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Item No. 21.4
Halifax Regional Council
September 9, 2025

TO: Mayor Fillmore and Members of Halifax Regional Council

FROM: Cathie O'Toole, Chief Administrative Officer

DATE: May 26, 2025

SUBJECT: Sulphide-bearing Material Management Issues and Alternatives – Final Report

INFORMATION REPORT

ORIGIN

On May 31, 2022, Regional Council passed the following motion:

MOVED by Councillor Austin, seconded by Councillor Mason

THAT Halifax Regional Council direct the Chief Administrative Officer to provide a staff report on what the HRM, the Port of Halifax, and other relevant stakeholders should undertake to situate pyritic slate disposal sites.

MOTION PUT AND PASSED UNANIMOUSLY.

EXECUTIVE SUMMARY

In May 2022, Regional Council requested staff to consider what HRM and others should undertake to situate pyritic slate disposal sites. Staff engaged Stantec Consulting Ltd. (Stantec) to prepare a report outlining what methods of pyritic slate disposal are available in the municipality and to suggest options for the Municipality to manage pyritic slate disposal by infill. Pyritic slate falls under the more general term, Sulphide-Bearing Material (SBM), which is the preferred term in Stantec's final report. The final report *Sulphide-bearing Material Management Issues and Alternatives* (SBM Management Report, see Attachment 1) provides an overview of the issues around SBM disposal and summarizes pertinent regulations and alternatives for SBM management in its analysis.

The SBM Management Report identifies the multi-jurisdictional issue and identifies HRM's limited ability to control shoreline infilling. The Report does not provide a direct cost-benefit assessment of the options, nor does it propose specific water lot locations for SBM infill. The SBM Management Report outlines:

- SBM can generate acidic runoff that has potentially harmful environmental impacts if not managed and disposed of properly. Submerging SBM in saltwater is a common and effective method of neutralizing its acidic effects.
- HRM has no direct control over ocean shoreline infilling with SBM. Approval of shoreline infilling

with SBM is granted through federal authorities with some provincial regulation.

- The Halifax Port Authority (HPA) Ocean Terminal Sequestration Facility is an approved disposal facility in the municipality that accepts qualifying SBM for a fee and has capacity to do so for approximately 8 to 10 years.
- Other methods of SBM disposal include disposal on HPA-approved Crown land water lot leases, SBM as structural infill for industrial development, disposal at sea, and more. Each method has advantages and constraints identified in the final report, considering cost, transportation, environmental, and social-political impacts.

Given the issues of pyritic slate disposal, shoreline infilling, and related coastal management are multi-jurisdictional, an approach would benefit from coordination between responsible government agencies and key partners. As part of the approved 2025/26 Budget and Business Plan, staff are exploring the potential for a coastal management and/or adaptation strategy, beginning with further analysis of the municipality's jurisdiction over coastal management and a jurisdictional scan of multi-stakeholder coastal management approaches.

BACKGROUND

Construction in Halifax can involve the excavation of mineralized geological formations including sulphide-bearing materials (SBM), commonly known as pyritic slate. Once exposed to air or fresh water, SBM can generate acidic runoff that has potentially harmful environmental impacts.

As development in Halifax continues, it is likely that there will be a growing demand for the disposal of SBM. There are several known methods for disposing of SBM, each with advantages and constraints to implementation. One of the most environmentally acceptable practices for disposal is to submerge SBM in saltwater as ocean shoreline infill, which neutralizes its acidic effects. The Municipality is aware of growing public concern over shoreline infill projects, such as those located in Dartmouth Cove and the Northwest Arm. In response, Regional Council passed a motion on May 31, 2022 requesting "a staff report on what the HRM, the Port of Halifax and other relevant stakeholders should undertake to situate pyritic slate disposal sites". Stantec Consulting Ltd. (Stantec) was engaged to prepare a report to assist staff in responding to this motion. The final report dated April 12, 2023 and titled *Sulphide-bearing Material Management Issues and Alternatives* (SBM Management Report) is provided as Attachment 1 of this report.

The details of the case of Dartmouth Cove are not included in the scope of this staff report and are being addressed separately through a process initiated by Regional Council on August 6, 2024. Specific concerns related to infilling in the Northwest Arm were also addressed in a separate report to Regional Council dated December 6, 2023.

DISCUSSION

Final Report Results

Pyritic slate falls under the more general term, Sulphide-Bearing Material (SBM). The SBM Management Report provides a general overview of the issues, pertinent regulations, results of key interviews, and alternatives for SBM management. The report does not provide a detailed cost-benefit analysis of the options, nor does it propose specific water lots for SBM infill. Its purpose is to provide information on the advantages and constraints of SBM management options to help guide policy for HRM and inform any multi-party engagement on the future of SBM management and infilling.

The consultants met with several interested parties (HPA, Construction Association of Nova Scotia (CANS), and Build Nova Scotia) for their comments and insights on the advantages and challenges of different SBM disposal methods. Build Nova Scotia is a provincial Crown corporation with a mandate that includes waterfront development. The Port of Halifax provided insights on the operation and capacity of their SBM

management facilities in Halifax Harbour. CANS provided perspectives from the development community. HRM Planners were also consulted, to provide additional context on municipal concerns as well as a historical perspective regarding SBM infilling in Bedford Basin.

Research was conducted on federal, provincial and municipal legislation and policy relevant to SBM management. Examples include the provincial *Sulphide Bearing Material Disposal Regulation* (NS Reg 57/1995), *Halifax Port Authority Disposal of Pyritic Slate or Inert Construction Material Agreement* (2022), *Halifax Port Authority Marine Infill Framework* (2012), and Halifax Regional Municipality Information Report on *Dartmouth Cove Infilling Pyritic Slate Disposal Sites* (2022). The results of a 2022 IAAC engagement regarding shoreline infilling were also reviewed.

A list of potential options for SBM management was developed based on the interviews, regulatory research, and the professional judgement of the consultant team members who bring experience in local shoreline infill projects and SBM disposal permitting processes. Eight options for SBM disposal were identified within the HRM context as follows:

- **Halifax Port Authority (HPA) approved facilities** – The Ocean Terminal Sequestration Facility (OTSF) at the South End terminals currently accepts qualifying SBM for a fee and has capacity to do so for approximately 8 to 10 years. This assumes the historical average volume disposed per year remains consistent. It is noted that there is potential for additional terminal expansion (resulting in more infill opportunity) however future expansion beyond their current Phase 1 project has not yet been approved.

- **Privately-owned pre-Confederation water lots** – There are several privately owned, pre-Confederation water lots around Halifax Harbour. Many of these lots have been partially or completely infilled over the years to create land and expand properties. Recent proposals to develop these water lots as SBM management sites have met significant public opposition (e.g., Dartmouth Cove).

- **Crown land leases (administered through HPA)** – Developers may apply to lease water lots from the Halifax Port Authority for SBM management with certain restrictions. HPA has developed guidelines for proponents wishing to do this; none have taken the initiative to date.

- **Structural fill for industrial development** – Some developers may wish to accept SBM material for land reclamation or other structural elements (e.g., wharf development). The primary purpose of these infills would be project-specific (e.g., Irving Shipyard) although they could offer some limited commercial opportunities to charge those seeking to dispose of SBM material on a temporary basis.

- **Disposal at sea at approved disposal sites** – Developers could apply for marine disposal of SBM at approved deepwater sites (and away from sensitive coastal habitats). Stringent requirements would need to be met. While this method could potentially accept large amounts of clean SBM, it would substantially increase costs due to the need of a truck to barge transfer facility.

- **Beneficial use (habitat creation and enhancement)** – Developers could apply to use SBM to create artificial reefs. While this option offers opportunity for habitat restoration and, therefore, would not add to the cumulative loss of fish habitat associated with shoreline infilling, this method is also likely to be costly due to increased handling and transfer costs. Additional research would also be required to inform the location and type of habitat that was to be created.

- **Land-based containment or disposal** – Developers could manage SBM on land in containment cells, offsite or onsite subject to approvals.

- **Sheet Harbour** – To help facilitate port improvement projects beyond the HRM urban core, the

Port of Sheet Harbour was suggested as an example of a potential site for marine management of SBM material. Trucking and handling fees associated with this option would be costly for developers.

The above options were analyzed for their relative advantages and constraints based on the following criteria:

- Physical
- Transportation
- Proximity to adjacent land and water use
- Environmental constraints
- Socio-political considerations
- Property access
- Permitting considerations
- Overall costs/technical feasibility
- Potential cumulative effects

Key conclusions are outlined below:

- **While marine disposal of SBM affects marine habitat, it is otherwise generally a safe and effective way to manage SBM** and avoid potentially serious impacts on land-based ecosystems that would arise if SBM were improperly disposed of onshore.

- **Shoreline infilling is separately regulated by three levels of government** in a fragmented system that does not favour a coordinated approach.

- **Infilling at Bedford Basin and Fairview Cove is not active, and Halifax Port Authority (HPA) currently operates the only large-scale commercial SBM infill project at Ocean Terminal Sequestration Facility (OTSF)** to support future wharf development at the Halifax South End terminals.

- **HPA is an experienced operator of such facilities, and it estimates that it has approximately 8 to 10 years of permitted capacity at the OTSF.** This estimate could vary depending on several factors (e.g., the rate of future development and the schedule for completing the associated port infrastructure). Additional phases could potentially be available but remain to be permitted.

- **The OTSF represents a reliable SBM management option in an industrialized setting for developers within reasonable trucking distance from the facility.** The OTSF presents few land use conflicts within the port, raises few concerns by interested parties, and has created no known bylaw issues for HRM. In general, the use of the OTSF carries relatively lower environmental and socio-political risk compared with other options. However, HPA has expressed concern about the longer-term availability of SBM infill capacity at the OTSF and the need to plan for additional capacity in the future. While the existing capacity at the OTSF is 8 to 10 years at current rates, this estimate can be affected by several variables. Further expansion beyond HPA's projected timeframe has not been approved, and planning for the future should begin now.

- **While HRM has no direct control over infilling, the Municipality can influence infill processes through its established ability to regulate nuisances and land use.** In addition to restricting activities that generate unacceptable noise under By-law N-200, By-law T-400 might arguably prevent trucks from using local streets to transport SBM on the assumption that the deposit of SBM does not qualify as "delivery or collection of goods or [supply of] a service."

- **The Municipality can also limit and direct land use on infilled land.** Although HRM has generally applied the zoning of abutting upland to infilled water lots, the Municipality could be more

prescriptive. For example, the Water Access Zone in the Regional Centre limits buildings on wharves, docks, and similar marine structures to public infrastructure, utilities, publicly-operated ferries and boat club uses. Similar provisions could be made for land created by infill in specific zones or in the general provisions of the land use bylaw. This would echo the approach used by HPA under their current infill policy for water lots under their management, which only allows uses consistent with adjacent upland that has a specific marine industrial requirement.

Due to the multi-jurisdictional nature of SBM management and multiple private and public interests in shoreline infilling, the report recommended that the Municipality consider promoting a joint planning or advisory process with relevant partners and levels of government to address SBM management for the medium and longer term. Key members of this joint planning process could include (but may not be limited to) the HPA, Build Nova Scotia, the federal Department of Fisheries and Oceans (DFO), Department of National Defence, Transport Canada, Indigenous groups, members of the development community, environmental advocacy groups, etc.

Going Forward: Joint Strategy and Governance

When Halifax Regional Council initiated its first Regional Municipal Planning Strategy (or Regional Plan) in 2002, the process included the work of a Harbour Steering Committee to inform a future plan for Halifax Harbour.

Based on the Committee's preliminary recommendations, the 2006 Regional Plan proposed the development of a Halifax Harbour Functional Plan with a series of initiatives to address 15 topics of interest related to harbour management. One of the topics proposed establishing "*an inter-governmental working committee of environmental approval agencies to determine water lot infill objectives, legislative regimes and improved coordination of application processes, and other matters related to the environmental improvement of the Harbour*" (p. 98). The Halifax Harbour Functional Plan was not carried forward through the 2014 Regional Plan and, instead, many of the areas of interest were addressed as part of other new and ongoing planning initiatives such as the Centre Plan, and various other plans approved by Regional Council. Since circumstances affecting the Harbour, and the Municipality at large, have changed since 2014, including development pressures and the expected impacts of climate change, staff have identified that there may be renewed benefit in exploring the creation of a joint strategy and governance model that helps direct the sustainability and management of shoreline development.

The management and disposal of SBM is just one consideration for how we utilize and manage activity along HRM's urban shorelines. Other factors such as increased development within the Urban Service Area Boundary, shoreline erosion and coastal flooding, climate change adaptation measures (e.g., managed retreat, green and hybrid infrastructure),.) and ongoing investment in transportation infrastructure (e.g., bridges, ferry terminals, roads) are a few examples of changing circumstances where strategic planning and action will likely require a coordinated approach.

The need for joint planning efforts related to the Municipality's urban shorelines has also been identified by *HalifACT: Acting on Climate Together*. Within Planning & Development, the Resilient Infrastructure Standards Group has been operating since 2022 to lead the development and implementation of policies and standards which are designed to enhance the resilience of infrastructure. Coordination between the Municipality and the multiple groups who hold interest in the Harbour, its shoreline, and waterways, has the potential to both strengthen climate resilience throughout the municipality and direct infill opportunities.

The following are examples of ongoing and proposed HRM-initiated projects, all of which have expected impacts on coastal shorelines within urban HRM (note that these are not all infilling projects):

- Mill Cove Ferry Terminal;
- Additional potential ferry terminals and routes, e.g., Larry Uteck, Shannon Park (*Rapid Transit Strategy*, May 2020);
- Downtown Dartmouth Waterfront Revitalization Project (endorsed by Regional Council on March

5, 2024);
- Water lots in Dartmouth Cove (PLPROJ-2024-01075);
- Shore Road: Building with Nature (HRM – NIF Capital Project, scheduled to begin construction in Spring 2025);
- Point Pleasant Park erosion mitigation (HRM Capital Project, design work in progress);
- Dingle Seawall Replacement (HRM Capital Project, design work in progress);
- Regatta Point trail upgrades and erosion mitigation (HRM Capital Project, design work in progress).

The above list is not exhaustive and does not include projects initiated by other key partners. The Municipality will be exploring the benefits of coordinating planning efforts with groups who operate within or along the Harbour. Coordinated partnerships could facilitate the development of joint strategies for comprehensive coastal management, particularly regarding the placement and approval of SBM facilities, with a focus on shoreline infilling. Joint strategies that address flooding, climate risks, and the impact of ongoing and proposed projects on Halifax Harbour and its shoreline can be identified through a collaborative and integrated approach. This work can begin with HRM-led key partner consultations and engagement. Key partners may include the Halifax Port Authority, the Mi'kmaq of Nova Scotia, Build Nova Scotia, and the Department of National Defence.

Next Steps

Until a joint strategy can be realized, staff will continue to consider opportunities to regulate infilled water lots through the ongoing Regional Plan Review process, Suburban and Rural Community Planning programs, and other projects initiated by Council (such as the consideration of amendments for Dartmouth Cove). Typically, the Municipality's land use by-laws set out that once a water lot has been filled to create new land, the new land acquires the zoning that applies to the abutting land. In the Regional Centre and Halifax Plan areas, a Water Access Designation and Zone has been applied to properties on the Northwest Arm, Lake Banook and Lake Mic Mac, and limits uses of infilled land to water access structures, public works and utilities, passive recreation uses, and municipal, provincial, and national historic sites and monuments. As part of the ongoing Regional Plan Review and Suburban and Rural Community Planning processes, staff will consider whether a similar approach would be appropriate or necessary for the Halifax Harbour or other parts of the coast of the Atlantic Ocean. Specific approaches will be considered and brought forward for Council and public consideration as part of those planning processes.

The 2025/26 Budget and Business Plan included initial phases of work to better understand the municipality's role and opportunities to address coastal management, including:

- Conducting a legal analysis of the municipality's jurisdiction over coastal management and the legal opportunities for action, and how these mechanisms interact with other regulations and rights of other shoreline property owners;
- A jurisdictional scan of how multi-stakeholder coastal management has been done in other municipalities in Canada and the United States; and
- The development of an adaptation modelling tool that will model the damages (in dollars) from projected climate impacts as well as testing the cost/benefits of interventions. This will quantify the need for a coastal management strategy and/or adaptation plan and inform conversations with stakeholders.

Conclusion
Staff have completed a review of the issues and alternatives related to SBM management. HRM's actions are limited given the multi-jurisdictional nature of pyritic slate disposal, shoreline infilling, and related coastal management issues. There would be benefits to HRM to exploring the potential for a coastal management and/or adaptation strategy, and initial phases of this work have been included in the 2025/26 Budget and Business Plan. Staff will also consider appropriate land use regulations for coastal properties through the Regional Plan Review and Suburban and Rural Community planning programs.

FINANCIAL IMPLICATIONS

The HRM costs associated with this report can be accommodated within the approved 2025-2026 operating budget. Any further financial implications for future work related to a coastal management and adaptation will be outlined in future reports to Regional Council.

RISK CONSIDERATION

No risks were identified beyond those noted in the Discussion section of this report.

COMMUNITY ENGAGEMENT

Community engagement was not required as part of this report. It is anticipated that in the future, a coastal management and/or adaptation strategy may require community engagement. Details of any such engagement program will be presented in future reports to Regional Council.

The SBM Management Report highlights that in response to a request from a group of concerned citizens to conduct a Regional Assessment regarding infilling activities in the Halifax Harbour and surrounding areas, the federal Impact Assessment Agency of Canada (IAAC) organized a series of engagement activities in 2022 with regulatory authorities, Indigenous groups, and other members of the public to discuss infilling concerns. A summary of that process is outlined in Appendix A of Attachment A.

