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May 11, 2021

**Sent by E-mail**

Ken Swain  
Project Leader  
Nova Scotia Lands Inc.  
Halifax, NS Canada  
Email: [Ken.Swain@novascotia.ca](mailto:Ken.Swain@novascotia.ca)

Dear Ken,

**SUBJECT: Boat Harbour Remediation Project – Information Requirements, Round 1 - Part 2**

The Impact Assessment Agency of Canada (Agency) has determined that additional information is required to complete the technical review of the Environmental Impact Statement (EIS) and associated EIS Summary for the proposed Boat Harbour Remediation Project, as per the information requirements (IRs) attached.

The Agency is finalizing its review of the report from the External Technical Review and is anticipating Pictou Landing First Nation's submission in the near future. The Agency may issue additional IRs once these reviews are complete.

The responses to IRs may be in a format of your choice; however, the format must be such that the responses to individual IRs can be easily identified. You may wish to discuss certain IRs with the Agency or other government experts, as necessary, to obtain clarification or additional information, prior to submission of the responses. Working directly with government experts in this manner will help to ensure that IRs are responded to satisfactorily. The Agency can assist in arranging meetings with government experts, at your request.

The IRs and your responses will be made public on the Canadian Impact Assessment Registry Internet site: <https://iaac-aeic.gc.ca/050/evaluations/proj/80164>.

Please confirm receipt of this message and contact me if you require further information.



Sincerely,

<Original signed by>

Lachlan Maclean  
Project Manager – Atlantic Regional Office  
Impact Assessment Agency of Canada

Cc: Chief Andrea Paul – Pictou Landing First Nation  
Stephen Zwicker – Environment and Climate Change Canada  
Sean Wilson – Fisheries and Oceans Canada  
Jason Flanagan – Transport Canada  
Jeffrey Reader – Health Canada  
Bridget Tutty – Nova Scotia Environment  
Beth Lewis – Office of L'nu Affairs

Attachment 1 - Information Requirements for the Boat Harbour Remediation Project, Round 1 – Part 2,  
May 11, 2021

**Boat Harbour Remediation Project  
Information Requirements for the Environmental Impact Statement Review  
Round 1 – Part 2, May 11, 2021**

**INTRODUCTION**

The Impact Assessment Agency of Canada (the Agency) is continuing its technical review of the Environmental Impact Statement (EIS) and associated EIS Summary for the proposed Boat Harbour Remediation Project. The Agency's review is supported by submissions from government experts, Pictou Landing First Nation, and an External Technical Review. The Agency determined that information is required, as per the information requirements (IRs) below.

**ACRONYMS AND SHORT FORMS**

%HA	Percent of highly annoyed
Agency	Impact Assessment Agency of Canada
BHETF	Boat Harbour Effluent Treatment Facility
BHSL	Boat Harbour Stabilization Lagoon
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of the Environment
COPC	Contaminant of potential concern
DE	Diesel exhaust
DPM	Diesel particulate matter
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
EPC	Exposure point concentration
HELP	Hydrologic Evaluation of Landfill Performance
HHERA	Human Health Ecological Risk Assessment
HHRA	Human Health Risk Assessment
HQ	Hazard quotient
LFG	Landfill gas
LFN	Low frequency noise
LOD	Limits of detection
LSA	Local Study Area
NSE	Nova Scotia Environment
NSL&F	Nova Scotia Department of Lands and Forestry
PHC	Petroleum hydrocarbon
PLFN	Pictou Landing First Nation
PRA-HHRA	Project Related Activities – Human Health Risk Assessment
QA/QC	Quality assurance/quality control
RMA	Risk management area
RSA	Regional Study Area
SAF	Soil allocation factor
SSA	Site Study Area
SSTL	Site specific target level
TEQ	Toxic equivalency
TRV	Toxicological reference values

TSS	Total suspended solids
UCL	Upper confidence limit
VC	Valued component

**ATTACHMENT 1: INFORMATION REQUIREMENTS FOR THE BOAT HARBOUR REMEDIATION PROJECT (ROUND 1, PART 2)**

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
<b>EIS General Comments</b>					
IAAC-32	HC NSE IAAC	Section 7.3.7 Mi'kmaq of Nova Scotia  Section 7.4 Mitigation measures	EIS, Table 7.3-1- Mitigation Measures and Best Management Practices	<p>The EIS Guidelines require the description of mitigation measures that are specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent, interpretation and implementation.</p> <p>Many of the mitigation measures presented in Table 7.3-1 of the EIS do not provide sufficient detail to enable an understanding of potential residual effects on valued components, including human health. For example, the EIS lists "Control noise by maintaining separation distance between source and receptor and equipment design, where feasible" as a mitigation measure. However, no justification or rationale is provided to support the effectiveness of such an approach nor how feasibility would be determined. This information is needed to evaluate the adequacy of the mitigation measures proposed to protect human health due to the lack of necessary details, including:</p> <ul style="list-style-type: none"> <li>• the COPCs (contaminants of potential concern) and pathway of exposure targeted;</li> <li>• the threshold value(s) of the COPCs at which mitigation is necessary (with applicable rationale, as needed);</li> <li>• the mitigation measure(s) to be employed for each threshold limit that is exceeded with evidence supporting its anticipated effectiveness;</li> <li>• proposed monitoring activities to determine effectiveness of the proposed measure(s); and</li> <li>• additional mitigation measures to be utilized, as necessary, to reduce the risk to human health to acceptable levels.</li> </ul> <p>Additional details about the proposed mitigation measures are required to assess the potential adverse environmental effects of the Project on Mi'kmaq of Nova Scotia health.</p>	<p>Provide additional information, including supporting evidence (e.g. published, peer-reviewed literature) for the effectiveness of all proposed health-related mitigation measures and additional mitigation measures, as necessary, in accordance with Health Canada guidance documents<sup>1</sup>.</p> <p>Update analysis and determinations of significance, as required, based on revised mitigation measures.</p>
<b>Human Health Ecological Risk Assessment (HHERA)</b>					
IAAC-33	HC	Section 7.3.7 - Mi'kmaq of Nova Scotia	HHERA (Appendix A), Section 6.4.3	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project will affect the Mi'kmaq of Nova Scotia, including their health.</p> <p>In section 6.4.3 of the Human Health and Ecological Risk Assessment (HHERA – Appendix A of the EIS), it is stated that "Since vanadium was either not detected or detected at concentrations less than the guidelines for groundwater and surface water, exposure to vanadium through water is considered to be negligible. Therefore, exposure to water can be eliminated for vanadium. Vanadium is not volatile. Furthermore, vanadium was not identified as a COPC in soil and the Upland Study Area soil concentration is less than the background soil concentration. Furthermore, exposure to vanadium in airborne particulates is expected to be negligible for sediments. Therefore, exposure to air can also be eliminated for vanadium.</p>	<p>Revise the risk estimates considering that project-related sources of exposure should achieve a HQ of <math>\leq 0.2</math>. Alternatively, provide justification for the appropriateness of using a HQ <math>&gt; 0.2</math> for a specific pathway.</p> <p>Provide a numerical SAF in the SSTL equation to account for exposure to COPCs in other on-site media and update the effects assessment as necessary. Alternatively, provide a detailed rationale as to why the current equation is sufficiently protective of human health.</p>

<sup>1</sup> [Guidance for Evaluating Human Health Impacts in Environmental Assessment: Air Quality](#). Health Canada. 2017.  
[Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise](#). Health Canada. 2017.  
[Guidance for Evaluating Human Health Impacts in Environmental Assessment: Water Quality](#). Health Canada. 2017.  
[Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods](#). Health Canada. 2017.  
[Guidance for Evaluating Human Health Impacts in Environmental Assessment: Human Health Risk Assessment](#). Health Canada. 2019.

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
				<p>Vanadium is also not expected to be associated with any consumer products at the Site. Therefore, the only applicable exposure media remaining at the Site for vanadium are sediment and food. Using the equation presented above, the target Hazard Quotient (HQ) value can be increased from 0.2 (100%/5 exposure media) to 0.5 (100%/2 exposure media) for assessing potential hazards at the Site from vanadium.”</p> <p>Health Canada does not support the methodology used to adjust the target Hazard Quotient for vanadium to 0.5 in the Risk Characterization section of the HHERA. While this methodology may be appropriate for adjusting the Soil Allocation Factor (SAF – a numerical parameter used in site-specific target level (SSTL) calculations<sup>2</sup>), it is not an appropriate basis to adjust the target HQ. For example, although vanadium was “not detected or detected at concentrations less than the guidelines for groundwater and surface water”, it is not possible to ascertain that these concentrations represent an HQ of 0.2 unless the exposure pathways from these media have been deemed inoperable.</p> <p>A target HQ of <math>\leq 0.2</math> should be applied when background (i.e., off-site) exposures to the same substance may occur from other sources unrelated to the subject contaminated site and at locations other than the contaminated site. If these background exposures are not quantified (as is the case in the HHERA), they cannot be assumed to be absent. Therefore, applying a target HQ value of <math>\leq 0.2</math> minimizes the likelihood that total exposure (i.e., site + background) will exceed the toxicity reference value from all sources and locations to which a person may be exposed to the substance.</p> <p>The HHERA identified SSTLs for both vanadium and dioxins/furans toxic equivalency (TEQ) values in sediment but the report did not consider non-soil on-site exposure pathways in its equation. Health Canada notes that a SAF of 0.2 is recommended<sup>3</sup> for soil in the default scenario for guideline development to allow for 80% of the remaining tolerable incremental exposure for other on-site exposures to air, water, food, and consumer products.</p> <p>This information is required to ensure appropriate risk estimates for assessing how changes to the environment caused by the Project would potentially affect human health.</p>	
IAAC-34	HC	<p>Section 3.2.3- Spatial and Temporal Boundaries</p> <p>Section 7.3.7 - Mi’kmaq of Nova Scotia</p>	<p>HHERA (Appendix A), Figure 1A, Sections 1 and 6, Figure 12.</p>	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the Mi’kmaq of Nova Scotia, including health.</p> <p>The EIS Guidelines also require a description of the spatial boundaries of each valued component used in assessing the potential adverse environmental effects of the Project.</p> <p>It is unclear which portion of the Study Area, and therefore which data, is included within the scope of the HHERA. Sections 1 and 6 and figure 1A in the Human Health and Ecological Risk Assessment report (HHERA – Appendix A) indicates that data collected from the Boat Harbour stabilization lagoon (BHSL) was included in the HHERA dataset. However, the conceptual site model for Human Receptors at the Boat Harbour Effluent Treatment Facility (BHETF) shown in figure 12 of the HHERA report does not appear to include the BHSL study area.</p> <p>The conceptual site model for human receptors depicted in figure 12 of the HHERA report does not include exposure to contaminants in any media located within the BHETF areas even</p>	<p>Provide a figure outlining the Study Area boundaries with respect to the scope of the HHERA, including the Uplands Area boundaries. Clarify whether environmental data collected from the BHSL was included in the HHERA dataset.</p> <p>Discuss whether operable exposure pathways exist in the BHETF areas or provide rationale why these areas were not included in the conceptual site model. Include in the discussion how risk management decisions in the BHETF areas will be protective of human health, considering all potential exposures by future users of the site.</p> <p>Provide the locations of the environmental samples within the Uplands Areas in a figure.</p>

<sup>2</sup> A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines. Canadian Council of Ministers of the Environment (CCME). 2006. <http://cegg-rcqe.ccme.ca/download/en/351?redir=1611842640>

<sup>3</sup> A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines. Canadian Council of Ministers of the Environment (CCME). 2006. <http://cegg-rcqe.ccme.ca/download/en/351?redir=1611842640>

