



Comment Index

Birrette's East Uniacke Quarry Expansion Project

Additional Information Addendum

Publication date: July 26, 2019

Government

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2	Nova Scotia Office of Aboriginal Affairs	August 21, 2019
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6	Fisheries and Oceans Canada	August 28, 2019

Nova Scotia Mi'kmaq

Number	Source	Date Received
	Outside Comment period	
1	Kwilmu'kw Maw-Klusuaqn Negotiation Office (KMKNO) Native Council of Nova Scotia	September 9, 2019

To: [Mageste da Silva, Renata](#)
Cc: RE: Birrette"s East Uniacke Quarry Expansion Project - Additional Information registration - ICE REPSONSE
Subject:
Date: August 16, 2019 10:51:28 AM
Attachments: [image004.jpg](#)
[image003.jpg](#)

Hi Renata:

Further to our phone discussion today, I have reviewed the additional information provided by McCallum Environmental Ltd. dated July 14, 2019, registered July 26, 2019, regarding the Birette's East Uniacke Quarry Expansion Project – Environmental Assessment proposal.

As one of the representatives for the ICE Division, I confirm that we have no additional comments regarding the material submitted. Provided that the SAS representatives (Reviewers) accept the content of the additional information as being sufficient to address their concerns, and the DFO representatives (Reviewers) provide input regarding the possible DFO Authorization regarding Watercourse 3, then ICE has no objection to the project proceeding. If it does proceed, we look forward to working with you and the other Reviewers to craft the EA Approval terms and conditions, as well as the possible amendment conditions to the existing Industrial Approval.

Date: August 21, 2019

To: Renata Mageste da Silva, Environmental Assessment Officer

From: Gillian Fielding, Aboriginal Consultation Advisor

Subject: Birrette's East Uniacke Quarry Expansion Project – Additional Information Addendum Registration

OAA has reviewed the Additional Information Addendum Registration document for the proposed Birrette's East Uniacke Quarry Expansion Project and has no comments at this time. OAA will however, continue to work with the EA Branch to address any comments submitted by the Mi'kmaq through the environmental assessment process.

MEMORANDUM

DATE: August 21, 2019

TO: Renate Mageste da Silva

FROM: Protected Areas and Ecosystems Branch

SUBJECT: Birrette's East Uniacke Quarry Expansion Project Additional information

The Protected Areas and Ecosystems Branch have reviewed the Environmental Assessment application for the Birrette's East Uniacke Quarry Expansion Project additional information

Wetland Comments:

- Based on the Additional Information Addendum submitted in support for the proposed quarry expansion the revised water balance assessment predicted a reduction in surface water inputs to Wetland 7 are likely to occur as the quarry is developed in prescribed phases. As indicated in the assessment, surface water reductions are expected to commence in conjunction with development of Phase I with more substantial reduction as a result of Phase II as a result of land use changes and diversion of surface water runoff to the on-site water management pond. Shallow groundwater input reductions to Wetland 7 were also anticipated as a result of the expansion. Given that these reductions are predicted to result in a drying effect to Wetland 7 (throughflow tree/shrub fen) and changes to function characteristics and will be permanent over the course of the quarry life, it would be prudent to require a wetland alteration approval prior to quarry expansion developments that will disrupt surface water and groundwater inputs to wetland habitat. Establishment of baseline conditions and monitoring during the expansion period will be required to assess changes to the hydrological regime relating to surface water and groundwater reductions, changes to vegetation communities and other wetland characteristics.

Protected Areas Comments:

- Initially, there was some potential concern with regard to surface water quality and quantity changes that may have downstream effects on the Herbert River and the adjacent Devil's Jaw Wilderness area. There have been some significant additions to this aspect of the proposal in the new addendum.
- We do not have expertise in hydrology and can't really say if the new information is adequate, although it appears so. We will rely on the expertise within NSE to make a useful assessment on this analysis.

