



Mackenzie Valley Land and Water Board  
7th Floor - 4910 50th Avenue  
P.O. Box 2130  
YELLOWKNIFE NT X1A 2P6  
Phone (867) 669-0506  
FAX (867) 873-6610

## STAFF REPORT

<b>Company: BHP Billiton Diamonds Inc.</b>	
<b>Location: Ekati Mine Site</b>	<b>Application No.: MV2001F0032</b>
<b>Date Prepared: January 30, 2003</b>	<b>Meeting Date: February 13, 2003</b>
<b>Subject: Technical Specification and Construction Drawings: Stream Crossings for the Sable Road</b>	

### 1. Purpose/Report Summary

To allow the Board to review the Sable Road Stream Crossings for approval.

### 2. Background

Clause 26 of the Land Use Permit MV2001F0032 states:

*Prior to construction, the design of stream crossings must be approved by Inspector, and Board & the Department of Fisheries and Oceans.*

- MVLWB received the construction drawings on November 14, 2002
- Sent out for review on Nov 20, 2002, with a deadline of December 11, 2002.
- MVLWB's technical support at AMEC required further information to complete the review. BHP supplied this further information on Jan 9, 2003, and AMEC completed their review on Jan 22, 2003.

### 3. Comments

These construction plans were sent to MVLWB's technical support (AMEC) to ensure that the same situation did not occur as what happened with the last Sable Road Stream crossing with the 8 m high arched culvert put in place. AMEC did not have concerns regarding the size of the culvert, although they identified a number of deficiencies, in the hydrologic analysis, and the analysis of stream flow and culvert hydraulics.

It should be noted that BHP's engineers have signed off on the design of Sable Road Stream Crossings.

**4. Review comments**

See comment summary table.

**5. Conclusion**

**6. Recommendation**

BHP's engineers have already signed off on the construction plans, and the culvert is of adequate size, therefore I recommend that the Board approve the construction drawings.

**7. Attachments**

- Map of stream crossings

**Respectfully submitted,**

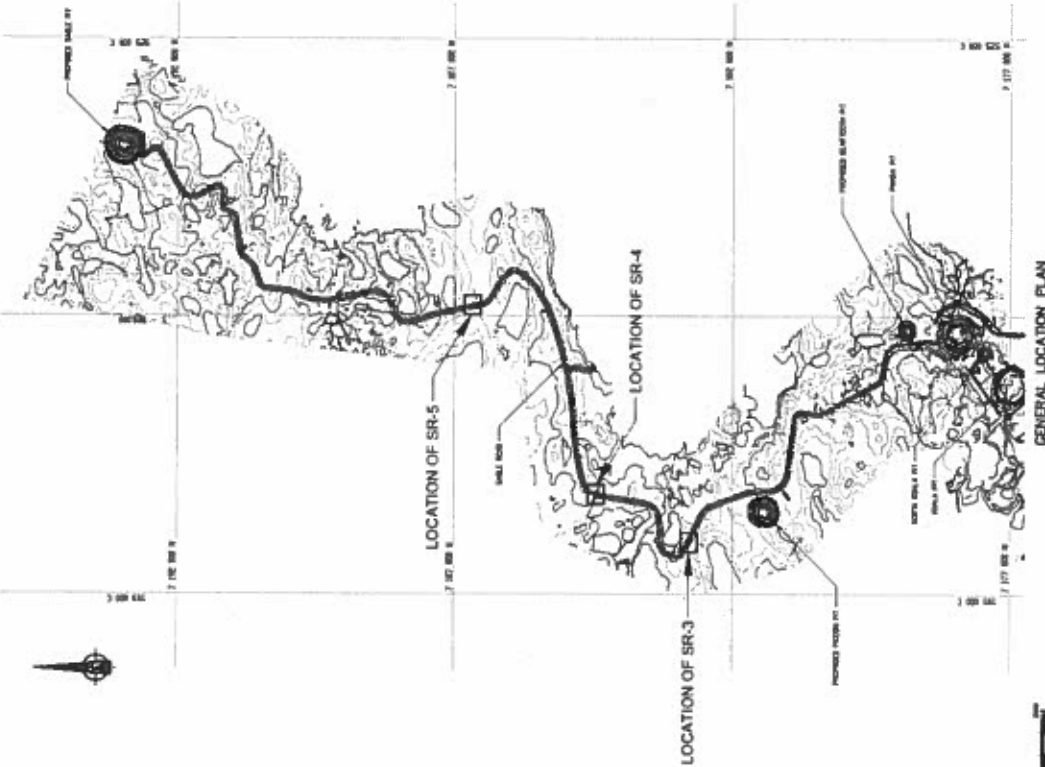
**Latisha Heilman  
Regulatory Officer**