ENVIRONMENTAL IMPLICATIONS

There are various environmental impacts of SBM disposal, as outlined in the report in Attachment A. The impacts of climate change hazards such as sea level rise, storm surge, wave runup, and resulting erosion must be considered as part of any coastal management and adaptation strategy. Changes to the shoreline resulting from climate adaptation measures (e.g., managed retreat, green and hybrid infrastructure) may impact existing infrastructure and the environmental health of the Halifax Harbour. Future discussion with potential partners will consider these and other environmental impacts.

LEGISLATIVE AUTHORITY

HRM Charter, Section 188 (1): “The Council may make by-laws, for municipal purposes, respecting

(a) the health, well being, safety and protection of persons;
(b) the safety and protection of property;
(c) persons, activities and things in, on or near a public place or place that is open to the public;
(d) nuisances, activities and things that, in the opinion of the Council, may be or may cause nuisances, including noise, weeds, burning, odours, fumes and vibrations…”

HRM Charter, Part VIII, Planning & Development

ATTACHMENTS

Attachment A: Stantec, *Sulphide-bearing Material Management Issues and Alternatives* (April 12, 2023)

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Attachment A

Stantec

Sulphide-bearing Material Management Issues and Alternatives

Final Report

April 12, 2023

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1.0 INTRODUCTION

Halifax Regional Municipality (HRM) is built on several mineralized geological formations that, once excavated and exposed to air and water, can generate acidic runoff that is a known risk to watersheds and associated ecosystems. This material, known as sulphide bearing material (SBM), is also commonly referred to as pyritic slate, and its management onshore is regulated by the Province of Nova Scotia, once excavated.[1] One of the most environmentally acceptable practices for SBM management over the past few decades in the HRM urban core (coinciding with areas of greatest development and SBM generation) is shoreline infilling where the material can be kept submerged in salt water. Marine placement mitigates the risk of acid generation and has also resulted in land reclamation at the shoreline of Halifax Harbour. Shoreline infilling in the Harbour has been practiced as a means of waste disposal and land reclamation since the founding of the city. Most recently, shoreline infilling with SBM has been undertaken in Bedford Basin and Fairview Cove (both now ended) and currently at the Ocean Terminal Sequestration Facility (OTSF).

While management of SBM in the marine environment has been widely accepted in recent years, it is not without its own environmental and social consequences. Recent infill proposals in the Northwest Arm and Dartmouth Cove have drawn significant public opposition. Shoreline infilling is separately regulated by three levels of government in a fragmented system that does not favour a coordinated approach, including the need for a safe and cost-effective means to manage SBM as an important component in the continued development of infrastructure in HRM. Members of the public have expressed concern with the potential use of private, pre-Confederation water lots around the harbour as SBM management sites.

In 2021, the Impact Assessment Agency of Canada (IAAC) received a request from a group of concerned citizens to conduct a Regional Assessment regarding infilling activities in the Halifax Harbour and surrounding areas, although the concerns were not specific to SBM. Although IAAC concluded that a regional assessment was not warranted, they organized a series of engagement activities with regulatory authorities, Indigenous groups, and other members of the public in 2022 to discuss infilling concerns (see Appendix A for the Overview and Summary of March 30, 2022, Workshop by IAAC).

Given these issues, including its own seemingly limited capacity to regulate SBM management, as well as public opposition, HRM Council passed a directive to *"Direct the Chief Administrative Officer to provide a staff report on what the HRM, the Port of Halifax and other relevant stakeholders should undertake to situate pyritic slate disposal sites*" (Regional Council motion of May 31, 2022).

[1] Sulphide-bearing material (SBM), also commonly referred to as pyritic slate, is defined in the Nova Scotia Sulphide Bearing Materials Disposal Regulations under Section 66 of the *Environment Act* as aggregate having a sulphide sulphur content equal to or greater than 0.4% (12.51 kg H_2SO_4/tonne).

This report is intended to inform HRM staff in the preparation of their report in response to the Council Directive. It is meant to provide a general overview of the issues, pertinent regulations, results of key interviews, alternatives for SBM management, and a summary of the analysis. This report does not provide a detailed cost benefit assessment of the various options or propose specific water lots for SBM infill. Rather, it offers useful information regarding the advantages and constraints of various SBM management options to help guide further policy planning for HRM and inform the multi-party engagement on the future of SBM management and infilling that will be required.

2.0 REGULATORY AND POLICY CONTEXT

2.1 OVERVIEW OF REGULATORY ENVIRONMENT

As detailed in Table 2.1, several acts and regulations apply within both the federal and provincial jurisdictions to manage and authorize the disposal of SBM. No HRM bylaw or regulation directly addresses the disposal of SBM; however, Municipal bylaws may be relevant to managing the infilling process (e.g., noise bylaw), and land use policies and bylaw requirements can direct and regulate the development on lands created by infilling.

Table 2.1 Legislation and Bylaws that may apply to Management of Sulphide-bearing Material in HRM

Legislation	Authority	Applicability
Canadian Environmental Protection Act, 1999 (CEPA, 1999)	Environment and Climate Change Canada (ECCC)	This Act contributes to sustainable development through pollution prevention and to protect the environment, human life and health from the risks associated with toxic substances. CEPA 1999, along with other applicable federal authorities, provides the authority to issue non-regulatory objectives, guidelines and codes of practice to prevent and reduce marine pollution from land-based sources.
Disposal at Sea Regulations	Environment and Climate Change Canada (ECCC)	Schedule 5 of CEPA, 1999 permits the disposal at sea where it is an environmentally sound and practical alternative. It is only permitted for substances listed in Schedule 5, including: • dredged material • fish waste and other organic matter resulting from industrial fish processing operations • ships, aircraft, platforms or other structures • inert, inorganic geological matter • uncontaminated organic matter of natural origin • bulky substances that are primarily composed of iron, steel, concrete or other similar matter Permits are granted on a case-by-case basis following a detailed application and assessment process described in schedule 6 of CEPA, 1999. This requires inclusion of alternatives to disposal at sea.

Table 2.1 Legislation and Bylaws that may apply to Management of Sulphide-bearing Material in HRM

Legislation	Authority	Applicability
Fisheries Act	Fisheries and Oceans Canada (DFO)	Section 36 (3) the *Fisheries Act* applies to deposits of deleterious materials into waters frequented by fish, unless specifically authorized by a federal act or regulation. Authorization, as per section 36 (5) under the *Fisheries Act,* would likely be required for the disposal of fill material in Halifax Harbour causing harmful alteration, destruction or disruption (HADD) and/or killing of fish.
Impact Assessment Act	Impact Assessment Agency of Canada (IAAC)	Under the *Impact Assessment Act* (IAA), federal impact assessments are undertaken for designated projects, as designated under the Physical Activities Regulations. For projects not covered by these Regulations but carried out on federal lands, Federal Authorities under the IAA are required under section 82 of the IAA to determine the significance of environmental effects related to the infill project. For projects located in Halifax Harbour on water lots managed by the Halifax Port Authority (HPA), HPA will be the regulating authority and require authorization under section 82.
Canadian Navigable Waters Act	Transport Canada	This Act aims to protect the public right to navigate on all Canadian navigable waters. Except in accordance with this Act, it is prohibited to construct, place, alter, rebuild, remove or decommission a work in, on, over, under, through or across any navigable water. An owner who proposes to construct, place, alter, rebuild, remove or decommission in, on, over, under, through or across any navigable water must make an application for an approval.
Nova Scotia *Environment Act*	Nova Scotia Department of Environment and Climate Change (NSECC)	The disposal of sulphide-bearing materials is regulated in Nova Scotia through the Sulphide Bearing Material Disposal Regulations made under section 66 of the *Environment Act*. Section 4(1) of these regulations prohibits the disposal of a sulphide-bearing material in the Province where the total volume excavated is greater than 500 m^3 *in situ* or 1,300 tonnes unless approval has been issued. The Nova Scotia Activity Designation Regulations Section 13 (h) designates the construction, operation or reclamation of a sulphide-bearing material disposal operation as an activity that requires an Approval. NSECC has indicated that the Province does not regulate with respect to private water lots in federally managed harbours (e.g., Halifax Harbour) (IAAC 2022).
Coastal Protection Act	NSECC	This Act, scheduled to come into effect in 2023, aims to protect natural ecosystems and ensure new homes and businesses are safe from sea level rise, coastal flooding, and coastal erosion.

Table 2.1 Legislation and Bylaws that may apply to Management of Sulphide-bearing Material in HRM

Legislation	Authority	Applicability
HRM Charter, Section 188 (1):	HRM	"The Council may make by-laws, for municipal purposes, respecting (a) the health, well being, safety and protection of persons; (b) the safety and protection of property; (c) persons, activities and things in, on or near a public place or place that is open to the public; (d) nuisances, activities and things that, in the opinion of the Council, may be or may cause nuisances, including noise, weeds, burning, odours, fumes and vibrations…"
HRM Bylaw Number N-200 – Respecting Noise	HRM	As per the bylaw, no person shall engage in an activity that unreasonably disturbs or tends to disturb the peace and tranquility of a neighbourhood. There are, however, activities that are expected, described in Schedule A, that are permitted during certain times of day. This includes provisions for the operation of any equipment in connection with construction.
HRM Bylaw Number T-400 – Respecting the Establishment of Truck Routes for Certain Trucking Motor Vehicles within the Halifax Regional Municipality	HRM	As per this bylaw, HRM may establish truck routes and related restrictions (e.g., time of day) on highways within the Municipal Core Service Area. Requires trucks to travel on designated truck routes within the "Urban Core" except for "the purpose of making a delivery or collection of goods or supplying a service at a location.
HRM Regional Centre Secondary Municipal Planning Strategy (MPS)	HRM	Section 2.3.1 of the Regional Centre Secondary MPS: recognizing it is the federal and provincial governments who provide approval for infilling projects, it is the goal of HRM to regulate land use on said infilled water lots. As per policy D-2 (f) the land use bylaw shall ensure water lots that are infilled are subject to the requirements of the abutting zone and maintain public access to the water's edge.

Additional information on the regulation of infilling in HRM is provided in Appendix C.

2.2 FEDERAL ENGAGEMENT PROCESS REGARDING SHORELINE INFILLING

The Impact Assessment Agency of Canada (IAAC) conducted an engagement process with stakeholders and Indigenous People regarding infilling activities in the Northwest Arm of the Halifax Harbour (Appendix A). The focus of that process was related to shoreline infilling generally and was not specific to SBM management. However, that recent process (2022) is considered highly relevant to SBM management relying on shoreline infilling in HRM.

The process in 2022 responded to the request for a Regional Assessment (RA) under the federal *Impact Assessment Act* (IAA) made by Juniper Law on behalf of residents and the Nova Scotia Ecology Action Centre. IAAC determined that a RA is not warranted because: 1) the infilling activities are not subject to the federal impact assessment requirements; and 2) a RA is not to be viewed as a means of addressing gaps in federal, provincial, and municipal policies. IAAC did, however, encourage continuing engagement between the public, stakeholders, and applicable departments and agencies to address the concerns raised regarding infilling and offered to facilitate such a process.

The process included: one-on-one meetings for collecting preliminary information, a notice of engagement posting to the Canadian Impact Assessment Registry (CIAR), consultation with involved stakeholders, developing an engagement summary document, and a workshop to present the findings of the engagement document.

The engagement sessions collected information from the participants regarding interests and concerns related to infilling, questions and suggestions they may have. IAAC held a workshop on March 30, 2022, that included elected officials and representatives from non-government organizations; local residents; Kwilmu'kw Maw-klusuaqn (KMKNO) representing some Mi'kmaw communities; and municipal, provincial, and federal departments.

Of note, IAAC became aware of a working group formed in 2007 (also noted below) that included all levels of government with a mandate to collaborate on new-HRM bylaws for infilling. IAAC determined through the current process that no such working group was currently active and earlier progress on the issue, if any, was unclear.

The main issues raised during the engagement sessions include:

- Current infill approval processes do not consider and evaluate all environment and socioeconomic potential effects
- General interest in increasing HRM's regulatory role, alongside TC and DFO
- Interest in a moratorium on infilling activities until an improved review process can be established
- Improved alignment of goals from all jurisdictions for the infilling review process
- More consideration of the cumulative effects of infilling
- Infilling activities in relation to other developments and activities on the Northwest Arm
- Concerns surrounding the cumulative impacts to the coastline environment, commercial and recreational use, seabed disturbance, and viewscapes
- Navigation impacts for tourists, recreation and commercial vessel traffic, adjacent property owners, yacht clubs and sailing programs, and liability concerns and accidents from increased traffic
- KMKNO expressed concerns regarding impacts to Section 35 Treaty Rights and loss/damage to underwater archeology
- DFO and TC both noted that their governing regulations --the *Fisheries Act* and the *Navigable Waters Convention Act* respectively-- are undergoing review and there is an opportunity for the public to provide feedback
- DFO and TC commented that their review and analysis of impacts has to remain within their jurisdiction and under applicable legislation; however, there is opportunity to collaborate with provincial agencies to determine potential affects to fish and fish habitat and navigation

- NSECC commented that their jurisdiction is limited to pre-Confederation water lots, and does not extend to the federally regulated harbour. The provincial *Coastal Protection Act* (2023) will also not apply to the infilling as it addresses submerged provincial Crown land, related to the *Crown Lands Act*
- HRM commented on a bylaw process in 2007 (noted above) that resulted in restrictions to land uses permitted on infill developments and led to the development of a working group committee that they suggested could be re-established.

Refer to Appendix A for the IAAC Overview and Summary of the March 30, 2022, Workshop for Infilling Activities in the Northwest Arm, Halifax.

3.0 STUDY APPROACH

Several methods were used to inform selection and evaluation of the potential SBM management methods described below. Stantec met with several key stakeholders for their commentary and insights on the advantages and challenges of different methods. These stakeholders included Build Nova Scotia, which is a provincial Crown corporation including the former Waterfront Development Corporation that was later changed to Develop Nova Scotia, with a mandate that includes waterfront development for Halifax Harbour. The Port of Halifax was consulted, which provided insights on the operation and capacity of their SBM management facilities in Halifax Harbour. The Construction Association of Nova Scotia (CANS) and Dexel Development provided perspectives of the development community regarding SBM management. HRM Planners were also consulted and provided additional context on HRM's concerns about SBM management as well as a historical perspective regarding SBM infilling in Bedford Basin.

Research was conducted regarding relevant federal, provincial and municipal legislation and policy on SBM management. Examples include the provincial Sulphide Bearing Material Disposal Regulation (NS Reg 57/1995), Halifax Port Authority Disposal of Pyritic Slate or Inert Construction Material Agreement (2022) (Appendix B), Halifax Port Authority Marine Infill Framework (2012), and Halifax Regional Municipality Information Report on Dartmouth Cove Infilling Pyritic Slate Disposal Sites (2022). The IAAC engagement process regarding shoreline infilling conducted in 2022 was also reviewed.

A list of potential options for SBM management was developed based on stakeholder interviews, regulatory research, and the professional judgement of Stantec team members who have conducted studies and permitting for several clients associated with SBM and other shoreline infill projects in Halifax Harbour. The following eight options have been identified:

- **HPA approved facilities** - OTSF at the south end terminals accepts qualifying SBM for a fee
- **Privately-owned pre-Confederation water lots** – various owners around Halifax Harbour can apply for approval to use the lots for SBM management
- **Crown land leases (administered through HPA)** – Developers can apply to lease water lots from HPA for SBM management with certain restrictions
- **Structural fill for industrial development** – Developers of Harbour projects can apply to use SBM as structural infill

- **Disposal at sea at approved disposal sites** – Developers could apply for marine disposal of SBM at approved deepwater sites
- **Beneficial use (habitat creation and enhancement)** – Developers could use SBM to create artificial reefs
- **Land-based containment or disposal** – Developers could manage SBM on land in containment cells or contained in onsite developments
- **Sheet Harbour** – Was offered as an example of use for potential marine management of SBM in a port outside Halifax.

These options are screened according to relative advantages and constraints with respect to the following criteria in Section 6:

- Physical
- Transportation
- Proximity to adjacent land and water use
- Environmental constraints
- Socio-political considerations
- Property access
- Permitting considerations
- Overall costs/technical feasibility
- Potential cumulative effects.

The advantages and constraints of each SBM management method are analyzed at a high level in Section 7 with a summary of implications for HRM in Section 8.

4.0 DEMAND FOR THE DISPOSAL AND MANAGEMENT OF SULPHIDE-BEARING MATERIAL

It is challenging to precisely forecast the demand for SBM management in HRM for several reasons. Mainly, it is difficult to accurately predict the amount of development requiring excavation coinciding with areas of SBM bedrock that would require management. There are many variables that can affect these estimates including economic conditions as well as the amount of material that is not suitable for marine disposal thus requiring other management options (e.g., treatment facilities such as Clean Earth).

Risk studies of SBM and acid rock drainage (ARD) potential of Nova Scotia bedrock have historically focused on two primary geologic groups: The Halifax Group and the Goldenville Group. Formations under these geologic groups have been developed and attributed to the potential of ARD in the south shore of Nova Scotia by White et al. (2008); specifically, the Beaverbank formation (Goldenville Group) and Cunard and Bluestone formations (Halifax Group). Mapping of these formations for the urban core of HRM has been completed by White and Goodwin (2011) and is shown in Figure 4.1. While formation-specific mapping is limited to the urban core, provincial bedrock mapping shows the Halifax and Goldenville Groups as predominant in the central and northern areas of Halifax, extending through HRM communities north of the urban core to the eastern boundary of the Municipality. The exception is a

central tract of Late Devonian Monzogranite extending from North Preston east through Musquodoboit Harbour through the community of Jacket Lake (Keppie 2000). There is limited presence of the Halifax and Goldenville Groups in the area of HRM west of the Late Devonian Quarry Lake Granodiorite belt shown on Figure 4.1. While SBM and ARD risk is heightened within specific geologic groups, understanding of disposal quantities associated with development is dependent on formation type and site-specific sampling, and thus difficult to predict on a widespread basis.