MEMORANDUM

To: Renata Mageste da Silva, EA Branch

From: Hydrologist, Industrial Management Unit, Sustainability and Applied Science Division

CC: Manager, Industrial Management Unit

Date: August 21, 2019

Subject: Birette's East Uniacke Quarry EA Review Comments

Scope of review:

The scope of this Environmental Assessment review from the NSE Sustainability and Applied Science Division Hydrologist is to evaluate the response of the proponent against the requirements within the Decision Letter issued by the Department (dated May 8, 2019), specifically from the perspective of the potential environmental impacts and proposed mitigations of the proposed undertaking on surface water quantity and management. While comments may also include considerations for impacts on general surface water quality, groundwater, freshwater fish habitat, and wetlands, appropriate technical specialists for these areas should be consulted for specific review and comment.

Documents reviewed:

The documents outlined below formed the basis for this EA review, and is referred to as the 'the submission' through the rest of this memorandum:

- Birette's East Uniacke Quarry Expansion Project – Environmental Assessment – Additional Information. Report prepared by McCallum Environmental Ltd. Dated July 14, 2019.
- Class 1 Environmental Assessment Registration – Birette's East Uniacke Quarry Expansion Project. Letter prepared by Nova Scotia Environment. Dated May 8, 2019, and accessed from <https://novascotia.ca/nse/ea/east-uniacke-quarry-expansion/>

Review re: Additional Information document:

General

- It is reported that “The quarry floor will be sloped from the quarry face downgradient eastward at a 2:1 slope”. It is assumed that this has been incorrectly reported, as this would result in a pit of significant depth (>400 m)

Decision Letter Requirements:

1. The key assumption related to runoff generated in the quarry footprint has been modified from what was originally submitted: originally, all water within the quarry footprint was assumed to be removed from the system. In the new submission, no water is removed from the system and will all become discharge from site
 - It is reported that this approach ‘represents a conservative “worst case scenario”’ (pg. 6). While this would represent the worst-case scenario from certain perspectives (e.g., potential for flooding and scour downstream), the previously identified scenario where water was removed from the system represented more of a worst-case scenario from the perspective of reductions of water available to downstream watercourses to support fish and fish habitat.
- As outlined in my original submission comments: For the water balance and associated analysis and results to be valid, surface water flows from the areas upstream of the quarry footprint within the Western and Eastern drainage areas that were not considered as part of the water balance must be diverted around quarry activities. Through a review of this submission, certain areas upstream of the quarry have been considered, but not all (e.g., area to the south of the quarry footprint in Western LCA)
- Based on the assessment provided, the overall impacts to surface water volumes within the broader O’Hearn Flowage catchment area look to be minor, with mitigations presented to address increases to the volumes outlined.
 - That being said, there is a large level of uncertainty surrounding the changes to flows expected from the proposed activities, as highlighted by the results provided in the two submissions received thus far
- Reclamation case: it has been assumed that the reclamation case will have similar infiltration characteristics as baseline conditions. As the project progresses, further information to support and validate this assumption is necessary. In addition, it is reported that an increase of runoff volume of 56.2% within watercourse 2 over baseline conditions in the reclamation case is predicted. The impacts to watercourse 2 resulting from this increase are not summarized in the submission. Adequate monitoring is required to support an assessment of the impacts of this potential permanent increase in flows in the reclamation phase, with a plan to require the appropriate approvals where necessary.
- The assessment of impacts to fish and fish habitat provided is reasonable
- Groundwater – it is reported that ‘effects to shallow ground water is being assessed as a reduction to groundwater recharge/infiltration within the quarry area as a result of the quarry expansion’ (pg 6) Changes to infiltration volumes is assessed as part of the water balance assessment, but overall impacts to groundwater are not addressed in any detail
 - Monitoring of impacts to groundwater is recommended so that any impacts can be understood and mitigated

- Various design requirements for the settling pond are outlined in page 21, and should be communicated to ICE for consideration during the approval phase
- Surface water quality and quantity monitoring programs are outlined on page 21, including collection of baseline flow measurements. As there is significant uncertainty in the runoff that will be generated in the quarry footprint, SAS and ICE review and acceptance of final monitoring plans is recommended
- Water Balance Results Table 2: what does Percent of Surface Runoff at Eastern LCA Outfall represent? This is misrepresented in the text on page 12, as the percentages do not represent increases in surface water run-off volume from baseline conditions. As baseline conditions are 0, the percentage increases cannot be calculated. In addition, shouldn't baseline have discharge volumes, as there is an existing pond there?