Organization & Contact	Concerns/ Suggestions	How they were dealt with / incorporated
AMEC Earth and Environmental- Neil van der Gugten	<ul style="list-style-type: none"> <li>• The subject streams have not been adequately characterize.</li> <li>• The appropriateness and adequacy of the proposed culvert designs for the subject streams have not been demonstrated.</li> <li>• The provision of fish passage through the proposed culverts has not been adequately addressed.</li> <li>• The installation designs for the culverts do not show an adequate bottom (invert) depth below the streambed.</li> </ul>	The department of Fisheries and Oceans has to approve the construction plans as well, therefore they will be able to address these concerns in their approval decision.

<p>DIAND – Darnell McCurdy</p>	<ol style="list-style-type: none"> <li>1. Has a watershed/drainage analysis been completed? If not how was the culvert size of 1000mm chosen and why are 2 culverts to be installed in locations SR3 and SR5?</li> <li>2. What was the flood cycle that was used in determination of the culvert size? 1:50, 1:100, 1:200.</li> <li>3. In the Section titled "General" 2.1 it is indicated that there will be borrow and stockpile areas utilized. If this is the case where will these areas be located?</li> <li>4. I am assuming that the source of the 20mm and 150mm crush will be from the granite waste rock generated from the open pits. Is this correct or will a quarry be needed?</li> <li>5. There was no mention of the use of silt curtains for the upcoming freshet. There is potential for silt and fines to move after construction during increased water flows.</li> <li>6. Are there going to be any stationary fueling facilities at any of these sites during construction? If so I will certainly be looking for lined and bermed structures to accommodate the fueling facilities.</li> <li>7. Where will the debris and vegetative strippings from these culverts installations be placed?</li> </ol>	<p>All questions were answered in the Letter from BHP to MVLWB, Jan 8, 2003.</p> <ol style="list-style-type: none"> <li>1. Culverts will be a minimum size of 900 mm to reduce the potential blockage by ice and debris, and to maintain flows under 1.0 m/s, thereby allowing fish passage. Two culvers are required to keep the flow below 1m/s even in a 1:200 AEP flood flow.</li> <li>2. 1:100</li> <li>3. Within the foot print of the road and will not be placed on the tundra.</li> <li>4. The crush material will be granite crush from either Koala or Beartooth pits.</li> <li>5. Silt curtains are available to place in steams if necessary.</li> <li>6. A fuel truck will deliver fuel on a regular basis.</li> <li>7. All material excavated will be returned to the main site where it will be placed in the salvage topsoil stockpiles.</li> </ol>
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LOCATION MAP



GENERAL LOCATION PLAN

SABLE ROAD - STREAM CROSSINGS - DRAWING INDEX

DRAWING NUMBER	DRAWING TITLE
11580.057-SR01	GENERAL LOCATION PLAN FOR SR-3, SR-4 AND SR-5
11580.057-SR02	SITE PLAN, CROSS-SECTIONS AND DETAILS FOR SR-3
11580.057-SR03	SITE PLAN, CROSS-SECTIONS AND DETAILS FOR SR-4
11580.057-SR04	SITE PLAN, CROSS-SECTIONS AND DETAILS FOR SR-5

<b>EBA Engineering Consultants Ltd.</b>		<b>Ekati Diamond Mine™</b>		<b>BHP Billiton Diamonds Inc.</b>	
PROJECT: EKATI DIAMOND MINE DRAWING NO: SR-01 SCALE: AS SHOWN DRAWING DATE: 02/27/11 DRAWING NO: 027-11580.057 AUTHOR: J. D. [Name]				SABLE ROAD STREAM CROSSINGS GENERAL LOCATION PLAN FOR SR-3, SR-4 AND SR-5	
PROJECT NO: 027-11580.057 DRAWING NO: 027-11580.057 AUTHOR: J. D. [Name]		REVISION NO: 0 DRAWING NO: 11580.057-SR01		REVISION DATE: 0 DRAWING DATE: 11580.057-SR01	