January 25, 2006 EBA File: 1100060.006

Tahera Diamond Corporation
Suite 1900 – 130 Adelaide Street West
Toronto, Ontario M5H 3P5

Attention: Dan Johnson
Executive Vice President, Operations

Subject: C1 Diversion – NWB and DFO Comments
Jericho Diamond Project, NU

Further to a request by Tahera Diamond Corporation (TDC), EBA Engineering Consultants Ltd. (EBA) was retained to address comments by the Nunavut Water Board (NWB) and Department of Fisheries and Oceans (DFO), regarding the proposed C1 Diversion development at the Jericho Diamond Mine in Nunavut.

In a letter to NWB dated November 7, 2005 (Appendix A), DFO requested further information on fourteen items. In TDC's November 25, 2006 response to the Nunavut Water Board (NWB), EBA provided technical replies on the fourteen items raised by DFO (see Appendix B). In order to facilitate more efficient technical discussions, TDC and the NWB recommended direct communication amongst the technical parties and plan reviewers. Through subsequent EBA communications with DFO in December 2005, it was learned that DFO were satisfied with the November 25th, 2005 replies regarding DFO Comments 1, 3, 6, 9, 10, 12 and 13, but sought further clarity on the remaining DFO comments. DFO and EBA subsequently discussed DFO Comments 2, 4, 5, 6, 7, 8, 11, and 14. The results of these discussions were informally reviewed with DFO to their satisfaction on January 20th and are summarized below.

DFO Comment 2 – Watershed Area

The original loss of watershed was understood to only be the open pit and the watershed area collected for the operation of Ponds A, B and C. - -

January 20, 2006 Discussion

The hydrological design assumptions for the design of the C1 Diversion and are unchanged from the parameters used at the time of the Water License for the C1 Diversion design (Memorandum W prepared by SRK). EBA has not reduced the area of the watershed other than the planned open pit which is in a sub-basin that is separate from the C1 Lake catchment and therefore does not change the amount of discharge from C1 Lake which is being managed by the C1 Diversion.

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DFO Comment 4- Riffle Design:

Details of the plans for the riffle design and locations were not originally provided by EBA. - -

January 20, 2006 Discussion

TDC will construct riffles in detail as appropriate later in the year after the channel is at low flow/no flow conditions. The exact location and design may require some field fitting, however, TDC agree to use the Newbury design (a copy of which was faxed to EBA on December 12, 2005, see Appendix C). This design will be considered by EBA as a preliminary design and will be adjusted accordingly and will make use of appropriately sized rounded stone. The locations will be initially identified as the straight areas between the meander bends, subject to further adjustment based on observations of the early performance of channel.

EBA confirm that the meander design (i.e. 6 metres) is appropriate for the water flow in the small channel based on EBA's expected patterns of flow.

DFO Comment 5 – Riparian Vegetation:

[DFO] would like to note the great effort put into maintaining the existing riparian vegetation in the design. The only other item related to this is the possible "trial" in relocating some of the existing riparian shrubs from the upper portion of Stream C1 to the banks of the low flow channel in Reach C. - - -

January 20, 2006 Discussion:

TDC will be maintaining the existing riparian vegetation in accordance with the design. TDC will also make a reasonable effort to "trial" relocate some of the existing riparian shrubs from the upper portion of Stream C1 to the banks of the low flow channel in Reach C. The intent is to attempt to maintain some of the natural input of nutrients into Stream C1, in the form of leaf litter, etc. This isn't a requirement of the license but is regarded by all parties as an opportunity to investigate whether these shrubs can be transplanted so as to maintain their contribution. DFO would not expect that their survival be maintained at all costs, but rather that reasonable efforts be committed by TDC.

Once snow free conditions exist, TDC will choose several locations along the low flow channel of Reach C. Trial work will be done sometime between the summer of 2006 and fall of 2007. Health of the tests will be observed before, during and after transplant to get a sense for whether the riparian vegetation can be successfully transplanted in the Arctic.

DFO Comment 7- Low Areas on south side of Reach C:

The low areas (unfilled) were mostly a concern [to DFO] on the south side of Reach C. - - -

January 20th, 2006 Discussion

Potential low areas (unfilled) of a concern to DFO on the south side of Reach C that form any 'pronounced' low spots outside of the low flow channel will be filled in as appropriate to avoid

stranding fish in temporary pools. This will be done where important riparian objectives are not compromised and where it will helps water drain positively toward the outlet end of Reach C.

DFO Comment 8 - Pool at end of Reach C:

The Fisheries Act Authorization states that a pool was to be located at the downstream end of Reach C. - -

January 20th Discussion

A pool will be placed by TDC at the downstream end of Reach C to comply with the authorization. DFO regard the pool to offer the following advantages:

- *First, any sediment in the water flow would naturally settle out in the pool and could be periodically cleaned, if necessary;*
- *Second, the pool could provide a refuge area for juvenile fish under high/low flows;*
- *Third, it provides an area to transition the diversion channel with the natural channel and allows for some armouring, if necessary; and*
- *Fourth, it provides a location to easily control water flow should problems be encountered within/downstream of the transition zone.*

By designing and implementing this into this plan now, the need to do so later is avoided, in the event erosion, scouring or fish passage issues are identified later on.

DFO Comment 11: - Operations

[DFO's] understanding is that the channel will be operated (i.e. it will have flowing water) in the first year,

January 20th Discussion

DFO and TDC agree that the term "operational" as used to described Reach C in the Fisheries Authorization will be applicable to the time sediment transport barriers (silt curtains and such) are removed. At that time there will be no artificial barriers to interfere with potential fish passage into Reach C. Spring and summer 2006 water flow through the newly constructed channel is needed so that TDC can assess flow patterns and make detailed field adjustments to the constructed channel. By exposing the channel to water, the C1 channel can stabilize geotechnically between the Lake C1 outflow to the lower reaches of Stream C1 prior to removal of fish barriers.

TDC have provided discharge quantities measured in past years at the outflow of C1 Lake. These flows are small by hydrotechnical standards and therefore with appropriate construction practices the risk of "excessive sedimentation" in this setting is low. Should unacceptable sediment transport be observed in any location, TDC would either temporarily disperse flows into the vegetated flood plain areas of Reach C and/or temporarily pump water from the upstream fish pool over the down-gradient (north) berm and disperse this flow to the well vegetated terrain down gradient.

TDC will sample water sediment loads in the channel during initial flow and maintain sediment barriers in place until such time as sediment transport is acceptable.

DFO Comment 13: - Silt Curtains

DFO is not supportive of stretching silt curtains across running water as an effective means of controlling sediment loss downstream.

January 20th Discussion

DFO have expressed doubts about placing silt curtains across running water as an effective means of controlling sediment loss downstream. DFO consider them to be most effective when parallel to the waterbody (with the base embedded in the soil) to prevent runoff from carrying sediment into the water.

For in-stream works, DFO have recommended and are accepting of the use of sandbags or rock check dams as needed. DFO report these methods work by slowing the water velocity, which allows sediment deposition. The advantage of rock check dams is that they could provide the basis for the riffles, thereby avoiding the need to construct these later.