Conclusions & Recommendations:

Operational Issues/Other Permitting Processes

- For the water balance and associated analysis and results to be valid, surface water flows from the areas upstream of the quarry footprint within the Western and Eastern drainage areas that were not considered as part of the water balance must be diverted around quarry activities.
- Recommend EA conditions be included that outline requirements for re-assessment of potential impacts to watercourse 2 using additional details surrounding the reclamation case as it becomes available (e.g., after Phase 1 and/or Phase 2), including how impacts to downstream will be mitigated from the permanent increases to runoff volumes outlined. Any approvals that may be necessary as a result of this analysis must be acquired prior to closure taking place.
- Recommend EA conditions for groundwater monitoring and assessment
- Details related to final settling pond design by a qualified professional is required as part of any industrial approval application for the works, including a plan to monitor compliance during the different operational phases of the year. Designs must consider the items outlined in the submission, at minimum, as well as considerations for appropriate removal of Total Suspended Solids.
- A detailed sediment and erosion control plan is to be developed by a qualified professional and is required to be submitted as part of any industrial approval application for NSE review and approval prior to construction activities, including clearing, grubbing, and stripping, take place.
- Details surrounding the plan for water use for the purpose of dust suppression must be provided to the Department prior to expansion activities taking place and any necessary approvals obtained.
- A surface water monitoring plan, as identified in the submission, must be developed and submitted to SAS & ICE divisions of NSE for review and acceptance. This plan is required to include a focus on validating the results presented in the submission, including discharges from the pond and their impact on Watercourse 2
- Recommend validation of assessment of impacts to water quantity and fish and fish habitat provided here through re-assessment at several points through the life of the project. For example, provide assessment of flows in WC2 at midway and end of Phase 1 to support the assessments and results completed here and modify mitigations and obtain approvals (e.g., watercourse alterations) where necessary.

Environment

Date: August 23, 2019

To: Manager, Water Management Unit

From: Senior Surface Water Quality Specialist, Water Management Unit

Subject: Birrette's East Uniacke Quarry Expansion Project - Environmental Assessment Additional Information: Review Comments & Recommendations

Scope of Review

As Senior Surface Water Quality Specialist with the Nova Scotia Environment (NSE) Sustainability and Applied Science Division, the following Birrette's East Uniacke Quarry Expansion Project Environmental Assessment (EA) Additional Information review focuses on the following subjects:

- Surface water quality & its management
- General surface and groundwater resources, and fish and fish habitat & their management

The following review considers whether the environmental concerns associated with the above subjects and the proposed mitigation measures have been adequately addressed in the Environmental Assessment. The recommendations provided below are meant to supplement the actions outlined in the EA submission documents.

While general comments on fish and fish habitat, wetlands, surface water quantity, and groundwater quality and quantity may be included below, applicable technical specialists should be consulted for specific review and comment.

Reviewed Documents

The following documents were the basis for this EA review:

McCallum Environmental Ltd (MEL). 2019. *Birrette's East Uniacke Quarry Expansion Project – Environmental Assessment Additional Information*. Bio Design Earth Products Inc.

McCallum Environmental Ltd. 2019. *Environmental Assessment Registration Document Birrette's East Uniacke Quarry Expansion Project, East Uniacke, Hants County, Nova Scotia*. Bio Design Earth Products Inc.

Comments

General

- *Project Interactions with Surface Water Resources and Fish and Fish Habitat:* A revised table (Table 2) has been provided that lists the different project phases (construction, operation & maintenance, decommissioning and accidents, malfunctions and unplanned events) and whether they are expected to interact with surface water and fish and fish habitat due to changes in water quality and water quantity. This revised table presents consistent surface water and fish and fish habitat interactions occurring for the same project activities, which would be expected from the proposed project.

