

**MEMORANDUM**

TO: Lachlan Maclean, Impact Assessment Agency of Canada

FROM: Bridget Tutty, NS Environment and Climate Change

DATE: December 10, 2021

SUBJECT: Boat Harbour Technical Review of Round 1 IR

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Good Afternoon Lauchie,

Please find below provincial comments on the provided Round 1 Information Requirement responses.

Boat Harbour Remediation Project – Federal Impact Assessment Provincial Technical Review December 2021

NS Environment and Climate Change

Comment #	Reviewer	Department	Information Request #	EIS Section and Page (if applicable)	Context and Rationale	Specific Question/ Request for Information
NSECC 1	SAS Hydrogeologist	NSECC	IAAC-53	p. 115	IR on - Drinking water for PLFN	<p>States the possibility for potable water exclusion zone around ASB. They have not defined background concentrations, just stating that Manganese is naturally elevated and not further evaluated. They state that potable exposure pathways are inoperable. My question still is in regard to assumptions that lead to the possibility that choosing risk management of groundwater, rather than more stringent criteria-based management, could leave it impacted in perpetuity.</p> <p>- Figure showing GW sampling results requested does not seem to have been provided ?</p>
NSECC 2	SAS Hydrogeologist	NSECC	IAAC-66	p. 93	IR on - HELP Model	<p>Point for clarification. The response states the “average porosity of 0.73, which is higher than the 0.67 default MSW porosity” - both of these seem extremely high for porosity of soil type materials. Are these correct? Why does the text go on to say – “the default MSW value of 0.292 was used to be conservative.” Which value is the default - MSW 0.67 or 0.292? What data are they using to make these estimates?</p>
NSECC 3	SAS Hydrogeologist	NSECC	IAAC-67	p. 73	IR on - Hydrogeological conceptual model	<p>Consultant was not able to fully answer this IR re: the PLFN capture zone. The modelling and field work previously conducted does not fully address the question. They state that “<i>the monitoring well network is not extensive enough to accurately map the extent of the PLFN off-peninsula wellfield capture zone</i>”</p> <p>Based on the response and a further review of the initial submission, there appears to be no truly completely confining hydrostratigraphic layer, but there is some stratigraphic geological layering. This have different primary porosities, however, the main groundwater flow feature is related to secondary porosity with in the bedrock fractures. Fractures are present in all the bedrock type. In my view, based on the data presented, the PLFN groundwater supply is not in a fully confined aquifer zone due to fracture flow. This should be considered a semi-confined or “leaky” aquifer situation, as evident in the initial data report and supported in the IR (which states “<i>A component of this [shallow] flow is directed downward into the deeper bedrock.</i>”).</p> <p>The previous groundwater modelling work conducted clearly finds there may be some effect of drawdown from lagoon dewatering at the location of some PLFN pumping wells, in addition to locations adjacent to the lagoon. The drawdown at pumping wells is estimated to be between 0.4 m (PW8) and 0.9 m (PW9). While lower than the threshold of 1 m that the consultant quotes as</p>

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						<p>significant, it should be noted that these are estimates (could be higher) and that the capacity of the pumping wells to accommodate these changes was not presented.</p> <p>Note also that the pumping wells intake zones are well below AMSL at -80 m (PW9) and -83 m (PW10).</p> <p>All of the above comments do not necessarily mean the PLFN well field is under increased risk of impact from the planned remedial activities, however it does provide additional context that could be meaningful if there are future activities that result in additional questions.</p>
NSECC 4	WR Engineer	NSECC	IAAC-14		<p>Results and conclusions from JWEL 2004 are summarized, but it is unclear whether the conclusions made in the JWEL 2004 report confirmed through field data collection and further assessments.</p> <p>It is stated that “A TSS compliance threshold of 25 mg/L was assumed by WSP for potential suspended sediment releases into the marine environment. The same threshold of 25 mg/L, as well as background concentrations and the allowable limit of 25 mg/L above background, was considered for the supplemental modelling and analysis.” It is unclear where this ‘allowable limit of 25 mg/L above background’ came from and what the justification for it is.</p>	<p>Confirm whether the conclusions made in the JWEL 2004 report can be confirmed through work that has taken place since</p> <p>Clarify where the ‘allowable limit of 25 mg/L above background’ was determined and its justification.</p>
NSECC 5	WR Engineer	NSECC	IAAC-31		<p>It is stated that a ‘six percent contingency capacity for climate change consideration for the projected 2080 rainfall increase’.</p>	<p>Provide a rationale or description of the methods used to come to this six percent number to support its use.</p>