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
				<p>though throughout the report it indicates that the spatial scope of the HHERA includes the BHETF areas. The exclusion of these areas of the site from the conceptual site model and from evaluation in the HHERA could underestimate potential risks to human health to future users of the site.</p> <p>The HHERA report states, “the main purpose of the SSI [Supplemental Site Investigation] and HHERA was to determine if remediation is also required in the surrounding Upland Areas, Freshwater Wetlands and Estuary (including the outfall to the Northumberland Strait) as part of the Boat Harbour remediation project.” However, none of the figures included in the report identify the location of the Uplands Area boundaries, which makes it difficult to comment on the adequacy of the site characterization (e.g., sampling density).</p> <p>This information is required to assess the potential risks to human health for future users of the site.</p>	
IAAC-35	HC	Section 7.3.7 - Mi’kmaq of Nova Scotia	HHERA (Appendix A), Sections 6.3 (Toxicity Assessment) and 6.4 (Risk Characterization), Tables H-2.10 to H-2.22 of Appendix H	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the Mi’kmaq of Nova Scotia, including health.</p> <p>Section 6.3 of the Human Health and Ecological Risk Assessment report (HHERA – Appendix A) indicates that sub-chronic toxicological reference values (TRVs) for vanadium and dioxins/furans TEQ were applied to calculate risks from direct sediment contact to multiple receptors at the site. Site users are anticipated to be exposed to sediment on a less-than-ongoing basis (30 weeks a year, with repeated annual exposure), yet the country food exposures for the same COPCs were identified as chronic in the report (i.e., people may be exposed to COPCs through food consumption over a year, with repeated annual exposure). Health Canada notes that the report does not provide justification for designating the 30-week-a-year exposures as sub-chronic, although a sub-chronic TRV was applied. Health Canada’s Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals document<sup>4</sup> recommends that human exposures occurring over a period greater than 90 days be considered chronic.</p> <p>Furthermore, for both chemicals, as the sub-chronic TRVs have different primary target organs than the chronic TRVs, it appears that the corresponding risk (in HQ units) is split between two toxic endpoints (immunological and developmental for dioxins/furans TEQ, and hematological and biochemical for vanadium), which will result in an underestimation of risk for exposure scenarios.</p> <p>Health Canada also notes that sub-chronic TRVs were also applied in the SSTL calculations presented in Table H-2-19 of Appendix H.</p> <p>This information is required to assess the potential risks to human health for future users of the site.</p>	<p>Apply a chronic TRV to evaluate ongoing chronic exposure, with risk estimates provided for the elevated total exposure over the summer months to all media (e.g., direct contact with sediments and food consumption). If risks for total exposure to all media are estimated to be above the target HQ, identify measures to mitigate the exposure.</p> <p>Update the SSTL calculations to include the chronic HC TRVs for vanadium and dioxins/furans TEQ. Alternatively, provide a rationale to support the TRV used to assess exposures and health risks from exposure to vanadium and dioxins/furans TEQ.</p>
IAAC-36	HC	Section 7.3.7 - Mi’kmaq of Nova Scotia	HHERA (Appendix A), Section 6.1.1.7, Section 4.3.4, Figure 12	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the Mi’kmaq of Nova Scotia, including health.</p> <p>It is unclear from the EIS if plant tissue is an operable exposure pathway in the Uplands Area. Section 6.1.1.7 of the Human Health and Ecological Risk Assessment report (HHERA – Appendix</p>	<p>Revise the country food exposure assessment to incorporate the vegetation transport pathway in the Uplands Area and provide information on the operability of the country foods exposure pathway in the Uplands Area. Update the effects assessment, as applicable. Alternatively, provide a rationale for why this pathway is</p>

<sup>4</sup> [Federal Contaminated Site Risk Assessment in Canada, Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals. Health Canada, 2010.](#)

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
				<p>A) states that “the PLFN [Pictou Landing First Nation] community is likely to collect and consume plants throughout the entire Site in the future.” However, plant tissue data appears to have only been collected from the Freshwater Wetlands and the Estuary portions of the site (see section 4.3.4, Tissue Analytical Results), while no samples appear to have been collected from the Upland Areas.</p> <p>In addition, the conceptual site model shown in figure 12 of the report indicates that vegetation uptake of COPCs from contaminated soil is a viable transport pathway, via vegetation and wild game uptake. However, vegetation consumption is considered an inoperable exposure pathway due to “COPC – None (no exceedances and bio-accumulative COPC limited and/or within background in Soil)”.</p> <p>It is unclear whether this pathway (consumption of country food, i.e., plants) is inoperable in the Uplands Area given the statement that plants are likely to be collected and consumed throughout the site. It is also unclear whether plant tissues from the Uplands Area are contaminated as no plant tissue samples have been collected.</p> <p>This information is required to assess the potential risks to human health for future users of the site.</p>	inoperable.
IAAC-37	HC NSL&F	Section 7.3.7 - Mi'kmaq of Nova Scotia	<p>HHERA (Appendix A), Section 6.4.3.6, Table 6.25 (Uncertainty Analysis)</p> <p>HHERA (Appendix A) Table H-1.12 Occurrence, Distribution, and Identification of Chemicals of Concern (COC) in Game Meat</p> <p>HHERA (Appendix A), Section 6.1.1.10 Game Meat (Mammals) COPCs</p>	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project will affect the Mi'kmaq of Nova Scotia, including their health. As part of this, the EIS must consider the current and future availability and contamination of country foods in its analysis.</p> <p>The uncertainty analysis in table 6.25 of the Human Health and Ecological Risk Assessment report (HHERA – Appendix A of the EIS) states that “The assumptions that were applied in the HHRA are based on a heavy consumer rather than the average consumer” and indicates that the corresponding health risk is therefore likely overestimated. However, this is contradicted in Section 6.4.3.6 of the report where it qualitatively eliminates the Pictou Landing First Nation Resident Game Consumption of Organs as an exposure pathway, stating “Based on the average game [organ] ingestion rate, the HQ values are less than 0.2.” If the average game organ ingestion rate is applied instead of the 95<sup>th</sup> percentile ingestion rate, it is unclear how this results in an overestimation of potential human health risk for this receptor.</p> <p>The HHERA report focuses on wetland species (beaver and muskrat) as game meat in the discussion on country foods. However, the Mi'kmaq of Nova Scotia Ecological Knowledge Study report (Appendix T of the EIS) indicated that rabbit (likely snowshoe hare) and deer were food sources, and both species were present within the project Study Area.</p> <p>Contaminant level determinations in game meat tissue were based on only one sample. Health Canada notes that data from a single sample may not be sufficiently representative of chemical concentrations in game meat and may not be appropriate to estimate the exposure levels and potential human health risks.</p> <p>Additional information to support the elimination of game meat consumption as an exposure pathway is required to assess the potential adverse environmental effects of the Project on human health.</p>	<p>Describe and discuss the level of uncertainty associated with ingestion exposures using the qualitative elimination of the ‘Pictou Landing First Nation Resident Game Consumption of Organs’ as an exposure pathway. Within the discussion, clarify whether the HQ values were based on heavy or average game organ ingestion rate.</p> <p>Provide the rationale to support the exclusion of terrestrial game mammals, like rabbit and deer, from sampling and analysis.</p> <p>Provide rationale to support using data from a single game meat sample to represent contaminant levels in game meat to estimate relevant exposure levels and potential human health risks.</p>



IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
IAAC-38	HC	Part 1: Sections 4.2 4.3  Part 2: Section 7.3.7 - Mi'kmaq of Nova Scotia	HHERA (Appendix A), Section 1.3 (Page 15)  HHERA (Appendix A), (Page 58)  Table C-1.13 of Appendix C-1	<p>The EIS Guidelines require all data, models and studies to be documented such that the analyses are transparent and reproducible and all data collection methods will be specified. In addition, when relying on existing information, the EIS should comment on how the data were applied to the Project, separate factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from the existing information.</p> <p>Section 4.3 of the Human Health and Ecological Risk Assessment report (HHERA – Appendix A of the EIS) indicates that data provided by Dalhousie University, including shellfish field data from the Northumberland Strait, was incorporated into the HHERA. However, the report does not present a quality assurance/quality control (QA/QC) analysis of the Dalhousie data, nor is there a discussion on the validity of using such data and/or any limitations associated with its quality and/or use in the HHERA.</p> <p>This information is required to ensure a thorough evaluation of the environmental effects of the Project on human health for future users of the site.</p>	Provide an analysis and discussion on QA/QC from the collection, analysis and interpretation of field data from Dalhousie University to demonstrate the applicability for its use in the HHERA, noting any limitations and/or discrepancy in this data compared to other data collected for this project.
<b>Project Related Activities-Human Health Risk Assessment (PRA-HHRA)</b>					
IAAC-39	HC	Section 7.3.7 Mi'kmaq of Nova Scotia	PRA-HHRA (EIS- Appendix A) Figures 3.2 to 3.5	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the Mi'kmaq of Nova Scotia, including health.</p> <p>Health Canada notes that an exposure pathway is considered operable if one or more receptors can be exposed to a COPC. However, in the Project Related Activities-Human Health Risk Assessment report (Appendix A of the EIS), potentially operational pathways were eliminated based on the concentration of the COPCs, not whether receptors could be exposed. For example, figure 3.5 of the report (Appendix A of the EIS) depicts the conceptual site models for human receptors during dam removal-related activities. For the source media "Sediment", the exposure pathways of "Sediment Dermal Contact/Incidental Ingestion" and "Consumption of Country Foods" were both identified as inoperable based on concentrations of COPC and not the potential for exposure.</p> <p>In addition, as receptors may be exposed to COPCs through multiple pathways, Health Canada recommends that the risk associated with human health should be based on the total exposure, as lower level exposures still contribute to the overall project-related exposure and risk to human health. For example, sediment released in the re-naturalization process (opening Boat Harbour up to the Northumberland Strait) may impact recreational water use areas in the Northumberland Strait, within Boat Harbour, and in the estuary, all of which may result in sediment dermal contact and/or accidental ingestion of potentially contaminated sediment that may pose a risk to human health.</p> <p>For additional information Health Canada refers the proponent to: Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessments: Human Health Risk Assessment (Health Canada, 2019). <a href="https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-risk-assessment.html">https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidance-evaluating-human-health-impacts-risk-assessment.html</a></p> <p>Determining which exposure pathways are operable is important for assessing the potential adverse environmental effects of the Project on Mi'kmaq of Nova Scotia health.</p>	Revise and re-evaluate the operability of potential exposure pathways in the Project Related Activities-Human Health Risk Assessment report in accordance with Health Canada guidance. Update the effects assessment in the EIS, as appropriate. Alternatively, provide rationale for why the operability of the exposure pathways provided in the report were appropriate.
IAAC-40	HC	Section 3.2.3- Spatial and	PRA-HHRA (EIS- Appendix A) Figure 3.1	The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the Mi'kmaq of Nova Scotia, including health.	Update the Project Related Activities-Human Health Risk Assessment to expand the spatial boundaries and include the potential impacts

