

January 4, 2019



New Brunswick Department of Environment and Local Government
Marysville Place
P. O. Box 6000
Fredericton, NB
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Attention: Ms. Cassandra Colwell
Project Manager, Environmental Impact Assessment Branch

RE: Hammond River Holdings Response to Technical Review Committee (TRC)
Questions and Comments – Proposed Upham East Gypsum Quarry, EIA Registration
Document File No. 4561-3-1508

Hammond River Holdings Limited (Hammond River Holdings) has reviewed and addressed the comments provided by the Technical Review Committee (TRC) in letters dated November 30, December 5, December 7, and December 17, 2018 for the Proposed Upham East Gypsum Quarry Environmental Impact Assessment (EIA) registration document (registered on November 2, 2018). Table 1, attached, summarizes the questions/comments as provided by the TRC, as well as Hammond River Holdings' responses.

Should you have any questions regarding the attached responses, please do not hesitate to contact the undersigned, at your convenience.

Sincerely,

DILLON CONSULTING LIMITED

A handwritten signature in blue ink that reads "Denis L. Marquis".

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Table 1: Summary of Responses to TRC Questions Regarding the Proposed Upham East Gypsum Quarry, Upham, New Brunswick

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
Letter Dated November 30, 2018		
Topic: Location		
1	Please note that the proposed project is located within the LSD of Upham which does not have a rural plan, and therefore, no zoning. Please note that any construction accessory to this use would still require building permit.	Thank you for the information. Regional Service Commission (RSC) 8 will be contacted with regard to the development and building permit requirements for the Project.
2	In Section 1.2.1 Project Overview (p. 3), how is the sump initially established at the bottom of the open pit?	For each rock cut, the grade will be controlled such that the drainage is directed away from the work area toward a temporary low point that will act as the sump. Water that collects in the low point will then be directed into a settling pond. As the quarry becomes established, it is anticipated that there will be sufficient room to establish a settling pond within the floor of the quarry, which we refer to as a pit sump.
3	In Figure 2.3.1 Conceptual Site Layout Plan (p. 17), can you please clarify the locations of the Gypsum Storage Area and the Topsoil and Overburden Storage Area?	This is a concept that will be refined during the detailed planning stage prior to the quarry becoming operational. To further elaborate on the concept, it is anticipated that the overburden will be used to level an area for the stockpiling of gypsum. Topsoil will be stockpiled separately to preserve it for future reclamation purposes. Surplus overburden materials will be used to progressively slope the final perimeter of the quarry benches to minimize re-handling of materials where appropriate. The goal will be to progressively reclaim areas of the quarry where the resource has been exhausted, while resource extraction is taking place at other areas of the quarry. The final design and management processes for the Project will be provided in the Application for an Approval to Construct for the Project.

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4	In Figure 2.3.1 Conceptual Site Layout Plan (p. 17), can you please clarify the locations of the Gypsum Storage Area and the Topsoil and Overburden Storage Area?	Question #4 is a duplicate from Question #3 above. Please refer to the response to Question #3 above.
Topic: Groundwater and Surface Water		
5	In Sections 2.3.5 Facilities for Pit Dewatering and Runoff Management (p.19), and 2.4.2.3 Surface Water Management (p.29), given the 10 to 16 m thickness of overburden in the quarry area, and occurrence of wetlands and streams on surface, what is the estimated seepage rates into the quarry? Is the planned area available for water management facilities adequate to handle all site runoff?	<p>Preliminary calculations are as follows. The 100-year, 24-hour total rainfall depth is estimated to be in the order of 177 mm. Assuming an average runoff coefficient of 0.7 (i.e., 70% rainfall flows to settling pond), this would result in a total runoff volume from the entire site of approximately 76,000 m³. Based on the concept of a 6 ha sedimentation pond footprint, the average depth in the pond would be in the order of 1.3 m. This is considered to be a conservative assessment of the storm water management requirements due to the fact that the quarry footprint will be developed in stages and it is anticipated that inactive portions of the site where the resource has become exhausted will be progressively rehabilitated during operations. The size, retention times, and configuration of the settling pond will be refined during the more detailed environmental protection planning phase of the Project.</p> <p>Given what is known from other quarrying sites for gypsum, groundwater seepage into the pit will likely be insignificant relative to the hydrological infiltration of water from rainfall events. Hydrogeological assessments conducted in similar gypsum units located in the Maritimes have concluded that massive gypsum typically has a very low range of permeabilities.</p>

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6	In Section 2.3.5 Facilities for Pit Dewatering and Runoff Management (p. 19), ERD looks forward to reviewing the Water Management Plan for the project when it becomes available.	Thank you. The water management plan will be shared with the TRC as part of the Environmental Protection Plan (EPP), when available.
7	In Section 2.3.5 Facilities for Pit Dewatering and Runoff Management (p. 20), the report indicates ".....it is expected that a water management (settling) pond will be constructed on site to temporarily store water from site runoff <u>and pit dewatering</u> prior to release to the natural environment." However, Section 2.4.2.3 (Page 29) indicates "In rare situations where dewatering of the open pit is required to maintain acceptable water levels in the pit but suspended sediment concentrations are at levels unsuitable for direct discharge to the environment, consideration will be given to directing water from the open pit to the settling pond, if feasible." These statements seem to be contradictory in nature. Can you please clarify and indicate what mitigation would be in place if this activity was not feasible?	<p>It is anticipated that the pit will include a low lying area (sump) that will be used for primary settlement of suspended sediment before periodically pumping the collected water out of the open pit. Water from the sump in the quarry will be directed to another segmented series of finger shaped settling ponds for final polishing of water quality parameters.</p> <p>If pumping of flows from the pit to the settling pond is not feasible (e.g. due to inadequate capacity in the pond, or unsuitable water quality parameters for direct discharge to the environment), the water will remain in the pit sump until conditions are suitable for dewatering to resume.</p> <p>In the rare circumstances where the above measures do not achieve the committed to water quality parameters, enough operational flexibility exists whereby the operation can be shut down until such water quality measures can be met.</p> <p>Additionally, during very extreme circumstances, the storage capacity of the pit is expected to be large relative to the disturbed area, such that pumping from the settling pond to the pit sump may be evaluated as an option during prolonged, extreme runoff conditions. Again, this would be done to ensure appropriate water quality parameters are met prior to discharge.</p>

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8	Please note that in Section 2.4.2.3 Reclamation (p. 29), a surface water monitoring plan should be submitted for approval prior to initiating construction on the site	Noted. A water management plan will be developed as part of detailed design to confirm that the settling ponds are operating according to the applicable performance specifications. This will be developed as part of the EPP prior to commencing construction and operation of the site, and submitted for approval.
9	In Section 5.3.3.2 Mitigation (p.82), mitigation to be implemented includes "Where possible, avoid construction within 30m of watercourses and wetlands." Can you please describe the impact of avoidance of WC 1 and WL 3 on the project?	<p>Imposing a 30 m setback from WC1 and WL3 would reduce the operational width of the quarry in this area from approximately 435 m to 315 m, or a corresponding 30% reduction in surface area. The shape of the resource also thickens toward the northeast corner of the Site. This, in conjunction with sloping and benching requirements prescribed by WorkSafe NB, would prematurely pinch out the floor of the quarry above a significant portion of the resource. For this reason, based on our current preliminary resource estimate, a 30 m buffer would reduce the extractable resource by 400,000 to 600,000 tonnes (or about 20% of the available mineral resource). This would reduce the project life to 7 or 8 years, making the project economically unfeasible. Even if one were to establish a 30 m setback from some wetlands on site, though they would not be directly affected by Project facilities, they would likely be indirectly lost due to seepage into the open pit.</p> <p>In addition, though it will not be directly affected by Project facilities, indirect loss of the portion of WL3 that occurs on the neighbouring property to the east due to seepage into the open pit. Hammond River Holdings will attempt to mitigate the indirect loss of that portion of WL3 to the extent possible through monitoring and</p>

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		<p>adaptive management. Mitigation measures may include the construction of a small berm in an attempt to preserve flow in WC1.</p> <p>As discussed in Section 5.5.3.3 of the EIA Registration document, Hammond River Holdings will undertake the steps for applicable authorization (i.e., watercourse and wetland alteration (WAWA) permit and associated wetland compensation) prior to undertaking construction activities within 30 m that could affect the functions of regulated wetlands.</p> <p>Additionally, if the loss of fish habitat to WC1 is deemed by DFO to result in serious harm to fish, such loss will need to be authorized under Section 35(2) of the Fisheries Act (with appropriate offsetting to achieve no net loss of fish productivity, as measured by habitat area) the appropriate authorization will be pursued through DFO prior to beginning the Project.</p>
10	<p>In Section 5.3.3.3 Characterization of Residual Effects (p.83), the report hypothesises that the impact of the project may result in cooler water being discharge to the receiving environment than is currently occurring. Will this hypothesis be tested with the collection of baseline data and implementation of a monitoring program during operations?</p>	<p>Gypsum is a white substance, which when exposed during quarrying will likely increase the ground surface albedo. As a result, the ground surface temperature within the quarry may be reduced compared to the current site conditions. Given the short storage duration and infiltration of groundwater to the pit, the overall net effect on temperature of the site discharge is not significant; however, we are committed to monitoring temperatures in the Hammond River to ensure that this hypothesis is tested thoroughly. This is consistent with a concern brought forth by a local association who has asked to be involved in monitoring of this kind throughout project life.</p>

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11	In Section 5.4.2.3 Field Assessment (p. 93), please note that water temperatures recorded in WC 1 and WC 3 would be typical of many of our brook trout streams in southern New Brunswick during summer months.	Thank you. This is consistent with the advice of our aquatic biologist.
12	In Section 5.4.3.1 Potential Effects (p. 96), one of the bullets refers to settling pond's" while the rest of the document only refers to one. Can you please clarify what surface water features will be used for this project?	Apologies for the inconsistency. At present, the plans are to have only one settling pond that is segmented into elongated "fingers" on the surface of the site (given space limitations), in addition to the pit sump. Over time, there will be sufficient room within the open pit to develop a second settling pond at the base of the pit, which is perhaps where the confusion lies. There will be a series of collection channels on-site (number and location currently undefined and will be determined following a topographic survey) to convey site water to the sump or settling pond. The intention is that under most conditions, water from the quarry area would remain in the pit sump/settling pond and water collected from other areas of the site (e.g., the storage pad) would be directed to the settling pond, with both operating independently of each other. Under extreme weather conditions or periods of high flow, transfer of water between the pit sump and the settling pond may need to occur to provide sufficient retention capacity for collected water.
13	In Section 5.4.3.3 Characterization of Residual Effects (p. 98), can you please clarify what the impacts to WC 3 will be? Figure 2.3.1 Conceptual Site Layout Plan (p. 17) seems to indicate minimal disturbance will be required to this watercourse.	The conceptual project layout has been developed to maintain the treed buffer of WC3. Temporary clearing over a small portion of the 30 m buffer may be required to accommodate for installation of a drainage channel, and some erosion control measures may be implemented to WC3 to prevent bank or stream bed erosion arising from the release of settled water from the surface settling pond. Adverse effects to fish and fish habitat in WC3 are not anticipated.