Comment #	Reviewer	Department	Information Request #	EIS Section and Page (if applicable)	Context and Rationale	Specific Question/ Request for Information
NSECC-6	Surface Water Quality Specialist (SWQS)	Environment and Climate Change, Water Branch	IAAC-14	Section 7.3.6 Section 7.1.6.1.1 Section 7.1.6.2 Section 7.3.7.4.3 Section 7.3.7.6 Appendix Z – Coastal Hydraulic Modeling (WSP 2020; Appendix Z)	<p>The EIS Guidelines require a detailed description of the baseline conditions to assess the potential changes to the marine environment in the estuary and along the Northumberland Strait shorelines immediately outside of the mouth of Boat Harbour, including potential changes to:</p> <ul style="list-style-type: none"> <li>• marine water quality, marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae, and phytoplankton;</li> <li>• marine fauna, including benthic organisms, fish, marine mammals and sea turtles and their associated habitat; and</li> <li>• federally and provincially listed marine species at risk</li> </ul> <p>Section 7.1.6.1.1 of the EIS describes the estuary and Pictou Road shorelines at a very high level and appears to be based on land and wetland surveys with no discussion of the marine benthic habitats. It is not clear from the EIS if the proponent incorporated Indigenous and local knowledge baseline information into the</p>	<p>Provide more detailed information on the baseline conditions in the estuary and the Northumberland Strait shorelines immediately outside of the mouth of Boat Harbour. Use this information and the results of the WSP 2020 Coastal Hydraulic Modeling Report (Appendix Z) to update the effects assessment of surface water, marine environment, and fish and fish habitat.</p> <p>This should include a discussion of the impacts from both water column increases in TSS and deposition of sediment on:</p> <ul style="list-style-type: none"> <li>• marine water quality;</li> <li>• marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae, and phytoplankton;</li> <li>• marine fauna, including benthic organisms, fish, marine mammals and sea turtles and their associated habitat;</li> <li>• federally and provincially listed marine species at risk; and</li> <li>• fisheries resources, such as aquaculture and seafood facilities.</li> </ul> <p>For the WSP 2020 Coastal Hydraulic Modeling Report:</p> <ul style="list-style-type: none"> <li>• Expand the model to include nearby marine habitat, provide the revised model results and update any relevant information such as the effects assessment based on those results. Alternatively, justify why the current model domain is sufficient.</li> </ul> <p>Provide sediment deposition thickness data for the marine environment in the Pictou Road area and update any relevant information such as the effects assessment, mitigation measures, and follow up monitoring.</p>

Comment #	Reviewer	Department	Information Request #	EIS Section and Page (if applicable)	Context and Rationale	Specific Question/ Request for Information
					<p>marine environment and fish and fish habitat assessments.</p> <p>The Coastal Hydraulic Modeling Report in Appendix Z of the EIS includes modelling for a potential increase in total suspended solids (TSS) based on the Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life (Marine). The modelling predicts an increase in TSS, well above the CCME guidelines of 25 mg/L above background levels, flowing into the estuary and strait for at least one year after the dam is removed and Boat Harbour is returned to tidal. The EIS determined that the effects on surface water are not significant; however, Appendix Z is not referenced in this analysis.</p> <p>DFO has noted that sensitive receptors, such as eelgrass beds, could be reduced or lost as a result of elevated TSS. Elevated concentrations of suspended sediment and increased turbidity may result in adverse effects in as little as days and biomass reductions in months.</p> <p>The Nova Scotia Department of Fisheries and Aquaculture stated that the commercial industry has expressed concerns with potential impacts of the Project on water</p>	

Comment #	Reviewer	Department	Information Request #	EIS Section and Page (if applicable)	Context and Rationale	Specific Question/ Request for Information
					<p>quality. Information about how fisheries resources such as aquaculture and seafood facilities may be impacted by the potential increase in TSS is required.</p> <p>The Coastal Hydraulic Modeling Report indicates that approximately 140,000 m<sup>3</sup> of sediment leaves the modeled domain with an unknown end point. The model domain does not address potential effects to nearby marine habitat.</p> <p>Figure 5.16 in the Coastal Hydraulic Modelling Report shows the sediment anticipated to be deposited on the sea floor in the Pictou Road area; however, the sediment deposition thickness is unclear.</p>	

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Date: December 6, 2021

To: Bridget Tutty  
Environmental Assessment Officer

From: Inspection Compliance and Enforcement, Nova Scotia Environment and  
Climate Change

Subject: Boat Harbour Remediation Project – Response to Information Requests

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The following comments have been developed by technical staff within the Inspection Compliance and Enforcement division, based on review of the *Boat Harbour Remediation Project Response to Information Requests*, September 2021.

### **IAAC03**

Although no response was provided by NS Lands in the Tables, a response was provided in Section 2.4.1. This section indicates the waste currently located in the containment cell will be relocated to the Settling Ponds and the ASB. Submissions by NPNS indicate the settling ponds were not constructed with an engineered liner to prevent interaction with groundwater. A plan to upgrade the settling ponds to ensure the waste is isolated will be required.

A geotechnical investigation of the ASB will be required to verify its' construction. Based on the results of that investigation, a plan for any necessary upgrades to the ASB to ensure the waste is isolated, will be required. Please note, any leachate generated by the waste while stored in the Settling Ponds and the ASB will be required to be collected and treated to CCME/EQS criteria prior to discharge at Point C. This could be a condition of EA and Provincial IA.

### **IAAC04 and IAAC05**

The point of discharge is significant in determining the criteria the effluent/wastewater from the project will be required to achieve. All wastewater/effluent generated from the dredging operations as well as the geotube dewatering process and leachate generated from stored waste will be required to be treated to meet the appropriate CCME/EQS criteria prior to discharge, this includes if the first point of discharge is back into Boat Harbour itself before entering the estuary. Dilution of waste to meet criteria is not an acceptable remediation strategy. This could be a condition of EA and Provincial IA.

### **IAAC14**

Modelling information was not provided.

### **IAAC31**

What is the rationale for using a 6% increase to allow for climate change on the sedimentation pond and ditching?

### **IAAC53**

The current use of groundwater in an area does not dictate the classification of the source with respect to potable or non-potable. The Province, as the regulator of groundwater, has deemed this site to be potable with respect to applicable remediation criteria. The site must be assessed against potable criteria. Please note, although the Province has chosen to manage this remediation project by way of Industrial Approval, this does not mean that the Contaminated Sites Protocols do not apply. On the contrary, the NSE Contaminated Sites Protocols and their intent, will be incorporated into the Industrial Approval.

### **IAAC55**

Background data must be collected, prior to the start-up of the project, that is representative of actual background conditions during the period prior to initiation of the project. This would include monitoring of NO<sub>x</sub>, SO<sub>x</sub> and CO. A monitoring plan should be provided for review and approval prior to monitoring. This could be a condition of the EA.