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
		Temporal Boundaries  Section 7.3.7 - Mi'kmaq of Nova Scotia	EIS, Figure 7.1-1  Coastal Hydraulic Modelling Report (EIS- Appendix Z)	<p>The Coastal Hydraulic Modeling report in Appendix Z of the EIS states that “A portion of suspended silt and clay exits the model domain into the Northumberland Strait, whereas sand tends to remain nearby the entrance channel. A total of approximately 270,000 m<sup>3</sup> (in-situ, including porosity) of sediment, primarily silt and clay, is mobilized during the re-naturalization process of which approximately 140,000 m<sup>3</sup> exits the model domain.”</p> <p>Health Canada noted that the area of sediment impact (as total suspended solids – TSS) modelled in the report extends beyond the regional study area identified in the Project Related Activities-Human Health Risk Assessment report (Appendix A of the EIS). It is not clear if the outflow of sediment would affect the numerous recreational areas in close proximity to the Project.</p> <p>Health Canada also noted that potential impacts to country foods associated with the release of this sediment into the Northumberland Strait was not evaluated in the EIS, including the potential risks associated with COPCs in the released sediment. The Northumberland Strait supports First Nation’s food, social, ceremonial and commercial fisheries, as well as non-Indigenous fisheries. The release of this sediment may have a direct impact on marine organisms or may result in food chain impacts through the bioaccumulation or biomagnification COPCs.</p> <p>Section 7.3.7.4.3 of the EIS states “The majority of potential effects from TSS will increase effects on other VCs [valued components], namely from the marine environment perspective, which are addressed in subsequent sections. It should be noted that the types of effects are considered temporary/short-term as the total TSS and turbidity from the dredging activity is expected to quickly return to background levels.” However, the Coastal Hydraulic Modeling report (Appendix Z) predicts an increase in TSS flowing into the estuary and Northumberland Strait for at least one year after the dam is removed. This suggests that impacts will occur in the medium- to long-term rather than only the short term, which may result in chronic or sub-chronic exposure to COPCs associated with these sediments that may impact recreational water users and country foods. Potential health risks associated with these chronic or sub-chronic exposures to COPCs were not evaluated and may contribute to overall underestimation of risks to human health.</p> <p>This information is need to evaluate potential risks to human health associated with the project-related activities.</p>	<p>and potentially impacted receptors for the release of sediment into the Northumberland Strait.</p> <p>Evaluate the potential impacts of sediment release on human health in the EIS, including country food and recreational water use pathways, as well as any other relevant human exposure pathways. Include COPC that may bioaccumulate or biomagnify within food chains in the evaluation. Alternatively, provide rationale for why the release of sediment is not expected to impact country food and recreational water use.</p> <p>Evaluate the potential risks to human health associated with exposure to potentially contaminated sediment released during the re-naturalization process for acute, chronic and sub-chronic exposure, as applicable. Alternatively, provide a justification for why this information is not needed.</p>
IAAC-41	HC	Section 7.3.7 Mi'kmaq of Nova Scotia	PRA-HHRA: Figure 3.5, p. 2  Risk Management Plan (Appendix K) of the HHERA (EIS -Appendix A)	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the Mi'kmaq of Nova Scotia, including health.</p> <p>The Project Related Activities-Human Health Risk Assessment report (Appendix A of the EIS) states that the suspended sediment in surface water exposure pathway' during and post dam removal was not carried through for evaluation because “Sediment potentially mobilized following dam removal will have concentrations of COPCs below remedial targets, based on protection of human health through the direct ingestion/dermal contact pathway.” However, according to Figures K-1 to K-8 of the Risk Management Plan in Appendix K of the Human Health and Ecological Risk Assessment report (Appendix A of the EIS) remediation will not be required for numerous samples that exceed the proposed SSTL for dioxins/furans TEQ (29 pg/g) based on the Exposure Point Concentration (EPC) risk management approach. Therefore, the rationale for not assessing the 'suspended sediment in surface water exposure pathway' is not</p>	<p>Assess the potential risks to human health associated with the 'suspended sediment in surface water exposure pathway' due to the resuspension and transport of sediment with COPC concentrations greater than the proposed SSTL. Alternatively, provide a justification for why this information is not needed.</p>

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
				<p>justified as concentrations above remedial targets, based on protection of human health through the direct ingestion/dermal contact pathway, will not be remediated. For example, the highest COPC concentration not requiring remediation based on the EPC risk management approach is dioxins/furans TEQ 61.9 pg/g (Figure K-7 of the Risk Management Plan), which is greater than twice the proposed SSTL.</p> <p>Since the 'suspended sediment in surface water exposure pathway' during and following dam removal was not carried through for evaluation, the potential risks to human health associated with the resuspension and transport of sediment contaminated with COPCs above the proposed SSTLs for dioxin/furans and vanadium were not fully evaluated. This may underestimate the potential health risks associated with project-related activities for receptors (i.e., recreational water users and country food consumers).</p> <p>This information is need to evaluate potential risks to human health associated with the project-related activities.</p>	
IAAC-42	HC	Section 7.3.7 - Mi'kmaq of Nova Scotia	PRA-HHRA (EIS- Appendix A), Section 2.1.4	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the Mi'kmaq of Nova Scotia, including health.</p> <p>Section 2.1.4 of the Project Related Activities-Human Health Risk Assessment report (Appendix A of the EIS) states that the dewatering effluent will mix with the bulk water and subsequently will be "managed through natural attenuation." It is unclear how persistent or bioaccumulative COPCs in the dewatering effluent are anticipated to attenuate in the natural environment or how they have been considered in the report. As certain contaminants are highly bioaccumulative (e.g., methylmercury), their concentrations at the discharge point may not necessarily be a good indicator of the contaminant accumulation in country foods via the aquatic food chain. Therefore, even though their concentrations are below the screening criteria at the discharge point, their characteristics may allow for bioaccumulation at high levels in country foods and lead to potential adverse health effects.</p> <p>This information is need to evaluate potential risks to human health associated with the project-related activities.</p>	Provide additional discussion on the expected fate and transport of persistent and/or bioaccumulative substances from dewatering effluent as they relate to potential human exposure and subsequent adverse health effects.
IAAC-43	HC	Section 7.3.7 - Mi'kmaq of Nova Scotia	Section 5 of Appendix G (Surface Water Quality / Mass Balance Predictions) of PRA-HHRA (located at end of HHERA (Appendix A)	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the Mi'kmaq of Nova Scotia, including health.</p> <p>The Project Related Activities-Human Health Risk Assessment report (Appendix A of the EIS) indicates that the proponent modelled future chemical concentrations in the surface waters of the BHSL prior to discharge into the Northumberland Strait (Appendix G of the Project Related Activities-Human Health Risk Assessment report). This water is understood to comprise effluent from the sludge dewatering process (i.e., Geotube® effluent) and groundwater and surface water entering Boat Harbour. Health Canada was not able to locate the water quality data, including QA/QC information such as sample collection methodology, number of samples collected, etc., used to represent the Geotube® effluent in this model. While section 5.3 states "A summary of the pilot water treatment composite effluent samples is provided in table 4 (attached)," table 4 could not be located in the report.</p> <p>This information is need to evaluate potential risks to human health associated with the project-related activities.</p>	<p>Identify where the Geotube® effluent water quality pilot data is located in the EIS. If it is not included, provide the information for review along with supporting QA/QC information such as sample collection methodology, number of samples collected, etc.</p> <p>Provide rationale for the representativeness of this data as a proxy for future Geotube® effluent water quality data.</p> <p>Indicate the location of relevant samples provided in the data tables presented in the Project Related Activities-Human Health Risk Assessment report (i.e. which table and the sample identifier), including the appendices, if relevant.</p>

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<b>Noise</b>					
IAAC-44	HC	Section 7.1.1 Atmospheric Environment	<p>Appendix W Noise Assessment Documentation Section 2 Methodology Appendix W- Noise Assessment Documentation, Table 3.2-1 Results of Background Sound Level Measurements (p. 5 to 11)</p> <p>Appendix W - Noise Assessment Documentation, Section 3.1 Observations (p. 4)</p> <p>Appendix W - Noise Assessment Documentation, Section 2 Methodology (p.2)</p>	<p>The EIS Guidelines require that the EIS contain ambient noise baseline data.</p> <p>Section 2 of the Noise Assessment Documentation states “as per industry practices sufficient background data should encompass 48 hrs of monitoring data without interruption from precipitation or wind speeds in excess of 20 km/h, and within instruments operation tolerance as related to relative humidity and temperature”.</p> <p>When measuring baseline noise levels, Health Canada’s guidance on evaluating noise impacts in environment assessments<sup>5</sup> recommends that wind speed should not exceed 14 kilometres per hour, any free-field monitor and microphone should be sheltered from exposed areas, there should be no precipitation, and all applicable conditions as per ISO 1996-2:2007 should be met.</p> <p>Table 3.2-1 of the Noise Assessment Documentation indicates that some noise measurements used in the calculation of baseline noise levels were taken during moments of precipitation and/or when wind speeds exceeded 14 kilometres per hour. Furthermore, information on the type of windscreen(s) used or a description of the physical location of the monitor was not provided in the report.</p> <p>Section 3.1 Noise Assessment Documentation states “While WSP staff were on site during commissioning, and data checks, the following sources were audible in the general vicinity and were the most likely causes of background sound levels measured: (a) Wildlife;...” Section 6.2.1 of Health Canada’s guidance document on evaluating noise in environmental assessments states, “sounds that are not generated by human activity (e.g. ocean, wind and animal noises) should not be included in determining a baseline sound level.” It is unclear whether non-anthropogenic sounds were excluded from the reported baseline sound levels as wildlife was noted as one of the sources of background sound.</p> <p>Section 2 also noted that the monitoring stations were deployed in November 2017 for one month. Health Canada notes that both Northern Pulp’s kraft pulp mill and the BHETF were in operation during this time. As the kraft pulp mill and the BHETF have since ceased operation, baseline noise measurements may not represent current noise levels. The baseline noise levels used will impact the calculations used in the determination of the change in percent of highly annoyed (%HA). For example, a +10 dB adjustment should be applied to baseline (ISO 1996-1:2003; ANSI, 2005) as well as predicted noise levels for all project phases for a “quiet rural community”, which, in the calculation of %HA, is intended to produce a greater change in %HA than would occur with unadjusted noise levels, to account for an expected heightened sensitivity to noise. If current baseline noise levels are lower than those monitored and are more representative of a quiet rural area at some points of reception (PORs), an adjustment may be warranted in the %HA calculations.</p> <p>This information is needed to complete its assessment of the potential effects of noise on human health.</p>	<p>Recalculate the baseline noise levels to determine representative baseline conditions, as per ISO 1996-2:2007, by excluding data containing:</p> <ul style="list-style-type: none"> <li>wind speeds exceeding 14 kilometers per hour;</li> <li>natural sounds, including but not limited to: wildlife and precipitation; and</li> <li>operation of the pulp mill and BHETF.</li> </ul> <p>Update the baseline monitoring and noise assessment, as required.</p> <p>Alternatively, provide rationale as to why calculated baseline noise levels are representative of current baseline conditions at the selected PORs and the appropriateness of using this data to calculate future changes in %HA.</p> <p>Provide additional information on the use of windscreens and the locations of equipment during the monitoring period (e.g., were they sheltered from the wind, the size of the windscreen, etc.).</p>

<sup>5</sup> Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Health Canada. 2017. [Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise - Canada.ca](https://www2.ec.gc.ca/info-fact/guidance/guidance_eh_hhi_ea_noise_e.pdf)