HPA has developed forecasts for SBM management demand out to 2031 that are considered suitable for general planning purposes (see Figure 4.2). Figure 4.2 presents the cumulative amount of SBM managed by the Fairview Cove Sequestration Facility (FCSF). It indicates closure of the FCSF would be required in early 2023 as has now occurred. The figure indicates a relatively higher predicted volume estimated by a third-party consultant, a lower volume estimated inhouse by HPA, and a median estimate that averages the two projections.

When assessing the future capacity of the OTSF, HPA prefers to forecast the quantity of SBM based on the historical average volume (i.e., received at the FCSF) rather than complex future variables such as expected development. Given 1.4 m^3 of SBM received at the FCSF over approximately 10 years, HPA estimates it will receive approximately 300,000 tonnes per year in the next decade.

HPA therefore expects Phase 1 of OTSF will reach its capacity in 8 to 10 years at which time additional phases may be initiated subject to future infrastructure requirements. HPA has, furthermore, emphasized the need for both contingency and long-term planning for SBM management. Capacity may be consumed more rapidly, for example, if there is an unusual increase in development requiring SBM management. Alternatively, capacity for SBM management could be reduced if a requirement for faster infilling necessitates the use of non-SBM fill for earlier completion of Phase 1.

A key consideration for SBM management is the transportation cost to truck the material to the management location. Typical rock haul costs are weighted to account for labour time and fuel cost associated with trip duration. Inherently, longer trips have a higher haul cost on a volumetric basis of material hauled. The 2023 Cubic Metre Kilometre Rates for Specific Rock Hauling Operations (Table 6) published by NS Public Works range from $4.15 per cubic metre ($m^3$) of material hauled for a 1-kilometre (km) haul distance, to $32.50/$m^3$ for a 100-km haul distance (NSPW 2023).

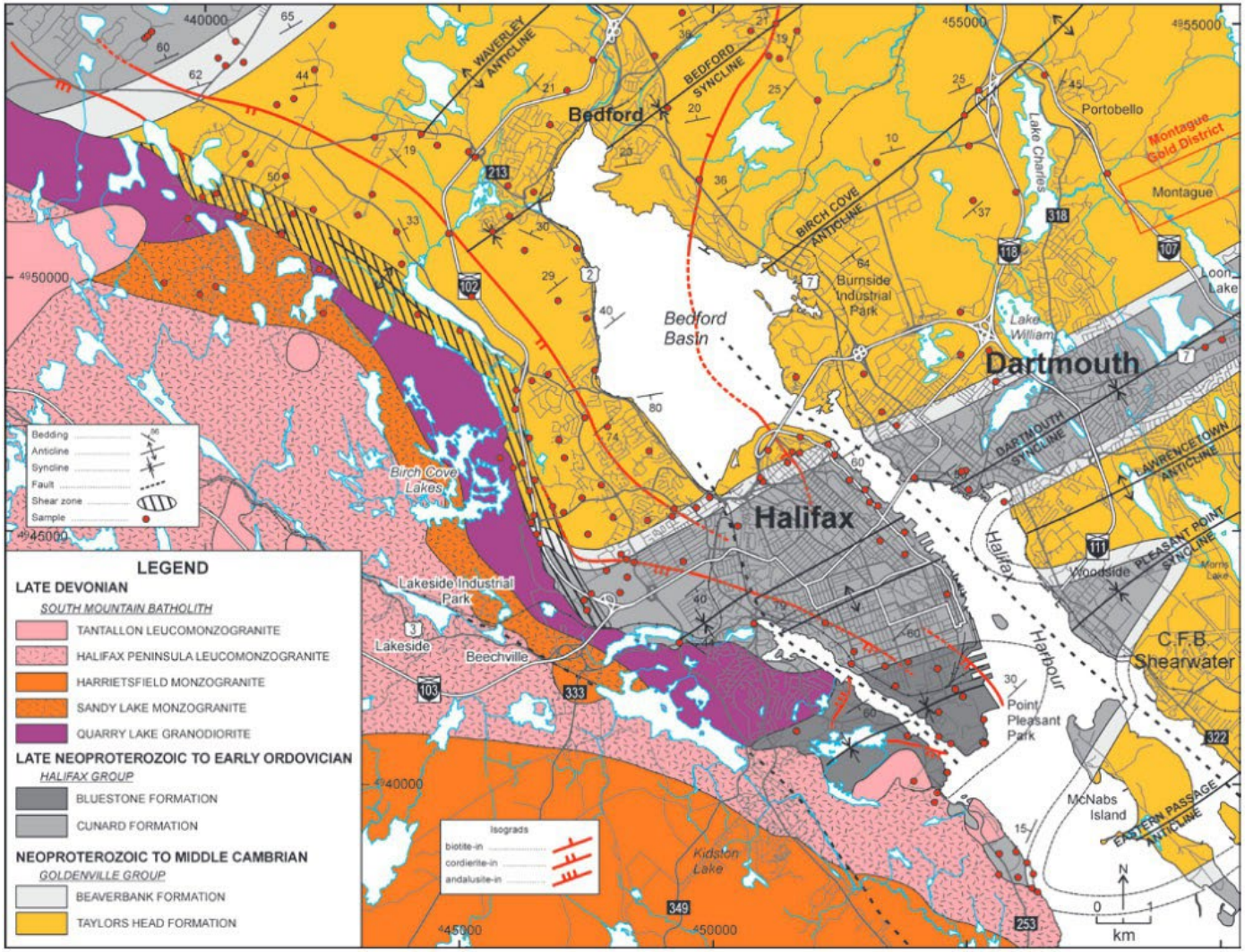

Figure 4.1 Geological map of Halifax Regional Municipality (White and Goodwin 2011)

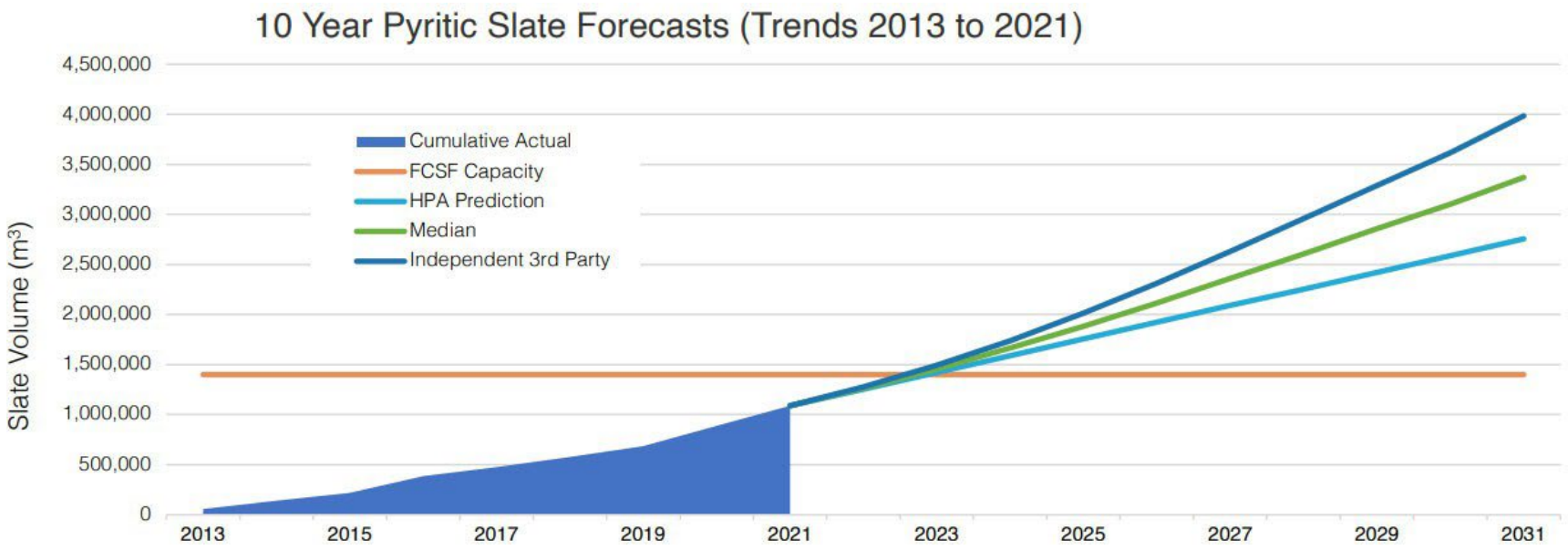

Figure 4.2 Ten Year Pyritic Slate Forecasts (HPA 2022)

5.0 STAKEHOLDER INTERVIEWS

Interviews with key stakeholders for SBM management in HRM included the Port of Halifax, Build Nova Scotia, and CANS. These semi-structured interviews were intended to gather information regarding SBM management practices, estimated demand, modes of transportation, tipping fees, and challenges and opportunities in the future (see Table 5.1 for information on the stakeholder interviews with key points from the discussion noted in the following sections). In addition to those organizations noted in Table 5.1, discussions were also held with HRM planners, who provided additional context and background (e.g., history of Bedford Basin infilling).

Table 5.1 Stakeholder interview information

Proponent	Interviewees	Date
Build Nova Scotia	Kristin O'Toole, Douglas Waugh, Terry Drisdelle	January 10, 2023
Port of Halifax	Mark Adcock, Tyler Boutlier	November 17, 2022
CANS	Duncan Williams and Kris Skiba (Dexel Developments)	November 30, 2022

5.1 BUILD NOVA SCOTIA

Build Nova Scotia (Build NS) is a Provincial crown corporation with a mandate to promote economic development that has historically included waterfront development in Halifax Harbour. Comments and concerns raised by Build NS are summarized below:

- Increase in development and a new housing strategy will generate SBM. Build NS owns the Bedford Infill site and operated it between 2000 and 2012; they are not interested in operating another disposal facility
- Build NS is primarily concerned with development, growth, connecting waterfronts, and other opportunities for Halifax and Dartmouth
- Build NS interests generally align with those of the development community and challenges regarding SBM management
- Build NS is interested in SBM management options that include a public benefit in terms of environmental protection, coastal mitigation, open space creation, and waterfront connection
- Build NS recommends a multi-party discussion including provincial, federal, and municipal regulatory bodies and stakeholders to catalyze a joint strategy for SBM management

5.2 PORT OF HALIFAX

The Port of Halifax engagement included discussions regarding the capacity, cost, and availability of SBM management:

- The SBM disposal demand is approximately 300,000 tonness per year, for a 10-year time horizon
- The SBM must be kept 0.6 m below low tide levels and capped with non-sulphide bearing material

- Fairview Cove SBM management facility received approximately 1.4 million cubic metres of SBM before closure in January 2023
- Tipping fees for HPA are $18.00 per tonne for new contracts as of April 1, 2023.
- HPA has 8 to 10 years of capacity at the OTSF to manage current volumes of SBM but the time frame could be less if the wharf development for Phase 1 must be accelerated or if the rate of development and demand for SBM management is unusually high
- Current constraints for HPA include the environmental effects determination process under Section 82 of the IAA as well as the provincial requirement not to stockpile SBM onshore longer than 30 days prior to marine deposit
- HPA is also aware of examples of encapsulation on site (e.g., 102/103 interchange) and also Dexter Construction cell in Rocky Lake that is being used for the Hwy 102 Aerotech Connector Road SBM
- HPA investigated transportation of SBM to their facilities by barge and rail and concluded that increased costs, time and emissions of additional handling can't be justified. Rail and barge may make sense over long distances (e.g., over 25 km) where the economies of scale for fuel and emission savings can compensate for the additional handling, but truck would be generally more efficient.

5.3 CONSTRUCTION ASSOCIATION OF NOVA SCOTIA

CANS and Dexel Developments were consulted regarding issues and concerns with SBM management. This included consideration of different and preferred disposal methods, SBM transportation, and fees associated with the SBM disposal. The comments from CANS and Dexel Development are summarized below:

- A secure method of disposal, available disposal locations, and reasonable, predictable costs are required to ensure development is not disrupted
- Increasing HRM's regulatory influence will continue to slow down the disposal process, which is already heavily regulated by DFO and HPA
- Material is commonly generated from urban areas and there is pressure to find alternatives to current HPA facilities
- Being certain of acceptance and testing criteria at HPA facilities is very important and has caused problems in the past when changed without much warning
- CANS reports that about 16,000 dwelling units will be required annually in the urban centre with a 10- to 15-year time frame
- Increased distances raise the cost for SBM management and could make the difference in project feasibility
- SBM that does not meet HPA's quality criteria -- most notably material containing excessive hydrocarbons, which characterize a substantial portion of SBM derived from the Halifax Peninsula (Section 2.04 of Appendix B) -- must be brought to Clean Earth at a much higher cost
- Development in HRM is generally difficult given labour costs, low return rates, rising interest rates, supply chain disruptions, climate change, and net-zero action plans
- In general, CANS would like to see much better lines of communication with HRM.

6.0 OPPORTUNITIES AND CONSTRAINTS FOR SULPHIDE-BEARING MATERIAL MANAGEMENT

Table 6.1 summarizes opportunities and constraints for SBM management according to the options and criteria described in Section 3 and other information presented in the forgoing sections.

Table 6.1 Opportunities and Constraints of SBM Management

Disposal Options	Constraints								
	Physical	**Transportation**	**Proximity to Adjacent Land and Water Uses**	**Environmental Constraints**	**Socio-political Considerations**	**Property Access**	**Permitting Considerations [11]**	**Overall Costs/Technical Feasibility**	**Potential Cumulative Effects**
HPA Approved Facilities	SBM shall be well-graded, generally free of clays, silts, debris or any other deleterious material[1]. SBM fill shall have a maximum size of 1200 mm and generally free of fines[1]. SBM must be disposed of below the lowest low tide and must be capped with non-sulphide rock to high tide level with a maximum particle size of 300 mm[1].	Transportation by truck to the approved facility at the Ocean Terminal Sequestration Facility in Halifax. The Ocean Terminal Sequestration Facility is centrally located on Halifax peninsula close to potential large sources of SBM into the future (e.g., hospital development), assuming SBM can meet quality guidelines for marine disposal. HPA investigated transportation of SBM by barge and rail and concluded it was not justified in most cases given increased costs, time and emissions associated with additional handling. Rail and barge may be justified over long distances (e.g., over 25 km) where the economies of scale for fuel and emission savings can compensate for the additional handling[13].	Not a concern; HPA facilities are in industrialized port areas and HPA has approval to receive truckloads of SBM at their facilities.	SBM must not be contaminated[1,2] Greenhouse Gas (GHG) emissions dependent on trucking distances.	No anticipated controversy, federally approved facilities within industrialized port areas. HPA is an experienced operator of marine sequestration facilities (i.e., Fairview Cove Sequestration Facility, Ocean Terminal Sequestration Facility). It is noted that heavy truck traffic on municipal roads is currently a socio-political issue.	HPA facilities are currently accessible to receive truckloads of SBM through port roadway network.	None – HPA has federal approval for their facilities and would be responsible for the permitting of new facilities. Permitting of additional infill areas would require new studies and environmental assessment.	Transportation costs of trucking SBM to facility[3]. HPA charges tipping fees[4]. HPA facilities are centrally located near major potential sources of future SBM excavation. No technical constraints to HPA operations. The Ocean Terminals site contains approximately 8 – 10 years of currently permitted capacity at current volumes. This capacity is highly dependent on several variables including: development demand and schedule for Phase 1 wharf development. Future phases (not permitted, would add additional capacity).	There is potential for cumulative loss of fish habitat; however, the existing HPA facilities are in a heavily industrialized port area with no loss of natural shoreline. Heavy trucks using municipal streets can cause cumulative roadway damage and discourage residents from locating alongside truck routes.
Privately-owned Pre-Confederation Waterlots	SBM shall be well-graded, generally free of clays, silts, debris or any other deleterious material[1,A]. SBM fill shall have a maximum size of 1200 mm and generally free of fines[1,A]. Depth of water lot could be a consideration where SBM must be disposed of below the lowest low tide and must be capped with non-sulphide rock to high tide level with a maximum particle size of 300 mm[1,A].	Transportation by truck to approved water lot; barge disposal not likely a cost effective option within Halifax Harbour[13]. Water lot may or may not be centrally located near the sources of major SBM excavation.	Could be an issue depending on the location of the water lot. For example, land use conflicts may arise if nearby land uses are not compatible with SBM disposal operations, and/or HRM land use bylaws allow future land use which would not be compatible with SBM disposal operations. Disposal operations may also not be compatible with other marine activities (e.g., neighbouring wharves, vessel movements, navigation, anchorages, etc.)	SBM must not be contaminated[1,2,A] GHG emissions would depend on trucking distances and alternative modes/technologies. There may be differences in fish habitat quality at the water lots	Potentially highly controversial depending on the location of the water lot, adjacent land and water uses and access requirements. It is noted that heavy truck traffic on municipal roads is currently a socio-political issue Intensive public and stakeholder engagement may be required.	Could potentially require permissions to access water lot (e.g., rail, road and trail right of ways). Potential controversy surrounding trucking routes to water lot and hours of operation if adjacent to sensitive land uses (e.g., residential, commercial or industrial land uses).	A new SBM disposal facility at a private water lot would require a number of government approvals and supporting studies. These could take up to a year or two to process including associated obligations (e.g., marine habitat offsetting plan). DFO has indicated concern regarding the potential cumulative effects of shoreline infilling projects, particularly in Halifax Harbour, and associated issues related to Indigenous rights. Applicable Acts and Regulations include: Federal - *Canadian Navigable Waters Act*; *Fisheries Act;* and *Canadian Environmental Protection Act, 1999*	Transportation costs of trucking SBM to waterlot[3]. Owner of water lot may charge tipping fees[7]. Depth of water lot could be a limitation. The bathymetry will determine the capacity of the site and the economic feasibility of a site for SBM disposal.	Cumulative effects would depend on the location of the water lot and if there are other marine industrial activities at that location. DFO has indicated concern regarding the potential cumulative effects of shoreline infilling projects, particularly in Halifax Harbour, and associated issues related to Indigenous rights. There is further potential for cumulative effects if it becomes a continuing trend for the owners of pre-confederation water lots to accept SBM for infilling or revenue generation purposes.