### **IAAC58**

In addition to truck traffic, fugitive dust emissions may be released as a result of construction of the containment cell, including from stockpiled materials. Ceasing truck traffic until dust settles may not be an acceptable or reasonable alternative during the project. NS Lands should have a comprehensive plan in place for the continued management of fugitive dust, from all potential sources. If sources are eliminated because of mitigative measures, this should be discussed. The plan should include the mitigation thresholds and how they will be measured.



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Date: December 6, 2021

To: Bridget Tutty  
Environmental Assessment Officer

From: Resource Management Unit staff within the Sustainability and Applied Sciences  
Division of Nova Scotia Environment

Subject: Boat Harbour Remediation Project – Response to Information Requests

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### Introduction

The following comments have been developed by technical staff within the Resource Management Unit of NSE based on review of the *Boat Harbour Remediation Project Response to Information Requests*, September 2021.

It should be noted that several comments provided by reviewers to previous submissions (i.e., Project Description and Environmental Impact Statement (EIS)), were not reflected in the information requests prepared by EAAC or responses provided by the proponent.

### **Report layout and Presentation of Information**

In many cases the responses provided did not appear to address the questions being asked. In some cases, the numbering was off (e.g., IAAC-IR reference in Section 1, Table of Concordance did not align with corresponding IR response in Section 2) and in other cases the response simply did not speak to the information requested.

### **Application of Contaminated Sites Regulations (IAAC-53)**

Consistent with comments provided to previous submissions, the Response to Information Requests did not acknowledge the requirements of the Nova Scotia Contaminated Sites Regulations. The Contaminated Sites Regulations are supported by seven Ministerial Protocols, which prescribe the minimum requirements applicable to contaminated sites within provincial jurisdiction.

With respect to ground water potability on site, the response to IAAC 53, does not conform to the NS Contaminated Sites Regulations. Regardless of current groundwater use at the site, the site is considered potable according to the Regulations. The Notification Protocol defines potable as “all groundwater in the Province outside of municipal water serviced

areas, and as determined following Appendix 2, Figure 3 in this protocol.” As per the Remediation Levels Protocol, “the determination and applicability of land use and potential groundwater potability must be as described in PRO-100, Notification of Contamination Protocol.”

It is inappropriate to remove the potable groundwater exposure pathway based simply on current groundwater use at the site. The remediation project cannot rely on the “likelihood” of future well locations or groundwater use at the site or defer evaluation to potential future developers. The potable groundwater pathway must be considered as part of the remediation project. The application of any administrative controls or groundwater exclusion zones to eliminate the potability pathway, may be addressed through conditional closure under the Limited Remediation pathway.

It is unclear from the information provided what impact the application of potable criteria may have on the design, operation, and management of the proposed project.

### **Containment cell design and operation (Ref. IAAC-03, 66, 75, 76)**

Information requests were not provided to address items previously communicated by reviewers concerning the proposed cell design.

As noted by others, the final cover materials and 4H:1V side slopes assumed in the HELP closure model scenario, as well as the contingency option of 3H:1V side slopes do not align with the guidance outlined in the Nova Scotia Industrial Landfill Guidelines. Furthermore, a significant portion of the waste material proposed to be placed within the containment cell has been defined as hazardous waste. Insufficient information has been provided to demonstrate the cell location and design have been established in accordance with the criteria set out in CCME National Guidelines for Hazardous Waste Landfills. (Issues include depth and permeability of substrate below the cell, thickness of clay and composite layer).

The response provided to IAAC 66 noted that the primary purpose of the HELP model is to assist in the comparison of design alternatives as judged by their water balances. The response indicates that historic, site-specific data was used for input parameters for weather/climatic data and soil/design data. It is unclear from this information, what affect potential increases in precipitation, attributed to climate change may have on model outputs.

No information was provided concerning the effectiveness of the clay liner system within the existing containment cell or whether the soil beneath the current cell has been impacted by leachate. Beyond the estimated top 0.15 m of clay liner to be removed with existing sludge, due to disturbance from heavy equipment and increased moisture content, it is unclear whether the base of the existing cell will be assessed and remediated if applicable, prior to cell modifications.

Although the HELP model reportedly indicated minimal leachate generation following final cover placement and very low leakage, the amount and characterization of noted leakage was not defined.

The response to IAAC-66, noted a long-term monitoring program will be in place to sample for all Site leachate indicator parameters to ensure no negative environmental impacts. Details of the sampling program and applicable criteria have not been defined. The proponent has noted that as a conservative measure when designing the containment cell liner system, the worst-case results from bench/pilot scale testing were evaluated against the NSE Tier 2 Table 3 Groundwater Discharge to Surface Water (Greater than 10 m from Surface Water Body, Marine). The response does not acknowledge the potable water designation that is applicable to the site.

The response to IAAC -03, indicates that there are no plans to develop a new temporary waste staging area for waste sludges. Sludge in the existing containment cell will be relocated to portions of BHETF (settling basins or ASB) or the pilot scale temporary treatment pad and rely on existing processes used to currently manage waste in those locations, (leachate sent to ASB then to Boat Harbour stabilization basin via a gravity outfall). No additional information was presented to discuss effects of placing approximately 180,000 m<sup>3</sup> of waste sludge into the settling basins or ASB. There does not appear to be any plan to isolate materials or prevent interactions with surface water and groundwater.

The response to IACC-75 does not address how the end dumped material will be contained within the containment cell or how it would be compacted. IAAC-74 indicates that “non-dredged loose sludge” will be placed in the cell after bulk dewatering has been complete. It is unclear from the information provided how infilling between geotubes will occur or whether the approach could result in cavities within the cell that could result in geotubes shifting during vertical placement.