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		Additionally, a WAWA permit will be obtained for any alterations to, or loss of, watercourses or their 30 m buffers.
14	Please note that fueling is not permitted within 30 metres of a wetland or watercourse.	Thank you. As stated in the EIA Registration, there will be no permanent storage of fuel on site, and any tankers brought to the site to refuel mobile equipment will be located well outside 30 m of a watercourse, including the settling pond and pit sump.
15	Will baseline potable water supply testing include Bacteriology and turbidity? Can you please provide the baseline tests results? Will post blasting testing be completed on nearby wells?	<p>At present, baseline well samples are proposed to be analyzed for general chemistry (including physical parameters like turbidity), bacteria, and trace metals. The baseline well sampling results will be compiled and provided to NBDELG (anonymously, to protect the privacy of the homeowners), for information purposes.</p> <p>Sampling of wells is currently planned to be conducted annually during operation of the project at residences within approximately 400 m of the perimeter of the Project site, but post-blasting sampling of other wells is not proposed to be conducted unless a specific concern arises with a particular well.</p>
16	Is there any potential for groundwater contamination due to explosive residue from any blasting activities?	Commercial explosives contain ammonium nitrate, which if not managed properly, can leach into groundwater. Historically ammonium nitrate/fuel oil (ANFO) is the most common bulk blasting agent used in quarries, and case studies have identified the potential for uncontrolled losses of ANFO to cause elevated levels of ammonia and nitrate in groundwater. For this reason, ANFO will not be used for blasting at this site. Instead, specialized emulsions that are designed by the manufacturers to be more impervious to water leaching will be selected, in consultation with the licensed blasting contractor. As a result of the approach chosen, groundwater contamination due to blasting residues is considered unlikely.

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17	How much water could be pumped from the pit at maximum pumping rate?	The hydrology assessment and water management plan development is ongoing and will be provided to the TRC when complete. The plan will specify the capacity of pumps that will be required based on the hydrology assessment.
18	Can you please indicate on a map the location of the proposed water settling pond? How much water will the pond hold?	<p>A notional location for the settling pond was provided in Figure 2.3.1 of the EIA Registration. Preference would be to locate the settling pond in the southern portions of the project site, south of the storage pads and within the existing cleared area. However, as water that is pumped out of the quarry will be directed to the settling pond by gravity, the specific location of the settling pond will be determined following a topographic survey of the site to determine existing topography as well as preliminary design of the site to better represent how it may be reshaped for the Project.</p> <p>As for the storage capacity of the settling pond, please note that the intention is that both the settling pond and the pit sump be used together as water management features for the Project. Operational needs may vary and storage requirements may require that water be transferred from one to the other for short periods in order to meet discharge requirements. To clarify, the EIA Registration committed that the settling pond would be sized to store water arising from the 24-hour 1:100 year return period flood event, but this is an error. This should rather state that the pit sump and settling pond combined will be sized to such that together they can store the volume of water from the 24-hour 1:100 year return period flood event. Under these conditions, based on a back of the envelope calculation, the combined storage capacity for the pit sump and settling pond is in the order of 100,000-125,000 m³, to be</p>

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		<p>refined as part of development of the water management plan. An erratum will be issued to correct this error, everywhere where it appears in the document.</p> <p>It should also be noted that an error also appeared on Figure 2.3.1 of the EIA Registration document, which shows that collection channels on site do not connect to each other and some of them appear to discharge directly to the discharge point rather than be directed to the settling pond. This is an error and will also be corrected in an erratum; a revised version of Figure 2.3.1 is attached.</p> <p>Lastly, the design parameters for the storm water management plan will be undergoing a more detailed review, and the findings will be submitted to NBDELG for review under the application for an Approval to Operate. Given that development will occur progressively approximately over a 10 year period, there will be ample time to validate the design inputs and the functionality of the settling ponds. The performance of the ponds will be reviewed on an annual basis and, if necessary, an application will be made to NBDELG to proactively adjust the storm water management plan to achieve the applicable discharge limits.</p>
19	In Section 2.7.5, the document indicates that a Water Management Plan will be submitted for review. Will this include a potential water balance for the site?	The water management facilities (pit sump and settling pond) will be sized based on a volumetric assessment of peak runoff conditions during the 100-year, 24-hour rainfall event. It is anticipated that high-intensity, short duration rainfall events and/or minimum retention time will govern the design of the storm water management facility. The hydrological assessment will include a

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		<p>water balance based on available information (climate normals and extremes).</p> <p>Further to the above information on the Water Management Plan for the site footprint, it is not expected that the site will significantly affect average runoff conditions to the downstream environment during construction or operation and maintenance. Runoff from surrounding areas will be diverted away from the site as appropriate (i.e., wherever the elevation of the Project site is lower than that of surrounding properties), having a hydraulic travel time similar to existing conditions. Rainfall within the quarry and pit will be temporarily stored on site, and released to the environment after the required residence time. This will result in some local attenuation of runoff from the site compared to pre-development condition; however, given the portion of the drainage area affected by the quarry, the impact to downstream areas is expected to be minor at a regional scale. At closure, filling of the open pit would be primarily achieved by capturing storm water and snowmelt outside of low flow conditions for the watershed during the summer. If necessary, active pumping would be conducted during the filling of the open pit to help maintain base flows in watercourse WC3 located immediately to the southeast of the site, to prevent downstream flow reductions.</p>
20	<p>In Section 5.3.3.2 of the document, it indicates that up to 20 water wells will be sampled as part of a baseline water quality survey. Can you please show the location of those wells on a map? Please note that the water quality analyses should include, but not necessarily</p>	<p>The baseline water quality survey will be completed for wells within a 2 km radius of the centre of the Project site prior to the commencement of development activities. A more detailed plan, including a map, will be submitted to NBDELG as part of the</p>

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	<p>limited to, general chemistry, trace metals, and microbiology. An effort should be made to sample wells that are closest to the proposed site and those that might be most likely to be impacted by changes to the groundwater environment (e.g. dug wells, etc.).</p>	<p>development of the EPP and in response to anticipated conditions of the EIA determination. In the first half of 2019, door to door surveys will be conducted to identify all wells within a 600 m radius of the site, with additional sampling of wells within 2 km as part of the EPP development, including wells that were drilled prior to 1994 and thus were not included in the NBDELG database.</p> <p>In the meantime, Hammond River Holdings intends to conduct a more detailed baseline assessment of the water wells located within 400 m of the perimeter of the site. Those already known are identified on the attached figure titled "Proposed Sample Location". Contingent on homeowner permission, the wells will be sampled during the winter 2019 and pressure transducers will be installed at 4 locations to monitor seasonal water level fluctuations. The 4 domestic water wells will remain instrumented and water quality samples will be collected on an annual basis throughout the operational life of the quarry. As suggested, priority will be given to the closest wells in determining the location for this additional monitoring effort.</p> <p>Perimeter monitoring wells will also be installed and sampled prior to commencing activities at the site (locations to be confirmed, since landowner permission is required). Water samples will continue to be collected from the perimeter monitoring wells on an annual basis until the quarry is reclaimed. Data loggers will also be installed in the perimeter monitoring wells to record water levels.</p>

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21	<p>The report indicates that a Groundwater Monitoring Plan will be submitted for review. The baseline sampling should be included as part of the groundwater monitoring plan. In addition, the potential locations of the 4 shallow and 4 deep monitoring wells should be included for review before they are constructed. The groundwater monitoring plan should include details on the frequency of groundwater quantity and quality monitoring and parameters.</p>	<p>Understood. Baseline sampling will be included as part of the groundwater monitoring plan, which is currently being developed. Further information on the groundwater monitoring plan (including the location of proposed monitoring wells to be drilled) will be provided as part of the application for an Approval to Operate for the Project.</p>
22	<p>Can you please describe potential impacts and mitigation for the domestic drinking wells which are located within 600 metres of the work area?</p>	<p>The expected depth of the quarry is 75-80 m from current ground surface. Based on our understanding of the local geology, we do not anticipate that the physical presence of the quarry (i.e., an excavation that acts as a groundwater sink) or vibration from blasting activities (due to the limits on concussion levels and peak particle velocities that will be observed) will have a substantial effect on the local drinking wells, for both the quality and quantity of water. The quarry will be located at a sufficient distance from residences, and concussion levels and peak particle velocities will be subjected to strict limits, such that groundwater would be unlikely to be affected by the project. Hydrogeological assessments conducted in similar gypsum units located in the Maritimes have concluded that massive gypsum typically has a very low range of permeabilities, and potable wells located outside of the immediate vicinity of the quarrying area typically remain hydrologically isolated from quarrying activities.</p> <p>Anecdotal information collected from property owners near the Project site suggests that wells screened directly in the gypsum bedrock have low yields and are not aesthetically suitable as a</p>

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		<p>potable water source. For this reason, local residents have, where possible, avoided drilling wells in the gypsum unit. This finding is further supported by the available information presented in the provincial OWLS water well registry.</p> <p>No chemical processes are taking place on-site, and other than for the extraction of gypsum rock, there will be no alterations to geology. Therefore, we do not anticipate any chemicals to leach into the groundwater. In terms of dissolving, gypsum is soluble in water; however, the groundwater chemistry is not expected to change significantly from currently as gypsum is naturally occurring in the bedrock. Further, a localized steep drawdown cone will likely develop as the quarry becomes established, hydraulically capturing water in the immediate vicinity of the operation.</p> <p>Drill and blasting operations will be planned to meet the provincial ground vibration threshold of 12.5 mm/s peak particle velocity. This threshold was established to minimize the potential for minor cosmetic damage to occur in a dwelling. The provincial limit is significantly below the threshold that is required to structurally damage a water well. Studies completed by the United States Bureau of Mines have shown that blasting can occur in close proximity (<50 m) and at higher vibrational velocities without damaging a water well. In some instances, there may be some short-term turbidity observed in a well if mud infilled fractures are disturbed, which typically results in an improvement in the long term yield of the well. As a due diligence measure, turbidity will be</p>

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		<p>measured in the baseline sampling and monitored annually in wells located within 600 m of the site.</p> <p>Monitoring wells will be installed around the perimeter of the site (location to be determined) to monitor both the water quality and groundwater gradients to provide advanced warning of potential groundwater concerns.</p> <p>Despite the reasons above for the conclusion that domestic wells are unlikely to be affected, the intention is that the monitoring wells would provide early warning for any water quantity or quality issues related to the operation prior to any domestic well being affected. At that time, operational changes can be made to mitigate water quantity issues (i.e., stop pumping water, cease blasting, move operation to higher elevation, etc.). In the unlikely event that domestic wells do become affected by the operation, the steps outlined in the EIA Registration will be followed. It is not the intention that bottled water would be used for any significant duration (i.e., days or weeks, not months). During this time, affected residents will be given the opportunity to stay in a hotel until their well can be drilled deeper or until a well in a new location is achieved.</p>
23	<p>The report states that of the 13 unmapped wetlands in the PDA, 11 of the 13 wetlands are likely to be affected. Are you able to avoid any more of these wetlands, or possibly avoid areas of the wetlands? If avoidance and minimization is not possible, what mitigation</p>	<p>Based on the current project plan and configuration (which is based upon the known location of the gypsum resource), it has been assumed as a worst case that 11 of the 13 unmapped wetlands present on site will be unavoidably lost due to direct loss of footprint to make way for Project facilities (representing a total area of</p>

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	<p>measures will be taken to offset the functional loss of these wetlands (ie. water storage, etc.)?</p>	<p>approximately 4.78 ha). As the Project is in the early stages of planning, it is possible that certain infrastructure requirements or locations may change and that some further wetland loss could be avoided, but for the purposes of the EIA Registration, it has been conservatively assumed that they would be lost. Efforts will be made to minimize work within 30 m of a wetland, if possible.</p> <p>As discussed in Sections 5.5.3.2 and 5.5.3.3 of the EIA Registration, Hammond River Holdings will undertake the steps for applicable authorization (i.e., WAWA permit and associated wetland compensation for regulated wetlands) prior to undertaking construction activities. Following approvals, a wetland compensation plan will be developed and implemented to compensate for net loss of wetland function of regulated wetlands. The plan will outline the specific functions lost or altered as a part of the Project, and the measures that will be undertaken to offset the net loss of functions.</p>
24	<p>The report includes functional assessments on each of the unmapped wetlands in the PDA and acknowledges that any loss of wetland function in regulated (mapped) wetlands requires wetland compensation at a 2:1 ratio. Furthermore, the report states that, "The construction and operation phases of the Project may result in the indirect loss of wetland area or function associated with a regulated (mapped) wetland on a neighbouring property within the LAA (on the northeast corner of the PDA), which is connected to WL3 and WC1". Can you please provide a shape file identifying the boundary of the regulated wetland as determined on the ground and information regarding the functions of this wetland? This</p>	<p>A shapefile of the boundaries of the 13 delineated wetlands on-site has already been provided to the TRC electronically as part of the initial submission of the EIA Registration document. Due to property access issues at the time of the functional assessment, the portion of the regulated wetland (connected to WC1 and WL3) located on the adjacent property to the northeast of the Project site has not been field delineated or functionally assessed. As a result, there are no field delineated shapefiles or functional assessment results for this portion of the regulated wetland occurring outside the Project site. Assuming that property owner's permission is achieved, it is our intention to field delineate WL3 in Spring 2019.</p>