DFO Comment 14 - Monitoring:

Based on what we finally agree to, any changes to monitoring (as it relates to fisheries) will be discussed - -

January 20th Discussion

Through discussion with DFO it is understood that TDC will comply with the following requests by DFO so that we remain in full compliance with the existing Fisheries Act Authorization, therefore no changes in the monitoring plan are proposed.

Closure

We trust this information satisfies your present needs. Please call if you have any questions.

Respectfully submitted,
EBA Engineering Consultants Ltd.

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Arctic Practice
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/ln

APPENDIX

APPENDIX A DFO LETTER TO NWB NOVEMBER 7, 2005

Fisheries and Oceans Canada
Pêches et Océans Canada

Eastern Arctic Area
P.O. Box 358
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Secteur de l'Arctique de l'est
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November 7, 2005

Your file *Votre référence*
NWB1JER0410/TR/D16

Our file *Notre référence*
NU-00-0068

Ms. Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Via Electronic Mail
licensing@nwb.nunavut.ca

Dear Ms. Beaulieu:

Subject: Specification for the C1 Diversion Channel – Jericho Diamond Mine.

Fisheries and Oceans Canada (DFO) would like to thank the Nunavut Water Board (NWB) for the opportunity to review the design for C1 Diversion structure for the Jericho Diamond Mine. Based on a review of the C1 Diversion – Geotechnical Design, as submitted by EBA Engineering Consultants Ltd. on behalf of Tahera Diamond Corporation (TDC), dated August 30 2005, DFO offers the following comments/recommendations to protect fish and fish habitat related to the construction of the C1 Diversion Channel:

General Comments:

The diversion of the upper portion of Stream C1 is required to develop the open pit to allow access to the kimberlite deposit. Baseline fisheries studies conducted prior to mine development identified six species of fish (including arctic char, arctic grayling, burbot, slimy sculpin, lake trout and round whitefish) utilizing Stream C1 as fish habitat. These studies suggest that Stream C1 provides foraging, rearing and potential spawning fish habitat.

The diversion of Stream C1 will result in a loss of fish habitat that would have, at a minimum, contributed to downstream fish habitat by providing food and nutrients to both the lower portion of Stream C1 and Carat Lake itself. However, various restrictions (safety, space limitation, channel gradients, etc) associated with the overall design of the diversion channel have been identified, and therefore fish habitat enhancement was agreed to be completed along Reach C of the diversion channel to offset the loss of fish habitat.

Specific Comments

1. Previous drill data suggested that ice-rich permafrost may be encountered as shallow as 1.0 m. DFO identified the concern with constructing a diversion channel in shallow permafrost area during both the NIRB and NWB review. However, TDC

Canada

responded in their Memo to DFO from Mainstream Aquatics, dated November 22, 2004 that this was to be mitigated by the:

"*…use of a base layer of material between the diversion channel and the permafrost layer. Additional riprap would be placed in sensitive areas to buttress permafrost zones below the active layer*."

However, based on the current report, the stability concerns for the pit wall due to potential thaw of the ice-rich permafrost along Reach C resulted in changes to the original "cut channel" design for Reach C to a "fill construction with minor cuts" for fish habitat. DFO feels that because of these channel design changes, the opportunity for long term and good quality fish habitat may be compromised. What are the advantages/disadvantages, including long-term stability, of these two design approaches as it relates to functional fish habitat?

2. The construction of berms on either side of the diversion channel will further reduce the size of the C1 drainage area and consequently the amount of runoff available for the diversion. The additional reduction in water supply in the C1 drainage area needs to be determined and detailed flow information provided such as water depths, flow rates and duration. Furthermore, information on the duration and frequency when fish will be unable to use Stream C1 due to the lack of water needs to be provided along with the overall ability of Stream C1 to support various fish life history stages.

3. The diversion channel has been designed for a 1:200 year precipitation event to ensure protection of the pit from overtopping and failure of the channel banks. It is recognized that this channel width would not be conducive to enhancing fisheries values and as such a smaller low flow channel has been designed into the larger channel. However, it is not clear what precipitation event the low flow channel has been designed for. Typically, 1:2 year precipitation events define and maintain the channel characteristics, which create stable conditions for biological activity. Therefore, the smaller low flow channel should be designed with this in mind.

4. If design changes to the low flow channel are warranted based on the aforementioned (i.e., water flows, decreased watershed size) then the width, depth, and substrate type will need to be revised and submitted. Furthermore, the rationale for the 6 m radius sinusoidal meander design needs to be provided. DFO also requires the rationale for not including the details of the riffle dimensions, substrates and locations in Reach C as outlined in section 6.3.2.2 of the *Fisheries Act* Authorization (April 15, 2005).

5. The loss of natural and productive riparian vegetation in the new diversion channel represents a reduction in fish habitat productivity in Stream C1. Given the difficulties of re-vegetating disturbed or newly created areas, the proponent should consider other alternatives to maintaining riparian vegetation (e.g., transplanting existing vegetation, including riparian shrubs, from Stream C1 to the banks of the new diversion channel).

6. Substrate size and type (e.g., rounded stone, and not angular rip-rap) should mimic that found in the existing Stream C1 to be beneficial to fish habitat yet appropriately sized to ensure stability. As such, consideration should be given to salvaging substrate materials from the existing channel into the new diversion channel or using

the borrow pit as a source of granular material for the substrate in the newly created diversion channel.

7. In the fill zone areas of Reach C, it appears there will be sections within the larger (1:200 year) channel that have a bottom elevation lower than the top-of-bank elevation of the low flow channel. This suggests that any flows greater then the low flow channel design flows will overtop the low flow channel banks and be trapped outside the smaller channel. The rationale for this design needs to be clarified along with solutions to preventing this scenario.

8. There are no details on the transition zone between Reach C and the downstream natural channel to identify how the diversion channel will be tied into the braided, narrow channels of the existing stream. The details should address the difference in channel widths and water flows and include the measures to mitigate scouring/erosion in this area. Given the limited stream length between the lower end of Reach C and the upper portion the "fish-bearing" section of Stream C1, consideration should be given to enhancing/ensuring the transition zone can facilitate fish passage. DFO also requires the rationale for not including another fish pool at the lowermost end of Reach C as outlined in section 6.3.2.6 of the *Fisheries Act* Authorization (April 15, 2005).

9. The proponent should provide drawings of the proposed diversion structure that will be constructed to divert water from the Lake C1 stream outflow into Reach A.

10. The proposed water crossing structure at the upstream end of reach B is a 30 m long by 900 mm diameter corrugated round steel pipe (CSP). In order to reduce potential downstream scouring, sedimentation and channel morphology issues, the culvert should be designed in a manner that maintains upstream/downstream channel width, bottom substrates and water velocities. DFO would therefore suggest the use of a bridge or open bottom culvert. If a culvert is used, it should be designed to handle peak flows and be the width of the upstream/downstream channel or wider.

11. TDC stated in the Memo to DFO from Mainstream, November 22, 2004 that

    "*…the diversion channel will be built one year prior to required operation. This will provide sufficient time to identify any potential issues related to stability and make the necessary adjustments before the channel becomes operational*."