The response to IAAC-76 indicates that material described as “end dumped” will be permitted to “dry out prior to placement in containment cell”. It is unclear how materials will be permitted to dry out or where this material will be staged. It is unclear how associated dewatering effluent/ bulk water/leachate will be managed.

#### **Dust (Ref. IAAC-58)**

The response to IAAC 58 discusses the control of dust emissions associated with vehicle traffic during the remediation project, however, the issue of dust releases from the open face of the containment cell does not appear to be addressed. Furthermore, the report proposes in IAAC-03 that the materials removed from the containment cell would be stockpiled in the settling basin/ASB and the materials excavated from the ditches, berms, causeway (IAAC- 76) would be end dumped and allowed to dry out. In both situations, these stockpiles could be the source of fugitive dust emissions that do not appear to be addressed.

#### **Uncertainty regarding waste volumes and lack of contingency plan (Ref. IAAC-73, 74)**

Uncertainty remains concerning the total volume of material to be handled, achievable volume reduction, and dewatering time. The response provided to IAAC 73 does not adequately address need/options for a contingency plan, should the final volume of material exceed cell capacity.

Although the proponent has indicated that a 3:1 containment cell side slope scenario provides for 15 percent contingency capacity above the anticipated volume if the cell were to reach capacity, the appropriateness of a 3:1 side slope in the design, or whether 15% contingency capacity is sufficient are uncertain.

As delineation continues in the wetland, it remains unclear how much wetland sludge will be required to be placed in the containment cell. Allowances for additional material, if identified by further sampling during the remediation phase must also be considered.

The overall volume reduction in Geotubes is anticipated to be 50%, based on the second layer volume reduction measured in pilot testing; however, it should be noted that this was not the lowest volume of reduction measured in pilot testing (~30% when sediment present) and may not be a conservative estimate of overall volume reductions.

The percent solids within the slurry were reportedly lower than expected in the pilot study, which may extend Geotube dewatering time. It is also unclear from the information provided how precipitation and the potential for increased precipitation due to climate change in the future may affect dewatering time within an uncovered containment cell.

Insufficient information has been provided to support proposed measures to avoid exceeding containment cell capacity noted in response to IAAC 74.

It is unclear how remedial sequencing to remove all potentially hazardous soil prior to non-hazardous contaminated soil, to accommodate potential offsite disposal of non-hazardous contaminated soil would be achieved. Insufficient information has been provided to support how materials would be segregated, managed, assessed, and ultimately disposed of offsite.

There is also a concern that providing disincentives for the contractor to dredge beyond the allowable tolerances and exceed the containment cell capacity could adversely influence dredging effectiveness.

Significant uncertainty identified in total volumes, achievable volume reduction, and dewatering time, warrant the need for a contingency plan.

### **Water Management (bulk water, effluent and Leachate) (Ref. IAAC 04, 05, 13, 43, 77)**

Concern remains whether the proposed process to manage bulk water, dewatering effluent and leachate generated during the remediation phase of the project (i.e. prior to interim cover on containment cell) will effectively ensure potential contaminants are attenuated/treated, instead of being diluted and discharged.

The response to IAAC 04 references process flow diagrams, which appear to describe the proposed system to treat leachate generated following interim cell cover to an effluent that can be discharged to BHSL (Point D) only. No additional information has been provided to support proposal to manage surface drainage and groundwater seepage of wastewater (bulk water, effluent and leachate) prior to interim cover placement.

Although pilot scale testing of bulk water treatment was reported to be effective at reducing parameter concentrations to below comparison criteria with the addition of an organo-clay media to its four-step system (i.e., between the filtration and adsorption steps) to reduce the

concentrations of long-chain organics (e.g., Total Petroleum Hydrocarbons), this treatment was not carried forward in the proposed design. Instead, an untested approach to bulk water management was proposed, which assumes natural attenuation via discharge to the BHSL. An assumption that water quality within the BHSL and at Point C will remain improved because of the cessation of effluent flow into the BHETF in 2020 has been presented; however, no information has been provided to demonstrate that contaminants of concern within the bulk water, effluent and leachate generated during the multi-year remedial phase of the project, will be naturally attenuated.

The response to IAAC 05 indicates that the pre-treated effluent from the Temporary Leachate Treatment System (TLTS) will discharge to the estuary without undergoing mixing with the water in the Boat Harbour Stabilization Lagoon (BHSL). It is unclear why effluent proposed to be discharged to the estuary is termed “pre-treated effluent”.

The response to IAAC 13 indicates that the forecasted leachate quality was projected based on the pilot scale testing results and reflects maximum concentrations. The forecasted leachate quality presented in Table 2.19 was reported to meet NSE groundwater criteria except for TPH (Lube). No information was provided to indicate that TPH (Lube) exceedances would be treated.

It is important to note that forecasted Leachate Quality in Table 2.19 was compared to NSE Tier 2 Table 3 GW Discharge to Surface Water (Marine) **Greater than 10m** from the Surface Water Body. If the “pre-treated effluent” characterized within Table 2.19 is proposed to be discharged directly to the estuary as reported, analytical results should be compared to surface water criteria (i.e. *Table 3 - Nova Scotia Tier 1 Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water (µg/L)*) and in particular the values for *Surface Water (Including Groundwater < 10m from Surface Water Body)*. Comparison to the Marine surface water criteria, applicable to a direct discharge scenario would identify exceedances of several parameters beyond those reported. As previously noted, comparison should also be made to potable groundwater criteria.