Table 6.1 Opportunities and Constraints of SBM Management

Disposal Options	Constraints								
	Physical	Transportation	Proximity to Adjacent Land and Water Uses	Environmental Constraints	Socio-political Considerations	Property Access	Permitting Considerations [11]	Overall Costs/Technical Feasibility	Potential Cumulative Effects
							(Disposal at Sea Regulations)[5] Provincial –*Environment Act*((Sulphide Bearing Material Disposal Regulations)[6, 12] Municipal – HRM nuisance bylaws		
Crown Land Leases (Administered through HPA)	SBM shall be well-graded, generally free of clays, silts, debris or any other deleterious material[1,A]. SBM fill shall have a maximum size of 1200 mm and generally free of fines[1,A]. SBM must be disposed of below the lowest low tide and must be capped with non-sulphide rock to high tide level with a maximum particle size of 300 mm[1,A].	Transportation by truck to approved site; barge disposal not likely a cost-effective option within Halifax Harbour[13]. Lease may or may not be centrally located near the sources of major SBM excavation.	Could be an issue depending on the location of the lease. For example, land use conflicts may arise if upland/adjacent land uses are not compatible with SBM disposal operations Substantial restrictions on use of the reclaimed land: HPA's infill policy for Port Authority managed water lots prohibits the use of the water lot for a commercial/industrial, institutional, residential, retail or recreational purpose and only allows use consistent with adjacent upland that has a specific marine industrial requirement. HRM land use bylaws also restrict future land for reclaimed land to that consistent with the zoning of the adjacent upland Disposal operations may also not be compatible with other marine activities (e.g., neighbouring wharves, vessel movements, navigation, anchorages, etc.)	SBM must not be contaminated[1,2,A] GHG emissions would depend on trucking distances or alternative modes/technologies. There may be differences in fish habitat quality at the lease areas.	Potentially highly controversial depending on the location of the lease, adjacent land and water uses and access requirements. It is noted that heavy truck traffic on municipal roads is currently a socio-political issue Intensive public and stakeholder engagement may be required.	Could potentially require permissions to access lease (e.g., rail, road and trail right of ways). Potential controversy surrounding trucking routes to lease and hours of operation if adjacent to sensitive land uses (e.g., residential, commercial or industrial land uses).	Federal - *Canadian Navigable Waters Act*, *Fisheries Act; Canadian Environmental Protection Act, 1999* (Disposal at Sea Regulations)[5] Section 82 environmental effects determination under Impact Assessment Act Municipal – HRM nuisance bylaws	Transportation costs of trucking SBM to lease[3]. Lessee may charge tipping fees[7]. Depth of lease could be a limitation. The bathymetry will determine the capacity of the site and the economic feasibility of a site for SBM disposal.	Cumulative effects would depend on the location of the leased water lot and if there are other marine industrial activities at that location. Heavy trucks using municipal streets can cause cumulative roadway damage and discourage residents from locating alongside truck routes. DFO has indicated concern regarding the potential cumulative effects of shoreline infilling projects, particularly in Halifax Harbour, and associated issues related to Indigenous rights. There is also the potential for cumulative effects if it becomes a trend for the operators of Crown land leases to accept SBM for infilling or revenue generation purposes.

Table 6.1 Opportunities and Constraints of SBM Management

Disposal Options	Constraints								
	Physical	**Transportation**	**Proximity to Adjacent Land and Water Uses**	**Environmental Constraints**	**Socio-political Considerations**	**Property Access**	**Permitting Considerations [11]**	**Overall Costs/Technical Feasibility**	**Potential Cumulative Effects**
Structural Fill for Industrial Developments[B]	SBM shall be well-graded, generally free of clays, silts, debris or any other deleterious material[1,A]. SBM fill shall have a maximum size of 1200 mm and generally free of fines[1,A]. SBM must be disposed of below the lowest low tide and must be capped with non-sulphide rock to high tide level with a maximum particle size of 300 mm[1,A].	Transportation by truck to approved development. Development site may or may not be centrally located near the sources of major SBM excavation.	Could be an issue depending on the location of the development. For example, land use conflicts may arise if upland/adjacent land uses are not compatible with SBM disposal operations and/or HRM land use bylaws restrict facility access or allow incompatible adjacent future land use. Disposal operations may also not be compatible with other marine activities (e.g., neighbouring wharves, vessel movements, navigation, anchorages, etc.)	SBM must not be contaminated[1,2,A] GHG emissions would depend on trucking distances or alternative models/technologies. There may be differences in fish habitat quality at the development sites	Potentially controversial depending on the location of the development, adjacent land and water uses and access requirements. It is noted that heavy truck traffic on municipal roads is currently a socio-political issue. Public and stakeholder engagement may be required.	Could potentially require permissions to access development site (e.g., rail, road and trail right of ways). Potential controversy surrounding trucking routes and hours of operation if adjacent to sensitive land uses (e.g., residential, commercial or industrial land uses).	Federal - *Canadian Navigable Waters Act*, *Fisheries Act* Provincial – *Environment Act* (Sulphide Bearing Material Disposal Regulations)[6] Municipal – HRM nuisance bylaws	Transportation costs of trucking SBM to development site[3]. Developer may charge tipping fees[7]. Depth of development site could be a limitation. The bathymetry will determine the capacity of the site and the economic feasibility of a site for SBM disposal. Industrial developments may be limited opportunities for SBM disposal that depend on timing and schedule.	Cumulative effects would depend on the location of the development and if there are other marine industrial activities at that location (e.g., quality of marine habitat). Heavy trucks using municipal streets can cause cumulative roadway damage and discourage residents from locating alongside truck routes. DFO has indicated concern regarding the potential cumulative effects of shoreline infilling projects, particularly in Halifax Harbour, and associated issues related to Indigenous rights. There is also the potential for cumulative effects if it becomes a trend for developers accept SBM for infilling and/or revenue generation purposes.
Disposal at Sea at Approved Disposal Sites	SBM must be disposed at an approved disposal site. The approved disposal sites are typically in deep water. Disposal site would preferentially be located in an area that has been previously approved for disposal at sea. Disposal sites are located away from heavily fished areas and areas used for anchoring. Terminal and laydown area, and associated material handling and equipment will be required.	Transportation by truck to barge[13], transportation by barge to an approved disposal site. Disposal site may not be centrally located.	Disposal sites are typically located away from heavily fished areas and other marine constraints (e.g., navigation and anchoring). The onshore transfer facility should be located away from conflicting land uses.	SBM must meet CEPA, 1999 Disposal at Sea Guidelines. GHG emissions would depend on trucking, barging distances and technologies. Runoff from stockpile areas must be controlled and managed to prevent discharge of deleterious materials into marine environment. Nuisances (e.g., noise, dust, light) must also be managed. Stockpiling limited to 30 days.	Could cause conflict with fishing activities in the area and associated controversy. Onshore transfer facility could cause conflict with adjacent sensitive land uses and associated controversy and nuisance concerns. It is noted that heavy truck traffic on municipal roads is currently a socio-political issue Public and stakeholder engagement may be required.	Could potentially require permissions to access development site (e.g., rail, road and trail right of ways). Potential controversy surrounding trucking routes and hours of operation if adjacent to sensitive land uses (e.g., residential, commercial or industrial land uses). Disposal at sea operations could cause temporary restrictions to navigation in a localized area and require notifications to other mariners.	Federal – *Fisheries Act*, *Canadian Environmental Protection Act, 1999* (Disposal at Sea Regulations) Provincial – *Environment Act* (Sulphide Bearing Material Disposal Regulations)[6] Municipal – HRM nuisance bylaws New disposal sites will require an enhanced level of engagement with fish harvesters and Indigenous groups. Dispersion modelling may be required. Physicochemical characterization of SBM would be required by an accredited laboratory. Bioassays may also be required. SBM not satisfying these requirements will not be approved for marine disposal. Contaminated	Transportation costs of trucking SBM to barge[3], and for transportation on barge to disposal site[8,]. Relatively high costs of double handling material and operation of transfer site. SBM may need to be stockpiled prior to loading onto barge.	Cumulative loss or modification of fish habitat until benthic community is reestablished. Cumulative effects are relatively less than for shoreline or shallow water infilling. Heavy trucks using municipal streets can cause cumulative roadway damage and discourage residents from locating alongside truck routes.

Table 6.1 Opportunities and Constraints of SBM Management

Disposal Options	Constraints								
	Physical	Transportation	Proximity to Adjacent Land and Water Uses	Environmental Constraints	Socio-political Considerations	Property Access	Permitting Considerations [11]	Overall Costs/Technical Feasibility	Potential Cumulative Effects
							material not typically accepted for marine disposal. Time limits for stockpiled material (e.g., 30 days)		
Beneficial Use (Habitat Creation and Enhancement)	SBM must be disposed at a location and a depth that would support benthic communities and other marine life (e.g., within the photic zone). SBM should not be placed in areas with productive fish habitat. Depth, not impacting existing good fish habitat, proper geotechnical characteristics, not impeding navigation, anchorages, vessel movements or existing heavily fished areas are all important. Ideally would be located adjacent to areas of good fish habitat that are trending towards less quality habitat, or in areas that have previously been degraded by industrial activities (i.e., dredging).	Transportation by truck to barge[13], transportation by barge to approved site. May require additional equipment or methodologies for creating beneficial habitat (i.e., artificial reefs). Disposal site may not be centrally located.	Disposal sites would likely be located away from heavily fished areas and other marine constraints (e.g., navigation and anchoring). The onshore transfer facility should be located away from conflicting land uses.	SBM must not be contaminated[1,2,A]. GHG emissions would be dependent on trucking and barging distances. Runoff from stockpile areas must be controlled and managed to prevent discharge of deleterious materials into marine environment. Nuisances (e.g., noise, dust, light) must also be managed.	Could cause conflict with fishing activities in the area and associated controversy. Onshore transfer facility could cause conflict with adjacent sensitive land uses and associated controversy and nuisance concerns. Public and stakeholder engagement may be required.	Could potentially require permissions to access development site (e.g., rail, road and trail right of ways). Potential controversy surrounding trucking routes to lease and hours of operation if adjacent to sensitive land uses (e.g., residential, commercial or industrial land uses). Creation of artificial reefs could cause temporary restrictions to navigation in a localized area and require notifications to other mariners.	Federal - *Fisheries Act* Provincial – *Environment Act* (Sulphide Bearing Material Disposal Regulations)[6] Municipal – HRM nuisance bylaws Time limits for stockpiled material (e.g., 30 days)	Transportation costs of trucking SBM to barge[3, 13], and for transportation on barge[13] to approved site[8]. The use of SBM for habitat creation and enhancement is an unproven technology. Relatively high costs of double handling material and operation of transfer site. SBM may need to be stockpiled prior to loading onto barge. Additional handling of material at disposal site to create reefs.	Cumulative loss or modification of fish habitat until benthic community is reestablished. Cumulative effects are relatively less than for shoreline or shallow water infilling. Depending on the effectiveness of the created reefs or enhanced habitat, could create a net positive effect.
Land-based containment or disposal	Must have containment cell of sufficient size to accept the SBM generated. Engineered containment cell must meet requirements[6] (e.g., permeability, distance from watercourses) None for disposal at approved facility (i.e., Clean Earth).	Transportation by truck to approved containment cell or disposal facility. Containment cell or land-based disposal facility may or may not be centrally located near the sources of major SBM excavation.	Could be an issue depending on the location of the containment cell and surrounding land uses. Not an issue for approved land-based disposal facility (i.e., Clean Earth).	GHG emissions would depend on trucking distances and alternative modes/technologies. Containment cells must maintain separation distance from watercourses and sensitive receptors and must meet design criteria[6].	Potentially controversial depending on the location of the containment cell, adjacent land and water uses and access requirements. It is unclear if the containment cell and surrounding lands would be appropriate for future development once capped and closed. Public and stakeholder engagement may be required.	Could potentially require permissions to access containment cell (e.g., rail, road, and trail right of ways). Potential controversy surrounding trucking routes to containment cell and hours of operation if adjacent to sensitive land uses (e.g., residential, commercial or industrial land uses).	Provincial- *Environment Act* (Sulphide Bearing Material Disposal Regulations)[6]	Construction of containment cell[9]. Relatively higher costs associated with constructing engineered containment cell. Engineered containment cell must meet technical requirements[6] including separation distances from sensitive areas. Transportation costs of trucking or transloading SBM to containment cell or disposal site[3]. Approved land-based disposal sites charge tipping fees[10].	Cumulative effects would be relatively low.

Table 6.1 Opportunities and Constraints of SBM Management

Disposal Options	Constraints								
	Physical	**Transportation**	**Proximity to Adjacent Land and Water Uses**	**Environmental Constraints**	**Socio-political Considerations**	**Property Access**	**Permitting Considerations [11]**	**Overall Costs/Technical Feasibility**	**Potential Cumulative Effects**
Sheet Harbour	SBM shall be well-graded, generally free of clays, silts, debris or any other deleterious material[1, A.] SBM fill shall have a maximum size of 1200 mm and generally free of fines[1, A.] SBM must be disposed of below the lowest low tide and must be capped with non-sulphide rock to high tide level with a maximum particle size of 300 mm[1,A].	Transportation by truck to barge[13]. Transportation by barge to Sheet Harbour. Sheet Harbour is not centrally located near the sources of major SBM excavation.	Could be an issue depending on the selected disposal site. For example, land use conflicts may arise if upland land uses are not compatible with SBM disposal operations and/or HRM land use bylaws limit facility access or allow incompatible future land use nearby. Disposal operations may also not be compatible with other marine activities (e.g., neighbouring wharves, vessel movements, navigation, anchorages, etc.) It is noted, however that there is a large, underutilized industrial park next to the marine terminal	SBM must not be contaminated[1,2,A]. GHG emissions would depend on trucking, barging distances and technologies.	Potentially controversial depending on the location of the development, adjacent land and water uses and access requirements. Public and stakeholder engagement may be required.	Could potentially require permissions to access site (e.g., road and trail right of ways). Potential controversy surrounding trucking routes to site, if applicable, and hours of operation if adjacent to sensitive land uses (e.g., residential, commercial, or industrial land uses). It is noted, however, that there is a separate service road to the industrial park and port, so eastbound trucks would not traverse the village itself. Barging would avoid trucking issues.	Federal - *Canadian Navigable Waters Act*, *Fisheries Act* Provincial – *Environment Act* (Sulphide Bearing Material Disposal Regulations)[6] Municipal – HRM nuisance bylaws	Transportation costs of trucking SBM to barge[3,13, C], and for transportation on barge to Sheet Harbour[8, 13]. Depth of the site could be a limitation. The bathymetry will determine the capacity of the site and the economic feasibility of a site for SBM disposal.	Cumulative effects would depend on the location of the disposal site in Sheet Harbour, and if there are other nearby marine industrial activities. It is noted that disposal could be accessed from the west without traversing the village, and accessed by barge[13] via the adjacent dock thus reducing cumulative effects.

Notes:

1 HPA's Marine Infill Framework and HPA's Minimum Requirements for Pyritic Slate Infill (Appendices B and C)

2 HPA's Disposal of Pyritic Slate or Inert Construction Material Agreement (Appendix B)

3 Typical rock haul costs are weighted to account for labour time and fuel cost associated with trip duration. Inherently, longer trips have a higher haul cost on a volumetric basis of material hauled. The 2023 Cubic Metre Kilometre Rates For Specific Rock Hauling Operations (Table 6) published by NS Public Works range from $4.15 per cubic metre ($m^3$) of material hauled for a 1 kilometre haul (km) distance, to $32.50/$m^3$ for a 100 km haul distance (NSPW 2023); transportation costs for trucking would depend on the distances traveled and labour costs

4 HPA charges $16.50/tonne based on Disposal of Pyritic Slate or Inert Construction Material Agreement (2022) (Appendix B)

5 *Canadian Environmental Protection Act*, 1999 Disposal at Sea Regulations may be applicable if not considered a beneficial use

6 Sulphide Bearing Material Disposal Regulations made under Section 66 of the NS *Environment Act*

7 Tipping fee would be determined by the operator

8 Marine transportation costs would depend on transportation costs and distance to infilling location

9 The construction of a containment cell and associated costs would be the responsibility of the proponent

10 Land-based approved disposal facilities (e.g., Clean Earth) charge a tipping fee according to the type of material and contamination

11 Permitting requirements are presented here for preliminary planning purposes only and are determined on a project specific basis. These permitting requirements are not intended to be exhaustive.

12 NSECC has indicated that the Province does not regulate with respect to private water lots in federally managed harbours (e.g., Halifax Harbour) (IAAC 2022)

13 HPA investigated transportation of SBM by barge and rail and concluded it was not justified in most cases given increased costs, time and emissions associated with additional handling. Rail and barge may be justified over long distances (e.g., over 25 km) where the economies of scale for fuel and emission savings can compensate for the additional handling.

Assumptions:

A Assumption that the equivalent of HPA's Marine Infill Framework (Appendix B) would be the criteria used

B Industrial developments may be limited opportunities for SBM disposal that depend on timing and schedule

C Assumption that barging is only feasible for trips greater than 25 km based on cost and GHG emissions (Mark Adcock, HPA, personal communication, 2023).

