Cumulative Volume (USG)	Rate (m^3/s)	Rate (USGPM)
0	0	0	0	0	0.034	539
1	2,938	776,032	2,938	776,032	Comments	
2	2,938	776,032	5,875	1,552,064	Rate based on freshet monthly average (see Tech Memo C).	
3	2,938	776,032	8,813	2,328,096		
4	2,938	776,032	11,750	3,104,128		
5	2,938	776,032	14,688	3,880,160		
6	2,938	776,032	17,626	4,656,192		
7	2,938	776,032	20,563	5,432,224		
8	2,938	776,032	23,501	6,208,256		
9	2,938	776,032	26,438	6,984,288		
10	2,938	776,032	29,376	7,760,320		
11	2,938	776,032	32,314	8,536,352		
12	2,938	776,032	35,251	9,312,384		
13	2,938	776,032	38,189	10,088,415		
14	2,938	776,032	41,126	10,864,447		
15	2,938	776,032	44,064	11,640,479		
16	2,938	776,032	47,002	12,416,511		
17	2,938	776,032	49,939	13,192,543		
18	2,938	776,032	52,877	13,968,575		
19	2,938	776,032	55,814	14,744,607		
20	2,938	776,032	58,752	15,520,639		
21	2,938	776,032	61,690	16,296,671		
22	2,938	776,032	64,627	17,072,703		
23	2,938	776,032	67,565	17,848,735		
24	2,938	776,032	70,502	18,624,767		
25	2,938	776,032	73,440	19,400,799		
26	2,938	776,032	76,378	20,176,831		
27	2,938	776,032	79,315	20,952,863		
28	2,938	776,032	82,253	21,728,895		
29	2,938	776,032	85,190	22,504,927		
30	2,938	776,032	88,128	23,280,959		
31	2,938	776,032	91,066	24,056,991		
32	2,938	776,032	94,003	24,833,023		
33	2,938	776,032	96,941	25,609,055		
34	2,938	776,032	99,878	26,385,087		
35	2,938	776,032	102,816	27,161,119		
36	2,938	776,032	105,754	27,937,151		
37	2,938	776,032	108,691	28,713,183		
38	2,938	776,032	111,629	29,489,215		
39	2,938	776,032	114,566	30,265,246		
40	2,938	776,032	117,504	31,041,278		
41	2,938	776,032	120,442	31,817,310		
42	2,938	776,032	123,379	32,593,342		
43	2,938	776,032	126,317	33,369,374		
44	2,938	776,032	129,254	34,145,406		
45	2,938	776,032	132,192	34,921,438		
46	2,938	776,032	135,130	35,697,470		
47	2,938	776,032	138,067	36,473,502		
48	2,938	776,032	141,005	37,249,534		
49	2,938	776,032	143,942	38,025,566		
50	2,938	776,032	146,880	38,801,598		
51	2,938	776,032	149,818	39,577,630		
52	2,938	776,032	152,755	40,353,662		
53	2,938	776,032	155,693	41,129,694		
54	2,938	776,032	158,630	41,905,726		
55	2,938	776,032	161,568	42,681,758		
56	2,938	776,032	164,506	43,457,790		
57	2,938	776,032	167,443	44,233,822		
58	2,938	776,032	170,381	45,009,854		
59	2,938	776,032	173,318	45,785,886		
60	2,938	776,032	176,256	46,561,918		
61	2,938	776,032	179,194	47,337,950		
62	2,938	776,032	182,131	48,113,982		

APPENDIX B

Photographs

Photo1: Outlet of Long Lake.

Photo 2: Stream bed between Long Lake and West Pond.

Photo 3. Outlet area of West Pond.

Photo 4. Rocky area where stream flows subsurface.

Photo 5: Rocky area where stream flows on the surface.

Photo 6: Upstream side of muskeg area where stream splits.

Photo 7: Centre of a muskeg area where stream has split.

Photo 8: Rocky stream bed

Photo 9: Predominantly grassy stream bed; rocks also present.