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
IAAC-45	HC	<p>Section 7.2.1 Changes to the atmospheric environment</p> <p>Section 7.3.7 Mi'kmaq of Nova Scotia</p>	<p>EIS, Figure 7.3-2 - Point-Of-Reception &amp; Operation Location Plan (p. 7-274)</p> <p>EIS, Section 7.3.3.3 - Predicted Changes to Noise (p. 7-273)</p> <p>EIS, Section 7.3.3.5 Project Activities and Noise Interactions and Effects and Mitigation Measures (starting p. 7-275)</p> <p>EIS, Section 7.3.3.6 Noise Monitoring (p. 7-288)</p> <p>EIS, Section 7.3.3.5.4 - Bridge at Highway 348 (p. 7-281) and Section 7.3.3.5.7 - Dam (p. 7-287)</p> <p>EIS, Figure 3.1-8 - Pipeline (p. 3-20)</p> <p>EIS, Table 7.3-49 - Potential Interaction Between Pipeline Decommissioning and Noise and the Significance of the Resulting Potential Effects from the Interactions (p. 7-284)</p> <p>EIS, Table 8.1-2 Summary Table of Environmental Impact Assessment (p. 8-11)</p> <p>9.2 Monitoring</p>	<p>The EIS Guidelines require the proponent to assess the predicted changes to ambient noise levels, the impacts to human health resulting from noise exposure, and to present an outline of preliminary environmental monitoring programs.</p> <p>The noise assessment presented in section 7.3.3.3 of the EIS appears to exclude potential human receptors located in closer proximity to certain project activities than some of the selected PORs, which may result in an underestimation of noise impacts. Figure 3.1-7 in the EIS indicates the presence of a structure, which appears to be a residential dwelling, within approximately 150 metres east of the bridge and dam project activities. An online search of local area maps identified the address as 6792 Pictou Landing Road.</p> <p>As well, the predicted nighttime noise levels resulting from each project component and at each POR are not provided. Section 7.3.3.3 of the EIS states that the quantitative noise assessment included "10 trucks per hour travelling at 25 km/hr during day/evening/night periods for construction and 2 per hour during the operation phases" and "three dredging barges" (and section 7.3.3.5 of the EIS states that dredging and associated activities will occur throughout the night).</p> <p>Section 7.3.3.6 of the EIS states that monitoring of noise during the project is not proposed, but rather that the principles of adaptive management will be followed. However, Table 8.1-2 indicates "[u]ndertake regular checks for excessive noise on-site and in proximity to sensitive receptors" as a mitigation measure to control noise impacts from most if not all project activities, although how these checks will be undertaken is not explained.</p> <p>The quantitative noise assessment modeling output file and calculations, which would support predicted noise levels, contour maps, %HA calculations, and other noise-related information is not provided in the EIS. This information is needed to validate the results of the noise assessment, including the %HA calculations.</p> <p>This information is required for the Agency to complete its assessment of the potential effects of noise on human health.</p>	<p>Update the effects assessment to include the receptor at 6792 Pictou Landing Road or provide a rationale for why it was not considered.</p> <p>Update the effects assessment to include predicted nighttime noise for each project activity at all receptor locations, including the new receptor at 6792 Pictou Landing Road, if applicable. Include a discussion on the sources and duration of noise during the nighttime period, and if applicable sound level adjustments were applied.</p> <p>Clarify how regular checks for excessive noise on-site, during both daytime and nighttime and in proximity to sensitive receptors, will be undertaken if no monitoring is planned.</p> <p>Provide the quantitative noise assessment model output file and related calculations that were used to support the predicted noise levels, contour maps, %HA calculations, and other noise-related information in the EIS. Include the %HA calculations (including inputs and outputs and adjustment factors used) and information on the project scenarios that were modeled (i.e. "project only" or "project + baseline" and pre- or post-mitigation).</p>
IAAC-46	HC	<p>Section 7.2.1 Changes to the atmospheric environment</p> <p>Section 7.3.7 Mi'kmaq of Nova Scotia</p>	<p>EIS, Section 3.2.1.2 - Dredging (p. 3-38)</p> <p>EIS, Section 3.2.2.4 - Bridge at Highway 348 (p. 3-46)</p> <p>EIS, Section 7.3.3.3 - Predicted Changes to noise (p. 7-271)</p>	<p>The EIS Guidelines require an assessment of the predicted changes to ambient noise levels.</p> <p>Section 3.2.1.2 of the EIS states:  <i>"Construction of temporary access points is anticipated to use a crew of three -to six staff and -two to four pieces of heavy equipment, which would include the following: [...], and pile drivers (for bride abutments)."</i></p> <p>According to Health Canada's guidance on evaluating noise impacts in environment assessments, impact pile driving is an internationally agreed upon example of a source of highly impulsive noise as listed in ISO 1996-1:2003. The EIS does not include discussion of potential impulsive noise or how it was included in the noise assessment.</p> <p>For highly impulsive noise sources, ISO 1996-1: 2003 recommends an adjustment factor of +12 dB. However, section 7.3.3.3 states that model inputs only included a +5 dBA adjustment for tonal sources where applicable. To evaluate change in %HA it is necessary to apply all</p>	<p>Clarify whether there will be impulsive sounds produced by project activities and the source(s).</p> <p>Should impulsive sounds occur, update the effects assessment and provide additional information as to:</p> <ul style="list-style-type: none"> <li>• whether it was considered in the noise modelling, and how;</li> <li>• whether it was considered in the %HA calculation, and if so, whether it was done in accordance with ISO 1996-1:2003; and,</li> <li>• how it will be managed/mitigated.</li> </ul>



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				<p>relevant sound character adjustments (regular impulsive, highly impulsive, high energy impulsive), as per ISO 1996-1:2016.</p> <p>This information is required for the Agency to complete its assessment of the potential effects of noise on human health</p>	
IAAC-47	HC	<p>Section 7.2.1 Changes to the atmospheric environment</p> <p>Section 7.3.7 Mi'kmaq of Nova Scotia</p>	<p>EIS, Section 7.3.3.2 - Predicted Changes to Noise (p. 7-271)</p>	<p>The EIS Guidelines require an assessment of the predicted changes to ambient noise levels.</p> <p>Section 7.3.3.2 of the EIS states:  <i>“Due to large separation distance between the Site Study Area and the existing residential areas vibration is considered to have an insignificant impact beyond 30 m of any vibratory activity”</i></p> <p>Low frequency noise (LFN) can travel longer distances with less attenuation than higher frequencies and may induce vibrations; however, this is not discussed in the EIS. It is unclear whether the proponent has made the conclusion that <i>“an insignificant impact beyond 30 m of any vibratory activity”</i> based on an assessment of project-induced LFN.</p> <p>Significant LFN (i.e., above 65 dBC at receptors) should be evaluated using Health Canada’s guidance on evaluating noise impacts in environment assessments, which provides additional information on how LFN can be modelled/assessed and considered in %HA calculations in Appendix C.</p> <p>This information is required for the Agency to complete its assessment of the potential effects of noise on human health.</p>	<p>Discuss whether LFN may occur as a result of project activities. Should LFN be thought to occur, update the effects assessment and provide information as to:</p> <ul style="list-style-type: none"> <li>• whether it was considered in the noise modelling, and how;</li> <li>• whether it was considered in the %HA calculation, and if so, whether it was done in accordance with ANSI 2005 standards (see Appendix C of Health Canada’s guidance on evaluating noise impacts in environment assessments); and</li> <li>• how it will be managed/mitigated.</li> </ul>
IAAC-48	HC	<p>Section 7.2.1 Changes to the atmospheric environment</p> <p>Section 7.3.7 Mi'kmaq of Nova Scotia</p>	<p>EIS, Section 7.3.3.3 Predicted Changes to Noise (p. 7-273)</p> <p>EIS, Section 7.3.1.1 Predicted Changes to Air Quality and Odour, <i>PM Impacts – Scenario 1 and 7</i> (p. 7-232)</p> <p>EIS, Figure 7.3-2 Point-Of-Reception &amp; Operation Location Plan (p. 7-274)</p> <p>EIS, Section 3.1.2 Dredging (p. 3-11)</p> <p>EIS, Section 3.2 - Project Activities, <i>Site Preparation and Construction</i> (p. 3-32)</p> <p>EIS, Section 3.2.1.2 Dredging (p. 3-38)</p> <p>EIS, Table 7.3-43 Potential interactions Between Wetland Management and Noise and the</p>	<p>The EIS Guidelines require the proponent to assess the predicted changes to ambient noise levels caused by Project activities, including impacts on human health.</p> <p>Section 7.3.3 of the EIS only lists four of the <i>“environmentally significant noise sources”</i> that were included in the quantitative noise assessment (i.e., four bulldozers, four excavators, ten haul route trucks per hour during the construction phase and two haul route trucks per hour during and three dredging barges during the operation phase). It is unclear what other project-related noise sources were included in the noise assessment (e.g., diesel generators, other stationary equipment), whether worst-case scenarios (i.e., when all equipment for concurrent project activities are running simultaneously) were modeled for each POR during each project phase, and how and to what sources time-weighted adjustments (p. 7-272 of the EIS) were applied.</p> <p>It is unclear which project activities/phases are included in determining the hourly number of trucks and which PORs will be affected by truck-related noise. While Figure 7.3-2 of the EIS indicates the main truck route and the section of Highway 348 occupied by the causeway as linear sources of noise, it is unclear whether the noise assessment includes other sections of the highway (e.g., section passing through PLFN community) as a linear source, given the project includes off-site disposal of demolition debris, as described in Section 3.1.2 of the EIS. The EIS also states, in Section 7.3.3.1, that more than 100 trucks may be travelling on the access road per day during containment cell final capping. It is unclear whether this truck traffic was considered in the noise impact assessment.</p>	<p>Describe all noise sources that were evaluated in the quantitative noise assessment, including:</p> <ul style="list-style-type: none"> <li>• the numbers of each type of equipment that will be used and its location and proximity to receptors;</li> <li>• the time-period when the equipment will be generating noise;</li> <li>• which sources were evaluated on a time-weighted base and for what duration of time they were modelled; and</li> <li>• which receptor locations were impacted.</li> </ul> <p>Provide information to support the assumption used as input into the quantitative noise assessment of ten haul route trucks running per hour during day/evening/night periods for the construction phase and two haul route trucks running per hour during operational phase.</p> <p>Clarify whether haul trucks will have potential noise impacts on PORs located along stretches of Highway 348 during construction and operation phases in addition to the linear noise sources presented in Figure 7.3-2. If additional noise impacts exist revise the noise assessment to include these sources. Alternatively, provide a rationale for why specific noise sources, locations, and project activities (e.g., additional haul routes, and access road construction and vegetation clearing) were excluded.</p>

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			Significance of the resulting Potential Effects from the Interactions (p. 7-280)	<p>Sections 3.2 and 3.2.1.2 of EIS indicates that construction of access roads and clearing of vegetation may be required for dredging of the Boat Harbour stabilization lagoon and estuary shorelines and for dam demolition activities. It is unclear whether construction of access roads and vegetation clearing were considered in the noise assessment and which POR(s) it may affect. Given construction of access roads and clearing of vegetation within access points for the remediation of wetlands is predicted to have moderate noise impacts on PORs (as indicated in Table 7.3-43 of the EIS), it may be relevant to assess the potential noise impacts of construction of access roads and clearing of vegetation within access points for all relevant project components.</p> <p>This information is required for the Agency to complete its assessment of the potential effects of noise on human health.</p>	
<b>Risk Management Plan (RMP)</b>					
IAAC-49	HC	Section 7.3.7 Mi'kmaq of Nova Scotia	Risk Management Plan (Appendix K) of the HHERA (EIS- Appendix A)	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the health of the Mi'kmaq of Nova Scotia.</p> <p>The Agency is aware that further sampling and delineation of the contaminants in the freshwater wetlands within the BHETF area have been completed since the EIS submission.</p> <p>To complete the analysis of the Risk Management Plan report (RMP), located in Appendix K of the Human Health and Risk Assessment report (Appendix A in the EIS), the results of the additional sampling and delineation is needed because:</p> <ul style="list-style-type: none"> <li>• results from additional samples may impact the areas designated to be removed based on SSTL exceedance; and</li> <li>• the EPC, which the proponent is using to identify wetland areas for removal, is an estimate of the average chemical concentration in an environmental medium; therefore, any modifications to the EPC calculations that result from the additional sampling may change the wetland areas designated to be removed.</li> </ul> <p>This information is required to complete the analysis of the RMP and determine whether there are potential adverse environmental effects of the Project on the Mi'kmaq of Nova Scotia.</p>	Update the RMP based on the results from the additional sampling completed since the submission of the EIS. Include all relevant information to support the sampling methods, analysis and integration of these results into the RMP.
IAAC-50	HC ECCC NSE IAAC	Part 2, Section 7.3.7 Mi'kmaq of Nova Scotia  Part 2, Section 7.1.4 Riparian, wetland and terrestrial environments	Risk Management Plan (Appendix K) of the HHERA (EIS -Appendix A)  EIS Section 7.3.9.4.3	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect fish and fish habitat and the health of the Mi'kmaq of Nova Scotia. The EIS Guidelines require that the uncertainty, reliability, sensitivity and conservativeness of models used in the EIS must be indicated.</p> <p>Section 7.3.9.4.3 of the EIS identifies two different approaches to delineate contaminated areas to be removed from the wetlands and estuary (termed risk management areas or RMA in the EIS), based on either the SSTLs or the EPCs. However, it is unclear which approach will be utilized for the remediation of each of the RMAs.</p> <p>The Risk Management Plan report located in Appendix K of the Human Health and Risk Assessment report (Appendix A in the EIS) proposes to remediate areas based on EPC, to achieve an EPC below the SSTL of 29 pg/g for dioxins/furans TEQ in sediment in both the freshwater wetlands and the estuary. Samples with concentrations exceeding the SSTL are to be removed until an EPC below 29 pg/g is achieved. The RMP predicted post-remediation EPCs for the wetland sediment (28.92 pg/g) and for the estuary sediment (28.17 pg/g), which are</p>	<p>Provide clarification on which proposed risk management approach (SSTL or EPC) will be utilized for the remediation of each RMA.</p> <p>Discuss the potential uncertainties in the EPC based-approach, including uncertainty in the sampling approach, calculations, and application of this remediation approach in the field.</p> <p>Discussion how uncertainty in the RMP will be minimized and whether a buffer will be incorporated into the RMP to account for any uncertainty.</p> <p>Update the RMP to include additional information to comprehensively support the delineation of the wetland and estuary areas to be removed, based on both EPC and SSTL for each RMA.</p>