7.0 ANALYSIS

HPA Approved Facilities

HPA recently closed its SBM infill facility at Fairview Cove. The Port Authority is now accepting SBM from developers at the approved OTSF at the South End Terminals provided the material meets HPA specifications. HPA charges a tipping fee for disposal.

Advantages

There are many advantages to the use of this facility in the near- and medium-term:

- The OTSF is a currently permitted and operational facility for marine sequestration of SBM at commercial scale.
- HPA is an experienced operator of SBM management facilities (e.g., Fairview Cove, previously) with detailed procedures and quality requirements.
- It is centrally located close to largest demand for excavated SBM management in the urban core.
- It has an anticipated capacity of 8 to 10 years at current volumes (approximately 300,000 tons per year) with room for further expansion .
- It is located within an industrial area readily accessible for trucks and separated from sensitive land uses. The marine footprint is also within an industrialized area. Areas for potential future expansion are also within these industrialized areas.
- The reclaimed land is a part of integrated port planning (Phase 1 of future wharf development).
- It is likely that the public and stakeholders along with the development community (with certain reservations) will continue to be accepting of HPA-operated SBM facilities in industrial areas.

Constraints

- The expected 8 to 10-year life of the current facility is uncertain given the potential that the rate of land development may increase generating more SBM than has been experienced in the past. There is also the possibility that port development may accelerate and require the use of non-SBM fill to create needed infill thus reducing SBM capacity.
- Future expansion beyond Phase 1 is not currently approved (e.g., by DFO) and not guaranteed .
- Developers have reported that a significant volume of SBM material, particularly material excavated from the Halifax Peninsula, does not meet HPA quality standards due to level of contamination, and must be taken to Clean Earth at a much higher disposal cost.
- Developers have expressed concern that HPA is essentially the sole option for management of clean SBM. They are also concerned by changes in HPA testing requirements, which can generate uncertainty for their operations.
- Trucking may include using Hollis and Lower Water Streets where truck traffic is already an issue.
- HPA concluded that transportation of SBM by barge and rail was not justified in most cases given increased costs, time and emissions associated with additional handling.

Privately-owned Pre-Confederation Water lots

There are several privately owned, pre-Confederation water lots around Halifax Harbour. Many of these lots have been partially or completely infilled over the years to create land and expand properties (e.g., Northwest Arm). Recent proposals to develop these water lots as SBM management sites have met significant public opposition.

Advantages

- Infilling of private water lots to improve properties and otherwise reclaim land has been practiced historically, although it has been subject to increasing regulatory scrutiny and public concern.
- Depending on the location, SBM facilities on private water lots could offer developers alternatives to HPA facilities based on more convenient location and lower tipping fees (it is assumed that private operations would be required to maintain quality standards similar to HPA's with non-compliant material going to Clean Earth).

Constraints

- There are extensive federal permitting requirements for a new facility including from DFO and Transport Canada. Authorization under the *Fisheries Act*, if granted, would require offsetting measures for loss of fish habitat.
- Depending on location, development on these sites could have issues with truck access and conflicts with surrounding land uses (e.g., residential, commercial, institutional) including nuisances during infill and accompanying high degree of public concern.
- Municipal land use by-laws restricting the future use of the land, once reclaimed (HRM currently restricts zoning of new land to that of the adjacent upland).
- Depending on location, the facility could impact sensitive marine environments and add to concern with cumulative effects of shoreline infilling.
- Depending on the size and depth profile of the infill area, the site could have limited capacity to accept SBM material and considering the requirement to maintain the material below low tide level and capped with clean, non-SBM fill.

Crown Land Leases (Administered through HPA)

Developers can apply to lease HPA-administered lots on federal lands within Halifax Harbour for the purpose of infilling with SBM. HPA has developed guidelines for proponents wishing to do this, although none has taken the initiative to date. Many of the same issues pertaining to infilling private water lots also apply to lands leased by HPA for that purpose and, like HRM, HPA applies broad restrictions on future land use.

Advantages

- Infilling of water lots to improve properties and otherwise reclaim land has been practiced historically, although it has been subject to increasing regulatory scrutiny and public concern and restrictions from HPA.

- Depending on the location, SBM facilities on HPA-leased water lots could offer developers alternatives to HPA facilities in more convenient locations at lower tipping fees.
- HPA guidelines would contractually maintain the same quality standards as currently applied at HPA facilities.

Constraints

- The lease must comply with extensive permitting requirements from DFO, including offsetting measures for loss of fish habitat, if Authorization under the *Fisheries Act* is granted.
- HPA would also require lease applicants to prepare an environmental effects determination report for projects on federal lands under s. 82 of the *Impact Assessment Act*.
- Authorization from Transport Canada under the *Canadian Navigable Waters Act* (CNWA) would also be required.
- Depending on location, could have several issues associated with truck access and conflicts with surrounding land uses (e.g., residential, commercial institutional) including nuisances and accompanying high degree of public concern.
- HPA's infill policy for Port Authority managed water lots prohibits the use of the water lot for a commercial/industrial, institutional, residential, retail, or recreational purpose and only allows use consistent with adjacent upland that has a specific marine industrial requirement.
- HRM land use bylaws also restrict future land use of reclaimed land to uses permitted by the zoning of the adjacent upland.
- Depending on location, the facility could impact sensitive marine environments and add to concern with cumulative effects of shoreline infilling.
- Depending on the size and depth profile of the infill area, the site could have limited capacity to accept SBM material and considering the requirement to maintain the material below low tide level and capped with clean, non-SBM fill.

Structural Fill for Industrial Developments

Some developers may wish to accept SBM material for land reclamation or other structural elements (e.g., wharf development). The primary purpose of these infills would be project-specific (e.g., Irving Shipyard) although they could offer some limited commercial opportunities to charge those seeking to dispose of SBM material on a temporary basis.

Advantages

- Beneficial use of SBM material to support otherwise approved developments assuming the material follows strict environmental standards and obtains the necessary federal authorizations (e.g., DFO, TC).
- Likely time and project-limited.
- Potentially more acceptable to the public and stakeholders if associated with a defined and otherwise approved project.

Constraints

- Similar constraints as those listed for private and HPA water lots above including restrictions on proposed use of the infilled land.
- Similar constraints as for private and HPA water lots depending on location in terms of potential for nuisance related to truck access and other disturbances to sensitive land uses, although this would be more time limited than a dedicated commercial SBM operation.
- Similar permitting requirements as those listed above for other infill projects with variations depending on ownership of the water lot.
- Potential for commercial SBM operations limited by capacity to accept large amounts of SBM depending on depth and capacity of the infill and time frame required by the specific project.

Disposal at Sea at Approved Disposal Sites

As a potential alternative to shoreline infilling, DFO has enquired about the feasibility of marine disposal of clean SBM in deeper waters away from the more sensitive coastal habitats. For example, a site off McNabs Island has previously been approved and used for disposal of clean dredged material.

Advantages

- Could potentially accept large amounts of clean SBM.
- Will not add to cumulative loss of sensitive and relatively more productive coastal habitats.

Constraints

- Transfer of SBM material from truck to barge and additional transport to the marine disposal site will substantially increase costs for developers and will make this option far less attractive compared with direct truck infilling.
- In addition to the permitting required for shoreline infilling noted above, ECCC must authorize disposal at sea -- an extensive process with stringent requirements.
- Depending on the location of the truck-to-barge transfer facility, there could be concerns with truck access, and nuisance issues with respect to sensitive land uses.
- Additional environmental issues associated with barge transfer (e.g., air emissions).

Beneficial Use (Habitat Creation and Enhancement)

One suggestion for SBM management is to place it in the marine environment to maximize its value for habitat restoration and/or creation as opposed to the previous option of simple marine disposal. Creation of artificial reefs is a well-known technique for enhancing marine productivity and has been widespread in Halifax Harbour in terms of placement of reef balls. Artificial reef creation with large amounts of placed rock was used to offset habitat loss/disturbance associated with major channel deepening in Sydney Harbour, Cape Breton.

Advantages

- Potential opportunity to restore/create/enhance marine habitats.
- Provide opportunities for habitat offsetting associated marine infrastructure projects and requirements of *Fisheries Act*.
- Provide research opportunities, particularly regarding the effectiveness of the use of SBM for artificial reefs.
- Would not add to the cumulative effects associated with shoreline infilling.

Constraints

- While creation of artificial reefs is proven to enhance habitat, the use of SBM for this purpose requires additional research.
- This option has similar issues as with disposal at sea noted above including increased handling costs and potential nuisance at land-based transfer facilities.
- Planning for the reef creation and specific requirements for location (e.g., depths, and avoidance of good habitats and conflicts with navigation and other uses) add to costs.
- Likely not a commercially viable option for large-scale SBM management at this point.

Land-based containment or disposal

Land-based disposal of SBM is permitted under conditions specified in the provincial Sulphide Bearing Material Disposal Regulations. These conditions specify the type of containment (typically an engineered cell) and siting and monitoring requirements. Cells have been developed in recent years in areas for project-specific applications (e.g., highway development). Land-based containment could also be used on a project-specific basis to manage excavated material on site (e.g., excavated SBM used as fill material on site) if it can be properly contained with low permeability material (e.g., covered with asphalt).

Advantages

- Can be used on project-specific basis where quantities of SBM are generated if placed in an engineered cell according to regulatory requirements to prevent seepage off acidic runoff into the surrounding environment.
- Can also be used in site development in cases where cut and fill or regrading is necessary if the excavated SBM material can be contained by a low permeability cover material (e.g., asphalt).
- Especially viable if the project is located at a distance from established marine disposal options and as a cost-effective use of excavated material onsite if properly contained.

Constraints

- Must be sited away from environmentally sensitive areas.
- Costs associated with design and construction of containment cell.
- Potential nuisances associated with construction of the facility if close to sensitive land uses.
- Unlikely to be feasible for use as a commercially operated facility due to volume constraints beyond those resulting from the original project and strict requirements for storage and handling of the material on land.

Sheet Harbour

Marine disposal sites for clean SBM are also potentially available outside the HRM urban core as part of port improvement projects. The port of Sheet Harbour has been selected as an example.

Advantages

- An SBM marine disposal site to support port development accepting potentially large volumes of fill and operated as a commercial facility (similar to HPA's operations) is theoretically possible.
- Some similar advantages as those associated with HPA's facility would likely apply such as relatively low potential for land use conflicts in an industrialized site and beneficial use of the material for port development.

Constraints

- Locally generated material would not be sufficient to support a full-scale commercial facility and it would not be cost effective or environmentally advantageous to truck material from the major sources of SBM to Sheet Harbour.
- HPA has reported that transportation by barge over 25 km would theoretically make a trip to Sheet Harbour from the urban core cost effective compared with trucking costs. But all the cost and other issues associated with multiple handling of material for barge transport as well as potential nuisance of operating a transfer facility, depending on location (noted for other barge-related options noted above) would apply.
- A new disposal site at Sheet Harbour would require multiple studies and permits. General feasibility studies and planning and design in conjunction with the Port of Sheet Harbour Agency (POSHA) would be required to advance this option.
- While it is possible that a small marine infill site to accept local SBM could be feasible at Sheet Harbour, it seems unlikely that it would be a viable option to accept large amounts of material from high generating sources in HRM.

8.0 SUMMARY

HRM is concerned about its role in the regulation of the safe and responsible management of SBM within its borders. HRM is growing rapidly, particularly in the urban core where much of the development coincides with the occurrence of geology that generates SBM once excavated. Large projects that have generated enormous amounts of SBM requiring safe disposal include the Halifax Convention Centre as well as other large projects, particularly those requiring large excavations to support underground parking. Future mega projects include the construction of new health care facilities. But other small- and medium-sized projects (including in response to housing shortages) also generate volumes of SBM.

The shorelines around Halifax Harbour have been modified with infill to dispose of material and create land for hundreds of years. In recent decades, SBM has been approved for use in shoreline infill projects to support land creation in Bedford Basin and Fairview Cove. Infilling at these locations has ended and HPA currently operates the only large-scale commercial SBM infill project at OTSF to support future wharf

development at the south end terminals. HPA is an experienced operator of these facilities (at Fairview Cove and now Ocean Terminals) and has estimated that is has approximately 8 to10 years of permitted capacity at the OTSF. This estimate could vary depending on several factors (e.g., the rate of future development and schedule for the completed port infrastructure) with additional phases potentially available, though not yet permitted.

The OTSF represents a reliable SBM management option in an industrialized setting for developers within reasonable trucking distance from the facility. The OTSF presents few, if any, land use conflicts within the port, raises few stakeholder concerns, and has created no known bylaw issues for HRM. In general, the use of the OTSF carries relatively lower environmental and socioeconomic risk compared with other options. One major concern expressed by developers is that the stringent quality standards imposed by HPA often require non-compliant material (e.g., contaminated with hydrocarbons) to be taken to a much more expensive facility for treatment at Clean Earth.

While the OTSF is a generally consistent use within the marine industrial setting of the port, it is acknowledged that trucking through downtown Halifax continues to be an important concern. HRM has raised the possibility of transporting of SBM by rail to the OTSF; however, HPA concluded that this mode was not justified, given increased costs, time, and emissions associated with additional handling and other logistical issues. HPA has also expressed concern about the longer-term availability of SBM infill capacity at the OTSF and the need to plan for additional capacity in the future.

The establishment of new commercial SBM infill facilities in Halifax Harbour either on private, pre-Confederation water lots, or water lots leased from HPA raises many concerns. These concerns range from the cumulative loss of coastal habitats expressed by DFO and others, to disruption of communities associated with trucking and operation of a commercial facility, depending on the location. The permitting of new facilities faces increasing scrutiny from regulatory authorities such as DFO as well as open opposition from local and regional stakeholders and the public (e.g., recent proposals in Northwest Arm and Dartmouth Cove).

While HRM has no direct control over infilling, it can influence infill processes through its established ability to regulate nuisances and land use. In addition to restricting activities that generate unacceptable noise under By-law N-200, By-law T-400 arguably prevents trucks from using local streets to transport SBM on the assumption that the deposit of SBM does not qualify as “delivery or collection of goods or [supply of] a service.” The Municipality also can limit and direct land use on infilled land. Although HRM has generally applied the zoning of abutting upland to infilled land, the Municipality could be more prescriptive. The Municipality can alter its zoning consistent with policy in an applicable municipal planning strategy. The WA Zone in Centre Plan, for example, limits buildings on wharves, docks, and similar marine structures to public infrastructure, utilities, publicly-operated ferries, and boat club uses. Similar provisions could be made for land created by infill in specific zones or in the general provisions of the land use bylaw. This would echo the approach used by HPA under their current infill policy for water lots under their management which only allows use consistent with adjacent upland that has a specific marine industrial requirement.

While marine disposal of SBM affects marine habitat, it is otherwise generally a safe and effective way to manage SBM and avoid potentially serious impacts on land-based ecosystems if improperly disposed on shore. SBM management will continue to be an important issue for the development community and government authorities during a time when HRM is rapidly growing and development is a key component to the ongoing and future well-being and prosperity of HRM and its citizens. Several options for SBM management noted above are problematic, where constraints outweigh the potential advantages so long as the HPA OTSF remains in operation. These constraints include a variety of environmental and social concerns and/or lack of economies of scale required to manage the volumes of SBM expected from future growth.

HPA has cautioned that while the current capacity at the OTSF is 8 to 10 years at current rates, this estimate can be affected by several variables. Further expansion beyond HPA's projected timeframe has not been approved and planning for the future should begin now.

Because of the multijurisdictional nature of SBM management, multiple stakeholders with interests in shoreline infilling, and HRM's currently limited jurisdiction over marine disposal, HRM should consider promoting a joint planning or advisory process to address the issue for the medium and longer term. Key members of the process could include HPA, HRM, Build Nova Scotia, DFO, Transport Canada, Indigenous groups, and stakeholder groups (e.g., representatives of the development community, fishing operators, environmental advocacy groups).

A recent and highly relevant engagement process was undertaken by IAAC regarding for shoreline infilling (though not exclusively for SBM) (see Section 2.2 and Appendix A) and a previous effort was also undertaken in 2007. HRM may not be the most appropriate entity to lead this process but can certainly support and actively participate to help mitigate the current patchwork nature of the regulatory environment around SBM management. The goals and objectives of such a planning process would need to be clearly established and terms set. For HRM, the goal should be a more integrated role in the approval process of SBM facilities, particularly for shoreline infilling. In the meantime, HRM should investigate, and where possible, strengthen the tools it currently has (e.g., land use planning and bylaw enforcement). Ultimately, HRM is obligated to balance the concerns of potentially affected communities and stakeholders with the long-term needs for safe and effective and reliable management of SBM as the Municipality continues its rapid growth.

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APPENDIX A

IAAC Overview and Summary of March 30, 2022 Workshop

Agence d'évaluation d'impact du Canada | Impact Assessment Agency of Canada

INFILLING ACTIVITIES IN THE NORTHWEST ARM, HALIFAX HARBOUR, NOVA SCOTIA
OVERVIEW AND SUMMARY OF MARCH 30, 2022 WORKSHOP

Introduction and Objectives

The objective of the workshop, conducted on March 30, 2022, was to bring together identified stakeholders, government departments, and Indigenous Peoples to discuss issues and concerns related to infilling activities in the Northwest Arm portion of Halifax Harbour, and to explore possible means of addressing identified issues through existing or potential regulatory processes or other initiatives.

The workshop was part of an engagement process carried out by the Impact Assessment Agency of Canada (IAAC), as directed by the Minister of Environment and Climate Change Canada in his recent decision regarding a request for a regional assessment of infilling activities in Halifax Harbour. Further context and background are provided in the following section.