    DFO requires the rationale for not taking this approach as outlined in section 5.5 of the *Fisheries Act* Authorization (April 15, 2005).

13. DFO requires other proven mitigation measures to address potential sedimentation issues associated with the construction and operation of the diversion channel, as a contingency measure.

14. Given the potential changes in the diversion channel, specifically as they relate to fish and fish habitat, it will be necessary to revisit the fish habitat monitoring plan submitted. Specifically, the monitoring plan needs to demonstrate that the diversion channel is providing functional fish habitat and that the remaining natural downstream fish habitat has not been negatively affected by the construction and operation of the upstream diversion channel. The plan should identify what newly

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constructed fish habitat features will be monitored and how they will be measured to determine their success/failure, including long term channel stability. Plan details also need to include location, frequency, and methodology. Furthermore, the plan needs to outline the contingencies that will be put in place in the event that the fish habitat features are found not to be functioning as intended, including the thresholds for action.

Please be advised that a contravention of subsection 35(1) of the *Fisheries Act* could result from any change to the proposed plan or from failure to properly implement the conditions of the *Fisheries Act* Authorization (dated April 15, 2005). An amendment to the *Fisheries Act Authorization* may be necessary, given the currently proposed plans for the diversion channel, which is not consistent with sections 5.5, 6.3.2.2, 6.3.2.5, and 6.3.2.6.

DFO would like to thank the NWB for the opportunity to participate in the review of the C1 diversion channel plans as required under the water license for the Jericho Diamond Project. If there are any questions concerning the above, or if my understanding of the proposal is either incorrect, incomplete, or if there are changes to the proposed works or undertakings, please contact me directly by telephone at 867-979-8011, or by fax at 867-979-8039.

Yours sincerely,

Original Signed By:

Derrick Moggy
Habitat Management Biologist
Fisheries and Oceans Canada – Eastern Arctic Area

copy Greg Missal – Tahera Diamond Corporation Rick Pattenden – Mainstream Aquatics Ltd.

APPENDIX

APPENDIX B EBA LETTER TO TDC NOVEMBER 25, 2005 (FORWARDED TO NW BAND DFO)

November 25, 2005 EBA File: 1100060.006

Tahera Diamond Corporation
Suite 803, 121 Richmond Street West
Toronto, Ontario M5H 2K1

Attention: Dan Johnson

Subject: Jericho Diamond Mine
C1 Diversion
Response to DFO

This letter addresses the technical questions raised in the letter to the Nunavut Water Board (NWB) from Mr. Derrick Moggy of the Department of Fisheries and Ocean (DFO) dated November 7, 2005 regarding the Jericho C1 Diversion - Geotechnical Design dated August 30, 2005. Items are discussed in the order as presented in DFO's letter.

Reply to DFO Comments 1 through 14

"1. Previous drill data suggested that ice-rich permafrost may be encountered as shallow as 1.0 m. DFO identified the concern with constructing a diversion channel in shallow permafrost area during both the NIRB and NWB review. However, TDC responded in their Memo to DFO from Mainstream Aquatics, dated November 22, 2004 that this was to be mitigated by the:

"...use of a base layer of material between the diversion channel and the permafrost layer. Additional riprap would be placed in sensitive areas to buttress permafrost zones below the active layer."

However, based on the current report, the stability concerns for the pit wall due to potential thaw of the ice-rich permafrost along Reach C results in changes to the original "cut channel" design for Reach C to a "fill construction with minor cuts" for fish habitat. DFO feels that because of these channel design changes, the opportunity for long term and good quality fish habitat may be compromised. What are the advantages/disadvantages, including long-term stability, of these two design approaches as it related to functional fish habitat?"

Reply

The proposed Reach C will also feature base material between the bottom of the channel and the [perennially frozen] permafrost. The proposed design also incorporates rip-rap protection; therefore, the design approaches are the same. For the currently proposed design, the intention is to preserve the native thaw stable active layer materials to function as the "base materials". The armouring in the revised case is important for erosion protection.

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Regarding advantages/disadvantages to long term stability - - - EBA's channel design is in part premised on the observed performance of an existing manmade (artificial) drainage in the same terrain units as those that will be crossed by Reach C. Included in EBA's submission to TDC were several photographs of the natural C1 channel and an artificial channel created in 1996 during exploration activities. The artificial channel has naturalized and shows that when water is diverted, channelized flow remains channelized for gradients of about 3 to 6 percent. The observed channel appears to at a thermal equilibrium resulting in minimal apparent long-term degradation. The design gradient of the C1 Reach C is about 3 percent.

"2. The construction of berms on either side of the diversion channel will further reduce the size of the C1 drainage area and consequently the amount of runoff available for the diversion. The additional reduction in water supply in the C1 drainage area needs to be determined and detailed flow information provided such as water depths, flow rates and duration. Furthermore, information on the duration and frequency when fish will be unable to use Stream C1 due to the lack of water needs to be provided along with the overall ability of Stream C1 to support various fish life history stages."

Reply

With respect to the Steffen Robertson and Kirsten (Canada) Inc. (SRK) designs put forth to date, the revised design does not reduce the amount of runoff available from that previously proposed and approved.

Drainage from C1 Lake will be captured by the diversion. There is other natural overland drainage which originates from the south side (upgradient) of Reach C and drains to the north side of Reach C (downgradient). The open pit lies on the upgradient side of Reach C. Once the open pit develops, there will not be any flow from upgradient. The only flows will be those diverted from C1 Lake to Reach C and some direct precipitation/snowfall.

Attached Figure C18 (from SRK's 2004 Supplemental Climate and Hydrology, Technical Memorandum C) provides flow measurements collected by SRK at the discharge from C1 Lake. This information illustrates pattern of discharge measured to 2001. Figures 1 to 3 attached show maximum theoretical flow depths and velocities as a function of discharge for Reaches A, B and C.

"3. The diversion channel has been designed for a 1:200 year precipitation event to ensure protection of the pit from overtopping and failure of the channel banks. It is recognized that this channel width would not be conducive to enhancing fisheries values and as such a smaller low flow channel has been designed into the larger channel. However, it is not clear what precipitation event the low flow channel has been designed for. Typically, 1:2 year precipitation events define and maintain the channel characteristics, which create stable conditions for biological activity. Therefore, the smaller low flow channel should be designed with this in mind. "

Reply

Figure C18 presents one of the source documents showing C1 observed flows patterns and discharges that were referred to for SRK's and our design. In 3 years of data collection, the patterns of flow were compatible with regional patterns and were used as the baseline information for all approvals to date. Much of the measured flow at the C1 Lake outlet is in rock and constitutes the primary source of water to C1 diversion. This diagram shows that flows are highest at the time of snowmelt and that within a short time the flow volumes decline by an order of magnitude. High intensity rainfall events result in surges of flow, however, these rainfall events contributions are still small.

Figure C.27 shows a relative comparison between 1 in 200 year rainfall intensity return events and 1 in 2.3 year return events. Using this information as a very rough guide, it shows that the 1 in 2.3 year return events are roughly 30 percent to 50 percent of the 1 in 200 year return event. Thirty (30) percent of the 0.7 cu.m/s return event is about 0.2 cu.m/s and is consistent with DFO's recommendation and the design assumption.