Surface Water Resources

- *Unnamed Tributary B:* The headwaters of unnamed Tributary B were ground truthed by MEL field staff using a handheld GPS to identify elevation/grade changes. The exercise included using the same device to identify areas south of the identified subwatershed divide in the subwatershed for the unnamed Watercourse 2 (WC2) to confirm surface water flow direction. The unnamed Tributary B was identified as not being located within project development area. A typical practice to confirm the watershed divide would be to use more accurate positioning equipment than a handheld GPS to assess changes in topography. The approach presented in the Additional Information submission given the amount of overlap/coverage during the ground truthing exercise between the two drainage areas is potentially adequate to identify the watershed boundary, but not as definitive as other available field geomatics survey techniques.

Surface Water Quantity

- A revised hydrological assessment was conducted by MEL staff, including input from a Senior Water Resources Engineer from GHD. A monthly water balance was developed to assess project effects on surface water quantity (i.e., surface water runoff during different months and project stages, shallow groundwater). The project stages include baseline, Phase I (1 to 4 years), Phase 2 (5 to 10 years), Phase 3 (11 to 25 years) and Reclamation.
- Assumptions are provided for the water balance assessment, including design plans (e.g., directing all active quarry site surface water flows to the location of the on-site settling pond, the pond discharge directed to the WC2 channel prior to connecting with the O'Hearn Flowage).
- The water balance assumed that the quarry floor was impervious, and no precipitation would infiltrate. No rationale is provided on why this assumption was made, except that it represents a worst-case scenario.
- The worst-case scenario is indicated as being an impervious quarry floor. This would be potentially an extreme scenario for infiltration and surface water runoff. There is another extreme scenario, which is if all surface water runoff infiltrates and there is no surface water runoff and settling pond discharge from the quarry site. This other extreme/worst-case scenario was not evaluated in the Additional Information submission.
 - The EA Registration Document water balance did consider this alternative worst-case scenario with all water infiltrating through the quarry floor and not being available for surface water runoff. There was a predicted 15% reduction in flow within WC2 and a 2.1% reduction in the O'Hearn Flowage. Reductions in flows to WC3 and unnamed Tributary A were similar to those reported in the Additional Information submission.
- The runoff/infiltration factor estimated for the undisturbed forest areas within the

assessed subwatersheds is estimated using an Ontario Ministry of the Environment Stormwater Management Planning & Design Manual (2003). No rationale is provided on why a Nova Scotia or Atlantic Canada-based infiltration factor was not used. Also, no rationale is provided either on how the factor chosen is representative of the land cover, soil and slope conditions within the Project Development Area.

- Additional catchments within this Additional Information submission were added to the water balance assessment for a total of six. A 1 m digital elevation model (DEM) was developed using available shapefile layers from the Nova Scotia Topographic Database to estimate the boundaries of the catchments. The Nova Scotia Topographic Database point and 5 m contour shapefiles would not be expected to be an adequate scale to support development of an accurate 1 m DEM.
- The following is a summary of the predicted changes to surface water runoff and infiltration within the various project development area catchments during the three operations phases:
 - The WC2 catchment (Easter LCA) is estimated to have an increase in surface water runoff volume and watercourse flow ranging from 42% to 255.6% during the quarry operations phase. The increase in flow is expected to be mitigated via settling pond outflow controls to reduce the potential for erosion and scour within the receiving watercourse. Upstream of the settling pond inflow point is expected to have a 25.1% decrease in surface water runoff and infiltration, which is expected to be most severe in the headwater area at Wetland 7 and experience a drying effect and an alteration in function. These predicted upstream and downstream changes to flows within WC2 would be considered substantial.
 - Section 3.2.5 indicates there will be increases of 40.1% to 76% from the existing condition for the surface water runoff to the existing settling pond area during the three operations phases. These percentage changes represent the percentage of runoff within the WC2 watershed from the quarry area and not changes in surface runoff directed to the settling pond.
 - The WC3 catchment (Central LCA) is estimated to have a decrease of 20.9% in surface water runoff and infiltration during the quarry operations phase. Headwater channel areas of WC3 are expected to potentially have periods of extended no flow. This is a substantial predicted reduction in flows. The potential severity of surface water runoff and infiltration changes due to the project development in headwater area, which includes Wetland 7, is not known.
 - The unnamed Tributary A catchment (Western LCA) is expected to have a reduction in surface water runoff and infiltration of 0% to 2.7% during the three quarry operation phases. The headwater areas adjacent to the project development area are expected to experience the highest overall surface water runoff reductions. These expected changes in flow would potentially not be measurable.
 - Within the O'Hearn Brook upstream of the O'Hearn Flowage there is a predicted reduction in surface water runoff and infiltration ranging from 0% to 1.9% during the three quarry operations phases. Upstream sections of the watercourse and their subcatchments are expected to experience