Background

- On May 27, 2021, a request was submitted to the Minister of Environment and Climate Change under the Impact Assessment Act (IAA) to conduct a regional assessment of the infilling of "water lots" in a section of Halifax Harbour known as the Northwest Arm (139291E.pdf (iaac-aeic.gc.ca)).
- The Northwest Arm is a narrow inlet within Halifax Harbour, approximately 3.5 km in length and located on the western side of the Halifax peninsula.
- The request was submitted by Jamie Simpson of Juniper Law on behalf of several local residents and the Ecology Action Centre.
- Shoreline properties in the Northwest Arm have an associated (underwater) water lot that was deeded, pre-confederation, to landowners. In recent years, a number of these water lots have been infilled as an extension of the landowners' property.
- The regional assessment request cited concerns regarding the environmental and socioeconomic effects (including cumulative effects) of infilling activities, a perceived lack of existing regulation of these activities under federal, provincial and municipal legislation, and questions around associated jurisdictional matters.
- Upon receipt of this regional assessment request, IAAC undertook a detailed review and analysis of it to inform the Minister's decision and associated response to the requestors.

- In addition to the original request, letters of support were also received from the following parties:
    - Twila Gaudet - Director of Consultation, Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO);
    - Councillor Shawn Cleary – Councillor for District 9, Halifax West – Armdale;
    - Senators Mary Coyle, Colin Deacon, and Stan Kutcher (joint letter);
    - Andy Filmore - Halifax MP; and
    - Dennis Campbell - CEO of Ambassatours Gray Line.
- On November 30, 2021 the Minister issued his decision and response to the requestors, stating that a regional assessment would not take place, for the following reasons:
    - Infilling activities are not subject to federal impact assessment requirements, and thus there is no potential for a regional assessment to inform or influence future impact assessments.
    - A regional assessment is not intended to be viewed and used as a means of addressing gaps in, or other issues regarding the application of, federal, provincial, or municipal regulation or policies.
- The Minister's response however, acknowledged the public interest in these infilling activities and the potential effects, while also recognizing that the nature and location of such activities and associated jurisdictional considerations have created a unique regulatory situation.
- In his response, the Minister encouraged the requestors to continue to communicate and work with applicable government departments and agencies regarding their concerns.
- To help facilitate this, the Minister directed IAAC officials to coordinate discussions involving applicable federal, provincial, and municipal agencies as well as non-governmental organizations to discuss these issues further, and to explore potential means of addressing them through other existing or potential regulatory and planning processes.

Engagement Process

As directed by the Minister in his decision on the above noted regional assessment request, IAAC staff began planning and conducting the post-decision engagement process in early 2022. Activities included:

- Hiring an independent facilitator to support the planning of the engagement process and to lead the associated discussions.
- Initial outreach to identified participants in January 2022 (attachment 1) to confirm their participation, provide an overview of the planned engagement process, and to seek any input into its design and suggestions for others that should be contacted and invited.

- The planning and conduct of initial, “One on One” meetings with participants to gather preliminary information.
- Notice of Engagement activities posted to the Registry (Notice of Engagement Activities - Canada.ca (iaac-aeic.gc.ca)) to invite additional stakeholders to participate.
- Development of a “What We Heard” summary document to summarize the key outcomes of the above noted ”One on One” meetings, to help inform, focus and guide an eventual group workshop.
- The planning and conduct of the March 30, 2022 workshop, including development and distribution of associated material, and preparation of this summary.

A timeline of key activities is provided in Attachment 2.

Preliminary Engagement Sessions

In advance of and preparation for the workshop, 11 preliminary one-on-one meetings were arranged and undertaken by IAAC staff and the facilitator with identified participants.

These meetings were conducted virtually (through Microsoft Teams) between February 16 and 28, 2022, with the following questions sent to participants in advance to help frame the discussions:

1. What is your / your organization’s role or interest related to previous or future infilling activities in the Northwest Arm?
2. What particular questions or concerns do you have around the environmental, social, or economic effects of these activities?
3. What views do you have around associated jurisdictional or regulatory matters – including any perceived gaps, or issues related to the existence, application or effectiveness of appropriate regulatory processes for these infilling activities?
4. What suggestions do you have around how infilling activities should be planned, regulated, or otherwise managed, to address your concerns?
5. What other information, views, or perspectives do you wish to provide on this issue?

The outcomes of these one-on-one meetings were summarized in a short “What We Heard” document (Attachment 3), which highlighted the key questions and issues raised by participants, as well as the existing regulatory and management processes that apply to infilling activities. This document was sent to all participants prior to the workshop.

Workshop – March 30, 2022

A workshop was conducted (through Microsoft Teams) on March 30, 2022, from 9:00 am to 12:30 pm Atlantic time. Participants included elected officials; members of municipal, provincial and federal government departments; KMKNO; non-government organizations; and local residents. A full participant list is provided in Attachment 4.

The emphasis of the workshop was on discussion of shared goals, and exploring potential means of addressing concerns and gaps through existing or potential regulatory and planning approaches.

The workshop began with a brief overview of the “What We Heard” summary document, and then proceeded to a question and comment period on the main issues noted. While it was clear that participants had varying interests and viewpoints on the effectiveness of existing regulation and preferred next steps, the discussion was productive and respectful with a shared objective of ensuring that infilling activities were subject to a robust and holistic review, and sound decision-making.

The minutes from the workshop are provided in Attachment 5. Key points from the workshop include:

- There was interest from some stakeholders in an immediate interim moratorium on all infilling activities until a robust regulatory process can be established that includes all levels of government. There was a stated sense of urgency to do this, before other infilling applications are submitted and potentially approved.
- In addition to calls for a full moratorium, others appeared to understand allowing some, reasonable and small-scale infilling activities to occur for the purposes of shoreline and property protection. The main concern is around very large infilling applications being approved.
- There were many concerns related to effects on safe navigation. Discussions included a visual presentation from Halifax Regional Municipality (HRM) outlining the use of the Arm for recreational sailing activities, and the issues surrounding navigation within the Arm that could arise from increased infilling.
- Participants reiterated environmental concerns related to infilling, including its effect on the overall area of the Arm, and potential for increased damage from storm surges and erosion rates on the shoreline.
- KMKNO noted that their concerns are focused on impacts to Section 35 Treaty Rights and loss/damage to underwater archeology from infill footprints. This organization also noted that it is being consulted by Transport Canada on current infilling applications, under the Navigation Protection Program regulatory process.
- Cumulative effects was raised as a concern, and it was noted that infilling applications seem to be reviewed in isolation, whereas proposed infills should be considered in the context of the total effects of all infills on the Arm as a whole.
- Some participants raised concerns over the precedent that has been set through past infilling applications, as it seems that all projects are eventually approved, with or without conditions, and that there appears to be little desire to reject an application. It was suggested that federal government departments have more powers than they choose to use, and that other levels of government do have jurisdiction, but do not assert it. Approving a large infill will continue to set precedent for future activities within the Arm.
- DFO spoke about the *Fisheries Act* and associated regulations, and noted that this legislation is currently under review, and that there is ongoing opportunity to provide

feedback on the process. This includes discussion on how regulations under the Act are applied and what should be considered (links for providing comments were provided).

- Transport Canada also indicated that the *Navigable Waters Convention Act* will also be coming under review in 2024, and that there will be an opportunity for public input to that process.
- For infilling activities, DFO and Transport Canada stated that their review and analysis must remain within the scope of applicable legislation but that there can be and has been collaboration between federal and provincial government agencies on infill applications, when required, on issues and assessment of potential effects to fish and fish habitat and navigation.
- Nova Scotia Environment noted that the Arm is viewed as a federally regulated harbour meaning that there is no provincial jurisdiction, and that the province does not have jurisdiction over pre-confederation water lots. It was noted that the new *Coastal Protection Act* (2023) will not apply because the Act will work through other legislation on submerged provincial Crown land via permits related to the *Crown Lands Act*.
- HRM discussed the 2007 bylaw process that resulted in restrictions on what could be built on infilled land. The process had involved the creation of a committee with the mandate to improve communications, review legislation and regulations, and to facilitate collaboration between different levels of government to address issues around infilling. It was suggested that an outcome to this workshop could be to re-initiate that committee. Transport Canada officials indicated they were not aware of this committee, and were interested to learn more about the 2007 process.
- Participants continued to express the urgent need for all levels of government to work together to create a process that allows all levels of government to have oversight on infilling activities.

Potential Next Steps

Further investigation into the 2007 working group is suggested as a potential next step. This committee included all levels of government with a mandate to work collaboratively once the new HRM by-laws were amended, but this did not materialize. Transport Canada indicated that they would be interested in learning more about the committee and future conversations with HRM could be possible.

Elected officials indicated that they would continue to use their position to help highlight issues of infilling activities to government officials, and to push for a stop to infilling activities in the Arm.

IAAC staff will compile the notes from the meeting and distribute this document to participants prior to finalizing.

Attachment 1 – Initial Outreach Email

Janes,Jeffrey (IAAC/ AEIC)

From : Bonnell,Stephen (IAAC/ AEIC)
Sent: January 19, 2022 1:36 PM
To: [redacted]
Cc: Janes,Jeffrey (IAAC/ AEIC); Burgess,Carys (IAAC/ AEIC)
Subject: Regional Assessment Request under IAA - Infilling in NW Arm, Halifax Harbour

Hello All –

In late May 2021 a request for a Regional Assessment of Infilling Activities in Northwest Arm was submitted to the Minister of Environment and Climate Change Canada under Section 97(1) of the Impact Assessment Act.

On November 29, 2021 the Minister issued a response to this request, determining that a Regional Assessment should not be carried out. http:// iaac-aeic.gc.ca/050/evaluations/document/140996?culture=en-CA

In his response letter, the Minister did, however, state that he has:

> "…asked Agency officials to coordinate discussions involving applicable federal, provincial, and municipal agencies as well as non-governmental organizations to discuss these issues further, and to explore potential means of addressing them through other existing or potential regulatory and planning processes.".

IAAC is currently in the process of planning these discussions, including identifying and contacting potential participants.

As you have been identified as an interested party who may wish to participate in this process, I am writing to provide an update on this initiative, and to seek your involvement.

We are in the process of contacting a professional facilitator to help coordinate and support these discussions, and propose that the process would occur as follows:

1) Participant Confirmation / Suggestions: Please confirm (in response to this email) whether you will be participating + Feel free to suggest any other persons or organizations that should be invited (contact information would be appreciated)
2) Planning and Logistics: An IAAC representative will then contact you in the coming days to arrange an initial discussion, and to identify any preferred dates, times and approaches for the eventual group workshop discussions
3) Initial "One on One" Discussions: An IAAC representative and/ or the facilitator will arrange a call with you at the date and time you've identified above, to walk through a few questions and gather some preliminary information. The information received from individual participants will then be "rolled up" and brought forward to the overall group to help guide and focus the workshops
4) Group Workshop(s): IAAC and the facilitator will schedule one or more (virtual) workshops involving all participants, likely in February 2022, to explore the issues raised and potential means of addressing them.
5) Summary: The results of these workshops will be summarized and distributed to the group for review before being finalized.

It would be appreciated if you could let us know asap if you do indeed wish to participate in this initiative, and if you have any suggestions for other participants.

If so, a member of the team will be in contact with you shortly to discuss and arrange. We would also welcome any comments or suggestions on the approach outlined above.

Thank you in advance for your reply, and future participation

Steve Bonnell

Steve Bonnell, PhD

Manager, Strategic and Regional Assessments
Impact Assessment Agency of Canada / Government of Canada
[redacted]

Gestionnaire, Évaluations stratégiques et régionales
Agence d'évaluation d'impact du Canada / Gouvernement du Canada
[redacted]

Government of Canada Gouvernement du Canada

Canada

Attachment 2 – Timeline

The following bullets provide a summarized timeline of key dates and activities:

- May 27, 2021: Request for regional assessment received by the Minister of Environment and Climate Change.
- November 30, 2021: Minister's response to the request posted on the Registry Minister's Response with reasons - Canada.ca (iaac-aeic.gc.ca).
- January 19, 2022: Initial outreach to identified participants to confirm their participation; provide an overview of the planned engagement process; seek input into the design of the process; and suggestions for others that should be contacted and invited.
- February 1, 2022: Calls made to KMKNO and other Indigenous contacts to describe the engagement process and invite participation.
- February 7, 2022: Follow-up e-mails sent out to KMKNO and other Indigenous contacts.
- February 16 and 28, 2022: One-on-one meetings with participants initiated.
- March 14, 2022: Notice of engagement activities posted on the Registry (Notice of Engagement Activities - Canada.ca (iaac-aeic.gc.ca)) to invite any additional stakeholders to participate.
- March 25, 2022: "What We Heard" document finalized and sent to participants.
- March 30, 2022: Workshop completed.

Attachment 3 – “What We Heard” Document

Agence d'évaluation d'impact du Canada | Impact Assessment Agency of Canada

Infilling Activities in the Northwest Arm, Halifax Harbour, Nova Scotia

Engagement Process

In February 2022, the Impact Assessment Agency of Canada commenced an engagement process with identified stakeholders and Indigenous Peoples to discuss infilling activities in the Northwest Arm. This process was initiated as directed by the Minister of Environment and Climate Change Canada in his November 2021 decision on a request for a Regional Assessment of infilling activities in the Northwest Arm of Halifax Harbour. In that response, the Minister asked Agency officials "…to coordinate discussions involving applicable federal, provincial, and municipal agencies as well as non-governmental organizations to discuss these issues further, and to explore potential means of addressing them through other existing or potential regulatory and planning processes."

As part of that process, Agency staff held "pre-engagement" one-on-one meetings with all participants to get initial information and input on this issue, the results of which are summarized in this brief "*What We Heard*" document. This summary document will be used to help inform a group discussion with all participants at a workshop planned for March 30, 2022.

Legislation & Regulatory Requirements

The following legislation was identified as considered and/or applied to infilling in the Northwest Arm:

- *Canadian Navigable Waters Act* (Transport Canada)
- *Species at Risk Act* (*SARA*) (Environment and Climate Change Canada and Fisheries and Oceans Canada)
- *Fisheries Act* (Fisheries and Oceans Canada and Environment and Climate Change Canada)
- *Migratory Birds Convention Act* (Environment and Climate Change Canada)
- *Coastal Protection Act* (Nova Scotia Environment)
- *Environment Act (*Nova Scotia Environment)
- *Regional Centre Land Use By-Law* (Halifax Regional Municipality)
- *Canadian Environmental Protection Act* (Environment and Climate Change Canada)

The main regulatory bodies involved in the review of infilling activities in the Northwest Arm include:

- Transport Canada (TC) – potential interference with navigation.
- Fisheries and Oceans (DFO) – potential effects to fish and fish habitat and aquatic species at risk.

- Halifax Regional Municipality – regulates what can or cannot be built on lands created by infills through zoning, setbacks and/or land use requirements.
- Environment and Climate Change Canada – potential for marine pollution (from potential disposal-at-sea activities).

Summary of the Infill Permitting Process

- Transport Canada
  - Processes applications through the Navigation Protection Program (NPP).
  - Applications are reviewed and assessed based on potential interference with both commercial and recreational navigation.
  - Process includes Indigenous engagement and a public comment period.
  - Approved applications may have conditions associated with them.
- Fisheries and Oceans Canada
  - Assesses applications through the Fish and Fish Habitat Protection Program (FFHPP).
  - Evaluates projects based on potential impacts to fish and fish habitat (Harmful Alteration, Disruption, or Destruction).
  - Can be contacted by Transport Canada or a proponent to review applications and determine whether an authorization is required.
  - Applications are processed with possible outcomes of site-specific advice to avoid or mitigate potential impacts to fish and fish habitat, or *Fisheries Act* authorizations can be required, which can have an outcome of being approved with conditions, or rejected.
- Halifax Port Authority
  - Regulates traffic within Halifax Harbour.
  - Deals only with post-confederation water lots or any lots non-granted when it comes to infill activities.
  - Only regulates infilling for marine industrial purposes; no mandate over residential infilling.
- Nova Scotia Environment
  - Responsible for approvals and monitoring of some infilling activities under provisions of the *Environment Act* and its associated regulations, including disposal of sulphide-bearing materials.
  - Does not have jurisdiction over pre-confederation water lots within a federally regulated harbour.
  - The *Coastal Protection Act* regulations for shoreline structures will be designed to apply to the foreshore (the area between the low-tide and high-tide marks).
  - Regulations under the *Coastal Protection Act* will not be applicable to pre-confederation lots.
- Halifax Regional Municipality
  - By-laws do not currently apply to submerged lands.
  - By-laws do apply to newly created lands (resulting from infill activities) through zoning, setbacks and or land use requirements.
- Environment and Climate Change Canada
  - Reviews activities to determine applicability to the *Canadian Environmental Protection Act,* and whether a Disposal at Sea Permit may be required.

- Activities must be are carried out in compliance with the *Canadian Environmental Protection Act, SARA,* and *Migratory Birds Convention Act and Section 36(3)* of the *Fisheries Act.*
- Has an advisory role to other departments / proponents on these mandated issues and coordinates/consults on regulatory process if a Disposal at Sea Permit is required.