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	<p>information is required to understand the baseline information that exists and the potential change to this wetland as a result of the proposed project.</p>	<p>As stated in Section 5.5.3.3 of the EIA Registration document, follow-up and monitoring (with adaptive management as necessary) will be conducted to monitor any changes in wetland function that may occur to WC3 (including the portion that occurs outside the Project site) and to plan adaptive response actions, in consultation with NBDELG.</p>
25	<p>As shown in figure 5.5.1, a second, larger regulated wetland exists to the east of the PDA with the shortest distance of this wetland being approximately 100 metres from the property boundary of PID 00149013. Do you foresee any potential impacts to this regulated wetland? Furthermore, do you foresee any potential impacts to the remaining two unmapped wetlands in the PDA?</p>	<p>The regulated wetland located further east of the Project site on the adjacent properties will not experience direct effects as a result of the Project, but indirect effects (potentially net loss of wetland function) are possible due to the hydrological connection of this wetland to WL3 and the offsite regulated wetland located adjacent to the northeast corner of the Project site. Wetlands, both on-site (unregulated) and off-site (regulated), if landowner permission is provided, will be monitored through the Project life. Net loss of wetland function will be subjected to a WAWA permit and associated compensation, as an adaptive management measure if necessary.</p> <p>Though it is not expected at this time that WL8 and WL9 within the property boundary will be lost directly as a result of the footprint of the Project, it is possible that they may experience indirect effects due to the potential localized changes in surface water hydrology as a result of the presence of the Project. Follow-up and monitoring will determine if, and to what extent, changes in wetland function may occur.</p>
Topic: Construction and Operation		

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26	In Section 2.4.1.5 Removal and Stockpiling of Topsoil and Overburden (p.26), it stated that removing 10 to 15 m of overburden will entail large storage requirements for the full footprint of the quarry. What are the volume calculations for overburden storage requirements considering safe angles of the pile, safe setback from the quarry, erosion and drainage control berms, etc.? Have those engineering calculations been made?	Those details will be developed as part of detailed design of the Project, prior to the Application for Approval to Operate.
27	In Section 2.3.4 Topsoil and Overburden Storage Area (p. 19), based on information available to date, what are the expected dimensions of the topsoil and overburden storage areas and how high are the piles expected to be?	Those details will be developed as part of detailed design of the Project, prior to the Application for Approval to Operate.
28	Please note that during the delivery of the Gypsum, dust should be mitigated from the delivery trucks as the number of trucks leaving the project site can potentially increase dust concentrations in the local area. Can you please describe mitigation techniques for dust control?	Mitigation for dust control was discussed in Section 5.2.3.2 of the EIA Registration and includes primarily maintaining a tree buffer surrounding the site to mitigate dust and application of dust suppressants (water) on unpaved roads. Additionally, though not specifically listed in Section 5.2.3.2, other measures to minimize dust emissions include the use of water spray bars on the crusher, crushing material to 6-8 inch diameter (instead of crushing to a finer consistency prior to transport), paving of the first 30 m of the access road to the site (which, by the time the truck has travelled on 30 m of pavement, most dust adhering to the tires would have been released), implementing a speed limit of 30 km/h on internal site roads, and the covering of all truck loads during transport to markets on NB highways.
29	Can you please provide specific information regarding the hours of operation?	Though the EIA Registration commits to conducting excavation and other operations to daylight hours only Monday to Friday (excluding statutory holidays), the proposed operation schedule is from

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		<p>7:00 am to 7:00 pm on Monday to Friday (excluding statutory holidays). Further, upon consultation with industry experts, blasting activities will be limited to 9:00 am to 4:00 pm on Monday to Friday (excluding statutory holidays).</p> <p>With respect to truck loading and transportation to markets, it is possible that loading of gypsum onto trucks, and transportation to markets, could occur at any time during the day, 24 hours per day, 7 days per week. Trucking equipment and staffing will be planned for the same operation as the quarry (7:00 am-7:00 pm, Monday to Friday). There are times in the year, however, where some extra trucking may be required to meet the wallboard plant's demands (such as prior to spring weight restrictions or prolonged periods of poor weather). It is expected that this will only occur rarely throughout the year. In initial conversations with the public, it is likely that this extra loading would occur from 7:00 am-7:00 pm on a Saturday and nighttime will be avoided. Nearby residents will continue to be consulted and informed as required.</p>
30	It is indicated that the use of a spray bar on the crusher will be considered. Please note that a spray bar will be required to be in use at all times while the crusher is operating.	Acknowledged.
Topic: Wildlife		
31	In Section 5.4.1.3 Significance Threshold (p. 85), can you please clarify how a "regional fish population" is defined?	The regional fish population is defined as fish populations in the Hammond River and its tributaries within the Local Assessment Area for fish and fish habitat, as detailed in Section 5.4.1.2 of the EIA Registration, as follows:

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		<p>"The Local Assessment Area (LAA) is the maximum anticipated area within which Project-related environmental effects are expected. For fish and fish habitat, the LAA includes the PDA, as well as a 500 m radius around the PDA that includes the Hammond River, as well as watercourses that extend off of the property and interconnect with tributaries of the Hammond River, or are connected to the main branch of the Hammond River, including a 30 m buffer around such watercourses."</p>
32	<p>In Section 5.4.2.2 Desktop Analysis (p. 87), please note that outer Bay of Fundy Atlantic Salmon are listed as endangered in the New Brunswick Species At Risk Act.</p>	<p>Thank you for the correction. This will be corrected in the erratum to be issued for the EIA Registration document.</p>
33	<p>In Section 5.6.4.2 Herpetiles (p. 130), please note that the New Brunswick Species At Risk Act lists wood turtles as 'threatened' and snapping turtles as a 'species of special concern'.</p>	<p>Thank you for the correction. This will be corrected in the erratum to be issued for the EIA Registration document.</p>
34	<p>In Section 11.1 Project-Related Documents (p. 207), can you please provide the data from the electrofishing surveys?</p>	<p>The catch data from the electrofishing surveys are attached. The objective of the electrofishing surveys was to determine presence/absence of fish species in the PDA to better understand the community structure within the assessed reaches. Length measurements were taken for the majority of the fish caught during processing to establish a size range of the fish present; the remainder were identified and counted without measurements to reduce unnecessary handling/holding time.</p>
35	<p>Please note that grubbing should occur outside the bird breeding season, whenever possible.</p>	<p>Acknowledged. Grubbing will be conducted outside of the regional nesting period for breeding birds, to the extent possible. Where this is not possible, ground conditions will be visually surveyed by a qualified birder or biologist prior to initiating the earth moving and grubbing phase of the work to visibly identify (and establish a buffer</p>

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		zone around) any nests that may be present on the ground surface. In such an event, the buffer zone surrounding the nest would remain in place until the young have fledged.
36	Can you please include a section on wildlife in the Environmental Protection Plan?	The Environmental Protection Plan (EPP) will include a section detailing measures to mitigate disturbance to wildlife.
Topic: Transportation		
37	Please note that you are requested to contact David Thompson, District Engineer in Saint John, well in advance of beginning the project, to ensure that all of the department's concerns are addressed.	Thank you. Mr. Thompson will be contacted at the appropriate time.
38	The proposed project location has been identified as near or within the vicinity of Route 111, Route 820 and Route 865. You are advised to consult DTI's trucking information which is available at: https://www2.qnb.ca/content/qnb/en/departments/dti/trucking.html	Thank you for the information.
39	Please note that a Highway Usage Permit may be required if you intend to carry out any development, construction, repair, or maintenance within the limits of a DTI road.	Acknowledged. Highway usage permits will be obtained for any development, construction, repair, or maintenance within the limits of an NBDTI road.
40	An Access Road Permit or Certificate of Setback may be required if you plan to construct a new access road, use an existing access road, or build a structure near DTI roads.	Acknowledged. The only planned activity for accessing the site is to widen and pave the existing access road at this time; however, this issue will be raised with NBDTI in the course of our discussions.
41	A Special Permit will be required for any transport on DTI designated roads that does not comply with Regulation 2001-67 under the NB Motor Vehicle Act. This Regulation includes the dimensions and mass information for legal operation on DTI designated roads. You are requested to contact the DTI Permit Office as early as possible to discuss the transportation requirements for this project.	Understood. Discussions with NBDTI with regard to special permits for oversized loads have already been initiated and are ongoing.

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42	<p>Table 1 below lists typical permits and legislation under the mandate of DTI. Note that Table 1 is not all inclusive and additional permits and requirements relevant to the project may be required. You are requested to review the table and speak with the appropriate contact regarding the permits/legislation which may be relevant to the project. You are advised to contact DTI as early as possible regarding any permits or approvals required. The process required for approvals can take up to several months to complete.</p> <p>Table 1: Permit/Legislation Requirements by the DTI</p> <table border="1" data-bbox="428 716 1121 922"> <thead> <tr> <th>Permit / Legislation Requirements</th> <th>DTI Contact</th> <th>Contact Number</th> </tr> </thead> <tbody> <tr> <td>Access Road Permit / Certificate of Setback</td> <td>David Thompson</td> <td>506-643-7463</td> </tr> <tr> <td>Highway Usage Permit</td> <td>Peter McDonald</td> <td>506-453-6724</td> </tr> <tr> <td>Special Permit</td> <td>Tanya Mitchell</td> <td>506-453-2982</td> </tr> <tr> <td>Community Planning Act</td> <td>Norm Cote</td> <td>506-457-7559</td> </tr> <tr> <td>Highway Act - Transfer of Administration and Control</td> <td>Colleen Brown</td> <td>506-444-2047</td> </tr> </tbody> </table>	Permit / Legislation Requirements	DTI Contact	Contact Number	Access Road Permit / Certificate of Setback	David Thompson	506-643-7463	Highway Usage Permit	Peter McDonald	506-453-6724	Special Permit	Tanya Mitchell	506-453-2982	Community Planning Act	Norm Cote	506-457-7559	Highway Act - Transfer of Administration and Control	Colleen Brown	506-444-2047	Thank you for the information.
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43	Trucks must adhere to legal load weight limits at all times, including spring weight restrictions when applicable. All loads are to be properly secured during transit according to the Motor Vehicle Act.	Thank you. Trucks used for the Project will adhere to the Motor Vehicle Act, including weight limits and spring weight restrictions as well as securing of loads during transit.																		
44	Any spillage of material that occurs during hauling must be kept to a minimum and promptly removed from the highway following appropriate safety procedures.	Acknowledged. Any major spills of material that may occur on New Brunswick highways will be promptly cleaned up upon discovery and in accordance with safe work practices.																		
45	The Work Area Traffic Control Manual (WATCM) provides a uniform set of traffic control guidelines for all work carried out on New Brunswick provincial roads. Any work that occurs within the right-of-way of a provincial road must conform to the guidelines prescribed by this manual. A PDF version of the manual is available at:	Work will be done within these guidelines.																		