- greater localized decreases in surface water runoff and infiltration. These expected changes in flow would potentially not be measurable.
 - Within the overall O’Hearn Flowage drainage area downstream of the project development area there is an estimated increase in surface water runoff ranging from 1.2% to 5.8%, and a reduction in infiltration ranging from 0.4% to 2.1% during the three quarry operations phases. These predicted changes may lead to a small increase in flow that could be potentially measurable.
 - Monitoring is proposed to assess potential effects to Wetland 7 via predicted drying with a wetland alteration application to be applied for if drying is observed. This process does not align with the wetland alteration approval program, where expected alterations should have an approval application submitted prior to the changes being observed.
- Reclamation Phase
 - The reclamation phase proposes to revegetate the site with soil materials with similar infiltration rates to the existing undisturbed forested land cover. No rationale is provided to support this assumption.
 - Unnamed Tributary A and WC3 are predicted to have similar reduced surface water runoff and infiltration to the operations Phase 3 condition due to the surface water runoff changes within the quarry area.
 - The WC2 subwatershed is expected to have an increase in infiltration of 56.2% that aligns with a similar reduction in surface water runoff. Overall the WC2 flows will be increased from the baseline condition. No discussion is provided on how settling ponds and site surface water runoff/infiltration will be managed during the reclamation phase with respect to discharges to WC2.
 - Within O’Hearn Flowage there are no predicted measurable changes in surface water runoff and infiltration at the watershed discharge point when compared to the baseline condition.

Fish and Fish Habitat

- An additional site visit was conducted in July 2019 to assess fish habitat quality within WC2, WC3 and Wetland 7 within and downstream of the project development area.
- WC2 was assessed to have two seasonal barriers restricting fish access to only during high flows to the upper section (above settling pond discharge point) and predicted to have a flow reduction. Due to these observations, no reduction in fish habitat is estimated from the Project development to WC2. The increase in WC2 flows from the quarry site surface water runoff is planned to be managed for peak flow conditions and potentially improve fish habitat in the downstream section of WC2.
- WC3 was assessed to be accessible to fish during high flow periods, and the July 2019 site visit identified dry channel sections with overall habitat in the watercourse considered poor. Potential Brook Trout rearing areas were identified in several areas but separated by sections of poor quality habitat. However, the reduction in flows was evaluated as a potential habitat loss that will require additional consultation with Fisheries and Oceans Canada with respect to a whether or not a Fisheries Authorization is required for WC3.
- The predicted changes in flows within O’Hearn Brook, unnamed Tributary A and

O'Hearn Flowage are considered within the range of natural variability and no measurable changes to fish and fish habitat are expected from the Project activities.

- Wetland 7 was assessed as providing a hydrologic connection with WC2 and WC3, and not providing fish habitat due to access barriers within the downstream watercourses.

Groundwater Quantity & Quality

- Within the quarry footprint there are expected reductions in localized infiltration/groundwater recharge based on the assumption of no infiltration within the quarry floor, there will be improved infiltration during the reclamation phase as part of the proposed revegetation plan.

Recommendations

The following recommendations could be potentially developed as conditions in support of an Industrial Approval for the Project.

Operational Issues/Other Permitting Processes

Surface Water Quality

- A surface water quality monitoring program should be developed to monitor discharge from the settling ponds, and potential effects on watercourses impacted by the project development (e.g., WC2 upstream and downstream of pond discharge location). A baseline monitoring site or sites should be established, if feasible. This plan should be submitted to NSE staff for review and approval.