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				<p>only slightly below the SSTL of 29 pg/g. EPCs are statistical estimates, and the practical application (in the field process) of removing impacted sediments to the target level is not precise. No discussion around the uncertainty in this risk management approach (either in the calculations or field application) is provided in the EIS. A systematic approach to incorporating a buffer into the RMP could protect against potential errors in both statistical calculation and/or incomplete removal; thus providing additional assurance to the protection of human health.</p> <p>Figures K-1 to K-8 of the Project-Related Activities Human Health Risk Assessment report (PRA-HHRA – Appendix A in the EIS) and Figures 7.3-19 to 7.3-23 in the EIS show the RMAs that were delineated using both the SSTL and EPC approaches. However, no information is presented in the EIS to comprehensively support the delineation of each RMA. For example, RMA 5 (Figure K-5 in the PRA-HHRA) has relatively few sampling points to delineate the COPCs in the wetland:</p> <ul style="list-style-type: none"> <li>• Sample FSP3-SED-12 exceeds the dioxins/furans TEQ SSTL, but no additional samples were presented beyond this point; therefore, it is unclear how the delineation of the RMA was determined to be inclusive of all areas exceeding the SSTL.</li> <li>• The area to be removed based on the EPC encompasses sample FSP3-SED-7A and the next closest sample to the south does not exceed the proposed SSTL for dioxins/furans (FSP3-SED-4); however, the line to delineate the EPC area has been drawn between these points with no evidence to support its location.</li> </ul> <p>This information is required to assess the potential adverse environmental effects of the Project on the health of the Mi'kmaq of Nova Scotia.</p>	
IAAC-51	HC ECCC NSE IAAC	Section 7.3.7 Mi'kmaq of Nova Scotia  Part 2, Section 3.1	Risk Management Plan (Appendix K) of the HHERA (EIS- Appendix A)  Section 3.1 Project Components	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project could potentially affect the health of the Mi'kmaq of Nova Scotia.</p> <p>The Risk Management Plan report located in Appendix K of the Human Health and Risk Assessment report (Appendix A in the EIS) states: "Risk Management Areas 3 (FSP2) and 5 (FSP5) are located within a densely vegetated cattail marsh. In their existing condition, the presence of the vegetation would act as a sufficient barrier to contact with the underlying impacted sediment (Figures K-3 and K-5)... Therefore, two risk management alternatives are recommended for this area: 1) monitor and maintain the existing vegetative cover, and 2) in the case where vegetative cover is absent or its future presence is affected by the BHETF Remediation Project (e.g. change in water levels), removal of the sediment is recommended." However, more information is required to evaluate the effectiveness of this approach, including scientific evidence and details on how the vegetation will be monitored and maintained.</p> <p>Assuming the vegetation cover is maintained in its current state for each of these two risk management areas, there still appears to be two potential pathways that may result in human exposure to COPCs in this sediment:</p> <ul style="list-style-type: none"> <li>• Erosion over time may cause the sediment to be suspended in the water column and transported to recreational water areas in Boat Harbour or out in the Northumberland Strait.</li> <li>• Vegetation growing in the wetlands may take up contaminants from the sediment. This contaminated vegetation may then be consumed directly by human receptors or indirectly through the trapping and consuming of animals in the area that feed on this</li> </ul>	<p>Provide scientific evidence (e.g. published, peer-reviewed literature) to support the use of the risk management plan proposed for RMAs 3 &amp; 5, including details on how maintenance of the vegetation will be conducted.</p> <p>Provide additional information to address the potential exposure pathways in RMAs 3 and 5 from sediment transport and the consumption of contaminated vegetation by humans or other animals. Include any controls that would be in place to prevent exposure to contaminated vegetation within wetlands.</p> <p>Discuss the potential for vegetation loss, due to water level and salinity changes, to expose the contaminated sediment and increase accessibility of these sites to recreational users.</p> <p>Provide information, including potential mitigation measures, to address the potential contamination of the surrounding area, including associated impacts to human health, if it is determined in the future that sediment must be removed because the cattails were not sufficient for preventing access to sediment.</p> <p>Clarify how cattails and other organic material will be characterized as either being suitable for a mulch/soil amendment or as requiring disposal.</p>



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				<p>vegetation, which could result in a bioaccumulation or biomagnification of the contaminants in the food chain.</p> <p>The RMP does not provide details to address these potential exposure pathways nor does it discuss controls that would be in place to prevent exposure, such as restricted site access, etc.</p> <p>There is uncertainty concerning the future state of Boat Harbour, the freshwater wetlands, and the estuary once the site is returned to a tidal estuary. Section 7.3.9.1 in the EIS states “The removal of the flow control structure found at the mouth of the BHSL has the potential to alter the water levels in the area, this change may cause wetlands to expand, shrink, or dry up depending on the wetland location within the watershed.” Future water levels and salinity in portions of the site are unknown, which may result in additional human exposure routes as:</p> <ul style="list-style-type: none"> <li>• changes in water level and salinity could impact the viability of the current vegetation in the wetlands, and if vegetation dies, contaminated sediment may get suspended in the water column and enter Boat Harbour and eventually the Northumberland Strait; and</li> <li>• a change in water levels may also increase the accessibility of these areas to recreational users, resulting in increased exposure to COPCs.</li> </ul> <p>This uncertainty is not discussed in the RMP.</p> <p>If it is determined that cattails are insufficient to prevent access to contaminated sediments, the RMP states that sediment will be removed; however, the report does not address:</p> <ul style="list-style-type: none"> <li>• the potential impacts to human health from contaminants during sediment removal; and</li> <li>• where the contaminated sediment will be placed if it is determined that the sediment needs to be removed after the remediation project is complete and the containment cell capped.</li> </ul> <p>Section 3.1 of the EIS states “Cattails and other organic material where deemed necessary will be removed from the wetlands through clearing and grubbing activities. The material will be mechanically processed through chipping and grinding and stockpiled for future use as mulch/soil amendment. This material may also be removed as part of the dredging operation and disposed of within the containment cell.” However, the EIS does not describe how cattails and other organic material will be characterized to determine whether suitable for mulch/soil amendment or requires disposal in the containment cell.</p> <p>This information is needed to assess the potential effects on Mi’kmaq of Nova Scotia health, fish and fish habitat, and the marine environment.</p>	<p>Describe where sediment will be disposed of after the containment cell is capped, if it is determined that the cattails need to be removed.</p>
IAAC-52	HC NSE	Section 7.3.7 Mi’kmaq of Nova Scotia	Risk Management Plan (Appendix K) of the HHERA (EIS -Appendix A)	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project would potentially affect the health of the Mi’kmaq of Nova Scotia.</p> <p>The calculation of one EPC to represent all of the freshwater wetlands may not be adequately protective of human health. Statistics used to generate the freshwater wetland and estuary EPCs should consider measured differences in COPC distribution and concentrations as well as in relevant microenvironments.</p>	<p>Provide information to support the use of one EPC in sediment for the entire site to represent all of the freshwater wetlands and the estuary, taking into consideration:</p> <ul style="list-style-type: none"> <li>• the site-specific differences between the various wetland areas (composition, layout, accessibility);</li> <li>• the lack of a current pattern of usage for the freshwater wetlands at the BHETF; and</li> <li>• the potential for measured difference within discrete regions (microenvironments) of the wetlands and estuary.</li> </ul>

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				<p>According to the Risk Management Plan in Appendix K of the Project-Related Activities Human Health Risk Assessment (PRA-HHRA – Appendix A of the EIS), the freshwater wetlands and estuary EPCs for the COPCs in sediment were based on the 95% upper confidence limit (UCL) for dioxins/furans and vanadium. However, it is unclear from the report if the presence of potential microenvironments was considered in the statistical analysis. Health Canada recommends that statistics used to generate an EPC consider microenvironments and exposure patterns. Analysis of microenvironments would identify areas where elevated exposures may occur.</p> <p>Figures K-1 to K-8 of the RMP report identify impacts concentrated in some of the freshwater wetland risk management areas in comparison to others and in some microenvironments within the freshwater wetlands and the estuary (i.e. “hot spots”). However, no rationale was provided to support whether a 95% UCL value to represent an EPC in sediment for the entire site would accurately represent measured differences in COPC distribution and concentrations between the various freshwater wetlands (risk management areas) and within discrete regions within those freshwater wetlands or within discrete regions of the estuary.</p> <p>An EPC is an estimate of the average chemical concentration in an environmental medium in a defined area. The ‘defined area’ in the United States Environmental Protection Agency’s (US EPA) guidance document <i>Calculating Upper Confidence Limits For Exposure Point Concentrations At Hazardous Waste Sites</i><sup>6</sup> refers to a ‘defined area’ as an exposure unit. The exposure unit as defined in the US EPA guidance document is: “the area throughout which a receptor moves and encounters an environmental medium for the duration of the exposure; an individual receptor is assumed to be equally exposed to media within all portions of the exposure unit over the time frame of the risk assessment, unless there is site-specific evidence to the contrary.”</p> <p>Based on the information provided in the RMP report, it is unclear if using only one EPC to represent all of the freshwater wetlands is adequate to support the assumption that an individual receptor is “...equally exposed to media”, considering the site-specific differences between the wetland areas and the lack of a current pattern of usage for the freshwater wetlands at the BHETF. Additional information is required to support this assumption.</p> <p>Insufficient information was provided to support the calculation of the EPC for each COPC, including sampling methodology, vertical delineation, or sample representativeness.</p> <p>This information is required to assess the potential adverse environmental effects of the Project on surface water and groundwater, which can impact fish and fish habitat and Mi’kmaq of Nova Scotia health.</p>	<p>Provide additional details on the EPC calculations, including any information:</p> <ul style="list-style-type: none"> <li>to support whether the number of sample measurements was sufficient to accurately characterize the site for the purposes of calculating the EPCs;</li> <li>to demonstrate that random sampling was utilized for the collection of samples (for each RMA);</li> <li>regarding any potential bias introduced through sampling methodology;</li> <li>regarding the vertical delineation of the sample measurements used for the EPC calculations; and</li> <li>to support that samples used to calculate the EPC were representative of “site-related” concentrations expected to be routinely contacted by receptors.</li> </ul>
<b>Drinking Water</b>					
IAAC-53	HC NSE	Section 7.3.7 Mi’kmaq of Nova Scotia	EIS: Section 4.4.1.2; Section 7.1.4.1.3; Section 7.3.6.2; Section 7.3.6.4.2  PRA-HHRA (Appendix A): Section 3.1.4.2.2	The EIS Guidelines require the assessment of impacts to Mi’kmaq of Nova Scotia human health resulting from potential changes to water quality (drinking, recreational and cultural uses).  In Table 4.4-2 of the EIS, the proponent’s response to the public question: “Will groundwater be protected?” is recorded as “We have tested groundwater at different points in the pre-remediation process and there are no signs of contamination. Best practices will be in place to	Clarify the state of groundwater in the project area, including future use as a potable source. Include all groundwater sampling results to date, represented on figure(s) of appropriate scale to show location and date of sampling. Any exceedance of applicable health-based criteria, such as the Canadian Drinking Water Quality Guidelines (CDWQGs), should be clearly indicated.

<sup>6</sup> Calculating Upper Confidence Limits For Exposure Point Concentrations At Hazardous Waste Sites. Office of Emergency and Remedial Response U.S. Environmental Protection Agency Washington, D.C., 2002.