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	https://www2.gnb.ca/content/dam/gnb/Departments/trans/pdf/en/RoadsHighways/WATCM/WATCM2015_Revised_Manual_EN.pdf	
46	Are you aware of any additional transportation issues?	Other than the initial mobilization of mobile equipment to the Project site which may require special permits, Hammond River Holdings is not aware of any other transportation issues that are not addressed in the EIA Registration document or in the responses herein.
Topic: Other		
47	Please note that the federal environmental assessment process is set out in the Canadian Environmental Assessment Act, 2012 (CEAA 2012). The Regulations Designating Physical Activities (the Regulations) under CEAA 2012 set out a list of physical activities considered to be "designated projects." For designated projects listed in the Regulations where the Canadian Environmental Assessment Agency (the Agency) is the responsible authority, the proponent must provide the Agency with a project description that includes information prescribed by applicable regulations (Prescribed Information for the Description of a Designated Project Regulations). Based on the information provided to the Province of New Brunswick on the proposed Upham East Gypsum Quarry Project, it does not appear to be described in the Regulations. Under such circumstances the proponent would not be required to submit a project description to the Agency. However, the proponent is	<p>Thank you for the information. This confirms the statements of the EIA Registration that an EA under CEAA 2012 does not appear to be required for the Project as it is not a designated activity. Further, no aspect of the Project will be carried out on federally-owned lands.</p> <p>The discretion of the federal Minister to require an EA even if one is not "triggered" is understood.</p>

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	<p>advised to review the Regulations and contact the Agency if, in their view, the Regulations may apply to the proposed project. The proponent is advised that under section 14 of CEAA 2012, the Minister may, by order, designate a physical activity that is not prescribed by regulations made under paragraph 84(a) if, in the Minister's opinion, either the carrying out of that physical activity may cause adverse environmental effects or public concerns related to those effects may warrant the designation. Should the Agency receive a request for a project to be designated, the Agency would contact the proponent with further information. The proposed project may be subject to sections 67-72 of CEAA 2012. Section 67 requires that, for any project occurring on federal lands, the federal authority responsible for administering those lands or for exercising any power to enable the project to proceed must make a determination regarding the significance of environmental effects of the project. The Agency is not involved in this process; it is the responsibility of the federal authority to make and document this determination. You are encouraged to contact the Agency at (902) 426-0564 if you have additional information that may be relevant to the Agency or if it has any questions or concerns related to the above matters.</p>	
Letter Dated December 5, 2018		
48	<p>Please note that Migratory birds, their eggs, nests, and young are protected under the Migratory Birds Convention Act (MBCA). Migratory birds protected by the MBCA generally include all seabirds (except cormorants and pelicans), all waterfowl, all shorebirds, and most landbirds (birds with principally terrestrial life cycles). The list</p>	<p>Thank you for the information. The applicability of the Migratory Birds Convention Act (MBCA) and its regulations, including prohibitions relating to the destruction of nests, harassment/harm/injury/death of a migratory bird, and other prohibitions, is acknowledged in Section 5.6 of the EIA Registration.</p>

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	<p>of species protected by the MBCA can be found at: https://www.ec.gc.ca/nature/default.asp?lang=En&n=496E2702-1. Bird species not listed may be protected under other legislation. Under Section 6 of the Migratory Birds Regulations (MBR), it is forbidden to disturb, destroy, or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities. Furthermore, Section 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds: "5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area. (2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area — that is harmful to migratory birds." It is the responsibility of the proponent to ensure that activities are managed so as to ensure compliance with the MBCA and associated regulations.</p>	

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49	<p>Please note that clearing vegetation may cause disturbance to migratory birds, and may inadvertently cause the destruction of their nests and eggs. Many species use trees, as well as brush, deadfalls and other low-lying vegetation for nesting, feeding, shelter and cover. This would apply to songbirds throughout the region, as well as waterfowl in wetland areas. Disturbance of this nature would be most critical during the migratory bird nesting period. Please see the webpage "General Nesting Periods of Migratory Birds in Canada" (Website: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4F39A78F-1) for more specific information concerning the breeding times of migratory birds in the proponent's local area. This project area falls within zone "C3".</p>	<p>Thank you. The referenced website lists the regional nesting period for Zone C3 as being "mid-April to end of August". Section 5.6.3.2 of the EIA Registration states "...clearing and grubbing activities will be scheduled to the extent possible outside of the normal breeding bird and migratory bird season (April 1 to August 31)...". Thus the commitment is consistent with the regional nesting period.</p>
50	<p>It is recommended to avoid certain activities, such as clearing, during the regional nesting period for migratory birds. The breeding season for most birds within the project area occurs between April 5th and August 30th in this region (see above website for more specific time periods by zone).</p>	<p>Understood. The EIA Registration states that clearing activities will be avoided during the normal breeding bird season of April 1 to August 31, where possible. Where this is not possible, other measures would be discussed with CWS and NBDERD prior to proceeding, including conducting a nesting survey and establishing a buffer zone around nests until the young have fledged prior to completing clearing in these areas.</p>
51	<p>Please note that active nests can be discovered during project activities outside of the regional nesting period. To reduce the risk of impacting nests or birds caring for pre-fledged chicks at those times, it is recommended to implement measures such as the establishment of vegetated buffer zones around nests, and minimization of activities in the immediate area until nesting is complete and chicks have naturally migrated from the area. It is incumbent on the proponent to identify the best approach, based on</p>	<p>Hammond River Holdings understands that regional nesting periods are intended to be guidelines and that nesting could occur earlier or later, depending on weather and other factors.</p> <p>Mitigation for migratory birds is listed in Section 5.6.3.2 of the EIA Registration, which include provisions for establishing setbacks around nests until the young have fledged. The buffer will be</p>

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	the circumstances, to complying with the MBCA. Can you please describe mitigation measures which will implemented to reduce impacts on migratory birds?	<p>maintained by flagging tape and all personnel on site will be trained to avoid the area while flagged.</p> <p>If additional mitigation measures should be considered, Hammond River Holdings would be happy to undertake a specific discussion with CWS and/or NBDERD regarding practical measures that need to be implemented.</p>
52	<p>Please note that while most migratory bird species construct nests in trees (sometimes in tree cavities) and shrubs, mitigations should be appropriate for migratory birds with different breeding strategies. For example, several species nest at ground level (e.g. Common Nighthawk, Killdeer, sandpipers), in hay fields, pastures or in burrows. Some bird species may nest on cliffs or in stockpiles of overburden material from mines or the banks of quarries. Some migratory birds (including certain waterfowl species) may nest in head ponds created by beaver dams. Some migratory birds (e.g., Barn Swallow, Cliff Swallow, Eastern Phoebe) may build their nests on structures such as bridges, ledges or gutters.</p>	<p>Hammond River Holdings understands that nesting can occur outside of trees or vegetation, such as in soil piles or man-made structures, and that the same prohibitions of the MBCA as for nests in trees would apply. Mitigation measures beyond those stated in Section 5.6.3.2 of the EIA Registration, if required, will be detailed in the EPP to be developed for the Project.</p>
53	<p>It is recommended to develop and implement a management plan that includes appropriate preventive measures to minimize the risk of impacts on migratory birds (See "Planning ahead to reduce risks to migratory bird nests", Website: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/reducing-risk.html. For beneficial management practices regarding how to avoid the incidental take of migratory birds nests and eggs, please refer to the Avoidance Guidelines (Website: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=AB36A082-1). The management plan</p>	<p>Thank you for the information. The referenced publications will be consulted in the development of the EPP for the Project, which will address measures to be taken should an active nest be found.</p>

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	should include processes to follow should an active nest be found at any time of the year.	
54	<p>Please note that regarding nest searches, migratory bird nests can be found in a wide variety of habitats and locations. Depending on the species, nests may be found at many heights in trees, in tree cavities, in shrubs, on the ground (including in hayfields, crops and pastures), on cliffs, in burrows, in stockpiles of overburden from mines, in quarry banks, within wetlands, and on human-made structures such as bridges, ledges, and gutters. It is difficult to locate most nests. Nest sites are often hidden and adult birds avoid approaching their nests in a manner that would attract predators to their eggs or young. Moreover, the amount and complexity of habitat to be searched often limits the success of surveys intended to locate all active nests. The nests of a few species are easier to locate, particularly those in isolated trees, on human-made structures and/or in colonies.</p>	<p>Thank you. This information will be considered by our avian biologist prior to conducting the bird surveys for the Project in spring and summer 2019.</p>
55	<p>In order to determine the likelihood that migratory birds, their nests or eggs are present in a particular location, use a scientifically sound approach that considers the available bird habitats, which migratory bird species are likely to be encountered in such habitats, and the time periods when they would likely be present. This will help you plan work activities to avoid having an impact on nesting birds. If further investigation is required to determine the presence of breeding birds, consider conducting an area search for evidence of nesting (e.g., presence of birds in breeding habitat through observation of singing birds, alarm calls, distraction displays) using non-intrusive search methods to prevent disturbance to migratory</p>	<p>Thank you. This information will be considered by our avian biologist prior to conducting the bird surveys for the Project in spring and summer 2019. A combination of point counts and area searches by habitat types will be considered.</p>

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	<p>birds. In the case of songbirds, for example, "point counts" (a technique to locate singing territorial males) may provide a good indication of the presence of nests of these birds in an area. Please contact Environment and Climate Change Canada's Canadian Wildlife Service office in your region for further technical information about investigation methods for non-song bird species (notably, waterfowl, waterbirds and shorebirds).</p>	
56	<p>Please note that in most cases, nest search techniques are not recommended because, in most habitats, the ability to detect nests remains very low while the risk of disturbing active nests is high. Flushing nesting birds increases the risk of predation of the eggs or young, or may cause the adults to abandon the nest or the eggs. Therefore, except when the nests searched are known to be easy to locate without disturbing them, active nest searches are generally not recommended; they have a low probability of locating all nests, and are likely to cause disturbance to nesting birds. In many circumstances, incidental take is likely to still occur during industrial or other activities even when active nest searches are conducted prior to these activities.</p>	<p>Thank you. This information will be considered by our avian biologist prior to conducting the bird surveys for the Project in spring and summer 2019. Since there is little mature vegetation to clear to accomplish the Project, nest searches are not currently planned as part of the breeding bird surveys for the Project, but will be followed if clearing activity cannot be avoided between April 1 and August 31.</p>
57	<p>Please note that in some cases, nest surveys may be carried out successfully by skilled and experienced observers using appropriate methodology, and in the event that activities would take place in simple habitats (often in man-made settings) with only a few likely nesting spots or a small community of migratory birds. Examples of simple habitats include: an urban park consisting mostly of lawns with a few isolated trees; a vacant lot with few possible nest sites; a previously cleared area where there is a lag between clearing and</p>	<p>Thank you. This information will be considered by our avian biologist prior to conducting the bird surveys for the Project in spring and summer 2019. We believe that the largely cleared nature of the Project site since the early 2010s would qualify it as a "simple habitat".</p>

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	<p>construction activities (and where ground nesters may have been attracted to nest in cleared areas or in stockpiles of soil, for instance); or a structure such as a bridge, a beacon, a tower or a building (often chosen as a nesting spot by robins, swallows, phoebes, Common Nighthawks, gulls and others). Nest searches can also be considered when looking for: conspicuous nest structures (such as nests of Great Blue Herons, Bank Swallows, Chimney Swifts); cavity nesters in snags (such as woodpeckers, goldeneyes, nuthatches); or colonial-breeding species that can often be located from a distance (such as a colony of terns or gulls).</p>	
58	<p>Please note that the nest itself should never be marked using flagging tape or other similar material as this increases the risk of nest predation. If necessary, flagging tape should be placed at the limits of the buffer zone. Setback distances are often determined scientifically, based on the distance at which nesting birds react to human disturbance; expert opinion, however, is often used to supplement scientific data. Alert distance and flush distance are two benchmark measurements of disturbance distance that are often used to develop a baseline equation to help determine a setback distance. Alert distance is the distance at which the bird adopts an alert posture or emits alarm calls. Flush distance is the distance at which a bird takes flight or moves away from a threat, performs distraction displays (e.g., feigning a broken wing or sitting down on a non-nesting site to draw attention away from the nest), or actively defends the nest. To help with the determination of appropriate setback distances for your circumstances, here are examples of setback ranges for different types of birds: 1-5m up to 10-50m or</p>	<p>Thank you. This information will be considered by our avian biologist prior to conducting the bird surveys for the Project in spring and summer 2019. If flagging of nests is required, flags will be deployed at the edge of the buffer to be established for the nest, as recommended by the comment. Hammond River Holdings will consider the setback distances recommended as well, depending on the species to be avoided with consultation from a biologist.</p>