"4. If design changes to the low flow channel are warranted based on the aforementioned (i.e., water flows, decreased watershed size) then the width, depth, and substrate type will need to be revised and submitted. Furthermore, the rationale for the 6 m radius sinusoidal meander design needs to be provided. DFO also requires the rationale for not including the details of the riffle dimensions, substrates and locations in Reach C as outlined in section 6.3.2.2 of the Fisheries Act Authorization (April 15, 2005). "

Reply

No changes are proposed at this time. The finished channel will include the 6 m radius sinusoidal meander design as per DFO's Authorization 6.3.2.1. The riffles will be constructed by hand under the direction of a qualified biologist once the channel has undergone some stabilization.

"5. The loss of natural and productive riparian vegetation in the new diversion channel represents a reduction in fish habitat productivity in Stream C1. Given the difficulties of re-vegetating disturbed or newly created areas, the proponent should consider other alternatives to maintaining riparian vegetation (e.g., transplanting existing vegetation, including riparian shrubs, from Stream C1 to the banks of the new diversion channel)."

Reply

Preserving riparian vegetation was considered an important objective. The revised design maintains more riparian vegetation in close proximity to the "low flow" channel than the previously approved design. Measures proposed to retain as much riparian vegetation as possible in proximity to the low flow channel are as follows:

- The channels will be constructed during winter snow cover conditions when snow accumulations can be used as a protective layer to reduce site disturbance and damage to the riparian vegetation;
- Excepting the excavation of the low flow channel, the design specification instructs the owner not to remove riparian soils/vegetation in the channel bottom outside the low flow channel;
- Localized rip-rap was only used as cover in the riparian areas to compensate for natural low areas in the topography to provide erosion protection and/or to satisfy the stipulated shape of Reach C; and
- Rip-rap protection is typically 150 mm minus crushed granular materials and will overly riparian vegetation. The underlying riparian vegetation would provide some nutrients so that in time the Rip-rap material itself may well support some of the native vegetation.

"6. Substrate size and type (e.g., rounded stone, and not angular rip-rap) should mimic that found in the existing Stream C1 to be beneficial to fish habitat yet appropriately sized to ensure stability. As such, consideration should be given to salvaging substrate materials from the existing channel into the new diversion channel or using the borrow pit as a source of granular material for the substrate in the newly created diversion channel. "

Reply

EBA reviewed rounded versus angular erosion protection and suggests there should be a blend of both. Erosion protection and overall thermal stability objectives are better served using the 150 mm maximum size angular rip that has been prescribed. The initial channel construction as proposed is a conservative and consistent foundation that allows meaningful performance monitoring. The import of rounded boulders, cobbles and gravel to construct some of the more minute detailed channel features such as riffles and periodic habitat boulders will be done under the direction of a biologist after a stabilization period.

"7. In the fill zone areas of Reach C, it appears there will be sections within the larger (1:200 year) channel that have a bottom elevation lower than the top-of-bank elevation of the low flow channel. This suggests that any flows greater then the low flow channel design flows will overtop the low flow channel banks and be trapped outside the smaller channel. The rationale for this design needs to be clarified along with solutions to preventing this scenario."

It is agreed that it is not desirable to strand any overflow water and the occurrence of this is expected to be insignificant. Typically any water that jumps the low flow channel will flow downgradient in the north direction toward the inside toe of the downstream embankment and as well in the northwest direction toward the natural C1.

"8. There are no details on the transition zone between Reach C and the downstream natural channel to identify how the diversion channel will be tied into the braided, narrow channels of the existing stream. The details should address the difference in channel widths and water flows and include the measures to mitigate scouring/erosion in this area. Given the limited stream length between the lower end of Reach C and the upper portion the "fish-bearing" section of Stream C1, consideration should be given to enhancing/ensuring the transition zone can facilitate fish passage. DFO also requires the rationale for not including another fish pool at the lowermost end of Reach C as outlined in section 6.3.2.6 of the Fisheries Act Authorization (April 15, 2005).

Reply

In the 2004 SRK design, the juncture between the C1 Diversion outlet and the natural channel required a lower pool to satisfy hydraulic design and hence fish habitat protection needs. The angle of incidence between the SRK C1 Diversion outlet and the Natural C1 Stream was almost 90 degrees; therefore, without a pool, it would have been difficult to change flow direction without high risk of sediment transport and consequent high probability of rapid change to fish habitat. For SRK's design, a pool was a valid and integral component to protect fish habitat.

The currently proposed design, features a natural merge of the C1 diversion low and high flow with the top of Reach 2 of the C1 Stream. At the outlet, the C1 Diversion will be following the fall line of the slope and channel gradients will be from flatter to steeper channel gradients. Therefore, for this design scenario the pool offered no hydraulic design advantage and elimination of the pool reduced the risk of time construction site disturbance near the top of Reach 2.

"9. The proponent should provide drawings of the proposed diversion structure that will be constructed to divert water from the Lake C1 stream outflow into Reach A. "

Reply

See Drawings 1100060006-01a, 01b and Section A and Detail 3 on Drawing 1100060006-02. Please note that the geomembrane liner shown in Section A and Detail 3, will extend from Station 0+000 to at least Station 0+050 so that water from C1 lake flows over a lined channel for a distance of 50+ m to the bedrock based channel of Reach A.

"10. The proposed water crossing structure at the upstream end of reach B is a 30 m long by 900 mm diameter corrugated round steel pipe (CSP). In order to reduce potential downstream scouring, sedimentation and channel morphology issues, the culvert should be designed in a manner that maintains upstream/downstream channel width, bottom substrates and water velocities. DFO would therefore suggest the use of a bridge or open bottom culvert. If a culvert is used, it should be designed to handle peak flows and be the width of the upstream/downstream channel or wider. "

Reply

Using the previously approved hydrologic criteria, the culvert design is adequately sized and laid out to carry the expected 1:200 year return event. Scour potential is offset by the choice of rip-rap. The rip-rap size and gradation has been chosen to reduce the possibility of scour.

"11. TDC stated in the Memo to DFO from Mainstream, November 22, 2004 that

"…the diversion channel will be built one year prior to required operation. This will provide sufficient time to identify any potential issues related to stability and make the necessary adjustments before the channel becomes operational."

DFO requires the rationale for not taking this approach as outlined in section 5.5 of the *Fisheries Act* Authorization (April 15, 2005). "

Reply

The channel construction will precede operation by one year. The winter construction and installation of several silt fences for sediment collection will provide the opportunity for TDC to capture transported sediment and observed the performance of the channel in the first year. This will also allow water to continue to flow to the natural C1 Stream. Silt fences will be removed after the first year of exposure to water (summer 2006) and when the following objectives are satisfied

- sediment transport has subsided;
- minor stability issues, if any, are resolved; and
- the riffle pool structure and boulder habitat is in place.

At that time fish movement into wetted channel will be possible and will be deemed fully operational.