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
			PRA-HHRA (Appendix A), Section 3.1.4.2, human health screening table H.1.2	<p>ensure groundwater remains clean.” However, Section 7.1.4.1.3 of the EIS states “Groundwater samples exceeded the applicable provincial and/or federal groundwater criteria for some metals and general chemistry parameters.” Clarification is required on the state of groundwater contamination in the Project Area.</p> <p>There are inconsistencies in the EIS in relation to the future potential for potable groundwater wells within the Site Study Area. Section 7.3.6.2 of the EIS states “The NSE Tier 2 Pathway Specific Standards (PSS) for groundwater discharging to surface water will be applied, as the future use of the Site will be non-potable for groundwater.” However, section 3.1.4.2.2 of the Project-Related Activities Human Health Risk Assessment (PRA-HHRA – Appendix A in the EIS) states “Should the addition of potable wells be proposed within the Site Study Area in the future, groundwater will need to be sampled and analyzed to confirm compliance with Health Canada’s drinking water quality guidelines (Health Canada, 2020), as is standard practice for potable water supplies”.</p> <p>The EIS did not carry forward manganese in groundwater despite concentrations well over human health guidelines, according to human health screening table H.1.2 of Appendix A. Section 3.1.4.2 of the PRA-HHRA report states that elevated manganese in groundwater on-site is likely related to natural geological conditions; however, background manganese concentrations were not provided. Given that the groundwater on-site has been identified as potentially potable, the choice of background data used in this screening step could impact the chemicals carried forward into the human risk assessment.</p> <p>Section 7.3.6.4.3 states “Should groundwater impacts above applicable criteria for the Site be detected during monitoring the effects would be further evaluated by a re-sampling and if found to be indicative of an effect, mitigation measures would be employed in consultation with appropriate regulatory agencies as per the draft PEPP.” No information is provided as to what the indicator and mitigation criteria would be during remediation.</p> <p>This information is required to assess the potential adverse environmental effects of the Project on surface water and groundwater, which can impact fish and fish habitat and Mi’kmaq of Nova Scotia health.</p>	<p>Update the effects assessment to include manganese in groundwater as a COPC or provide a justification as to why the manganese concentration in groundwater was not carried forward in the effects assessment.</p> <p>Provide additional information related to the indicator and mitigation criteria for groundwater remediation.</p>
<b>Air Quality</b>					
IAAC-54	HC	Section 3.2.3. Spatial and temporal boundaries	<p>EIS, Section 7.3.1.2 Air Quality and Odour Boundaries (p.7-234)</p> <p>Appendix A, Section 3.1.1 Identification of Study Boundaries (p.15)</p> <p>EIS 7.1.1.1, Figure 7.1-1 (p. 7-7)</p> <p>Appendix A, Figure 3.1 (pdf p.5338) and Appendix U, Figures D-1 to D-3 (pdf p.104 to 106)</p> <p>Appendix U, Figures E-1 to E-13 (pdf p.112 to 124)</p>	<p>The EIS Guidelines require the description of spatial boundaries taking into account the appropriate scale and spatial extent of environmental effects, community knowledge and Aboriginal traditional knowledge, current or traditional land use and resource use by Mi’kmaq of Nova Scotia, ecological, technical, social and cultural considerations.</p> <p>The proposed regional study area (RSA) in the atmospheric dispersion and deposition modelling presented in the Air Quality Impact Analysis report (Appendix U of the EIS) and the Project-Related Activities Human Health Risk Assessment report (PRA-HHRA – Appendix A of the EIS) is inconsistent with the RSA defined in the air quality assessment in section 7.3.1.2 and figure 7.1-1 of the EIS. The RSA for the air quality assessment was set to encompass all lands and water within 3 to 5 kilometers from the Site Study Area (SSA) perimeter. In contrast, the RSA for the atmospheric dispersion and deposition modeling and PRA-HHRA was reduced to an area within approximately one kilometre from the SSA perimeter (Appendix A, Figure 3.1; Appendix U, figures D-1 to D-3).</p>	<p>Update the atmospheric environment effects assessment to include the RSA identified in section 7.3.1.2 and figure 7.1-1 of the EIS, with consideration of traditional land use receptors. Alternatively, provide a rationale for the specific RSA selected in the atmospheric dispersion and deposition model.</p> <p>Update the health effects assessment to include the consideration of the ingestion of contaminated soil and country foods due to deposition of air quality contaminants, as well as direct inhalation of air contaminants. Alternatively, confirm that these exposure pathways were considered and provide details on how they were incorporated into the assessment.</p>

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				<p>The reduced RSA includes human receptor locations only within the Pictou Landing First Nation community, and along the Pictou Landing and Chance Harbour Roads (Appendix U, Figure D-1) and it remains unclear whether other human receptors besides the permanent residences considered in the EIS may be exposed to elevated levels of air contaminants near the project site during traditional land and resource use activities (e.g., hunting, fishing, trapping, plant gathering, ceremonial or spiritual practices).</p> <p>It also remains unclear whether the ingestion of contaminated soil and country foods due to deposition of air quality contaminants, as well as direct inhalation of air contaminants, was considered in health effects assessment.</p> <p>This information is required for the Agency to complete its assessment of the potential effects to air quality on human health.</p>	
IAAC-55	HC NSE	Section 7.1.1. Atmospheric environment  Section 7.6.3	<p>EIS, Section 7.1.2.1 Air Quality and Odour (p.7-8)</p> <p>Section 7.4.3.4.1.3 Cumulative Effects on Air Quality and Odour (p.7-737) <i>“Construction activities for the BHRP are scheduled to commence in 2021 and have the potential to overlap with the construction phase for Northern Pulp’s proposed new effluent treatment facility.”</i></p> <p>Appendix U, Air Quality Baseline Review (WSP 2018), Tables 3-1 to 3 (p.12 to 14)</p>	<p>The EIS Guidelines require a baseline survey of ambient air quality and an assessment of the Project’s cumulative effects by comparing future scenarios with the Project and without the Project.</p> <p>In the Air Quality Impact Analysis report (Appendix U of the EIS) air quality data used to establish baseline levels reflect two different datasets. Baseline levels for particulate matter were established after the closure of the Northern Pulp’s kraft pulp mill in January 2020. However, baseline levels for other air pollutants, such as nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO), were established based on monitoring data of two National Air Pollution Surveillance stations from 2016 to 2018, when the kraft pulp mill was still operational (Appendix U, Tables 3-1 to 3).</p> <p>It is not clear whether potential resumption of the Northern Pulp’s kraft pulp mill operations was also considered in the cumulative effects assessment.</p> <p>This information is required for the Agency to complete its assessment of the potential effects to air quality on human health and cumulative effects.</p>	<p>Provide a discussion on the uncertainties related to the baseline air quality levels used in the Air Quality Impact Analysis report given the closure of Northern Pulp’s kraft pulp mill in 2020, including:</p> <ul style="list-style-type: none"> <li>• how these uncertainties impact the overall air quality effects assessment; and</li> <li>• a rationale for why baseline particulate matter was established using air quality data collected after the mill was closed while NO<sub>2</sub>, SO<sub>2</sub>, and CO, were established based on monitoring data collected while the mill was still operational.</li> </ul> <p>Clarify whether potential resumption of the Northern Pulp’ kraft pulp mill operations was considered in the cumulative effects assessment. If it was not included, provide a rationale or update the cumulative effects assessment to include it.</p>
IAAC-56	HC	Section 7.2.1. Changes to the atmospheric environment	<p>EIS, Section 7.3.1.1 Predicted Changes to Air Quality and Odour (p.7-233)</p> <p>EIS Table 7.3-5 Comparison of Anticipated Air Quality Concentrations to Canadian Ambient Air Quality Standards (CAAQS) (p.7-232)</p> <p>Appendix U, Air Quality Impact Analysis (GHD 2020), Appendix E Air Modelling Results, Figures E-1 to E-18a (PDF p.111 to 131)</p> <p>EIS 7.3.1.1 Predicted Changes to Air Quality and Odour</p>	<p>The EIS Guidelines require the assessment of atmospheric emissions from various project-related activities.</p> <p>Diesel exhaust (DE) emissions can be generated from project activities, such as transport truck traffic and operation of heavy equipment during construction activities related to the Project. For example, the Air Quality Impact Analysis report (Appendix U of the EIS) predicted elevated levels of PM<sub>2.5</sub>, NO<sub>2</sub> and SO<sub>2</sub>, which are commonly associated with DE emissions, near the human receptor locations within the PLFN and along the Pictou Landing Road (Appendix U, Figures E-4 to E-13).</p> <p>The EIS concluded that the predicted air contaminant levels are not likely to impact Local Study Area/Regional Study Area (LSA/RSA) during the construction phase, partly because construction activities will be of short duration. However, there are potential adverse health effects associated with both short-term and long-term inhalation exposure to several air pollutants. Changes to air quality and associated health effects should be fully assessed for both short- and long-term exposures during all phases of the project.</p>	<p>Assess the potential health risks associated with short-term exposures of PM<sub>2.5</sub>, NO<sub>2</sub>, VOC, PAH and DPM for all phases of the Project and include additional measures, as required, to minimize/mitigate short-term emissions.</p> <p>Assess potential health risks posed by additional air contaminants associated with DE emissions, such as PAH, VOCs, and DPM, during all phases of the Project. Alternatively, provide a detailed rationale if an assessment is deemed unnecessary for any air pollutants or if the use of other assessment approaches, including the use of surrogates and/or a qualitative assessment, is considered appropriate. Include an estimate of the uncertainty associated with the use of the alternative approaches.</p>

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			EIS Table 7.3-1 Mitigation Measures and Best Management Practices (p.7-219 and 7-220)	<p>The project-associated air pollutant emissions, especially DE emissions, may contribute considerably to elevated levels of polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and diesel particulate matter (DPM) in air. Although most of these DE components are considered carcinogens, the EIS provided only an evaluation of non-cancer health effects of DPM based on the short-term (1 hr) and long-term (annual) exposure values.</p> <p>The EIS did not carry forward air contaminants associated with DE, such as PAHs and VOCs, to the Air Quality Impact Analysis (Section 7.3.1.1) or Project-Related Activities Human Health Risk Assessment (Appendix A, Section 3.1.4.7) as the baseline levels of these contaminants were not affected by the Pilot Scale Remediation activities.</p> <p>However, the truck traffic volume is predicted to be the greatest (i.e., more than 100 trucks travelling on the access road every day) during the Containment Cell Final Capping and Grading (Scenario 7), which was not considered in the air quality study for the Pilot Scale Remediation. The large volume of truck traffic was evaluated only as a source of fugitive dust, such as ambient total suspended particles, PM<sub>10</sub> and metals (EIS 7.3.1.1 p.7-234), and not properly investigated as a source of DE emissions.</p> <p>This information is required for the Agency to complete its assessment of the potential effects to air quality on human health.</p>	
IAAC-57	HC	Section 7.2.1. Changes to the atmospheric environment	<p>Appendix U, Air Quality Impact Analysis (GHD 2020), Table 7.3-2 Air Quality Modelling Scenarios (p.6): Scenario 4, Sources.</p> <p>EIS, Section 3.1.2 Dredging (p.3-11)</p> <p>EIS, Section 7.3.9.4.2 Dredging – Project Activities and Wetlands Interactions and Effects and Mitigation Measures (p.7-423)</p> <p>EIS, Section 7.1.10.3 Human Health, Figure 7.1-54 (p.7-200)</p> <p>Appendix A Human Health Risk Assessment (GHD, 2020), Table 3.1 (p.16)</p> <p>Appendix U Air Quality Impact Analysis (GHD 2020), Table 1.2 (p.6)</p>	<p>The EIS Guidelines require the assessment of atmospheric emissions from various project-related activities.</p> <p>Section 1.3 of the Air Quality Impact Analysis report (Appendix U of the EIS) categorized project activities into seven different scenario groups and identified air contaminant emission sources associated with each group. In Scenario 4 (Shoreline Dredging), air contaminants are assumed to be released from dredging pump diesel engines and exposed sediments during dredging due to shallow water levels. All sediment is assumed to be dredged or excavated in a wet condition. The shorelines of the effluent ditches, twin settling basins, aeration stabilization basin, BHSL, wetlands and estuary will be mechanically excavated and the material will be transported by trucks to the containment cell. However, it remains unclear how many transport trucks are anticipated to operate in Scenario 4 or whether the trucks are considered as a DE emission source in the air quality assessment.</p> <p>In addition, some of the shoreline excavation areas within the remediation boundary (i.e. the current high water mark) are not submerged in water (EIS, Figure 7.1-54 Human Health Risk Assessment Study Area Boundaries, p.7-200) and may be excavated under dry conditions, which could allow the release of fugitive dust and volatilized sediment contaminants at much greater rates than predicted in Scenario 4 (i.e. based on an assumption that all sediment will be excavated in wet condition).</p> <p>Decommissioning of the existing infrastructure, such as the wastewater effluent pipeline, treatment buildings and small structures, berms, and a water dam, is anticipated to occur during a 4-year period (Years 2 to 6) (Appendix A). However, it is unclear whether these activities are reflected in the Air Quality Impact Analysis report (Table 1.2 – Appendix U of the EIS).</p>	<p>Clarify how many transport trucks are anticipated to operate in Scenario 4 and whether diesel exhaust emissions from the trucks are considered in the air quality assessment and PRA-HHRA. Update the effects assessment as necessary.</p> <p>Update the health effects assessment to consider the potential air emissions in a dry sediment excavation scenario. Alternatively, provide rationale on how it can will be ensured that all shoreline sediments are excavated in wet condition.</p> <p>Clarify whether existing infrastructure decommissioning activities are considered in the Air Quality Impact Analysis. If not, provide a rationale for its exclusion or update the analysis to integrate the existing infrastructure decommissioning activities.</p>