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	<p>more for most nests of songbirds and other small birds; 10-25m up to 50m or more for swallow colonies, and 10-30m up to 50m or more for most waterfowl nests. The shorter distances are more reflective of urban backyards and the longer distances are more reflective of rural or natural habitats. The following examples are for sensitive species or species at risk: up to 500m or more for Trumpeter Swan; 50-100m up to 200m or more for Pileated or Red-Headed woodpecker cavities; 100-150m up to 300m or more for nests of Piping Plover; 100m up to a 1000m or more for nests of Sandhill Crane. Remember that these general examples should serve as a general starting point and must be adjusted after assessing relevant factors, such as those described above. For more information concerning buffer zones and setback distances please consult Environment and Climate Change: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/technical-information-risk-factors.html</p>	
59	<p>Please note that you are responsible to ensure that all precautions are taken by the contractors to prevent fuel leaks from equipment, and that a contingency plan in case of oil spills is prepared. Furthermore, you should ensure that contractors are aware that under the MBR, "no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds." Biodegradable alternatives to petroleum-based chainsaw bar oil and hydraulic fluid for heavy machinery are commonly available from major manufacturers. Such biodegradable fluids should be</p>	<p>Understood – Hammond River Holdings will comply with these recommendations and implement as part of the EPP. Maintenance of the heavy equipment will be the responsibility of the third-party contractor or owner of the equipment who will be made aware of the EPP and the spill response plan during orientation. The Hammond River Holdings on-site representative will conduct daily and ongoing visual inspections of all equipment to make sure that visible leaks are addressed promptly and contractors are compliant. Mobile equipment on site will be equipped with spill kits.</p>

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	<p>considered for use in place of petroleum products whenever possible, as a standard for best practices. Fueling and servicing of equipment should not take place within 30 meters of environmentally sensitive areas, including shorelines and wetlands. Provisions for wildlife response activities should be identified in the Oil Spill Prevention and Response Plan to ensure that pollution incidents affecting Wildlife are effectively and consistently mitigated. The document "Birds and Oil - CWS Response Plan Guidance" is attached and is provided to offer guidance on the development of wildlife response activities. The following information should be included in any Oil Spill Prevention and Response Plan: mitigation measures to deter migratory birds from coming into contact with the oil, mitigation measures to be undertaken if migratory birds and/or sensitive habitat becomes contaminated with the oil, and the type and extent of monitoring that would be conducted in relation to various spill events.</p>	<p>As noted in the response to Question #14 above, there will be no permanent storage of fuel on site, and any tankers brought to the site to refuel mobile equipment will be located outside 30 m of a watercourse, wetland, or on-site settling pond/pit sump.</p>
60	<p>Please note that certain species of migratory birds (e.g. Bank Swallows) may nest in large piles of soil left unattended/unvegetated during the most critical period of breeding season (April 5th through August 30th). To discourage this, you should consider measures to cover or to deter birds from these large piles of unattended soil during the breeding season. If migratory birds take up occupancy of these piles, any industrial activities (including hydroseeding) will cause disturbance to these migratory birds and inadvertently cause the destruction of nests and eggs. Alternate measures will then need to be taken to reduce potential for erosion, and to ensure that nests are protected until chicks have fledged and left the area. For a</p>	<p>Please refer to the response to Question #52 above. This information will be considered by our avian biologist prior to conducting the bird surveys for the Project in spring and summer 2019. Re-vegetation of topsoil and overburden piles, or other measures to deter birds from establishing nests in topsoil or overburden piles, will be undertaken during operation of the Project. Prior to reclamation and disturbance of the topsoil during the nesting window, bird surveys will be performed as required.</p>

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	<p>species such as the Bank Swallow, the period when the nests would be considered active would include not only the time when birds are incubating eggs or taking care of flightless chicks, but also a period of time after chicks have learned to fly, because Bank Swallows return to their colony to roost. See also for example the attached guidance concerning beneficial management practices that should be considered for implementation when designing mitigation measures for Bank Swallows, as well as guidance provided at https://www.canada.ca/en/environment-climate-change/services/migratory-bird-conservation/publications/bank-swallow-riparia-sandpits-quarries.html.</p>	
61	<p>A variety of species of plants native to the general project area should be used in revegetation efforts. Should seed mixes for herbaceous native species for the area not be available, it should be ensured that plants used in revegetation efforts are not known to be invasive.</p>	<p>Understood. The approach to reclamation and closure of the site at the end of the Project life (including re-vegetation activities) is described conceptually in Section 2.4.3.2 of the EIA Registration. Although it is expected that portions of the site will re-vegetate naturally over the course of the Project (albeit likely consisting largely of low value vegetation), active re-vegetation of the Project site will be conducted through progressive reclamation of the quarry during operation and as part of closure of the Project. Native species of seed, trees, and shrubs will be used for this purpose.</p>
62	<p>Please note that attraction to lights at night or in poor visibility conditions during the day may result in collision with lit structures or their support structures, or with other migratory birds. Disoriented migratory birds are prone to circling light sources and may deplete their energy reserves and either die of exhaustion or be forced to land where they are at risk of depredation. In order to reduce risk of incidental take of migratory birds related to human-induced light,</p>	<p>Noted. Given the simplicity of the Project and planned operations there (including no excavation, crushing, or stockpiling activities at night), limited lighting is required for the Project, with the exception of lighting near the portable trailer/office and security gate. Any lighting required for the Project (e.g., dusk to dawn lighting, lighting for the portable trailer/office) will consider this guidance.</p>

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	<p>Environment and Climate Change Canada's Canadian Wildlife Services branch (ECCC-CWS) recommends implementation of the following beneficial management practices:</p> <ul style="list-style-type: none"> • The minimum amount of pilot warning and obstruction avoidance lighting should be used on tall structures. Warning lights should flash, and should completely turn off between flashes. • The fewest number of site-illuminating lights possible should be used in the project area. Only strobe lights should be used at night, at the lowest intensity and smallest number of flashes per minute allowable by Transport Canada. • Lighting for the safety of the employees should be shielded to shine down and only to where it is needed. • LED lights should be used instead of other types of lights where possible. LED light fixtures are less prone to light trespass (i.e. are better at directing light where it needs to be, and do not bleed light into the surrounding area), and this property reduces the incidence of migratory bird attraction. 	
63	<p>Please note that no high disturbance activities (i.e. blasting) within 1 km of active Common Loon nests should occur during the nesting season (May, June, and July).</p>	<p>Understood. We understand that loons tend to preferentially use lake habitats, and there are few large lakes present in the area. However, if loon nests are incidentally identified within 1 km of the Project site, consideration will be given to limiting high disturbance activities such as blasting during its nesting season.</p>

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
64	<p>The following avian species at risk (as listed on Schedule 1 of the Species at Risk Act) may occur within the study area: Bank Swallow (Threatened), Barn Swallow (Threatened), Bobolink (Threatened), Canada Warbler (Threatened), Chimney Swift (Threatened), Common Nighthawk (Threatened), Eastern Whip-poor-will (Threatened), Olive-sided Flycatcher (Threatened), Wood Thrush (Threatened), Eastern Wood-Pewee (Special Concern), Rusty Blackbird (Special Concern), and Evening Grosbeak (COSEWIC assessed as Special Concern). It is requested that sightings be reported to ECCC-CWS.</p>	<p>Any sightings of bird species that are confirmed by an experienced birder or avian biologist to be species at risk or species of conservation concern will be reported to ECCC-CWS and AC CDC.</p>
65	<p>Can you please clearly describe mitigation measures to avoid/lessen all adverse effects of the project on the above species at risk, which are consistent with best available information, and plans to monitor effects and effectiveness of mitigation measures? In instances where habitat is not avoided, can you please clarify why avoidance is not possible and include a discussion of conservation allowances?</p>	<p>Mitigation for all migratory birds is listed in Section 5.6.3.2 of the EIA Registration, regardless of conservation status of the species. Should the bird surveys to be conducted in spring/summer of 2019 indicate the presence of a specific species at risk that requires additional protection or mitigation beyond the general mitigation measures listed in Section 5.6.3.2 of the EIA Registration, discussion with CWS and NBDERD would be initiated.</p> <p>Avoidance of adverse effects on the environment will be practiced to the extent possible as part of the Project, except where areas are required for placement of Project components. Mitigation or compensation will be considered in those areas where Project components are to be located. Follow-up plans to monitor the effectiveness of mitigation would depend on whether any species at risk are present on-site (to be determined as part of the bird survey in spring/summer 2019), and the specific species involved.</p>

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
		<p>Of the above species at risk, although targeted bird surveys have not yet been completed for the Project, Canada warbler and common nighthawk were the only species incidentally observed during field surveys conducted in the PDA for other disciplines (i.e., rare plants, aquatic, and noise surveys). As discussed in Section 5.6.2.1 of the EIA Registration, breeding bird surveys will be conducted at the appropriate time in the spring and summer of 2019 and results will be provided in a supplementary report.</p> <p>A wetland compensation plan for the direct loss of wetland function of regulated wetland due to the project will be completed using a compensation ratio of 2:1 (subject to acceptance by the applicable regulatory authorities), consistent with the provincial and federal policies on wetland conservation. Additionally, a WAWA permit will be obtained for any alterations to, or loss of, watercourses or their 30 m buffers.</p> <p>Conservation allowances have not been considered for this project, given the small-scale nature of the Project and the ample availability of forest habitat nearby.</p>
66	For federal environmental assessments, SARA 79(2) requires that persons responsible for an environmental assessment "must identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans." For species which	The EIA registration considers species at risk (i.e., those that are listed as extirpated, endangered, threatened, or special concern under Schedule 1 of the federal Species at Risk Act as well as the New Brunswick Species at Risk Act) and species of conservation concern (i.e., those species that are not species at risk but are listed by other conservation agencies such as AC CDC and COSEWIC due to their rarity or other condition). For practical purposes, no distinction

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
	are not yet listed under SARA, but are listed under provincial legislation only or that have been assessed and designated by COSEWIC, it is best practice to consider these species in EIA as though they were listed under SARA.	is made between mitigation measures identified for species at risk versus those for species of conservation concern. We believe this is a best practice that is consistent with the comment.
67	The following non-avian species at risk (as listed on Schedule 1 of the Species at Risk Act) may occur within the study area: Little Brown Myotis (Endangered), Northern Myotis (Endangered), Tri-colored Bat (Endangered), Monarch (Endangered), Wood Turtle (Threatened), and the Snapping Turtle (Special Concern). Though unlikely to be found within the project footprint, these species may occur within the project area and it is requested that sightings be reported to ECCC-CWS.	Thank you. All species at risk listed in this comment are addressed in Section 5.6 of the EIA Registration. Though unlikely, any sightings of these species at risk that are confirmed by an experienced biologist will be reported to ECCC-CWS and AC CDC.
68	Please note that following the Listing of three species of bats (Little Brown Myotis, Northern Myotis, and Tri-coloured Bat) to the List of Wildlife Species at Risk in Canada, the Government of Canada has published factsheets providing information on the Emergency Listing Order, the disease threatening bats, the requirements of the Species at Risk Act, and ways to protect and preserve bat populations. The factsheets are available at http://www.sararegistry.gc.ca/default.asp?lang=En&n=073DC653-1 .	Thank you for the information.
69	Please note that monarch butterflies may be present in the area and may be affected by project activities. ECCC-CWS recommends that the proponent: Alert project staff/contractors to the possible presence of the Monarch butterfly in the project area during fall; Avoid mowing this species' nectar sources (e.g. goldenrods, asters, clovers, milkweed) and milkweed in autumn; Ensure that staff/contractors take care to not run over Monarch butterflies.	Thank you for the information. Though several species of goldenrod were noted during the vegetation surveys conducted for the Project in August 2018, milkweed (the preferred food source of monarch butterflies) was not observed on the Project site. Nevertheless, measures to protect the monarch butterfly will be noted in the EPP for the Project.

