



Letter

TO: Kathy Eichenberger, Project Assessment Director
British Columbia Environmental Assessment Office
2nd Floor 836 Yates St
Victoria, BC
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November 17, 2008

RE: Ministry of Environment, Environmental Quality Section Comments on Davidson Project Application for Environmental Assessment Certificate August, 2008

The following letter summarizes the review of Jack Love Environmental Impact Assessment Biologist for the Ministry of Environment Environmental Quality Section comments regarding the Davidson Project Aquatic Environmental Effects Monitoring (EEM) Program. This letter supports the tracking table submitted to the Environmental Assessment Office from the Ministry of Environment, Environmental Protection Division.

The Application presents the aquatic EEM program in 4 main sections:

- Chapter 13 of Volume I
- Appendix G1 and G2 Volume IV and
- Appendix c 9 volume III

The application does not sufficiently summarize the entire receiving environment data that has been collected. Chapter 13 Environmental Effects Monitoring presents a list of commitments to achieve a reasonable EEM program, however; at this stage the main body application should include a summary, discussion and interpretation of the biological data that was collected. It will be imperative the Blue Pearl Mining presents a critical path to completing and Aquatic EEM program in order for Ministry of Environment, Environmental Quality Section to endorse the proposed project.

It is our recommendation that Blue Pearl Mining hire a qualified environmental professional with experience in designing aquatic EEM programs for mining projects to review and update the proposed EEM program. Review and revisions to the program should address the following items:

- 1) **“Time Zero” Characterization:** To be useful in identifying potential impacts from the mine, the Environmental Effects Monitoring (EEM) Program must characterize time zero in an ongoing impact assessment. The EEM program as presented does not adequately identify baseline conditions at the monitoring locations. Appropriate biological monitoring tools must be used, and sufficient data must be collected and presented to demonstrate that the EEM program will be able to detect significant change.

If significant change is detected, decisions can then be made to take appropriate management actions.

- 2) **Critical Effects Thresholds:** The report does not identify critical effects thresholds, or what would be considered a biologically significant change. The report should identify thresholds or triggers for the various EEM components (water, sediment, benthic invertebrates, fish, etc.), and these should be identified prior to considerable data collection. These thresholds are flexible guidelines and are not compliance limits.
- 3) **Power Analysis:** The EEM program requires a power analysis be conducted and presented in order to confirm that sufficient data is being collected to measure possible mine related impacts. There may be different degrees of statistical power associated with each of the data sets (such as concentrations of the various metals of concern in the ambient waters of the Bulkley River).
- 4) **Receiving Environment Objectives:** When contaminants of concern in the receiving environment are expected to exceed provincial water quality guidelines in the absence of mine related discharges, site specific water quality objectives must be developed to take the place of the provincial water quality guidelines. The objectives should be established according to approved Ministry principles and methods (see: “Principles for preparing water quality objectives in British Columbia” and “Methods for deriving site-specific water quality objectives in British Columbia and Yukon”). Proposed objectives need to be presented in the Application.
- 5) **Impact Pathways:** An impact pathway assessment needs to be conducted, including:
 - a. Inventory of potential physical and chemical impact-causing pathways.
 - b. Identifying the degree to which receiving environment receptors are exposed to the proposed discharges
 - c. Cumulative/synergistic effects assessment
- 6) Characterization of and risks associated with the Kathlyn Creek discharge are not adequately addressed. Without further information, it is unlikely that this discharge would be permitted since this proposed discharge is in proximity of drinking water users, creating the potential for chronic human health effects.
- 7) An aquatic EEM program is required for Lake Kathlyn. The Technical Assessment Report indicates that very limited sampling is planned for one site in the lake, however, the report (and likely the program) lacks sufficient detail and data is not presented in the Application.

The overall impact assessment focuses discussion on the risks associated with arsenic and molybdenum and does not discuss other potential contaminants of concern, nor does it consider upset conditions. The text identifies that some contaminants in the Bulkley River are already above the B.C. water quality guidelines and does no further analysis. The data below suggest contaminants such as: cadmium, chromium, selenium, mercury and possibly tin are also of potential concern. Cadmium for instance is four times above the guideline in the Bulkley River, and the proposed discharge is 370 times above the guideline.

The table below is an example of the type of table that must be used to present calculations to determine other contaminants of potential concern. A full list of potential contaminants of concern needs to be generated. A number of contaminants will likely need to have permit limits and/or site

specific water quality objectives developed. A monitoring program must then be proposed to assess attainment of the water quality objectives and determine trends in water quality over time at appropriate locations.

	Aquatic Life Guideline (ALG) (mg/l)	Bulkley River Background (mg/l) factor above (ALG)		Modelled end of the pipe (mg/l) factor above (ALG)		Bulkley 13 m downstream (mg/l) factor above (ALG)	
Ammonia	20.2(4)	0.006	0	10	0	0.1	0
Sulphate	100	4.38	0	729	7	11.6	0
Cadmium	0.00002(3)	0.00008	4	0.0074	370	0.000103	5
Chromium VI	0.001	0.0006	1	0.0049	5	0.0019	2
Copper	0.007(2)	0.0018	0	0.022	3	0.0046	1
Lead	0.034(2)	0.00024	0	0.001	0	0.0008	0
Mercury	0.00001(5)	0.00003	3	0.000107	11	0.000044	4
Nickel	0.025	0.0007	0	0.004	0	0.0022	0
Selenium	0.002	0.0005	0	0.001	1	0.0005	0
Tin Tributyl tin	0.000008	0.00005	6	no data		no data	
Zinc	0.033(6)	0.003	0	0.012	0	0.0097	0

- (1) when pH is greater than 6.5
 - (2) when hardness is 50 mg/l CaCO₃
 - (3) when hardness is 60 mg/l CaCO₃
 - (4) for a pH of 7.0 and a summer temperature of 12 degrees Celsius
 - (5) 30 day average when MeHg = 1.0% of THg
 - (6) water hardness less than or equal to 90
- Bulkey river data used average values from Table 5.2-1

Based on the comments above a written response from Blue Pearl Mining outlining a critical path forward with key deliverables will be required as an initial step for the Aquatic EEM program. We would be happy to assist the proponent in planning this work based on their project schedule. I can be contacted at 250-847-7302.

Regards,

Via email

Jack Love RPBio,
Environmental Impact Assessment Biologist
MOE Environmental Protection Division

cc: Ian Sharpe MoE, Craig Stewart MoE, AJ Downie MoE, Karie Hardie EAO, Ally Taylor MoE

JL/jl