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				This information is required to complete the assessment of the potential effects to air quality on human health.	
IAAC-58	HC NSE	Section 7.3.7. Mi'kmaq of Nova Scotia	Appendix A Human Health Risk Assessment (GHD, 2020), Section 3.1.4.5.2 BHRP-Related Activities Scenario (p.38)  PRA-HHRA (located at end of HHERA (Appendix A)), Section 3.3.1  Appendix U - Air Quality Impact Analysis Technical Report Section 2.1.2	The EIS Guidelines require the assessment of impacts to human health resulting from potential changes to air quality.  The Project-Related Activities Human Health Risk Assessment report (PRA-HHRA – Appendix A of the EIS) does not consider contaminants resulting from truck traffic-related DE emissions, such as PAHs and DPM, which may deposit onto soils. There exists the potential for deposition of PAHs and DPM onto soil, edible plants and surface waters. DPM also has the potential to adsorb other chemicals, which as a result may also settle onto soil, edible plants and surface waters.  Additionally, dust suppression is identified as a best management practice that may be used to mitigate dust from construction and demolition activities. The Air Quality Impact Analysis Technical Report (Appendix U) states that water will occur twice daily and is expected to achieve 80 percent control over untreated roadways for fugitive dust emissions. Nova Scotia Air Quality Unit notes that the Government of Canada's 'Road Dust Emissions from Unpaved Surfaces: Guide to Reporting' states that water twice a day achieves a control of 55 percent. The PRA-HHRA states that the dust suppressant may be water but further details about the source of water are not provided.  This information is required for the Agency to complete its assessment of the potential effects to air quality on human health.	Evaluate the potential for atmospheric deposition of air pollutants from DE emissions, including PAHs and DPM, onto nearby soils and subsequent bioaccumulation by country food species (e.g., edible plants). Provide rationale on why this is not an operable pathway. Identify the dust suppressant to be used at the site. If a chemical suppressant is intended as the dust suppressant at the site, provide a discussion on potential human exposures. If water is intended as the dust suppressant at the site, identify the source of the water and how the conclusion was reached that it would achieve 80 percent control over fugitive dust emissions.
IAAC-59	HC	Section 7.2.1. Changes to the atmospheric environment	EIS, Section 7.3.1.1 Predicted Changes to Air Quality and Odour (p.7-226)  EIS, Table 7.3-3 Summary of Air Quality Modelling Results (p.7-230)  Appendix Y, Section 5.1- Sediment Quality (p.49 to 53)	The EIS Guidelines require the assessment of impacts to human health resulting from potential changes to air quality.  Section 7.3.1.1 of the EIS considered only H <sub>2</sub> S, dioxins/furans and petroleum hydrocarbons (PHC) as potential air contaminants. However, contaminants present in sediment can be released to air through volatilization process during wet excavation, dredging, and dewatering of sediment. No rationale is provided for why other potential air contaminants, such as VOCs (1,2-dichlorobenzene and toluene), whose levels are also elevated in sediment and volatilization characteristics are similar to those of the selected contaminants, are not considered for further evaluation. For example, the Geology and Geochemistry Assessment documentation (Appendix Y of the EIS) reported that concentrations of the following sediment contaminants were determined to be above ecological quality criteria for sediment or human health criteria for soil:  <ul style="list-style-type: none"> <li>Metals (exceeding provincial human health criteria for soil): aluminum, cadmium, iron, thallium, and vanadium</li> <li>PAHs (exceeding the freshwater or marine sediment criteria)</li> <li>PHC (exceeding the freshwater or marine sediment criteria): Fraction 1, 2, and 3</li> <li>VOC (exceeding the freshwater or marine sediment criteria): 1,2-dichlorobenzene and toluene</li> <li>PCB (exceeding the freshwater sediment criteria): total PCBs</li> <li>PCDD/PCDF (exceeding the freshwater or marine sediment criteria)</li> </ul> This information is required for the Agency to complete its assessment of the potential effects to air quality on human health.	Update the air quality effects assessment to include an analysis on the atmospheric release of sediment contaminants, including but not limited to VOCs, through volatilization. Alternatively, provide a rationale for why the atmospheric release of certain sediment contaminants are not considered in the effects assessment of air quality.

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
IAAC-60	HC	Section 9.2. Monitoring	<p>EIS, Section 9.2 - Monitoring Programs, Table 9.2-1 (p.9-11)</p> <p>EIS, Section 3.2.3.1- Waste Management (p.3-47)</p> <p>EIS, Table 9.1-1 (p.9-5)</p> <p>Appendix A- Human Health Risk Assessment (GHD, 2020), Section 3.1.2 Identification of Human Receptors (p.17)</p>	<p>The EIS Guidelines requires an outline of preliminary environmental monitoring programs.</p> <p>The Independent Ambient Air Monitoring Program will continue to support monitoring of ambient air quality during the construction and operation phases until completion of major remediation activities. The Independent Ambient Air Monitoring Program specifies four air contaminants to be monitored in real-time (Table 9.2-1). Considering insufficient evaluation of project-associated DE contaminants, such as PM<sub>2.5</sub> and NO<sub>2</sub>, and their health effects at sensitive receptor locations (see HC-AQ-03), monitoring of PM<sub>2.5</sub> and NO<sub>2</sub> at a frequency that is consistent with the averaging time period and the statistical form associated with the CAAQS.</p> <p>It is unclear whether air contaminants of potential health concerns, including VOCs and Reduced Sulfur Compounds (RSCs) that may be released as part of Landfill Gas (LFG), will be monitored after the site closure (i.e. Containment Cell Final Capping and Grading). It is prudent to continue air quality monitoring as the entire SSA, except for the containment cell, will become accessible for PLFN residents' recreational use after the remediation is completed (Appendix A, Section 3.1.2, p.17) and as the containment cell will not be decommissioned for an indefinite period (3.2.3.1 Waste Management, p.3-46).</p> <p>This information is required for the Agency to complete its assessment of the potential effects to air quality on human health.</p>	<p>Update the long-term monitoring plan for air contaminants to include PM<sub>2.5</sub> and NO<sub>2</sub>, and emissions from LFG after the site closure. Alternatively, justify why air quality monitoring of these potential air contaminants is not required during the post-remediation phase.</p>
IAAC-61	HC	Section 7.5. Significance of residual effects	<p>EIS Table 7.2-4 Characterization Criteria for Residual Environmental Effects (p.7-215)</p> <p>EIS, Section 7.3.1.3 - Air Quality and Odour Standards or Thresholds for Determination of Significance (p.234)</p>	<p>The EIS Guidelines require the identification of criteria used to assign significance ratings to any predicted adverse effects.</p> <p>The magnitude of residual effects (Table 7.2-4 of the EIS) was determined partly based on whether the effects deviate from the baseline conditions within (or outside of) "the range of natural variation" or whether the effects "marginally" exceed the guideline values. It is unclear what the range of natural variation is and what the marginal exceedance scale is in relation to the baseline conditions and air quality guidelines, respectively. Furthermore, no explanation is provided on how the proposed judgement criteria were developed, or whether they are adequate to protect human health.</p> <p>The Canadian Air Quality Management System explicitly recognizes that health effects occur below the CAAQS values, and proposes additional management levels in recognition of the health and environmental benefits that can be realized by taking actions to decrease or maintain background levels of air pollution. Therefore it is unclear how the proposed "low-magnitude" significance criterion for residual air effects would adequately protect against human health considering some air contaminants are non-threshold and health effects may occur below the CAAQS.</p> <p>The duration of residual effects was determined based on the amount of time for the effects to become reversible. For example, the long-term residual effect is reversible within a "defined length of time". However, it is unclear what the defined length of time is or whether it corresponds to the "2 percent of the time" that is used as part of significance determination criteria in Section 7.3.1.3.</p> <p>This information is required to complete its assessment of the potential effects to air quality on human health.</p>	<p>Update the criteria for determining significance of adverse residual effects for air quality and describe the following:</p> <ul style="list-style-type: none"> <li>• how the proposed judgement criteria were developed and how they are protective of human health;</li> <li>• the range of natural variation and marginal exceedance scale in relation to the baseline conditions and air quality guidelines, respectively;</li> <li>• the amount of time for the residual effects to become reversible; and</li> <li>• how the proposed "low magnitude" significance criterion for residual air effects would adequately protect against human health considering some air contaminants are non-threshold and health effects may occur below the CAAQS.</li> </ul>

IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
<b>Country Foods</b>					
IAAC-62	HC	Part 2, Section 7.3.7	HHERA, Table H-1.15, Section 6.1.1.12, Section 5.2	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project will affect the Mi'kmaq of Nova Scotia, including their health. The EIS must consider the current and future availability and contamination of country foods in its analysis.</p> <p>Table H-1.15 and table C-1.12 of the Human Health and Ecological Risk Assessment report (HHERA – Appendix A of the EIS) reported that shellfish tissue collected from the Northumberland Strait, at the outfall of the estuary, have concentrations of aluminum, lead and manganese above the shellfish tissue screening guidelines and background level concentrations. The HHERA stated that these contaminants were not evaluated further because:</p> <ul style="list-style-type: none"> <li>• the distinct exceedances were observed only in three (3) out of ten (10) clam tissue samples and the contaminant levels of the remaining seven (7) samples were similar to or below the selected screening criteria or background concentrations;</li> <li>• aluminum and manganese are ubiquitous in sediment and the elevated levels are not necessarily related to the BHETF; and</li> <li>• the clam tissue samples were not deperated prior to laboratory analysis (i.e. contaminants in stomach could have been detected in addition to the ones truly accumulated in tissue).</li> </ul> <p>However, it is noted that aluminum and manganese concentrations in all ten clam tissue samples were above their respective background concentrations. Furthermore, the high concentrations of aluminum, manganese and lead in clam samples are not observed consistently from the same samples (i.e. samples higher in aluminum do not necessarily have corresponding higher manganese or lead, which is what you might expect if it was just background). The analytical results, although limited in sample size, appear to be normally distributed. Therefore, the elevated contaminant concentrations in all clam tissue samples should be properly evaluated in the HHERA.</p> <p>Furthermore, contaminant concentrations in clam tissue from the project site were compared to “background concentrations” if the site concentrations were above the screening guidelines. However, section 6.1.1.12 of the HHERA indicates that the background concentrations used for comparison were collected from several shellfish tissues, including crab, lobster and mussels, rather than from clam. It is inappropriate to determine COPCs or characterize potential health risks from consuming contaminated clams based on the background data collected from crustacean shellfish and other bivalve species.</p> <p>The Canadian Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products (CFIA guidelines)<sup>7</sup> were used to determine whether arsenic, lead, mercury and dioxins/furans be qualified as COPCs in fish and shellfish. However, they are not valid screening guidelines for arsenic and lead in fish and shellfish as these values are specifically designed for fish protein or a standardized concentrated product (described under B.021.027 of the <a href="#">Food and Drug Regulations</a>), but not for the commonly consumed muscle tissue of finfish or shellfish. Health Canada also does not recognize these guidelines as a safety standard for dioxins/furans in fish</p>	<p>Carry forward the aluminum, lead, and manganese in clam tissue samples to a full HHERA. Alternatively, provide additional rationale to support screening them out of the HHERA.</p> <p>Determine COPCs in fish and shellfish country foods based on a comparison to the levels observed at a reference site (i.e. background concentrations). In the absence of such background data, the contaminants (i.e. lead, vanadium, arsenic, mercury, and dioxin/furans in fish) should be carried forward as COPCs to a full HHERA. Alternatively, provide evidence-based rationale supporting the use of the selected screening criteria; include a discussion on the uncertainties in using this criteria.</p> <p>Provide a detailed rationale on how the proposed background contaminant concentrations from crab, lobster, and mussels can support proper screening of contaminants in clam tissue and assessing potential human health risks.</p>

<sup>7</sup> CFIA (Canadian Food Inspection Agency). 2016. Fish Products Standards and Methods Manual. Appendix 3: Canadian Guidelines for Chemical Contaminants and Toxins in Fish and Fish Products.