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
70	<p>Please note that the mitigation hierarchy of avoidance, minimization, and as a last resort, compensation should be followed with respect wetlands in this project. Can you please provide additional information regarding options for avoidance and minimization for wetland impacts?</p>	<p>The hierarchy of avoidance, minimization/mitigation, and compensation was considered for the Project. Since most of the areas of the Project site that are already cleared are required to carry out the Project (i.e., there is little extra space available), any small wetlands (all unmapped and unregulated under the NB Watercourse and Wetland Alteration (WAWA) Process) located within cleared areas have been assumed as a worst case for the purpose of the EIA Registration to be lost, and avoidance or minimization has been assumed to not be possible—compensation for net loss of wetland function in these areas as applicable will be implemented, as determined by the WAWA process. Wetlands that are currently located within uncleared areas of the site (particularly WL8, WL9, WL12, and a portion of WL11 located on the southeast, south, and southwest portions of the site) will be maintained as much as possible (i.e., avoidance), and where avoidance is not possible, mitigation and compensation will be considered in accordance with provincial policies.</p> <p>The feasibility of this project as a whole does not permit the avoidance of all unregulated wetlands on-site. If all unregulated wetlands were avoided with a 30 m setback, there would be virtually no resource to extract.</p>
71	<p>Please note that in order to promote wetland conservation ECCC-CWS recommends the following general beneficial management practices:</p> <ul style="list-style-type: none"> – Developments on wetlands should be avoided. 	<p>Noted. The listed measures are addressed in the EIA Registration document. Please refer to Section 5.5 of the document for further details.</p>

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
	<ul style="list-style-type: none"> – Where development does occur in the vicinity of wetlands, a minimum vegetation buffer zone of 30 meters should be maintained around existing wetland areas. – Hydrologic function of the wetland should be maintained. – Runoff from development should be directed away from wetlands. – The use of a 30 meter buffer from the high water mark of any water body (1:100 year Flood Zone) in order to maintain movement corridors for migratory birds. Please see https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=8D910CAC-1 for further information concerning buffer zones. 	
72	<p>Please note that pollution prevention and control provisions of the Fisheries Act are administered and enforced by ECCC. Subsection 36(3) of the Fisheries Act prohibits “anyone from depositing or permitting the deposit of a deleterious substance of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter such water”. It is the responsibility of the proponent to ensure that activities are managed to prevent the release of substances deleterious to fish. In general, compliance is determined at the last point of control of the substance before it enters waters frequented by fish, or, in any place under any conditions where a substance may enter such waters.</p>	<p>Thank you for the information. Since the Project is a simple quarry with few operations or chemicals on site, and since the product from the Project is gypsum which is chemically stable and inert, the release of deleterious substances from the Project is not anticipated. The potential for release of total suspended sediments (TSS) will be monitored and controlled to limit the release to a concentration less than 25 mg/L TSS above background levels, or other level as determined by the Province of New Brunswick as part of the Approval to Operate for the Project (if and when it is issued).</p>

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
73	<p>Please note that hazardous materials (e.g. fuels, lubricants, hydraulic oil) and wastes (e.g. waste oil) should be managed to minimize the risk of chronic and/or accidental releases. For example, the proponent should encourage contractors and staff to undertake refueling and maintenance activities on level terrain, at a suitable distance from environmentally sensitive areas including watercourses, and on a prepared impermeable surface with a collection system. You are encouraged to prepare contingency plans that reflect a consideration of potential accidents and malfunctions and that take into account site-specific conditions and sensitivities. The Canadian Standards Association publication, Emergency Preparedness and Response, CAN/CSA-Z731-03, reaffirmed 2014), is a useful reference.</p>	<p>Thank you. Hammond River Holdings will implement these measures in the development of the EPP for the Project.</p>
74	<p>All spills or leaks, such as those from machinery or storage tanks, should be promptly contained and cleaned up (sorbents and booms should be available for quick containment and recovery), and reported to the 24-hour environmental emergencies reporting system (Maritime Provinces 1-800-565-1633).</p>	<p>Understood. These requirements are reflected in the mitigation measures for accidental spills of hazardous materials in Section 7.4 of the EIA Registration, except for the 24-hour environmental emergencies reporting line, which will be added to the document as part of an erratum. All these measures will also be reflected in the EPP for the Project.</p>
75	<p>Section 5.1.2 states that the project will result in a change in both surface water and groundwater flow across the landscape as a result of the loss of on-site wetlands and the development of the open pit. As per section 20(2)(f) of the Fisheries Act, the proponent must maintain the flow of water that the Minister considers sufficient to permit the free passage of fish.</p>	<p>Monitoring and adaptive management during the operation of the Project will be employed to maintain sufficient flow as determined by the Minister. Other than temporary water storage in the open pit sump/settling pond, there are no features of the Project during construction or operation that would be expected to significantly alter surface water flows, and the Project is not a net user of water. However, the release of stored water to the receiving environment will be somewhat delayed while water is being subjected to gravity</p>

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
		<p>sedimentation in the settling pond/open pit sump. Given that relatively few watercourses are present (four in total, and two of them were dry at the time of the surveys) and their relative distance from the open pit, surface water infiltration into the open pit is not expected to occur at rates that would be expected to adversely affect maintenance flows in downstream watercourses (such as the Hammond River).</p>
76	<p>Please note that project related flow reductions, that are greater than 10% of the mean annual flow, must be included in the fish habitat impact area predictions. Can you please quantify the expected flow reductions in the unnamed tributaries to Hammond River (WC1 and WC3) downstream of proposed project development area (PDA)? Can you please quantify and characterize the extent of the impacts of reduced flow on the fish habitats and provide details on the measures that will be put in place to ensure minimum maintenance flow downstream of the open pit during construction activities?</p>	<p>Please refer to the response to Question #75 above. Substantive flow reductions in receiving watercourses during construction and operation are not expected. Hammond River Holdings is committed to monitoring downstream flows as part of operation of the Project, and adaptive management measures will be developed to respond to significant flow reductions, should they occur.</p>
77	<p>Can you please provide the expected footprint of the loss for the watercourse in relation to their existing dimensions?</p>	<p>Based on the existing dimensions (average bankfull widths and lengths of the watercourses), the expected footprint of the fish habitat loss within WC1 is approximately 1,000 m². An authorization under Section 35(2) of the Fisheries Act with appropriate offsetting, as well as a WAWA permit, will be obtained for the loss of fish habitat in WC1.</p> <p>WC2 is not fish habitat as there is no defined channel. Regardless, the intention is to maintain the current vegetation buffer surrounding WC2 and thus keeping it unaltered. Authorization</p>

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
		<p>under the Fisheries Act or WAWA permitting for WC2 are therefore not required, nor is offsetting.</p> <p>For WC3, although some bank stabilization and erosion protection measures may be put in place for WC3 to prevent erosion of the banks or stream bed arising from the release of water from the settling pond, loss of fish habitat is not expected to WC3 (contrary to what is stated in the EIA Registration) as existing forested buffers surrounding it will be maintained, and as such an authorization under the Fisheries Act or WAWA permit is not expected to be required for WC3. An erratum will be issued to correct this error in the EIA Registration document.</p> <p>Finally, though it is stated in the EIA Registration document that WC4 will not be affected by the Project, this is no longer believed to be correct. The flow direction arrow for WC4 in Figures 5.4.1 and 5.5.1 of the EIA Registration is incorrect, and in fact, water flows onto the Project site <u>from</u> the adjacent property to the east (rather than from the Project site towards that neighbouring property). Where appropriate (i.e., where the elevation of the Project site is lower than that of neighbouring properties), channels will be constructed along the perimeter of the Project site to prevent water from neighbouring properties from entering the Project site, and if this is determined to be required at WC4 (to be confirmed during site design), flow to WC4 will be permanently diverted into the perimeter channel and then to WC3 such that the portion of WC4 located on the Project site will be permanently lost (approximately</p>

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		<p>136 m²), which will require authorization and offsetting under the Fisheries Act as well as a WAWA permit. Revised Figures 5.4.1 and 5.5.1 are attached, and will be further corrected in the erratum.</p> <p>An authorization under Section 35(2) of the Fisheries Act with appropriate offsetting, as well as a WAWA permit, will be obtained for alterations to WC1 and WC4.</p>
78	<p>Can you please provide details on how the watercourses will be impacted by the construction of the open-pit quarry? Will the watercourses be removed/diverted outside of the PDA or altered in terms of excavation or infilling?</p>	<p>Please refer to the response to Question #77 above. As described in the EIA Registration, impacts to WC1 and WC4 are expected to occur, while the other watercourses can be avoided.</p> <p>Only two watercourses (WC1 and WC3) that are considered fish habitat on the Project site have water present year-round. Though identified as a watercourse based on the GeoNB mapping, WC2 was determined to not be fish habitat during the August 2018 field survey as there was no defined channel or water present. WC4 was identified during the field survey as a field-identified ephemeral watercourse, but had no water present during surveys conducted in August 2018. Further information is presented in Section 5.4.2.3 of the EIA Registration.</p> <p>An authorization under Section 35(2) of the Fisheries Act with appropriate offsetting, as well as a WAWA permit, will be obtained for alterations to WC1 and WC4, as required. These approval processes inherently consider the specific details of the alterations to ensure measures are taken to minimize impacts.</p>
79	<p>During the construction phase of the project will you be implementing an adverse weather shut down policy?</p>	<p>Yes, it is the intention of Hammond River Holdings to implement an adverse weather shut down policy during construction, although given the straightforward nature of the construction activities</p>

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		required for the Project, there are few activities that should be avoided during adverse weather. The responsibility for implementation of this policy will be determined by the Hammond River Holdings on-site representative.
80	Will any overburden removal work be completed outside of June 1 st to September 30?	While the intention of this question is not completely clear, we suspect it is in relation to avoiding impacts to receiving watercourses during key fish migration periods. The precise timing of construction activities has not been fully determined at this time and would depend on the timing of the receipt of all required approvals and permits for the Project as well as seasonal restrictions identified in the EIA Registration document (e.g., avoiding clearing during the regional nesting period). The EIA Registration commits to avoiding clearing activities during the period of April 1 to August 31 to avoid impacts on migratory birds, but other site preparation work on-site (e.g., topsoil and overburden removal, grubbing, pad construction, etc.) may occur at any time. Any work that is required within a watercourse or within 30 m of a watercourse would occur during the June 1-September 30 period wherever possible to avoid potential effects on migrating and spawning for key fish species such as salmonids. If in-water work is required outside of this period, consultation with NBDELG and DFO would be required to determine additional mitigation and/or permitting required.
81	Although the document suggest dust from crushing is unlikely to be an issue, do you plan on developing a dust mitigation plan in the event of an issue?	Yes, mitigation measures for dust were identified in Section 5.2 of the EIA Registration document and will be further detailed in the EPP for the Project.
82	What is the radius size that will be used for pre-blast surveys to be conducted at neighbouring properties?	The radius for the pre-blast survey can initially be conservatively calculated using a scaled distance (S) of 32 m/kg ^{1/2} . The equation