Surface Water Quantity

- Wetland 7 is predicted to have a reduction in wetland function due to drying. Due to the magnitude of the predicted changes, a wetland alteration approval application should be developed and submitted for review and approval to NSE staff prior to the commencement of the project activities that would impact surface water and groundwater inputs into the wetland.
- Given the proximity of the fully developed quarry site to Wetlands 13, 17, 9 and 2 that are proposed to not be impacted by the site development area, a long-term surface water quantity and/or water level monitoring program should be developed and conducted to assess potential impacts due to changes in local drainage patterns and the groundwater system. If impacts to any of these monitored wetlands are identified as part of the monitoring program, a wetland alteration approval application should be developed in consultation with and submitted for review and approval to NSE staff.
- Settling ponds should be designed by a qualified professional to reduce sediment loading from the quarry site. Pre- and post-development surface water runoff rates should be considered in the design with the objective of a zero increase in peak discharge from the project development area. Pond design should consider potential scour impacts to the receiving water environment given the expected increases in surface water runoff from the quarry to be discharged to WC2. Appropriate mitigation measures should be implemented to support surface water management. Pond design criteria, storm event sizing, and effluent

discharge concentration and monitoring requirements should be developed in consultation with and reviewed by NSE staff.

- A water quantity monitoring program should be developed to monitor discharge from the settling ponds and potential effects on appropriate watercourses (e.g., WC2). The sampling frequency and monitoring equipment used should be sufficient to estimate potential surface water quantity changes associated with the project, including whether watercourse alterations may be required in WC2 to reduce scour and erosion from the increased flows. A baseline monitoring site or sites should be established and monitored prior to construction. This plan should be submitted to NSE staff for review and approval.
 - The above program should be designed to assess whether the flows in WC2 downstream of the settling pond discharge point increase as predicted. A contingency plan should be developed to address if decreases in flows in WC2 are observed. Plan development should include consultation with Fisheries and Oceans Canada about potential requirements. This plan should be developed in consultation with and submitted to NSE staff for review and approval.
- The reclamation phase is predicted to have an increased diversion of surface water runoff and infiltration volumes to WC2 from the baseline condition. As indicated in the EA document submission a detailed reclamation plan should be submitted to NSE staff for review and approval prior to operations ceasing at the quarry. The reclamation plan should include details on how flows will be managed and maintained to WC2, including to minimize scour and erosion potential, for this long-term phase.

Fish and Fish Habitat

- Additional consultation by the Proponent with Fisheries and Oceans Canada should be conducted with respect to estimated reduced flows in WC3 and potential requirement for a Fisheries Authorization. If fish habitat improvements are subsequently developed for the Project within the O'Hearn Flowage watershed or any watercourse in NS, they should be developed in consultation with and reviewed and approved by NSE staff as per the watercourse approval program requirements.

Groundwater Quantity & Quality

- The groundwater monitoring program proposed within the EA Registration Document should be developed and implemented in consultation with NSE staff prior to the start of quarry development, including a monitoring interval to represent baseline monitoring conditions and evaluate localized changes to groundwater levels with the predicted reduced infiltration in the quarry floor.



Date: August 28, 2019

To: Renata Mageste da Silva, Environmental Assessment Officer

From: Erin Morash, Fisheries Biologist, Regulatory Review, Ecosystem Management

Subject: Birette's East Uniacke Quarry Expansion Project

Dear Ms. Mageste da Silva,

Below you will find the comments from DFO, Fish and Fish Habitat Protection Program regarding the most recent addendum submission:

- Any indirect impacts associated with the quarry expansion that may result in either the reduction or increase in surface water flow could result in the requirement for a *Fisheries Act* (FA) Authorization from DFO.
- Changes to the *Fisheries Act* are currently underway and the revised FA will come into force on August 28, 2019. As a result, any projects that are to be implemented after that time will be reviewed under ss.35(1)- *No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat* (HADD) and ss.34.4(1)- *No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.*
- Based on the additional water balance assessment that was submitted, DFO would like to review a summary of monitoring results for Watercourse 2 and Watercourse 3 at mid-Phase I to determine if the predictions are as provided in the addendum.
- Any direct impacts or physical alterations to fish and fish habitat as a result of the project footprint will also be reviewed under the revised provisions of the FA prior to any physical alteration taking place.