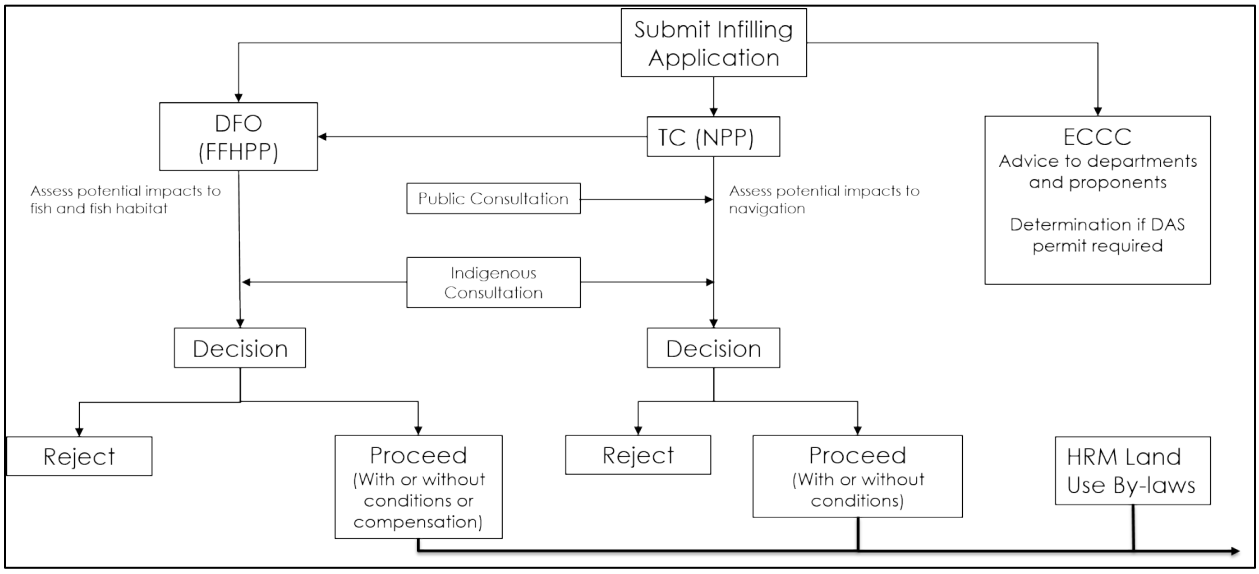

Figure 1: Overview of Applicable Regulatory Roles and Responsibilities

Concerns and Comments Related to the Infilling Application Process

- Concerns that current infill approval processes do not consider and evaluate all relevant environmental issues and potential effects. There is an urgent request to address this immediately.
- There is a desire by some to see an increased regulatory role for Halifax Regional Municipality in the review of infill proposals, alongside the existing processes of TC and DFO.
- Desire to see an immediate moratorium off infilling activities within the Northwest Arm, until a better process can be established for reviewing infilling applications.
- Would like to see better alignment of all levels of government in reviewing infilling applications.
- Cumulative effects should be considered when reviewing infilling applications.
- Proposed infilling activities should be evaluated in relation to the rest of the activities occurring within the Northwest Arm.

Concerns and Comments Related to Navigation

Navigation in the Northwest Arm includes that by recreational users, tourism operators, local boating organizations, commercial fishers, and others.

- Concern that infilling activities will further narrow the Arm and eventually impede the ability for all vessels to safely navigate this area.
- Interaction of commercial and recreational vessel traffic has been increasing in the Arm.
- Tourism operators concerned over ability of vessels to navigate safely into the Arm, and associated safety and economic risks.
- Concerns that adjacent property owners may have to infill to maintain safer access to their own water lots, due to the potential of larger, adjacent infilling projects.
- Potential impacts on yacht clubs, sailing programs, and race events due to less navigable space, especially during busy times of the year.
- Increased liability / insurance concerns if there is an accident due to difficult navigation.
- Potential accidents as future infilling narrows navigable space within the Northwest Arm.

Concerns and Comments Related to Environmental Impacts

All identified stakeholders have a shared goal of protecting the environment.

- Fragility of the coastline and the impact of permanent alterations.
- The need to prevent unnecessary, large scale interference with the coastline.
- Potential impacts to the overall ecosystem (aquatic, avian, etc.).
- Potential negative impacts on both commercial (e.g., lobster) and recreational fisheries due to impacts on fish and fish habitat.
- Narrowing of the Arm could increase storm surge damage, and increase tides and currents flowing into the Arm. This could increase rate of erosion on the coastline.
- Disturbance to seabed and associated release of trapped contaminants, from infilling activities.
- A desire to maintain and improve the condition of the Arm, especially following clean-up activities undertaken in recent years.
- Types and quality of materials being used for infilling activities and associated effects to marine environment.
- Loss of aesthetically important viewscapes.

Other Concerns and Comments

- Concern about setting a precedent if large-scale infilling is approved.
- This issue is divisive amongst residents and users on the Arm.
- The Arm is a place of historic significance, with a strong connection to the Mi'kmaq culture, and there are many archaeological sites in the area (e.g., Deadman’s Island, Melville Prison). There are concerns about a potential loss of areas of historical / cultural significance if multiple, large infilling activities are permitted in the Arm.
- Fishing and boating have long histories in Nova Scotia.
- Public points of access must be maintained.
- A general openness to reasonable activities to protect property and shoreline, but proper regulation must be in place before it can commence.
- The Arm is an attraction for current and new residents in the province, and so maintaining the accessibility and value of the area is important.
- Action needs to happen now, to prevent future large scale infilling from occurring.

Attachment 4 – March 30th Workshop Attendance Sheet

Date: March 30, 2022 Time: 9:00 am ADT In-person ☐ Virtual ☑

Spicer Facilitation ☑ Client IAAC Facilitator(s): Carole Spicer Signature: [redacted]

	Name	Organization	Signature
1.	Andy Fillmore	MP, Halifax	
2.	Alex MacKinnon	MP's office, Halifax	
3.	Colin Deacon	Senator, NS	
4.	Stanley Kutcher	Senator, NS	
5.	Steve Bonnell	Impact Assessment Agency	
6.	Jeffrey Janes	Impact Assessment Agency	
7.	Carys Burgess	Impact Assessment Agency	
8.	Jamie-Lynn Bruce	Impact Assessment Agency	
9.	Lauchlan MacLean	Impact Assessment Agency	
10.	Martyna Krezel	Impact Assessment Agency	
11.	Mona Sidarous	Environment and Climate Change	
12.	Stephen Zwicker	Environment and Climate Change	
13.	Isabelle Hurley	Environment and Climate Change	
14.	Mark McLean	Fisheries and Oceans	

	Name	Organization	Signature
15.	Mike Wambolt	Fisheries and Oceans	
16.	Donna McLean	Transport Canada	
17.	Melanie Leblanc	Transport Canada	
18.	Norm Thebeau	Transport Canada	
19.	Lydia MacKay Swiatkowska	Transport Canada	
20.	Gerald Gloade	Millbrook First Nation	
21.	Patrick Butler	Kwilmu'kw maw-klusuaqn (Mi'kmaq Rights Initiative)	
22.	Angela Birch	Government of NS	
23.	John Somers	Government of NS	
24.	Elise Martino	Halifax Regional Municipality	
25.	John Traves	Halifax Regional Municipality	
26.	Patty Cuttell	Halifax Councillor	
27.	Lane Farguson	Halifax Port Authority	
28.	Allan Shaw	Community Member	
29.	Anthony Rosborough	Community Member	
30.	Justin Stewart	Community Member	

	Name	Organization	Signature
31.	Leslie Shaw	Community Member	
32.	Michelle Raymond	Community Member	
33.	Phillip Saunders	Community Member	
34.	Will Balser	Ecology Action Centre	

Attachment 5 – Workshop Meeting Notes

Infilling Activities within Halifax Harbour – Workshop Meeting Notes

March 30, 2022, 9:00 am to 12:30 pm AST

Opening Remarks: S. Bonnell (IAAC)

Workshop comments and expectations: C. Spicer (Facilitator)

Expectations

- This session is to provide everyone an opportunity to come together to discuss identified issues surrounding infilling activities in the Northwest Arm. This session is not intended to change legislation, regulations, or the permitting process. It is, however, a chance to become more informed about the complexity of these activities and the current legislated processes that regulate them.
- This workshop is not intended to address any specific infilling application, past, current or future.

What We Heard Summary

- there are several acts considered and/or applied in the Northwest Arm;
- the main regulatory bodies are Transport Canada, Fisheries and Oceans Canada (DFO), and the Halifax Regional Municipality (HRM);
- a diagram has been provided outlining the application process;
- concerns have been raised during the one-on-one meetings that relate mainly to navigation and environmental impacts; and
- there is a common desire amongst participants to work together towards a solution.

Meeting Notes

Comments/Discussion:

- Participants noted that there is good environmental stewardship of property owners, but asked what the outcome and timeline is for this engagement process. There is worry that action will not be taken quickly enough to avoid current infilling applications from being approved.
- The Facilitator confirmed that the outcome of this engagement process is to gather feedback and focus on respectful dialogue. Following the workshop, a report will be provided to participants for review before being finalized.
- Participants asked if there was anyone that participated, or was met with who were in favour of infilling in the Arm? The Facilitator noted that she wasn't going to speak for

anyone specifically and that the results of the one-on-one meetings were provided in the What We Heard summary document.

- ECCC offered to provide a better summary of its mandate and could address questions or facilitate discussions as needed. ECCC will update the What We Heard summary document to reflect this information.
- HRM spoke about navigation and related safety concerns. The concerns related to navigation were focused on sailing activities in the Arm, and when boats move in/out of the harbour, particularly during foggy conditions. It was noted that the Arm is already a narrow body for sailing, and that multiple infills will make it even smaller. Sailboats rarely move in a straight line, and increased infilling could further restrict the room that boats have to navigate safely within the Arm.
- HRM agrees with the issues raised, and has initiated discussion with Transport Canada regarding jurisdiction. They noted that they are looking for a consensus with federal partners, and have engaged and collaborated with various provincial and federal departments on harbour issues. They also noted that a moratorium has been asked for by Mayor Savage, as the city feels that the infill application process is not working to adequately address the potential impacts.
- Some participants highlighted the need for a short-term consideration / solution. With respect to the What We Heard summary, it was stressed that there needed to be some urgency towards a solution. It was asked if there was a common acknowledgement around the path forward and what the next steps would be.
- The Facilitator confirmed that there would not be a commitment today from government agencies. The workshop would focus on a review of the updated What We Heard summary document and an overall discussion. A report will be provided to participants following the workshop.
- The Senators provided context as to why they are involved. They look at how the government functions and how processes proceed and if the legislation is achieving what it is designed to do. However, understanding the impact of how legislation is or is not achieving its purpose is a complex process. The importance of regulations was stated but it was noted that it is troubling to see that the regulations are not effectively serving the public in this case.
- Participants noted the importance of the cumulative effects of these infills over time (e.g., loss of a third of the Arm, reduction of less than half the space of the mouth) and what is considered the "private appropriation of public waters". It was stated that cumulative effects and the view of the Arm as a whole needs to be considered when infill applications are reviewed.
- Elected officials noted that in past discussions with the Minister of Transport, a decision not to pursue a navigation study was taken. It was noted that we shouldn't miss this opening to provide more information to the Minister and that this process will hopefully lead to that broader study moving forward.

- HRM stated that the municipality would be happy to proceed with a broader navigational study as there is no larger process that is contemplated when infill applications are reviewed (i.e., applications are assessed in isolation).
- Some Participants noted and appreciated the concerns on navigation. There was a discussion of the legal case: Thibeault vs Canada, which established that federal jurisdiction does not mean that navigable considerations are the only ones to consider and therefore the Minister does have the ability/discretion to look at other considerations, in addition to navigation. However it was also noted that:
    - it is a struggle to get this approach of considering other concerns such as environment, Indigenous rights etc., advanced; and
    - there are multiple levels of jurisdiction that apply to the Northwest Arm but not all levels of government choose to apply their jurisdiction. Specific reference was made to the province and the municipality (which derives from the province). Inland waters, like the Arm, fall within the jurisdiction of local authorities and it was suggested that HRM is overly cautious in applying municipal bylaws and that both federal and provincial approaches/legislation can co-exist. The Participant noted that there is a fundamental misunderstanding of these submerged lots and that they do in fact exist under provincial legislation.
    - It was suggested that the lots not be considered as "pre confederation" lots (as that term is actually for lake lots) but that the province and municipality do have Constitutional jurisdiction - these levels of government can refuse to approve an infill application under their own legislation. It was stated that this is where the conversations need to focus.
- Participants noted that proper regulation requires a coordinated approach. In the past, there was a policy that the federal government would not make a decision without approval of local governments (i.e., City of Halifax). Applications were approved, denied or modified. It was suggested that Transport Canada has the ability to take into account these lateral considerations with respect to the province and the municipality and also suggested engaging municipal affairs.
- A Senator suggested that this may be an action that can come from this meeting and agreed that there is a responsibility that falls to the Senators to promote the public good through legislation and regulations. The Northwest Arm is a public good and it was noted that there are other numerous benefits of the Arm including historic importance, Indigenous significance, a draw to immigrants, cultural value etc. It was highlighted that time is short, and if we take too much time to try to figure things out, more of the Arm will be lost.
- HRM supported the comments from Senators and noted that the 2007 bylaw process resulted in amendments to dis-incentivize infilled lots. However, the amendments have not worked as intended and infill applications continued to be submitted regardless of the restrictions. During the bylaw amendment process, it was recognized that more work needed to be done on the infill issues. To address this a committee was created with the mandate to improve communications; review of legislation and regulations; and to facilitate collaboration between different levels of government to address the infill issue.

It was suggested at this workshop that another outcome to the engagement process could be to re-initiate that 2007 committee.

- Nova Scotia Environment noted that, from a provincial perspective, the Arm is regarded as a federally regulated harbour so there is no provincial jurisdiction and that the lots are indeed considered to be "pre-confederation". It was noted that the new *Coastal Protection Act* (coming into effect in 2023, has been passed and now they are working on the regulations) doesn't apply in this case because the Act works through other legislation on submerged provincial Crown land via permits related to the *Crown Lands Act*.

- Participants mentioned the cascading effect of infrastructure in the Arm (docks, infills etc.) and the resulting reduction of the surface water of the Arm and the mouth. The indirect effects of this include reduced flushing ability of the Arm, causing water levels to continue to rise with more infills, which then increases the risk of significance of flooding, leads to impacts of wave energy on adjacent properties and increased erosion rates and affects to hydrology.

- KMKNO noted that they were attending this workshop to observe, and to let other participants know that they are in consultation with Transport Canada with regard to individual infilling applications, and have concerns that include impacts to Section 35 Treaty Rights, and underwater archeology from infill footprints.

- A Participant noted that in response to the remarks from Nova Scotia Environment that there is a need for provincial legislation and that there are some legislative options in place, although agreed that the *Coastal Protection Act* is not the legislation to address infilling activities. It was suggested to consider the municipal power over docks and that since HRM is taxing these lots, that this provides the jurisdiction to regulate them.

- Participants asked again if there were any arguments in support of infilling. The Facilitator noted that there were some that weren't in favour of a full moratorium but would not provide names. Some Participants wanted to clarify the "reasonability" for infilling – they are not interested in who has argued in favour of infilling, but what kinds of arguments have been advanced.

- Transport Canada noted that it has to stay within the scope of the legislation but that people have been heard and perspectives/concerns will be shared in the Department. Staff also noted that they did not know about the working group that had been formed in 2007, and would be interested in learning more about it.

- DFO commented on the process for protection of Fish and Fish Habitat and that the department must work within the confines of its legislation. It was confirmed that regulatory reviews are conducted for all infill projects, and that there is collaboration with Transport Canada and provincial government departments on issues with infilling applications. There is application of federal legislation and assessment of potential impacts under the *Fisheries Act* and the *Species at Risk Act*. Links (see below) to this information on-line were provided by DFO and it was further noted that there is an ongoing public comment process on regulations around protection of shorelines.

- Both Transport Canada and DFO noted that their legislation and regulations are or will be undergoing review. The *Fisheries Act* is currently under legislative review, and the *Canadian Navigable Waters Act* will be undergoing review in 2024. These processes will include public engagement, where stakeholders can provide feedback on the types of things that should be considered in both legislation and regulations.
- Other participants noted that while regulatory review will be important, the timing of it will not likely address the immediate issues that are occurring right now in the Northwest Arm.
- Both DFO and Transport Canada noted that they have to look at things with a national perspective.
- Some Participants stated concern with the precedent that has been set (to approve applications and consider to look at ways to accommodate, such as compensation) and suggested that government departments have more leeway than they exercise, to approve or reject applications. It was stated that almost everyone wants a moratorium and asked if there could be a step to look at what the people want and not at the precedent. Legislation is broad but it was suggested that the interpretation is not correct and encouraged a new precedent to be set.

Wrap Up:

- It was asked if the report from this engagement process will be publically available. The Agency noted that they will follow-up on this question, and that it is possible that the report would be posted publicly.
- The Agency committed to updating and finalizing the What We Heard summary document and providing it to attendees as well as posting the document on the Agency's Registry.
- There was a request made from participants to have the meeting attendance list provided to them. This was completed.

Links provided by DFO:

- DFO's Fish and Fish Habitat Protection Program's Engagement Platform (https://talkfishhabitat.ca/).
- Info on DFO's review of Projects Near Water to protect fish and fish habitat: Projects near water (Projects near water (dfo-mpo.gc.ca)).

APPENDIX B

HPA Disposal of Pyritic Slate or Inert Construction Material Agreement

DISPOSAL OF PYRITIC SLATE OR INERT CONSTRUCTION MATERIAL AGREEMENT

Between

_____

- and -

HALIFAX PORT AUTHORITY

Version 1.0

July 7, 2020

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THIS AGREEMENT made this _____day of _____20_____.

BETWEEN:

HALIFAX PORT AUTHORITY, a body corporate established pursuant to the *Canada Marine Act*, formerly known as Halifax Port Corporation, having its head office at 1215 Marginal Road, Ocean Terminals, P. O. Box 336, Halifax, Nova Scotia, B3J 2P6
("**Authority**")

- and -

_____

_____
("**Generator**")

WHEREAS:

A. Generator wishes to dispose of Pyritic Slate ("PS") and/or Inert Construction Material ("ICM") in a manner that is consistent with the applicable environmental laws of Nova Scotia and Canada;

B. The Authority is able to dispose of PS and ICM at the **Fairview Cove Sequestration Facility** as indicated in Schedule "A" ("**Authority Lands**");

NOW, THEREFORE, the Parties mutually agree as follows:

ARTICLE 1 – INTERPRETATION

1.01 Definitions

"Agreement" means this agreement including all schedules;

"**Authority Lands**" has the meaning assigned to it in the recitals;

"Business Day" means any day other than a Saturday, Sunday, or statutory holiday.