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
		<p>$d = S \times \sqrt{w}$ can then be used to calculate the appropriate radius for the pre-blast survey, where: d = distance (in m) from the from the perimeter blast holes; and w = mass of the explosives charge (in kg per delay in the blast).</p> <p>The mass of explosives per delay used in comparable quarry operations ranges from 200-350 kg. This equates to a radius for the pre-blast surveys that varies from 452 m to 600 m. Once the blast design is confirmed by a licensed blasting contractor, the radius for the pre-blast survey will be submitted to NBDELG as part of the EPP for review under the Approval to Operate. Once the site becomes operational, the radius for the pre-blast survey may be further refined using data collected from the seismographs to develop a site-specific empirical scaled distance equation to predict the peak particle velocity at adjacent receptors.</p>
83	<p>In the report it states that a baseline water quality will be established for up to 20 potable wells (section 5.3.3.2 and 5.3.3.3, Table 8.1.1) and within the Land Assessment Area (LAA) 4 shallow and 4 deep wells for water level monitoring purpose will be drilled in order to establish baseline condition and to monitor the changes over time. Can you please describe steps that will be taken to provide an alternate water supply in the event that a potable well experiences quantity or quality issues due to the project operation?</p>	<p>To be clear, all residents or facilities with wells within a 2 km radius, regardless of whether they are in the NBDELG OWLS database, will be provided the opportunity to have their well details documented and a baseline water sample taken prior to development of the Project, if they so choose. In resident visits that have already started, the offer of baseline and ongoing sampling (annually) has been made to residents living in close proximity to the site (300-600 m) as part of those sit-down conversations. Hammond River Holdings will attempt to sample every well within a 2 km radius as part of the development of the EPP, should the homeowner allow us to do so; based on a further</p>

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
		<p>review of the Service New Brunswick parcel attribute database, we expect that sampling could be required for up to 53 wells.</p> <p>In the unlikely event of a change in water quantity or quality in nearby wells, response measures to be undertaken would depend on the nature and extent of the observed changes to those wells. For example, if a change in well yield were to occur in a nearby well due to the project, some possible response measures include provision of water (truck or bottled), identification and development of an alternative water supply, deepening of an existing well, drilling of a new well, or other measures. If a change in water quality were to occur (e.g., increasing water hardness) due to the extraction of the gypsum resource, installation of a water softener could be a possible solution. This would be determined by testing of well water before the Project and water testing following the potential operation of the quarry.</p> <p>The Project is in a topographic divide whereby precipitation is draining to the west into the Hammond River, and as such, the Hammond River and topography provide a natural hydrogeological barrier. Beyond this barrier, the effects of the Project are unlikely to be distinguishable from current normal conditions.</p>
84	Can you please provide the following information for review as it becomes available? The location of the existing potable wells proposed for the water quality baseline, the location of the proposed 4 shallow and 4 deep wells, the baseline water quality and	The development of the water monitoring program is ongoing at this time. The water quality monitoring program will be incorporated into the EPP. The EPP will be provided to NBDELG prior to implementation.

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	water level data, the complaints, if any, received from potable well users, and the monitoring over time data.	
85	Please see attached the New Brunswick Department of Aboriginal Affairs' Initial Assessments regarding the Crown's Duty to Consult First Nations for this project that were sent to First Nations.	Thank you for the information. The chiefs of all fifteen First Nation communities in New Brunswick have been notified in writing about the Project, in addition to selected umbrella organizations (including WNNB, MTI, and Kopit Lodge). Some parties have requested further information about the Project, including some meetings. Engagement will continue as required.
Letter Dated December 7, 2018		
86	Have you considered the combined effects of a 1:100 year rainfall (groundwater seepage into the pit) and potential snow accumulation in the drainage, sump, and settling pond designs?	<p>In southern New Brunswick, and particularly in smaller watersheds having a relatively short hydraulic travel time, high intensity rainfall is generally the most critical design condition. Snow melt tends to be more gradual and will result in lower peak flows than high intensity, short duration rainfall events. The 100-year, 24-hour rainfall event is expected to be the governing design criteria for the storm water management facility.</p> <p>Snow removal will be undertaken should the accumulation of snow impact the performance of the drainage sump and settling pond.</p> <p>Hydrogeological assessments conducted in similar gypsum units located in the Maritimes have concluded that the permeability of massive gypsum is typically very low. Therefore, during the passage of the 100-year rainfall event, groundwater inflows to the pit are expected to be minor.</p>

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87	Do you anticipate any effects to nearby drinking water wells due to the disruption of the groundwater regime?	Please refer to the response to Question #22 and #83 above for information on the potential groundwater impacts.
88	Is any existing nearby infrastructure (e.g. culverts, ditches, roads) expected to be negatively impacted by the change in drainage regime, particularly in the case of high runoff events?	<p>As part of the initial site drainage review, an existing corrugated steel arch culvert under NB Route 111 (St. Martins Road) was identified. This culvert currently conveys flow from the site and adjacent areas. This is a large structure designed to convey peak flows during extreme weather events. We estimate that approximately 55% of the culvert capacity is used during a typical high-flow event (2-year rainfall event). This suggests enough capacity is available during normal flow conditions, and impact on the structure would be expected to be negligible.</p> <p>Water will continue to be directed from the site to the culvert. During intense rainfall, dewatering of the quarry will be paused, which will reduce the amount of water being directed toward the downgradient watercourse and culvert. This would be expected to provide temporary attenuation of runoff within the watershed, and potentially reduce peak flows to the Route 111 culvert during extreme events.</p>
Letter Dated December 17, 2018		
89	As per section 5.4.3.2, it states "Release of surface water from the Project site will target a total suspended sediment (TSS) concentration of less than 25 mg/L above background levels of the receiving watercourse and a pH of between 6.5 and 9.0, as a monthly average of grab samples". Why are TSS and pH the only two parameters of concern?	The establishment of appropriate monitoring parameters, monitoring frequency, and discharge limits for the Project is at the entire discretion of the NBDELG as part of the Approval to Operate for the Project. In its professional judgment, Dillon has recommended testing for and limiting TSS and pH primarily because of:

Comment/ Question No.	Question/Comment from Technical Review Committee (TRC)	Hammond River Holdings' Response
		<p>a) the nature of the Project, which is a simple quarry with no process unit operations, no chemical use, no transformation on-site, and thus no contaminating sources of other chemicals that could affect water quality; and</p> <p>b) the nature of the gypsum resource itself, which is an inert, chemically stable, pH neutral, non-reactive material that does not cause acid or alkali generation and thus does not result in metal leaching.</p> <p>In addition, Hammond River Holdings has further committed in responses above to monitor for temperature in the receiving environment and turbidity of the treated effluent.</p> <p>Given the nature of the Project, the simplicity of the operations on-site, and the inert nature of the gypsum resource, the only likely potential effect on surface water quality would be from suspended sediments in water. Hammond River Holdings understands that CCME Protocols Manual for Water Quality Sampling guidelines include in-situ measurement of conductivity, temperature, flow, and dissolved oxygen, but that requirements are determined on a case by case basis. Therefore, we expect that actual requirements will be defined by NBDELG in the Approval to Operate with consideration made to the above</p>

Upham Project - Electrofishing Catch Data

Date	Watercourse	Species	Length (mm)
29-Aug-18	WC1	WHS	96
29-Aug-18	WC1	CC	55
29-Aug-18	WC1	BND	63
29-Aug-18	WC1	BND	75
29-Aug-18	WC1	BND	73
29-Aug-18	WC1	BND	26
29-Aug-18	WC1	BND	73
29-Aug-18	WC1	BND	NA
29-Aug-18	WC1	CC	65
29-Aug-18	WC1	CC	67
29-Aug-18	WC1	CC	94
29-Aug-18	WC1	CC	52
29-Aug-18	WC1	CC	44
29-Aug-18	WC1	CC	44
29-Aug-18	WC1	CC	42
29-Aug-18	WC1	CC	42
29-Aug-18	WC1	CC	54
29-Aug-18	WC1	CC	50
29-Aug-18	WC1	CC	54
29-Aug-18	WC1	CC	107
29-Aug-18	WC1	CC	22
29-Aug-18	WC1	CC	112
29-Aug-18	WC1	CC	89
29-Aug-18	WC1	CC	25
29-Aug-18	WC1	CC	127
30-Aug-18	WC3	BND	54
30-Aug-18	WC3	WHS	73
30-Aug-18	WC3	BND	59
30-Aug-18	WC3	BND	64
30-Aug-18	WC3	BND	54
30-Aug-18	WC3	BKT	117
30-Aug-18	WC3	BKT	152
30-Aug-18	WC3	BKT	142
30-Aug-18	WC3	BKT	153
30-Aug-18	WC3	CC	57
30-Aug-18	WC3	BKT	62
30-Aug-18	WC3	BKT	77
30-Aug-18	WC3	BND	68

WC1 Batch Counts	
Species	Count
CC	48

WC3 Batch Counts	
Species	Count
BND	3

Date	Watercourse	Species	Length (mm)
30-Aug-18	WC3	CC	68
30-Aug-18	WC3	CC	NA
30-Aug-18	WC3	BKT	63
30-Aug-18	WC3	BKT	64
30-Aug-18	WC3	BKT	64
30-Aug-18	WC3	WHS	82

Legend:

BND = Blacknose Dace

CC = Creek Chub

WHS = White Sucker

BKT = Brook Trout



HAMMOND RIVER HOLDINGS LIMITED
 PROPOSED UPHAM EAST GYPSUM QUARRY

CONCEPTUAL SITE LAYOUT PLAN
 FIGURE 2.3.1

- PROPERTY BOUNDARY
- PROJECT DEVELOPMENT AREA
- WATERBODY
- WATERCOURSE
- REGULATED
- PROPOSED SITE FEATURES**
- DITCH
- TRUCK SCALE (OPTIONAL)
- SITE AREAS
- SETTLING POND
- DISCHARGE POINT
- ▲ SECURITY GATE
- PORTABLE TRAILER/OFFICE