IR Number	External Reviewer ID	Reference to EIS Guidelines	Reference to EIS	Context and Rationale	Specific Question/Information Requirement
				<p>as the value does not consider the current approach to deriving dioxin/furan toxicity or concentrations.</p> <p>Furthermore, the CFIA guidelines are developed to determine compliance of commercial foods and thus the underlying assumptions (e.g., consumption pattern) may not be directly applicable to the screening of country foods. Therefore, the guidelines for mercury is also not an appropriate screening criteria for the project.</p> <p>Clarification and additional information about the screening criteria used to determine COPC in fish and shellfish is required to assess the potential adverse effects of the Project on country foods, which can impact Mi'kmaq of Nova Scotia health.</p>	
IAAC-63	HC	Part 2, Section 7.3.7	HHERA, Table H-1.15	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project will affect the Mi'kmaq of Nova Scotia, including their health. The EIS must consider the current and future availability and contamination of country foods in its analysis.</p> <p>Table H-1.15 of the Human Health and Ecological Risk Assessment report (HHERA – Appendix A of the EIS) indicates several contaminants, including arsenic, cadmium, and mercury, were not included as COPCs in shellfish as their measured levels were determined to be non-detect, or below the analytical limits of detection (LOD). For these contaminants, the health-based guideline values cannot serve as adequate screening criteria as the guideline values are also lower than the LOD. Alternative screening criteria, such as background concentrations, were not provided. Health Canada recommends that when the measured concentration of a contaminant is below the LOD, and the LOD is higher than the background concentration or the health-based guideline value, the contaminant should be considered as a COPC and the potential health effects should be properly evaluated.</p> <p>Dioxins/furans were not included as a COPC in the HHERA. Health Canada recommends dioxins/furans to be included as a COPC due to their potential to accumulate in country foods.</p> <p>Additional information regarding the screening of COPCs in country foods is required to assess the potential adverse effects of the Project on country foods, which can impact the health of the Mi'kmaq of Nova Scotia.</p>	<p>Revise the HHERA to include arsenic, cadmium, mercury and lead as COPCs for further assessment. Alternatively, justify why arsenic, cadmium, mercury, and lead were not assessed further, considering their potential toxicity to human health (irrespective of the COPC screening results).</p> <p>Revise the HHERA to include dioxins/furans as a COPC due to their potential to accumulate in country foods. Alternatively, justify why dioxins/furans are not anticipated to accumulate in country foods.</p>
IAAC-64	HC	Part 2, Section 7.3.7	HHERA (EIS- Appendix A), Section 6.4.3.6 (p.143)	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project will affect the Mi'kmaq of Nova Scotia, including their health. The EIS must consider the current and future availability and contamination of country foods in its analysis.</p> <p>Table 6.15 of the Human Health and Ecological Risk Assessment report (HHERA – Appendix A of the EIS) provides a risk summary for the consumption of game organs by PLFN residents or recreational users. Based on an oral absorption factor of 1.0, the HQs calculated for cadmium and vanadium were both over the target HQ of 0.2. The HHERA suggests that although the HQs exceed the 0.2 HQ target, the oral absorption factor used (1.0) is much higher than the US EPA's gastrointestinal absorption factors for cadmium (0.025) and vanadium (0.026). Although the HQs are above the 0.2 target when using an oral absorption factor of 1.0, the HHERA states that this is overly conservative, and by using US EPA's gastrointestinal absorption factors, the HQ values for cadmium and vanadium would be well below the HQ target value of 0.2.</p>	<p>Update HHERA assuming 100% of contaminants present in animal tissues is bioavailable and absorbed by humans in the gastrointestinal tract through food ingestion. Alternatively, provide detailed rationale on how the proposed absorption factors of less than 1.0 for cadmium and vanadium can meet the specific requirements for an application to the present HHERA.</p>

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				<p>Additional information is required to substantiate application of an absorption factor of less than 1.0 for cadmium and vanadium. Several factors should be considered to determine whether an absorption factor of less than 1.0 is applicable for a study. For example, the proponent must demonstrate that the absorption factor for the contaminated medium used in the critical study is substantially different from the exposure scenario considered in the present HHERA, or that the test species used in the critical study absorbs the contaminant to a much greater extent than the target population in the present HHERA.</p> <p>Health Canada recommends that the proponent assume 100% of contaminants present in animal tissues is bioavailable and absorbed by humans in the gastrointestinal tract through food ingestion<sup>8</sup>.</p> <p>Rationale for using an absorption factor of less than 1.0 for cadmium and vanadium is required to assess the potential adverse effects of the Project on Mi'kmaq of Nova Scotia health.</p>	
IAAC-65	HC	Part 2, Section 7.3.7	<p>HHERA (EIS- Appendix A) 6.4.3 Quantitative Interpretation of Health Risks (p.138 -)</p> <p>HHERA (EIS- Appendix A) Table H-1.11 Occurrence, Distribution, and Identification of Chemicals of Concern (COC) in Fish (Fillet) Tissue [...] (pdf p.4911)</p>	<p>The EIS Guidelines require a description and analysis of how changes to the environment caused by the Project will affect the Mi'kmaq of Nova Scotia, including their health. The EIS must consider the current and future availability and contamination of country foods in its analysis.</p> <p>Section 6.4.3 of the Human Health and Ecological Risk Assessment report (HHERA – Appendix A of the EIS) assessed the potential exposure level and associated health risks for each contaminant in each type of country food (plant, game organ, waterfowl) separately, instead of providing a combined exposure level from all operable country food exposure pathways and a total risk estimate for that contaminant. The approach may lead to an underestimation of potential health risks.</p> <p>Mercury concentrations in shellfish and fish fillet samples were not available for review. Mercury concentrations were presented in whole fish samples rather than in specific tissues/organs (e.g. muscle) that may be consumed by local consumers. In the absence of information on the mercury concentrations in specific tissues/organs of fish and other aquatic food species, health risks from consuming mercury-contaminated aquatic food species may be underestimated.</p> <p>This information is required to assess the potential adverse effects of the Project on country foods, which can impact Mi'kmaq of Nova Scotia health.</p>	<p>Assess the potential health risks associated with combined exposure from all country foods for each COPC. Alternatively, provide rationale for why a combined exposure level is not necessary.</p> <p>Provide updated mercury exposure estimates and associated health risks based on mercury concentrations in shellfish fish tissues/organs that may be consumed by local consumers. Alternatively, provide rationale for why whole fish samples were adequate for determining health risks from consuming mercury-contaminated aquatic food species.</p>
<b>Surface Water and Groundwater</b>					
IAAC-66	ECCC	Part 2, Section 7.2.2	<p>Section 7.1.5 Groundwater and Surface Water</p> <p>Appendix Z Groundwater and Surface Water Assessment Documentation</p>	<p>The EIS Guidelines require the EIS to assess the potential changes to groundwater and surface water caused by the Project.</p> <p>The Hydrologic Evaluation of Landfill Performance (HELP) model does not include a component for water quality and is used for calculating infiltration and leachate. According to the HELP manual (EPA, 2020<sup>9</sup>), there are some limitations in the application of the model, and these are linked to modeling procedures being based on many simplifying assumptions. These include:</p> <ul style="list-style-type: none"> <li>estimation of snow portion of precipitation and snowmelt processes (e.g., melt factor;</li> </ul>	<p>Discuss the assumptions and limitations of the HELP model in its application to the specific design of the containment cell.</p> <p>Clarify how model uncertainties have influenced the design of the follow-up monitoring program.</p>

<sup>8</sup> Health Canada's Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods (Health Canada, 2018)

<sup>9</sup> U. S. Environmental Protection Agency: Hydrologic Evaluation of Landfill Performance: HELP 4.0 User Manual (2020). <https://www.epa.gov/land-research/help-40-user-manual>

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				<ul style="list-style-type: none"> <li>• prediction of frozen soil conditions, runoff computation (e.g., assuming that areas adjacent to the landfill do not drain into the landfill);</li> <li>• calculation of evapotranspiration; vegetative growth (i.e., crop growth model) assumptions;</li> <li>• vertical flow through layers (i.e., layers are assumed to be homogeneous);</li> <li>• lack of preferential flow (through cracks, fractures, holes, etc.);</li> <li>• estimating conditions for unsaturated flow;</li> <li>• conditions for percolation through the soil liners;</li> <li>• leakage through the geomembrane(s); and</li> <li>• conditions triggering subsurface inflow.</li> </ul> <p>The model and monitoring elements of the Project should be considered in concert (e.g., uncertainty in modelling may be addressed in the monitoring design).</p> <p>This information is needed to better understand potential impacts of the Project to groundwater and surface water, which can impact Mi'kmaq of Nova Scotia health, fish and fish habitat, and the marine environment.</p>	
IAAC-67	DFO NSE	Part 2, Section 7.1.5  Part 2, Section 7.2.2	Section 7.1.4.1 (page 7-93) - Surface and Groundwater Interactions  Appendix Z – two studies Boat Harbour Hydrogeology Assessment (AECOM 2016), p. 208 Well Field Evaluation Report (GHD 2018), p. 300 and Vol IV, p. 7-53 and Vol IV, P. 7-329	<p>The EIS Guidelines require a hydrogeological conceptual model of the project area that includes a description of the hydrostratigraphy and groundwater flow systems. The model should include a delineation and characterization of groundwater – surface water interactions and the locations of groundwater discharge to surface water and surface water recharge to groundwater.</p> <p>The hydrostratigraphic conceptual model presented in the EIS and appendices is unclear. In Appendix Z, two different studies seem to provide different views on the source of groundwater and impacts of construction to groundwater for the PLFN Wellfield. The 2016 AECOM Boat Harbour Hydrology Assessment Report indicates that the PLFN off-peninsula groundwater wellfield source capture zone is hydraulically connected to precipitation recharge. The report concludes that changes in groundwater levels in the PLFN wellfield will be present, although relatively small. Section 7.1.4.1.2 of the EIS further states “there is a downward vertical gradient between either the overburden or shallow bedrock and the deep bedrock” at the PLFN wellfield. Conversely, the 2018 GHD Well Field Evaluation Report states that there is no direct hydraulic connection between groundwater in the overburden/ shallow bedrock layers and the deeper PLFN wellfield and that the dewatering during remediation would not affect either the quality or quantity of groundwater in the PLFN wellfield. However, no evidence is provided in the EIS for an effective stratigraphic confining layer that is assumed in their conceptual hydrostratigraphic model to limit vertical hydraulic conductivity between the shallow aquifers and the deeper PLFN wellfield.</p> <p>Section 7.1.4.1 of the EIS states while there is limited interaction between surface water and groundwater in the project area, although groundwater does enter portions of some watercourses. However, the EIS does not specify which watercourses or the location of these surface water and groundwater interactions. Knowledge of these locations is important because temperatures in surface waters can change where groundwater and surface water interact.</p>	<p>Provide a detailed description of a conceptual hydrostratigraphic model for the PLFN groundwater wellfield that uses all available information to:</p> <ul style="list-style-type: none"> <li>• evaluate the PLFN off-peninsula wellfield source capture zone;</li> <li>• describe model layer infiltration, vertical and horizontal conductivity and flow;</li> <li>• describe the confining layer for the deeper groundwater zone, if present;</li> <li>• describe the potential for the Project to lower groundwater levels; and</li> <li>• update the effects assessment, as required.</li> </ul> <p>Describe the locations where the groundwater interacts with the surface water and any temperature changes in the surface water that may result. Update the effects assessment for surface and ground water quality and quantity and fish and fish habitat, if required.</p>

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				A detailed description of a conceptual hydrostratigraphic model is required to assess any potential project effects on surface and ground water quality and quantity, fish and fish habitat, and PLFN's water wellfield.	