### **Effectiveness of Silt Curtains (Ref. IAAC-15)**

Response to IAAC 15 on 139/275, does not present additional mitigation measures if silt curtains fail. The proponent proposes to place a single wall of “impermeable” silt curtains between the active dredging area and other cells and open water. It is proposed that the effectiveness of these curtains will be confirmed by checks every 5 hours by a worker with a handheld turbidity meter and if breakthroughs are discovered, work will be halted until turbidity is below authorized levels. It is unclear from the information presented what impact a 25 mg/L increase in TSS value above background concentrations may have on the distribution of contaminants. It is also unclear why only a single wall of curtains with no redundancy is proposed. No information was provided to support why 5-hour checks are proposed and why continuous monitoring is not. It is also not clear if climatic events such as heavy precipitation or high winds could adversely affect this protection system.

The proponent notes that establishing monitoring requirements would be part of the Industrial Approval step; however, a more detailed proposal at this stage would provide

greater insight into the proponent's plans to manage the water quality leaving the site and ensure the distribution of fine sediment particles outside of the active dredge area is avoided.

**Risk Assessment (Ref. IAAC-33, 35, 39, 41, 42, 50, 53)**

NSE Reviewers within SAS are interested in Health Canada's interpretation of guidance regarding the methodology used to adjust the target Hazard Quotient for vanadium in the HHERA (IAAC-34) and response provided to IAAC-35 concerning the rationale for using sub-chronic Toxicity Reference Values (TRVs) for direct contact exposure to sediment based on intermittent recreational exposure, instead of the more conservative chronic TRVs, required for exposure greater than 90 days.

Response to IAAC 39 provides reference to Section 3.1.5, which does not address the information request. Section 3.1.5 does identify several pathways as inoperable based on concentrations of COPC, rather than potential for exposure, as noted in the information request. The response provides no indication that the recommendation from Health Canada was followed to calculate human health risk based on the total exposure, as lower-level exposures contribute to the overall project-related exposure and risk to human health. No reference to Health Canada guidance or additional rationale was provided to support removal of pathways identified.

Response to IAAC 41 did not sufficiently address the information request. The proponent acknowledges that there may be some elevated concentrations of contaminants above the SSTLs remaining. The proponent notes that exposure to these elevated concentrations over extended periods of time would be unlikely and exposure is better characterized based on an average concentration characterized by the 95 percent UCLM. The elimination of this pathway is not protective of a worst-case scenario and appears to rely on unsupported human mobility patterns.

Response to IAAC 42 does not address the concern expressed in the information request that, "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." Response also does not address information request for "additional discussion on the expected fate and transport of persistent and/or bio accumulative substances from dewatering effluent as they relate to potential human exposure and subsequent adverse health effects."

As previously noted, response to IAAC 53 does not align with the NS Contaminated Sites Regulations regarding elimination of the potable groundwater pathway. See previous comments regarding application of Contaminated Sites Regulations within Provincial jurisdiction.

As an evaluation of the responses provided concerning the HHERA and Risk Management Plan are generally reliant on interpretation of Health Canada Risk Assessment Guidance. NSE reviewers will be informed by Health Canada's review of the information provided.

Date: December 6<sup>th</sup>, 2021

To: Bridget Tutty, Environmental Assessment Officer

From: Air Quality Protection Advisor, Air Quality Unit

Subject: Boat Harbour Remediation EA Project

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Further to your request, the Air Quality Unit provides the following comments regarding air quality and noise on the Environmental Registration Document for the Boat Harbour Remediation Project - Information Requests Round 1.

IAAC-32 (IAAC-33 to IAAC-65)

Discussions around exposure to air-derived pollutants cannot be finalized until the mitigation factor, that was used in the dispersion modelling assessment, has been justified. Uncertainties regarding various aspects of the remediation process should be resolved before impacts from air-derived pollutants are assessed. For example, it is unclear whether material described as being *end-dumped* (IAAC-76) will be dried in a way that potentially results in pollutants becoming airborne.

IAAC-55

While validated NAPS data are the preferred data for use in environmental assessment projects, raw data from the Nova Scotia NAPS sites are uploaded to the data portal on the NSECC website and are available for public use. These data would have provided an opportunity to compare pollutant concentrations before and after the mill closure.

IAAC-58

The specific request that was made to the proponent, with respect to mitigation, was:

*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.*

The response from the proponent was:

*For the air quality impact assessment, only fresh potable water was considered for dust suppression. Unpaved road dust emissions were estimated using the emission factors published in the USEPA's Compilation of Air Pollutant Emission Factors, AP-42, Section 13.2.2-Unpaved Roads. This section provides for estimating emissions after the application of dust suppressants. Control efficiencies of up to 95 percent are provided. We selected 80*

*percent control as a reasonably achievable goal given the conditions at the site and the short-term nature of the maximum vehicle traffic conditions.*

This does not adequately explain why 80% was selected as the control efficiency. There is insufficient referencing around the source of information with respect to control efficiencies, but it is likely that the proponent used Figure 13.2.2-2 *Watering control effectiveness for unpaved travel surfaces* to determine the quoted control efficiency. In order to achieve this, a moisture ratio of almost 3 must be maintained. It has not been demonstrated that this is possible under the meteorological conditions that are prevalent in the area, and through using water suppression twice per day.

*AP-42 13.2.2 Unpaved Roads* contains details on how the moisture ratio can be ascertained quantitatively. It is recommended that the proponent provide quantitative evidence that a moisture ratio of 3 can be achieved and maintained in order to justify a control efficiency of 80%. Alternatively, the proponent could adjust the control efficiency and/or modify the dust suppression plan to be more in line with published data.