12. Note: there is no DFO Comment 12.

"13. DFO requires other proven mitigation measures to address potential sedimentation issues associated with the construction and operation of the diversion channel, as a contingency measure."

Reply

Silt fence is a well-recognized method of capturing sediments and one that is used widely throughout the north and southern Canada. Please note that silt fences are only a temporary measure during the initial stabilization period for the C1 Diversion.

"14. Given the potential changes in the diversion channel, specifically as they relate to fish and fish habitat, it will be necessary to revisit the fish habitat monitoring plan submitted. Specifically, the monitoring plan needs to demonstrate that the diversion channel is providing functional fish habitat and that the remaining natural downstream fish habitat has not been negatively affected by the construction and operation of the upstream diversion channel. The plan should identify what newly

constructed fish habitat features will be monitored and how they will be measured to determine their success/failure, including long term channel stability. Plan details also need to include location, frequency, and methodology. Furthermore, the plan needs to outline the contingencies that will be put in place in the event that the fish habitat features are found not to be functioning as intended, including the thresholds for action."

Reply

At this time the only change to Reach C has been the inclusion of one long pool at the start of Reach C instead of pools at the beginning and end of Reach C. In previous designs, this pool was necessary for hydraulic design purposes. The removal of this pool was made possible by creating a natural merge with the existing stream. This change reduces the likelihood of sediment transport from pool construction by minimizing excavation and disturbance to riparian vegetation. This proposal was viewed as a positive outcome of the design. If after some stabilization and operation of the system either DFO or TDC's biologist deem this pool to be of special value, a pool could be added.

It is considered that no significant changes have been made and therefore no significant changes in monitoring are required.

We trust this information satisfies your present needs.

Respectfully Submitted,
EBA Engineering Consultants Ltd.

Mark D. Watson, P.Eng.
Senior Project Engineer, Arctic Practice
Direct Line: 780.451.2130 x277
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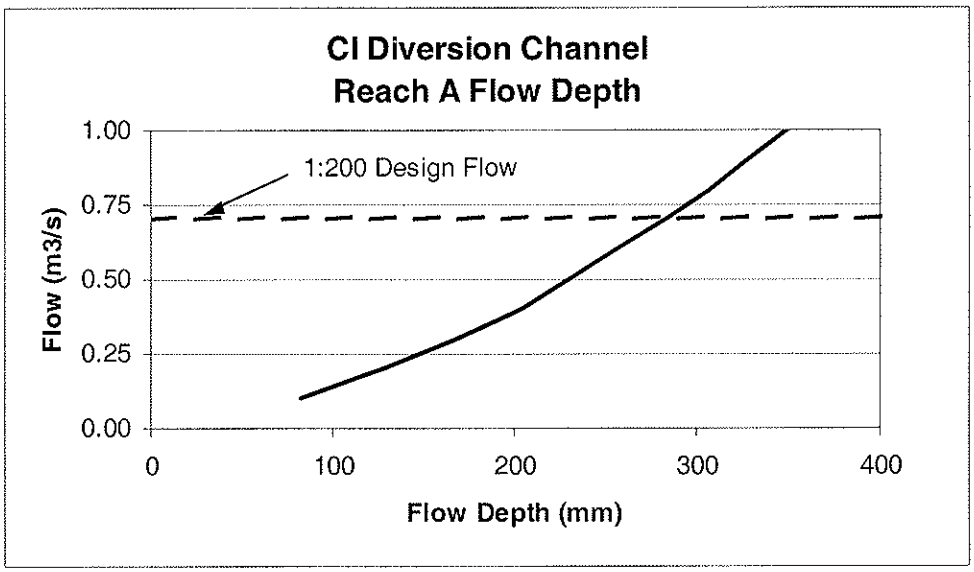
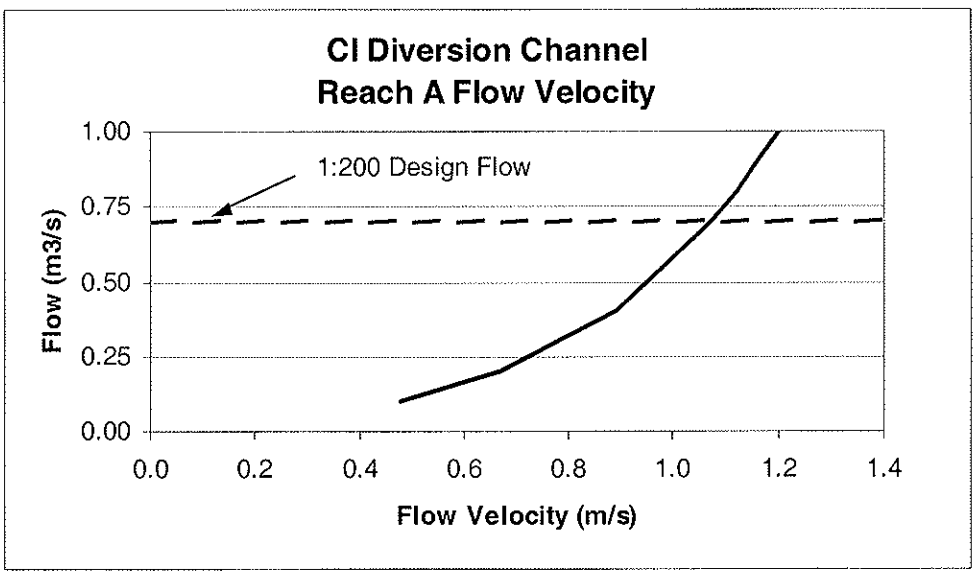
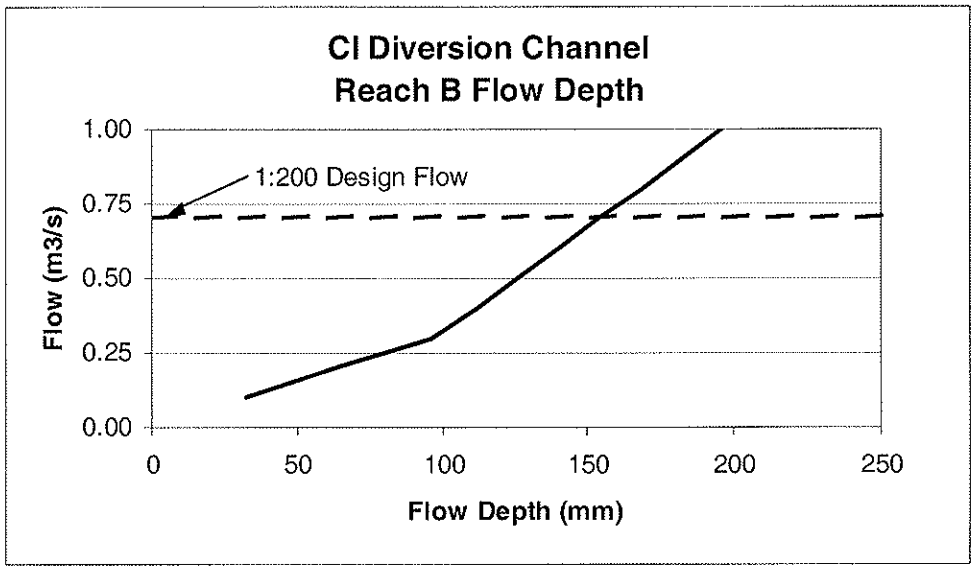
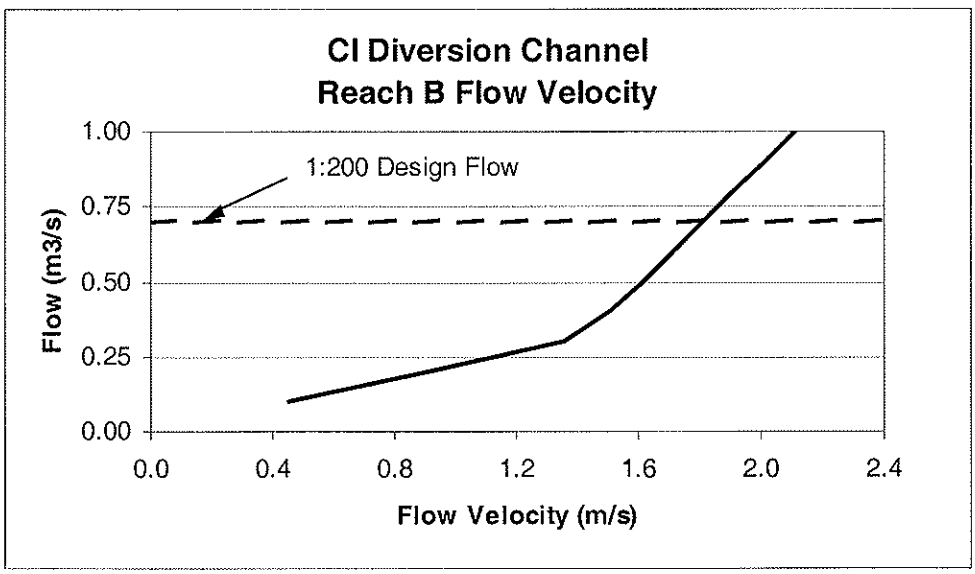


