

Version 3 Hammond Reef Gold Project EIS/EA – Addendum (Part B)
Responses to Provincial Information Requests

1656263

Identifier	Topic	Reference to EIS/EA Report	Summary of Comment	Proponent's Response	Subsequent Comment
			<i>Date: August 2015</i>	<i>Date:</i>	
MOE Hydrology-4	Upper Marmion Reservoir water balance modelling		<p>Upper Marmion Reservoir's long-term water balance was modelled using spreadsheet based accounting at monthly and annual scales considering average, wet and dry climatic conditions. In addition to long-term water balance modelling, potential changes in the outflows and water levels in Upper Marmion Reservoir were assessed during specific low water years of 1998 and 2010.</p> <p>The following influencing factors were considered during water balance calculations:</p> <ul style="list-style-type: none"> • inflows to Upper Marmion Reservoir from regulated and unregulated watersheds; • outflows and minimum flows from the Upper Marmion Reservoir; • precipitation directly falling on the reservoir; • evaporation loss from the reservoir; • loss of reservoir water to the mining open pits through seepage (estimated using groundwater modelling); • inflows from Lower Marmion Reservoir for certain months of the year (May - October); • reservoir's regulatory levels as per Seine River WMP; • water taking for the processing plant; • water taking for the workers' camp; • treated effluent discharge from the workers' camp; and • treated effluent discharge from the mining sewage work. <p>It appears, all major influencing factors were considered in water balance modelling. The modeling results can be considered reasonable at monthly and annual scales, but at daily scale that estimates would be crude as flow routings were not considered in the analysis. Seine River water management compliance is applicable at daily scale for flows and levels at each waterpower facility and control dam. Therefore, uncertainty exists about how the proposed mining work and its water takings would impact reservoir's water levels and outflows at daily scale. This uncertainty was noted when observed and modelled outflows for the Upper Marmion Reservoir were plotted for the year 1998 and 2010, not a perfect match was found. It is recommended to remodel the Upper Marmion Reservoir's water balance considering flow routings.</p> <p>Produce the results (reservoir water levels and outflows) at daily time scale, particularly for 2010 and 1998 dry years. Compare the results with the reservoir's operational rule curve and minimum flow constrains.</p> <p>Golder has simulated reservoir performance at a monthly time step using spreadsheet lake water balances under baseline conditions and with the project influences for a bounding or 'worst case' scenario (see item 2 in attached meeting minutes), in order to assess the possible changes in reservoir storage and outflows.</p> <p>The estimated maximum change in outflows from Raft Lake Dam lies within the error of flow measurement and calibration/validation of more detailed hydrologic models. Changes in Seine River flows downstream of Raft Lake Dam will be smaller due to additional inflows to the river system downstream of the dam.</p> <p>Continuous lake water balance modelling indicated an increase in the occurrence of the lower compliance level for Raft Lake Dam (defined in the SRWMP) from 65 to 66 months in a 27-year period, between baseline and</p>	<p>Golder has simulated reservoir performance at a monthly time step using spreadsheet lake water balances under baseline conditions and with the project influences for a meeting minutes), in order to assess the possible changes in reservoir storage and outflows.</p> <p>The estimated maximum change in outflows from Raft Lake Dam lies within the error of flow measurement and calibration/validation of more detailed hydrologic models. Changes in Seine River flows downstream of Raft Lake Dam will be smaller due to additional inflows to the river system downstream of the dam.</p> <p>Continuous lake water balance modelling indicated an increase in the occurrence of the lower compliance level for Raft Lake Dam (defined in the SRWMP) from 65 to 66 months in a 27-year period, between baseline and project scenario (an increase of 2%). It was concluded that there was effectively no increase in the frequency occurrence of the lower compliance limit.</p> <p>The scale of modelling being requested in the comment will require significant effort, cost, and data that are not currently available, without the expectation that the certainty or accuracy of the predicted changes will be improved (see item 8 in the attached meeting minutes).</p> <p>Rather than complete additional modelling work, CMC proposes to</p>	<p>MOE Hydrology-4B</p>

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			<p>project influenced conditions under the bounding or 'worst case' scenario (an increase of 2%). It was concluded that there was effectively no increase in the frequency occurrence of the lower compliance limit.</p> <p>The scale of modelling being requested in the comment will require significant effort, cost, and data that are not currently available, without the expectation that the certainty or accuracy of the predicted changes will be improved (see item 8 in the attached meeting minutes).</p> <p>Rather than complete additional modelling work, CMC proposes to identify contingency measures to reduce or eliminate the project influences during dry years, which should go some way to allaying the concerns of other river users.</p>	<p>identify contingency measures to reduce or eliminate the project influences during dry years, which should go some way to allaying the concerns of other river users.</p>	