For reference, the guidance for reporting emissions from vehicles travelling on unpaved roads, for reporting to the National Pollutant Release Inventory, reports a control efficiency of 55% when water is used for dust suppression twice per day (Table 4 [Road dust emissions from unpaved surfaces: guide to reporting - Canada.ca](#)).



## **Memo**

To: Bridget Tutty, EA Officer, NSECC

Fr: Environmental Health, NSECC

Date: December 6, 2021

### **RE: Boat Harbour Remediation Project – Response to Requests for Information - Comments**

The Environmental Health Program offer the following comments related to the responses provided by NSL to requests for information.

#### Air Quality and Odours

##### EIS Comment:

The reviewer was unable find information on what work was undertaken to identify Contaminants of Potential Concern (COPCs) for both the IAAMP and the real-time monitoring program. It is unclear how those identified COPCs were selected. Typically work of his nature would include establishing inclusion/exclusion criteria for identifying COPCs, and then screening all contaminants against the criteria to determine those deemed COPCs. Please describe the rationale/process for selecting COPCs.

##### Comment on NS Lands IR Response:

The Response provided for Information Request #54 provides additional information on considerations that were taken into account in the selection of COPC's, however a full suite of inclusion/exclusion criteria is missing. The process developed for selecting COPCs remains unclear.

#### Real Time Air Monitoring

##### EIS Comments:

The real-time monitoring program is not well described in terms of specific actions to be taken when action levels are approached/reached/exceeded. The plan currently does not provide specific direction for response. Describing in greater detail mitigations to be undertaken related to operations, monitoring and reporting will allow for a timely and coordinated response to such events.

##### Comment on NS Lands response to IRs:

Although the comments provided on the EIS related to real-time air monitoring was not addressed in the IRs, the reviewer recognizes this level of detail could be included within the Environmental Protection Plan as the project develops.

#### Odours

##### EIS Comment:

The EIS makes clear the potential for odours to be generated from site activity, though odour is not being separately monitored. Odour causing substances may have low olfactory thresholds, and individual perceptions of odours can vary dramatically among people. In anticipation of odour complaints related to project activity it is advised that a plan be developed to identify, monitor, mitigate and report on odours originating for the work site. The EIS makes passing mention of the potential use of odour suppression processes for reducing odours leaving the work site. It is recommended that

responsibility for activating odour suppressing materials is maintained by the proponent, rather than the contractor.

Comment on NS Lands response to IR:

The IRs did not request the proponent to develop an odour complaints response plan. The reviewer wishes to re-emphasize the value in undertaken planning to monitor and respond to odours, however the reviewer acknowledges this level of planning can be undertaken as the project progresses.

### Noise

EIS Comment:

The baseline noise monitoring work was undertaken in 2017, when the Pulp Mill was in operation. The EIS does not address what level of background noise measured at Boat Harbour in 2017 may have been attributed to the mill operations, if any. Please clarify and confirm whether mill operations would have impacted baseline noise levels measured in 2017, and if so, please justify why the 2017 observed noise levels would represent baseline conditions now that the mill is not operating. Data for the predicted/modelled noise impacts arising from site activities are not provided for review. Provide supporting data for the report's findings.

Comment on NS Land response to IR:

Original EIS comment was sufficiently addressed in NS Lands response to IR - #44.

Regards,

Environmental Health Program

## MEMORANDUM

**To:** Bridget Tutty, Environmental Assessment Officer

**From:** Wetland & Water Resources Specialist, Water Resources Management Unit

**Date:** December 3<sup>rd</sup>, 2021

**Subject:** Boat Harbor Remediation Project IR Technical Review

**Scope of Review:**

The following review of the Boat Harbour Remediation Project IR Technical Review was requested by the Impact assessment Agency of Canada (IAAC). The review considers whether the IRs originally submitted by the SAS wetland specialists IAAC-51 (NSE-WL-16; NSE-WL-17; and NSE-WL-18) and IAAC-20 (NSE-WL-03) have been adequately addressed within the IR Technical Review.

**Reviewed Documents:**

- Nova Scotia Lands Inc. *Boat Harbour Remediation Project Response to Information Requests*. Boat Harbour Remediation Project, Pictou Landing, Nova Scotia. September 2021.
- The four-part Information requests issued to NS Lands by IAAC, emailed by EA Officer Bridget Tutty on November 16<sup>th</sup>, 2021.

**General Comments:**

**IAAC-51**

Specific Questions/Information Requirements from IAAC	NSLI Response	NSE Wetland Specialist Review/Response
<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</p>	<p>The risk management plan included in Appendix K of the HHERA (Appendix A of the EIS) for RMA's 3 and 5 provided two potential alternatives to mitigate direct contact to sediment by humans: 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 was the preferred option. The use of the existing vegetation cover was identified as a potential option in</p>	<p>If stating, "The use of the existing vegetation cover was identified as a potential option in the risk management plan as the cattail mat currently covers the underlying impacted sediment creating a physical barrier to direct contact with the sediment.</p>