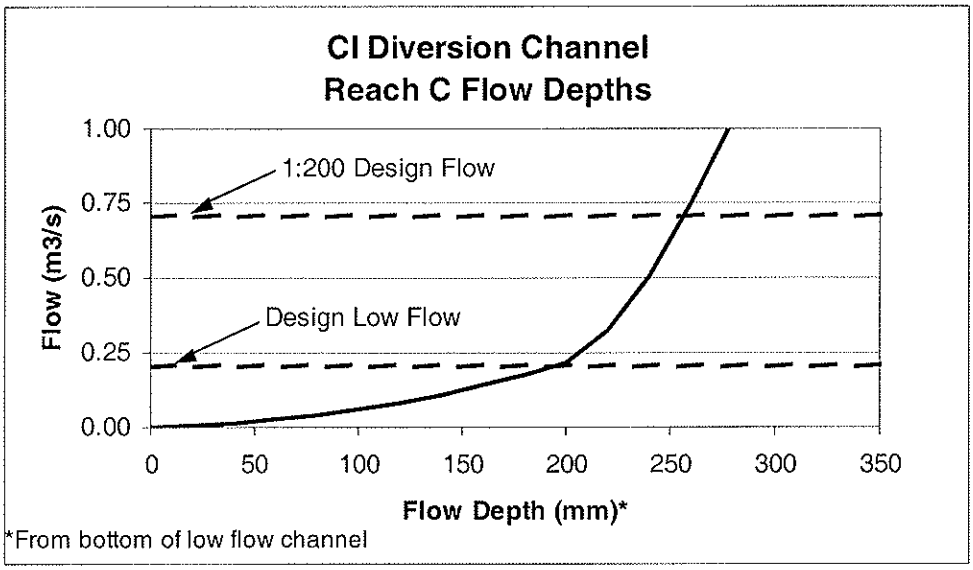


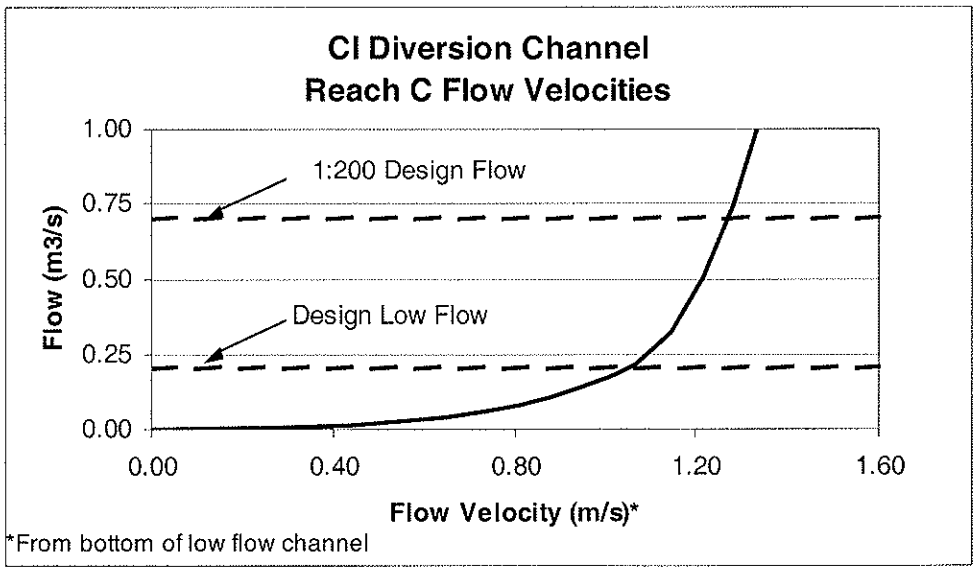
Channel Parameters in Reach A
Figure 1





Channel Parameters in Reach B
Figure 2





Channel Parameters in Reach C
Figure 3

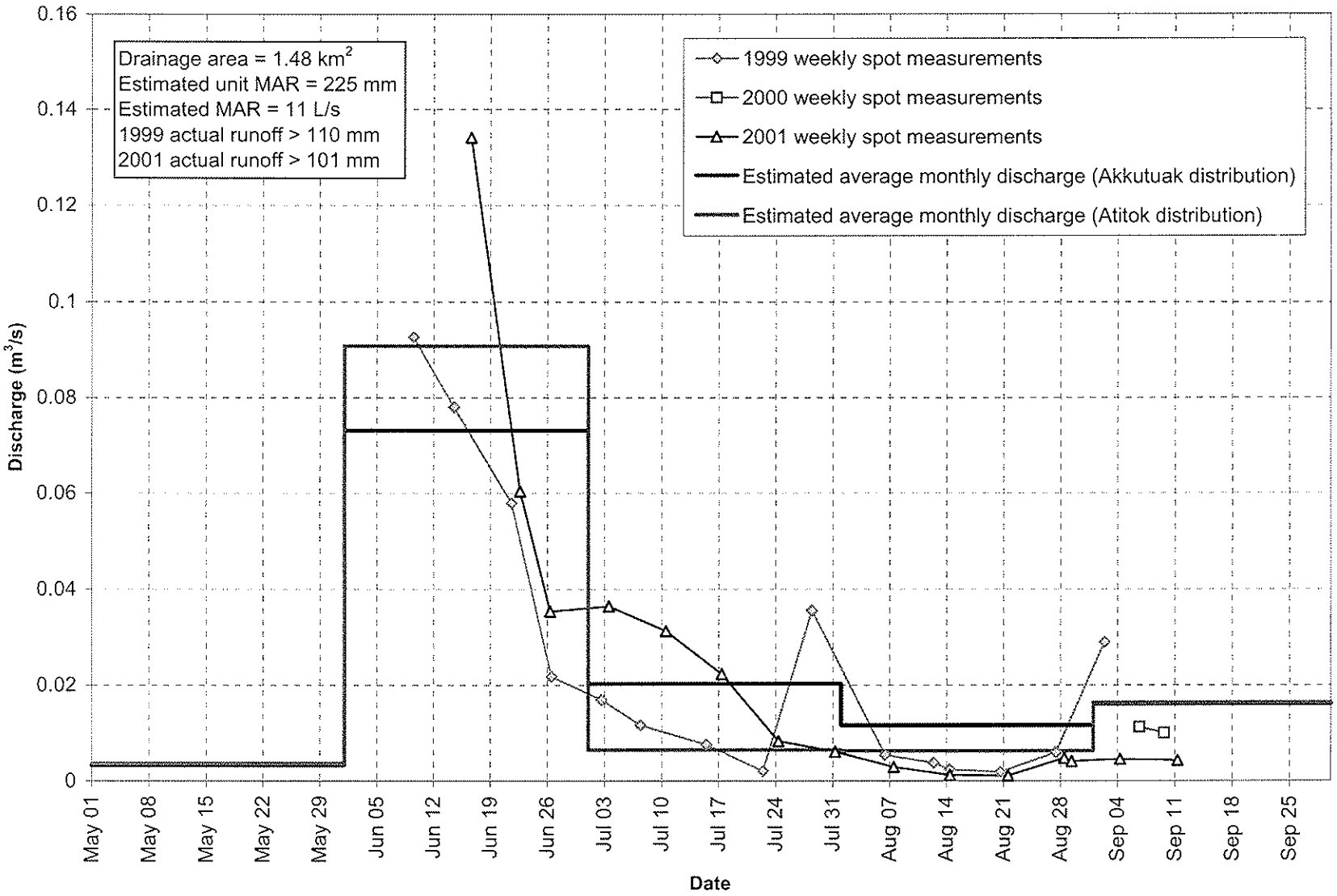


Figure C.18: Comparison of Estimated and Observed Flows for Stream C1 below Lake C1

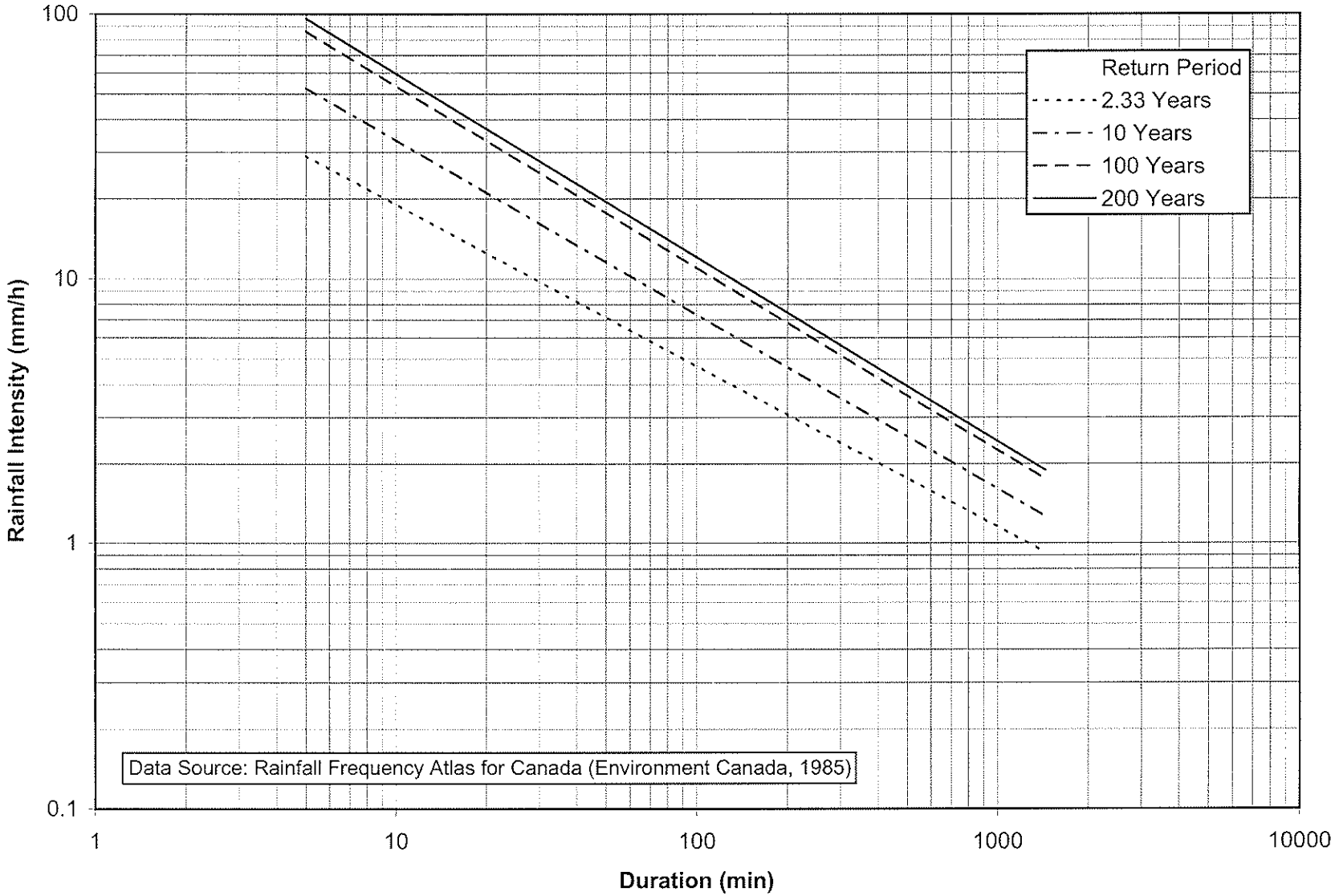


Figure C.27: Estimated Intensity-Duration-Frequency Relationship for Jericho Diamond Project

APPENDIX

APPENDIX C NEWBURY DESIGN PROVIDED TO EBA BY DFO ON DECEMBER 12, 2005

Fisheries and Oceans Canada

Fish Habitat Management

Eastern Arctic Area
P.O. Box 358
Iqaluit, NU X0A 0H0

Pêches et Océans Canada

Gestion de l'habitat du poisson

Secteur de l'Arctique de l'est
P.O. Box 358
Iqaluit, NU X0A 0H0

Fax

Central & Arctic Region – Eastern Arctic Area

Fish Habitat Management

Phone (867) 979-8011 Fax (867) 979-8039

Date : December 12, 2005	**DFO File N°:**
Sender's Name/Nom de l'expéditeur: Derrick Moggy	
Subject/Sujet:	