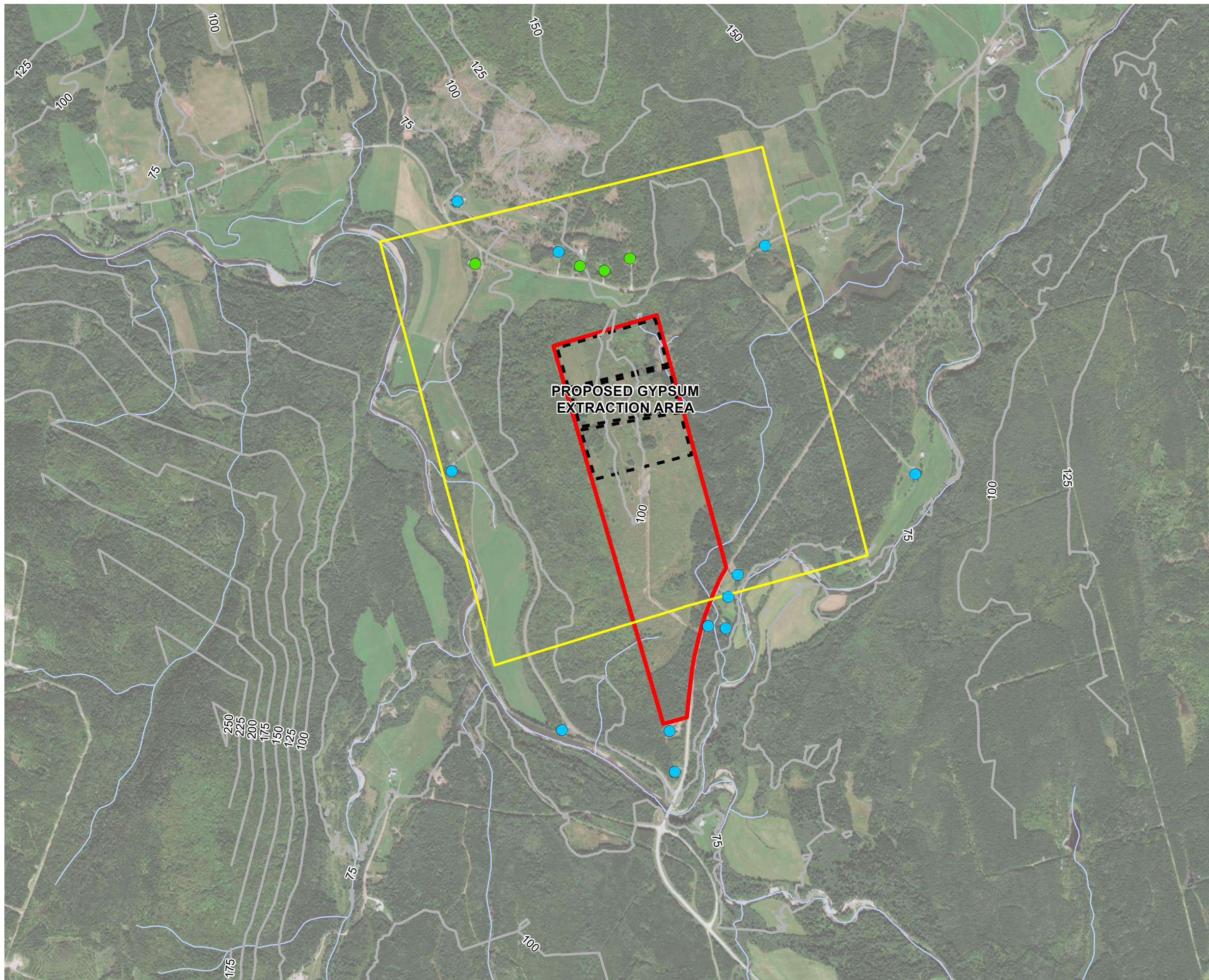


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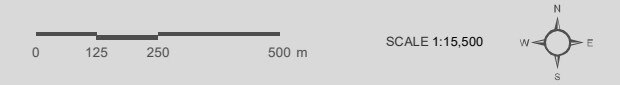
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HAMMOND RIVER HOLDINGS LTD.
 PROPOSED UPHAM EAST GYPSUM QUARRY

PROPOSED SAMPLE LOCATIONS

- BASELINE WATER QUALITY SAMPLE LOCATION
- PROPOSED DATA LOGGER & SAMPLE LOCATION
- 600 M OFFSET FROM PROPOSED GYPSUM EXTRACTION AREA
- PROJECT DEVELOPMENT AREA
- WATERCOURSES
- CONTOURS



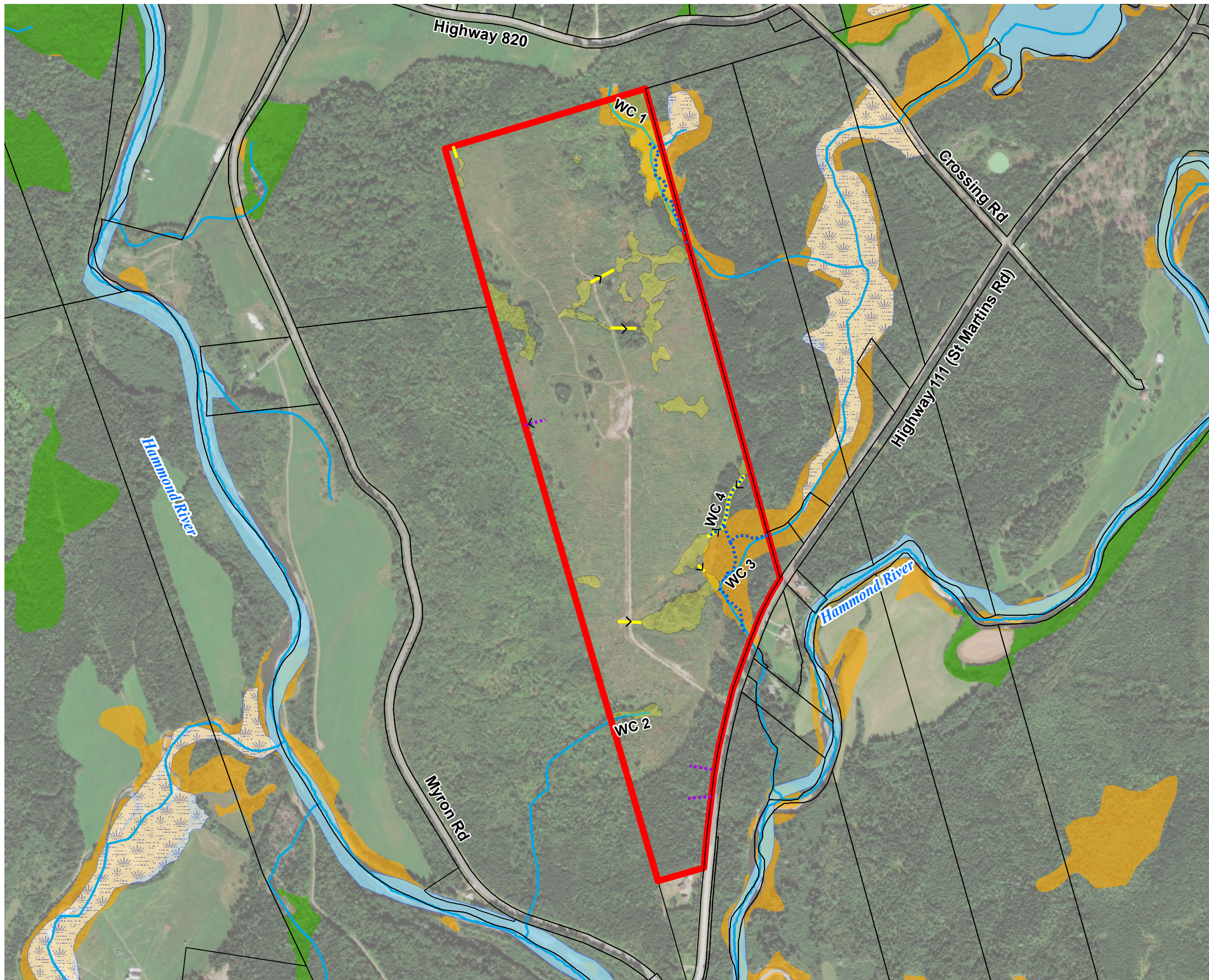
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



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HAMMOND RIVER HOLDINGS LTD.
PROPOSED UPHAM EAST GYPSUM QUARRY

FISH HABITAT
FIGURE 5.4.1

-  PROPERTY BOUNDARY
 -  PROJECT DEVELOPMENT AREA
 -  GEO NB MAPPED WATERCOURSE
 -  FIELD DELINEATED WETLANDS
 -  FIELD IDENTIFIED DRAINAGE CHANNEL
 -  FIELD IDENTIFIED WATERCOURSE
 -  FIELD IDENTIFIED WETLAND DRAINAGE CONNECTION (WITH FLOW DIRECTION ARROW)
 -  REGULATED WETLAND
 - NBDELG DRAFT BETA WETLAND MAPPING (UNREGULATED)**
 -  PROVINCIALY SIGNIFICANT WETLANDS
 -  INTERMEDIATE WETLANDS
 -  FORESTED WETLANDS
- WC = WATERCOURSE



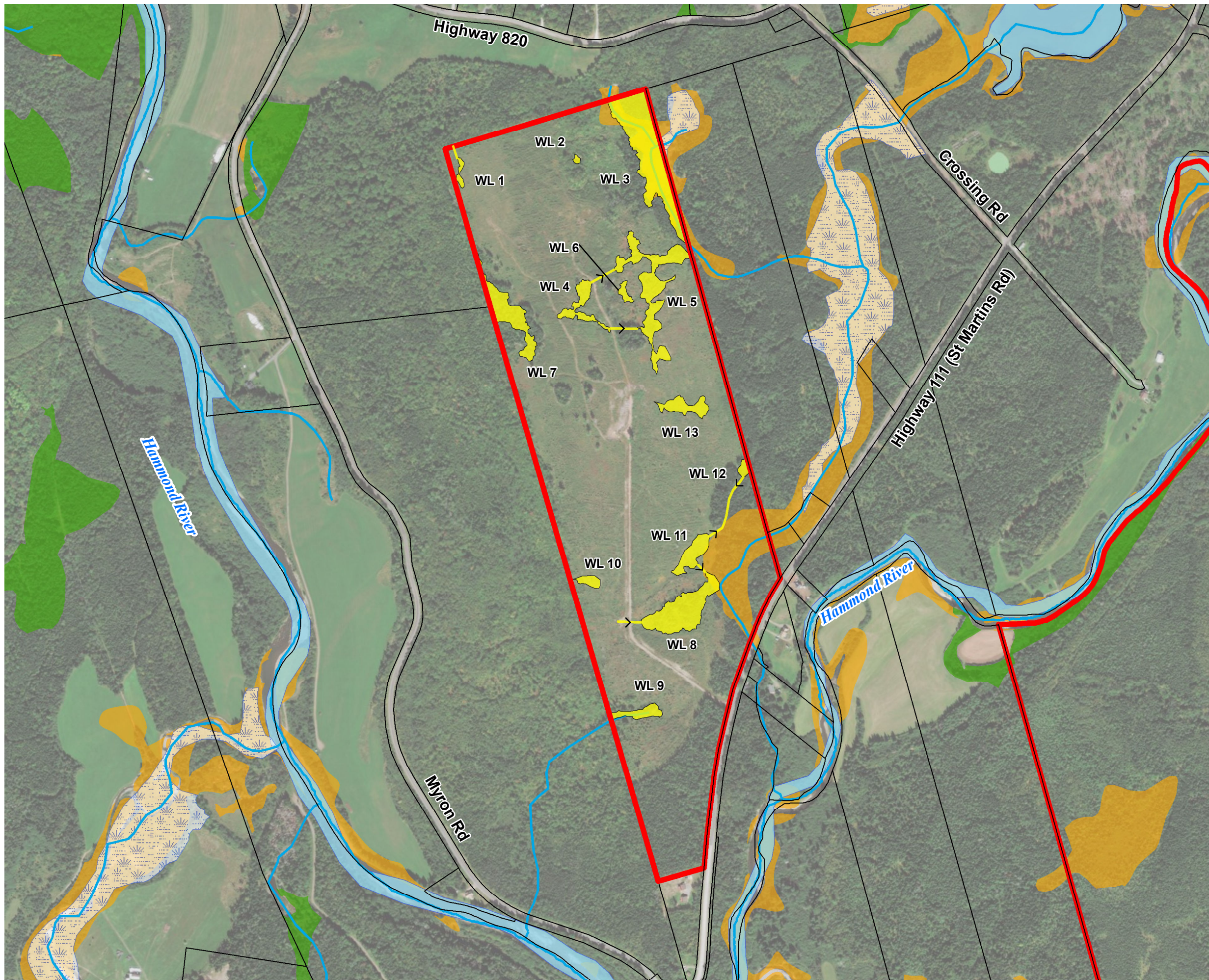
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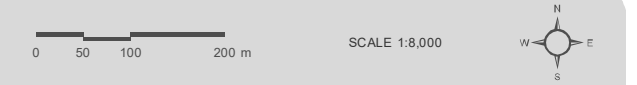
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HAMMOND RIVER HOLDINGS LTD.
PROPOSED UPHAM EAST GYPSUM QUARRY

WETLANDS
FIGURE 5.5.1

-  PROPERTY BOUNDARY
 -  PROPERTY OWNED BY J D IRVING LIMITED
 -  GEO NB MAPPED WATERCOURSE
 -  UNREGULATED WETLANDS
 -  FIELD IDENTIFIED WETLAND DRAINAGE CONNECTION (WITH FLOW DIRECTION ARROW)
 -  REGULATED WETLAND
- NBDELG DRAFT BETA WETLAND MAPPING (UNREGULATED)**
-  PROVINCIALY SIGNIFICANT WETLANDS
 -  INTERMEDIATE WETLANDS
 -  FORESTED WETLANDS
- WL = WETLAND



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