<p>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. 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>	<p>the risk management plan as the cattail mat currently covers the underlying impacted sediment creating a physical barrier to direct contact with the sediment. Using the existing vegetation and cattail mat as cover versus hydraulic dredging of the sediment also reduces physical disturbances to the existing wetland ecosystem.</p> <p>Given the uncertainties of the future hydraulic conditions of the wetlands following the dam removal and re-connection of Boat Harbour to the Northumberland Strait (return to a tidal estuary), the current remediation plan is to remove the cattails to allow for hydraulic dredging of the underlying sediment and disposal of the sediment in the containment cell consistent with the remediation plan for other areas of the BHETF.</p> <p>The current remediation plan included in the EIS does not include using the cattail mat as a protective cover given the uncertainties associated with the vegetation community that will present in the wetlands post-remediation (after returning the system to tidal). To ensure protection of human health, the same mitigation measures and remedial target levels will be utilized for sediment dredging in the wetland areas as proposed for the other BHETF areas requiring remediation. These mitigation measures will ensure protection of human health through the direct contact pathway during and post remediation.</p> <p>The primary difference between hydraulic dredging in the wetlands versus other areas of the BHETF is the removal of the cattail mat prior to completing the dredging activities. As indicated in the EIS, the cattails in this area of the Site were previously characterized and current concentrations of COPCs were determined not to pose an unacceptable health risks to human or ecological receptors. As such, the cattails harvested as part of the remedial activities will be segregated and used as mulch or soil amendments post-remediation. Results of the previous cattail sampling program are provided in HHERA (Appendix A of the EIS). Given that access to the area will be restricted during remediation and that the cattails will be removed during the remediation and allowed to naturally biodegrade consistent with current conditions, there is limited potential for collection and consumption of cattails at the Site during the remediation activities. Potential harvesting of country foods from aquatic areas within the BHETF is generally limited to post-remediation. Current concentrations of COPCs in plants do not result in unacceptable health risks to human and ecological health through the consumption pathway and concentrations of COPCs in sediment of the BHETF, including the wetland areas, will be substantially lower following sediment remediation activities (removal and disposal in the containment cell). As such, future concentrations of COPCs in country foods, including cattails, would be equal to or less than current COPC concentrations and will not pose an unacceptable risks to human health. Post remediation monitoring of country foods will be undertaken as part of the EIS to ensure COPCs in food items post-remediation are consistent with background conditions in the area.</p> <p>The cattails at the BHETF were collected and analyzed to support the completion of the HHERA. Based on the results of the HHERA, current concentrations of COPCs in plants do not result in unacceptable health risks to human and ecological health. The cattails are considered suitable for mulch/soil amendment and are not expected</p>	<p>Using the existing vegetation and cattail mat as cover versus hydraulic dredging of the sediment also reduces physical disturbances to the existing wetland ecosystem". Please provide scientific evidence that the cattail mat currently covering the underlying sediment reduces the physical disturbances to the existing wetland ecosystem.</p> <p>The potential for vegetation loss in the wetlands due to water level and salinity changes has not been discussed. Please provide additional information on this.</p>
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	<p>to require disposal in the containment cell.</p> <p>Retesting will occur prior to use using similar testing procedures. Since the containment cell will be remain under interim cover for a period of one to two years. There is ample time to re-test the cattail and other organic matter for reuse. If they are unacceptable for reuse they will be placed in the containment cell prior to the placement of final cover.</p>	
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**IAAC-20**

<b>Specific Questions/Information Requirements from IAAC</b>	<b>NSLI Response</b>	<b>NSE Wetland Specialist Review/Response</b>
<p>Provide mitigation measures for Black Ash, which is located within the Site Study Area, and listed under SARA and COSEWIC.</p> <p>Update the effects assessment to include Black Ash and determine the significance of those effects on Black Ash.</p>	<p>No remediation will occur within Wetland WL-10 and watercourses WC-6 and WC-4 where Black Ash has been identified. General mitigation measures will be employed for tree protection.</p>	<p>WL-10 would be considered a Wetland of Special Significance due to the presence of Black Ash. Since no remediation will occur within WL-10 and general mitigation measures will be employed, no further response is required by the SAS wetland Specialists.</p>

**Limitations of Review by NSE Wetland Specialist:**

Given the timeline for the IR review, only IAAC-51 and IAAC-20 were reviewed.

Date: November 26, 2021

To: Bridget Tutty, NS Department of Environment

From: Mark McGarrigle, Species at Risk Biologist, Wildlife Division, Department of Natural Resources and Renewables

Subject: Review of the Boat Harbour Remediation Project Response to Information Requests.

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**Scope:**

Review of the response to information requests to ensure wildlife and wildlife habitat, species at risk, and biodiversity and ecosystem concerns raised during review of the Boat Harbour Remediation Project Information Requests were sufficiently addressed.

**Documents Reviewed:**

The following document and associated appendixes were consulted as part of this review: *Boat Harbour Remediation Project Response to Information Requests. Boat Harbour Remediation Project Pictou Landing, Nova Scotia. Nova Scotia Lands Inc. September 2021. 275pp.*

**General Comments:**

The following comments are provided with respect to the Information Request:

- Review was challenging due to the short time to complete the review, volume of information presented, need to refer to previous comments and documents, and organization of the response to the Information Requests (IRs). **Not all IRs from the EIS review have been addressed through this submission; this will need to be corrected as a condition of approval prior to project commencement.**
- **There is a continued lack of acknowledgement of NSDNRR on issues relating to wildlife and species and risk on non-federal lands.** The proponent recognizes some aspects of a duty to consult with provincial regulators concerning wildlife, while ignoring it in other contexts. **As the project does not fall in its entirety on federal lands, for provincial Crown land and private land provincial Acts, regulations, and policies apply.** It has been challenging in the first submission and the IR response to identify federal and provincial roles

and responsibilities without a clear figure showing land ownership in relation to habitat information and species observations.