Name/Nom	Organization/Organisation	Facsimile N°/ N° de télécopieur
Mark Watson	EBA Engineering Consultants Ltd	780.454.5688

☐	Urgent	☐	For your information Pour votre information	☐	Action Faire le nécessaire	☐	As requested À votre demande

Mark

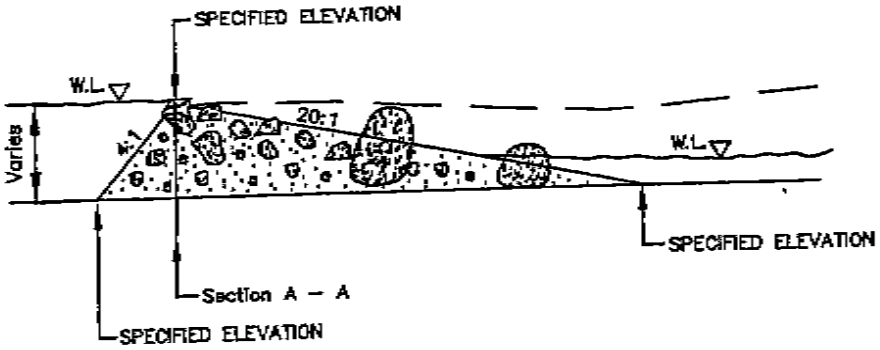
Here's the riffle design we discussed.

Derrick

Pages to follow/Pages à suivre: 1

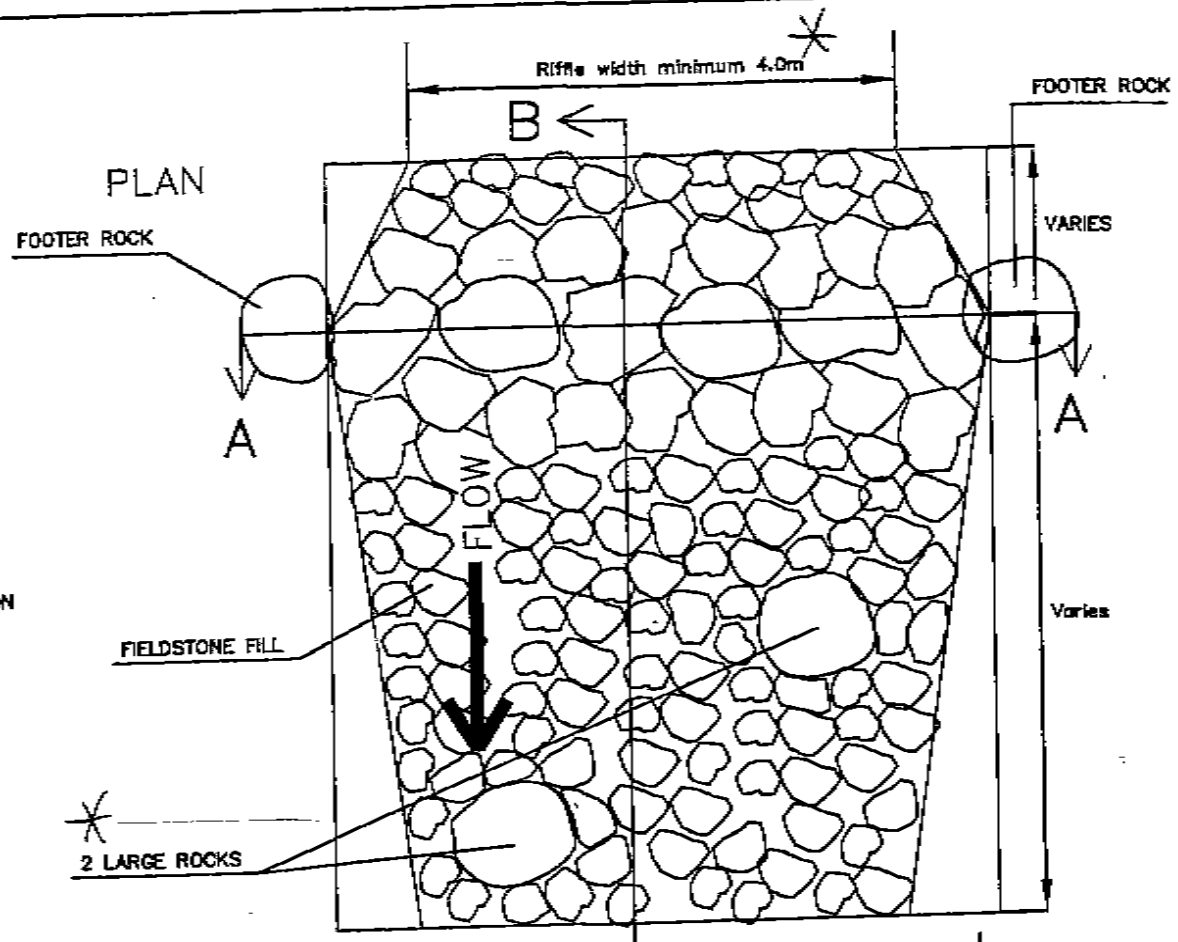
Canada

PROFILE

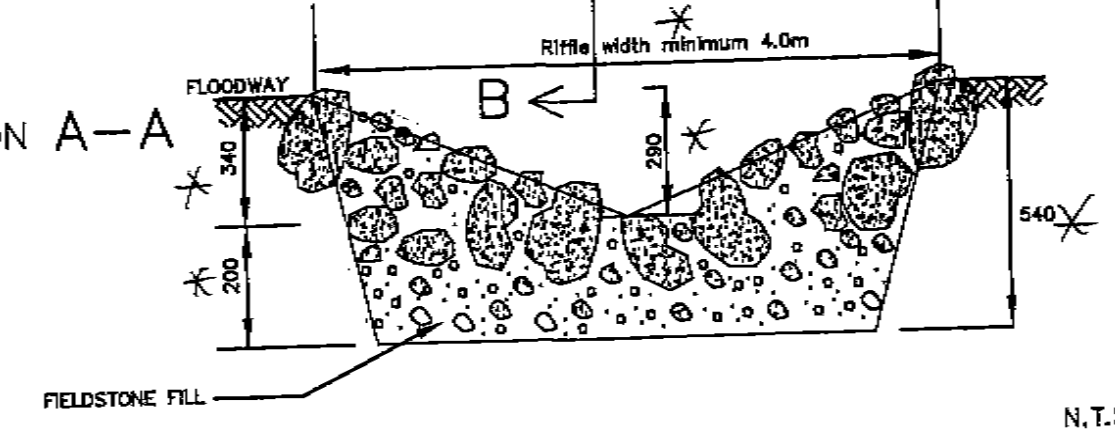


*depends on site conditions

PLAN



SECTION A–A



N.T.S.

TYPICAL FIELDSTONE RIFFLE