- **Failure to update information from the previous EIS submission (e.g., Table 2.9 and 2.21).**
- Inconsistency in data presented. For example, within table 2.10 one row has a general timing window the nesting period (i.e. mid-April to late August), while the next row provides a specific window (i.e. April 8 to August 28). This is also an issue throughout the text.
- **The proponent continues to state that avian SAR were not found within the Study Area, which is incorrect.** If a SAR bird species is using the site as part of staging or migrating habitat that is still considered habitat that is necessary for a part of the species life cycle. There is a concern that the mitigations for SAR are based upon an incorrect interpretation which devalues the role of non-breeding habitat within the Study Area. **Failure to acknowledge and sufficiently mitigate for SAR and their habitat found in the Study Area carries serious risk of violating provincial and federal Acts and regulations.**
- The proponent should be made aware of the requirement to protect any SAR that may be listed and already known for the area or could potentially be present (but due to requirements were not surveyed for), during the construction and monitoring of the project. Either the federal SARA, provincial ESA, or both, would be applicable.

#### Comments specific to IRs:

- **Table 1.6 and Table 1.8 IAAC-20.** The response statement “*General mitigation measures will be employed for tree protection.*” is implied to pertain only to Black ash, as the context and rationale for the information request only discussed Black ash. **This measure is not sufficient for the protection of a listed species under the ESA. No work is to occur in the vicinity of wetlands where Black ash has been identified without consultation and approval by appropriate regulatory agencies.**
- **Sections 2.1.12 and 2.7.1 IAAC-21.** “*As the proponent advances through the approvals stages, the restoration plans will be advanced in consultation with agencies such as ECCC, and consideration of the diversity of target species and habitats the restored features will support.*” **As the project also occurs on provincial Crown land and private land, the proponent is required to abide by provincial Acts such as the Wildlife Act and the ESA, and their associated regulations; consultation with provincial regulators (NSDNR) for measures to protect wildlife species and their habitat, including SAR, is required.**
- **Section 2.1.12 and 2.7.1 IAAC-21.** “*Species at Risk (SAR) birds have not been identified within the Study Area.*” Is this in reference to the Site Study Area, Local Study Area, or Regional Study Area? How has the proponent defined the term “identified”-is it based solely on breeding status or occupancy? **This statement is incorrect and is not supported by information presented in the EIS Appendix AA and CC and Table 6.2 on SAR found on the Site Study Area from the Summary of The Environmental Impact Statement (November 27, 2020).**
- **Section 2.1.12 and 2.7.1 IAAC-21.** “*Monitoring requirements for potential SAR*

*to be removed are included in the PEPP and are also outlined below.”* An explanation is required of what “removal” means in the context of the project. **Removal is not an acceptable mitigation option. Any removal of SAR or impacts to habitat that occurs on private or provincial Crown land unless under permit is a contravention of the ESA.**

- **Section 2.1.12 and 2.7.1 IAAC-21.** *“Establish a 300 m buffer around Piping Plover nests found during surveys (to remain in place until the young have naturally left).”* Please provide a reference for this buffer distance.
- **Section 2.1.12 and Section 2.7.1 IAAC-21.** *“Report all sightings of migratory bird individuals and/or nests to the Contractor(s) EM, CMOCEM and ECCC’s Canadian Wildlife Services.”* Information should also be provided to NSDNR.
- **Table 2.9 and Table 2.21.** Table was not updated from the previous submission. Species status has changed for following species: Barn swallow, Bobolink, Eastern wood-pewee, Evening grosbeak.
- **Table 2.10 and Table 2.21.** Mitigation measures for Barn swallow. The proponent should be aware that removal of a structure at any time of the year which contains a nest (active or inactive) of a migratory SAR would be a contravention of the MBCA, SARA, and/or ESA (if the activity is on provincial/private land) unless authorized under permit by one of more of the responsible agencies. This mitigation as proposed needs revision.
- **Table 2.10 and Table 2.21.** Mitigation measures for accidental mortality. Consultation for activities on non-federal land needs to also be with the Department of Natural Resources and Renewables.
- **Table 2.10 and Table 2.21.** Mitigation measures for accidental mortality. It should be indicated that activities in the vicinity of an active nest once discovered, should halt until consultation and appropriate mitigation measures are in place.
- **Table 2.10.** Mitigation measures for sensory disturbance/displacement. Proponent has not indicated in the table or subsequent text how the activity restriction guidelines and set-back distances associated with this potential impact will be developed.
- **Table 2.10 and Table 2.21.** Mitigation measures for sensory disturbance/displacement. Given anticipated activity level and vehicle traffic (refer to section 2.2.16) there is potential for disturbance to wildlife (including SAR) due to the amount of lighting required. Please provide mitigations to reduce the impact of light pollution and disturbance.
- **Table 2.10 and Table 2.21.** Dust suppression should also be employed as a mitigation measure for bird health potential impacts. Information presented in section 2.2.16 indicates significant traffic over the life of the project.
- **Section 2.1.12 and Section 2.7.1 IAAC-21.** Refer to comments on Table 2.10 with respect to mitigations measures for Barn swallow which as presented could be in violation of federal and provincial legislation.
- **Section 2.1.12 and Section 2.7.1 IAAC-21.** Under the pre-clearing surveys subsection there is mention of migratory birds, however, there is a requirement to also protect non-migratory birds for provincial lands under the Wildlife Act. Refer to section 39(2a) and 50 and 51 of the Wildlife Act.
- **Section 2.2.6 and Section 2.7.2 IAAC-37.** It was indicated that terrestrial game animals were not considered in the assessment due to “no soil COPCs carried



through the HHERA.” Terrestrial mammals (e.g., snowshoe hare and white-tailed deer) would consume vegetation or other vegetative materials such as seeds and berries. Bioaccumulation of heavy metals has been shown in numerous studies of terrestrial game animals such as deer. Vegetation was collected and analyzed as part of the original submission (Appendix A of the EIS). Given the data available, please provide details of the pathway and potential concerns (if any) associated with ingestion of terrestrial game animals that consume vegetation from within the Study Area.