"**Contract Quantity**" means _____metric tonnes of PS or _____metric tonnes of ICM, and is the maximum tonnage of PS or ICM that will be accepted for delivery to the Facility. The Authority reserves the absolute discretion to approve or deny any proposed adjustment of the Contract Quantity as set out here.

"Facility" or "Fairview Cove Sequestration Facility" means the Authority's Lands which is authorized, equipped and specifically purposed for disposal of PS or ICM at 5985 Africville Road, Halifax, Nova Scotia.

"Fines" means particles passing the No. 200 (0.075mm) US standard sieve.

"**Force Majeure**" means any act, event, cause or occurrence beyond the reasonable control of the Party claiming excuse, which partially or entirely prevents that Party's performance of its obligations and includes, without limitation, the following: (i) physical events such as acts of God, landslides, lightning, earthquakes, fires, storms or storm warnings which result in evacuation of the affected area, floods, washouts, explosions, breakage or accident or necessity of repairs or maintenance (including regularly scheduled repairs and maintenance) to machinery or equipment, weather related events such as hurricanes or freezing; (ii) acts of others such as strikes, lockouts, labour disruption, riots, sabotage, terrorism, insurrection or war, or the threat of any of the foregoing; (iii) governmental actions, such as necessity for compliance with any court order, law, statute, ordinance, or regulation promulgated by a governmental authority having jurisdiction; and (iv) any other causes, whether of the kind herein enumerated or otherwise that are not reasonably within the control of the affected Party to prevent or overcome.

"Generator's Contact" means:

name: _____
email: _____
cell phone: _____

"**Haul Unit**" means the trucks, trailers or other such acceptable conveyance employed by Generator for the purpose of transporting the PS or ICM to the Facility.

"ICM" means Inert Construction Material

"**ICM Tipping Fee**" means $10.00 + HST per metric tonne of ICM accepted by the Authority for disposal.

"**Originating Location"** means the property identified in Section A of Schedule "B" and is the only site from which the PS or ICM may be delivered to the Fairview Cove Sequestration Facility under this Agreement.

"**Party"** means any one of Generator or the Authority as the case requires; and,

"Parties" means both of them;

"PS" means Pyritic Slate

"**PS Tipping Fee**" means $16.50 + HST per metric tonne of PS accepted by the Authority for disposal.

"**Scale Person**" means the person authorized by the Authority to operate, manage and maintain the Authority's weigh scales.

"**Site Manager**" means a person authorized to represent the Authority at the Fairview Cove Sequestration Facility.

"**Working Day**" means 7:00 a.m. to 5:00 p.m. Monday to Thursday, 7:00 a.m. to 4:00 p.m. Friday, excluding statutory holidays, or other such time or times as may be established by the Authority and communicated to Generator in writing.

1.02 Number Gender

In this Agreement, when the context so requires, the singular includes the plural, and *vice versa* and the masculine gender includes the feminine and neuter genders and the neuter gender includes the masculine and feminine genders.

1.03 Interpretation not Affected by Headings

The division of this Agreement into Articles, Sections, Clauses and other subdivisions, and the insertion of headings, are for convenience of reference only and shall not affect the construction of this Agreement.

1.04 Currency

All references to amounts of money contained herein are in Canadian currency, unless otherwise specified.

1.05 Conflicts

If there is any conflict or inconsistency between a provision of the body of this Agreement and that of a Schedule or any document delivered pursuant to this Agreement, the provision of the body of this Agreement shall prevail.

1.06 Schedules

The following schedule, attached hereto, form part of this Agreement:

Schedule "A" – Location Plan – Fairview Cove Sequestration Facility
Schedule “B” – Acceptance Application for PS or ICM

ARTICLE 2 – PS OR ICM DISPOSAL

2.01 Right to Place PS or ICM on Authority Lands

The Authority hereby grants Generator the right to place the Contract Quantity of PS or his legally acquired Contract Quantity of ICM on Authority Lands in an area as indicated by the Site Manager. The Site Manager shall direct the placement subject to the conditions as set out in 2.02 through 2.11 inclusive herein.

2.02 Source and Quantity PS

The PS approved for placement under this Agreement shall come only from the Originating Location of PS as identified in Section A of Schedule “B”.

Prior to the Authority agreeing to accept PS from the Originating Location, Generator must complete Schedule “B” to this Agreement and submit it to the Authority. Schedule “B” contains information concerning the Originating Location of the PS, including but not limited to the history of use of the property and surrounding properties, the estimated quantity of PS, as well as the information required in Article 2.04 (Sampling Schedule). This information will be reviewed by the Authority to determine whether other testing is appropriate, prior to acceptance of PS by the Authority from the Originating Location.

Further, Generator, by proposing to deliver PS to the Facility from such Originating Location, makes representation and asserts as fact to the Authority that he / she is legally entitled to remove the subject PS from that source location by virtue and authority of other such agreements as are beyond the Authority’s knowledge.

2.03 Source and Quantity ICM

The ICM approved for placement under this Agreement shall come only from the Originating Location of ICM as identified in Section A of Schedule "B".

Prior to the Authority agreeing to accept ICM from the Originating Location, Generator must complete Schedule "B" to this Agreement and submit it to the Authority. Schedule "B" contains information concerning the Originating Location of the ICM, including but not limited to the history of use of the property and surrounding properties, the estimated quantity of ICM as well as the information required in Article 2.04 (Sampling Schedule). This information will be reviewed by the Authority to determine whether other testing is appropriate, prior to acceptance of ICM by the Authority from the Originating Location.

Further, Generator, by proposing to deliver ICM to the Facility from such Originating Location, makes representation and asserts as fact to the Authority that he / she is legally entitled to remove the subject ICM from that source location by virtue and authority of other such agreements as are beyond the Authority's knowledge.

2.04 Sampling Schedule

Generator shall engage an independent environmental consultant to conduct representative sampling of the PS or ICM to determine concentrations per the following parameters:

Parameter	Units	Proposed Screening Criteria
Benzene	mg/kg	1.2
Toluene	mg/kg	1.4
Ethylbenzene	mg/kg	1.2
Xylenes	mg/kg	1.3
Modified TPH	mg/kg	15
1-Methylnaphthalene	mg/kg	0.201
2-Methylnaphthalene	mg/kg	0.201
Acenaphthene	mg/kg	0.0889
Acenaphthylene	mg/kg	0.128
Acridine	mg/kg	0.763
Anthracene	mg/kg	0.245
Benzo(a)anthracene	mg/kg	0.693
Benzo(a)pyrene	mg/kg	0.763
Benzo(b)fluoranthene	mg/kg	0.763
Benzo(b+j)fluoranthene	mg/kg	0.763
Benzo(e)pyrene	mg/kg	0.763
Benzo(g,h,i)perylene	mg/kg	3.2
Benzo(k)fluoranthene	mg/kg	0.763
Chrysene	mg/kg	0.846
Dibenzo(a,h)anthracene	mg/kg	0.135
Fluoranthracene	mg/kg	1.494
Fluorene	mg/kg	0.144
Indeno(1,2,3)pyrene	mg/kg	0.88
Naphthalene	mg/kg	0.391
Perylene	mg/kg	0.763

Phenanthrene	mg/kg	0.544
Pyrene	mg/kg	1.398
Quinoline	mg/kg	0.763
Benzo(b+j+k)fluoranthene	mg/kg	4.5
Cadmium	mg/kg	4.2
Chromium (total)	mg/kg	160
Copper	mg/kg	108
Lead	mg/kg	112
Mercury	mg/kg	0.7
Zinc	mg/kg	271

Pursuant to analysis, and prior to delivering PS or ICM to the Facility, Generator shall submit to FCSFcontracts@portofhalifax.ca copies of all historical environmental site assessment reports and a signed report issued by an accredited independent environmental consultant declaring that the subject material satisfies these thresholds. Generator shall provide to FCSFcontracts@portofhalifax.ca the environmental consultant's declaration based on a rate of 1 sample per 500 metric tonnes of PS or ICM. Further, Generator shall ensure that the independent environmental consultant submits sufficient declarations to cover current delivery quantities. Deliveries from any Originating Location of PS or ICM which is non-compliant with these conditions will be suspended.

Testing for other parameters may be required based on current or historical use of the property or adjacent properties. It is expected that all testing will be representative of materials to be transported to the Facility and consist of both Fines and larger particles. It is also required that the independent environmental consultant declares that material consists of less than 10% Fines as the operational requirements of the Facility to accept material that is free of excess Fines.

2.05 Weigh Scale

For each delivery, Generator's vehicles shall report to the weigh scale upon arrival at Facility.

In the event of a weigh scale failure, or for any reason, the Authority reserves the right to measure the quantity of PS or ICM by volumetric truckload capacity. The acceptable volumetric truckload capacity for each truck will be established by the Authority prior to trucks commencing dumping.

2.06 On-Site Inspection and Placement

The Site Manager shall have the responsibility to inspect the PS or ICM for quality and for included materials as it comes to the Authority Lands and shall have authority to reject any Haul Unit load for stated cause in their absolute discretion. The Site Manager shall have authority and responsibility to direct Generator's Haul Units while on Authority Lands to the appropriate location within the Facility.

2.07 Scheduling of Haul Plan

Generator shall propose to the Site Manager a detailed haul plan for delivery of PS or ICM from the Originating Location of PS or ICM to the Facility. The proposed haul plan shall provide details including date, number of Haul Units, haul duration and estimated quantity of PS or ICM to be delivered. The Site Manager will review the haul plan and, in the Site Manager's sole and absolute discretion, will approve the haul plan, or require changes in order to make the proposed haul plan acceptable.

The haul plan shall not be considered by the Site Manager when/if Generator has not provided the Authority

with a completed Schedule B to this Agreement from the Originating Location or if the current status of the Contract is non-compliant on either, or both, of the Deposit Schedule in Article 3.01 and/or the Sampling Schedule in Article 2.04.

Proposed haul plans must provide a 24 hour lead time prior to the proposed start of the haul. Once a haul plan is accepted by the Site Manager, Generator shall provide contact information for a responsible person who shall communicate to the Site Manager, on the day(s) of the approved haul plan, and prior to the arrival of that Haul Unit at the Facility, the Provincial license plate number for each Haul Unit to be used in the approved haul plan. Any Haul Unit for which a license plate number has not been communicated shall not be weighed and shall be set aside at the Facility until such identifying communication has been made.

The Authority reserves the right to require Generator to produce and maintain a paper manifest system to identify, specify and record details of Generator's delivery.

2.08 Haul Units

Generator will direct the identified Haul Units to the Facility entrance at 5985 Africville Road. Haul Units shall proceed to the Weigh Scale observing and obeying all signage. The Haul Unit operators shall use the personal protective equipment required by NS Department or Labour for similar sites. The Haul Units operators shall take direction from the Site Manager and/or Scale Person. Haul Units used in the delivery of PS or ICM to the Authority Lands are, in every respect, the responsibility of Generator. Generator shall ensure that the Haul Units are mechanically sound, licensed and insured and shall ensure that the operators who operate them are legally entitled to operate them for the purposes of safety and efficient transportation of the PS or ICM to the Authority Lands. In addition, Generator is responsible for ensuring that the loads in the Haul Units do not exceed provincial weight restrictions.

When on Authority Lands, the Haul Units shall operate at the direction of the Site Manager in a safe, efficient and professional manner. The Site Manager shall have authority to refuse to receive any Haul Unit for just cause in the Site Manager's absolute discretion and shall advise Generator of any Haul Unit behaving in a way that is not conducive to the safe and efficient operation of the Facility. Such Haul Unit will be denied reception at the Fairview Cove Sequestration Facility for a duration of time as established by the Site Manager in consultation with Generator.

2.09 Construction Safety Measures

Generator shall ensure that any Haul Unit operator bringing Haul Units to the Facility on Generator's behalf will observe and enforce construction safety measures required by the applicable Federal, Provincial and Municipal Statutes or Regulations and, without limiting the generality of the foregoing, the *Canada Labour Code*, the *Workers' Compensation Act*, the *Occupational Health and Safety Act* and any other applicable legislation, as amended.

For greater certainty, the Site Manager will ensure that any Haul Unit operators attending the Facility and associated supervisors and other visitors will be provided with a site orientation identifying hazards in the Facility.

Generator will provide to the Authority confirmation of Workers' Compensation coverage of all Haul Unit operators attending the Facility on Generator's behalf.

2.10 Quality of Material

The Site Manager shall have the authority to inspect PS on delivery. For the PS to be accepted, it is to be well-grade PS fill, generally free of clays, silts, debris or any other deleterious material or contaminant,

including asphalt. The Site Manager, in his/her sole discretion, may reject any material delivered and Generator shall be responsible for removing such material from Authority Lands to the satisfaction of the Site Manager at Generator's cost.

The Site Manager will inspect ICM on delivery. The Site Manager's inspection and subsequent acceptance shall not in any way free Generator from responsibility to ensure that the material delivered to the Facility meets the terms and conditions for eligibility for disposal at the Facility.

By accepting the terms and conditions of this Agreement, Generator declares and affirms that the ICM which is the subject of this Agreement is free of contaminants which would: a) disqualify the material from being considered 'Inert' or, b) make it ineligible for marine disposal.

Examples of acceptable types of ICM are: broken concrete, clean gravel, concrete block, concrete brick, clay brick, and clean rock, homogenous common materials such as clay and till. Generator may propose any type of material for disposal at the Facility with the understanding that the Site Manager may reject any material which, in the Site Manager's sole discretion, does not meet the Facility's needs at any time. Broken asphalt shall not be accepted for disposal at the Fairview Cove Sequestration Facility.

It is Generator's responsibility to ensure that the accredited independent environmental consultant, who conducts representative sampling and provides the declaration pursuant to Article 2.04, attends at the Originating Location of PS or ICM to ensure that all material delivered to the Facility is representative of the test results and does not contain contaminated material or material which contravenes any condition in Article 2 of this Agreement.

The Site Manager reserves the absolute authority, from time to time, to conduct environmental investigation on any material delivered to the Facility to confirm the material's eligibility for disposal at the Facility. In the event that material from the Originating Location is found to be in contravention of the conditions for acceptance:

(a) the Site Manager shall act in the Authority's best interest in the non-compliant material's investigation, excavation, removal, transportation to, and disposal at an appropriate disposal facility. The complete cost for such remediation works by the Authority shall be borne by Generator whose malfeasance results in the illegal delivery of ineligible material to the Facility; and,

(b) the Authority retains the right, at the Authority's sole discretion, to require Generator to retain an accredited independent environmental consultant to conduct an analysis of each load of PS or ICM from the same Originating Location of PS or ICM. The accredited independent environmental consultant must provide to the Authority a signed report confirming that each load of PS or ICM satisfies the thresholds in the Sampling Schedule in Article 2.04 before the PS or ICM can be delivered to the Facility. The accredited independent consultant and Generator must ensure that each load of PS or ICM which is contaminated or exceeds the threshold(s) set out in the Sampling Schedule is directed to an alternate appropriate disposal facility.

2.11 Capping

The Authority shall be responsible for the supply and placement of capping material.

ARTICLE 3 – PAYMENT

3.01 Payment for PS or ICM

Generator agrees to deliver PS or ICM to the Authority Lands and to compensate the Authority at the rate of the PS Tipping Fee or ICM Tipping Fee.

Weigh scale tickets for individual transactions will not be produced at the Facility. The Site Manager will prepare and distribute to the Authority's Finance department a Daily Report of PS or ICM delivered to the Facility providing details of load counts, time and weights delivered by each Haul Unit from Generator's Originating Location. A separate sheet will be distributed to Generators by 10:00 am the following day for each day and for each Originating Location of PS or ICM. Reports will be considered reconciled and agreed unless a credible challenge is registered with the Site Manager within 72 hours of the distribution of the contested Report.

The Authority accepts responsibility for all costs related to the Authority's engineering and on-site inspection personnel, and the costs to receive, weigh, record, dump and place the PS or ICM.

Payment for PS or ICM is on the following terms:

A. **For Agreements up to and including 2,000 metric tonnes of PS or ICM**
On signing of this Agreement, Generator shall make to the Authority payment in full of the Contract Quantity. Final adjustment of payment will be made based on the final tonnage received. Any overpayment will be refunded by the Authority to Generator within 30 days of notification from Generator that the shipment has been completed. Any balance owed by Generator shall be paid within 30 days of the Authority's final invoice.

B. **For Agreements of 2,000 to 8,000 metric tonnes of PS or ICM**
On signing of this Agreement, Generator shall make to the Authority payment equivalent to fifty percent (50%) of the Contract Quantity. Within 5 days prior to shipping fifty percent (50%) of the Contract Quantity, Generator shall make to the Authority a second payment equivalent to fifty percent (50%) of the Contract Quantity. Final adjustment of payment will be made based on the final tonnage received. Any overpayment will be refunded by the Authority to Generator within 30 days of notification from Generator that the shipment has been completed. Any balance owed by Generator shall be paid within 30 days of the Authority's final invoice.

C. **For Agreements greater than 8,000 metric tonnes of PS or ICM**
On signing of this Agreement, Generator shall make to the Authority a payment of sixty six thousand dollars ($66,000) for PS or forty thousand dollars ($40,000) for ICM. Within 5 days prior to shipping additional 4,000 tonnes or the balance of the Contract Quantity, Generator shall make a sixty six thousand dollars ($66,000) payment(s) for PS or forty thousand dollars ($40,000) payment(s) for ICM or a single payment for the balance of the Contract Quantity to the Authority. Final adjustment of payment will be made based on the final tonnage received. Any overpayment will be refunded by the Authority to Generator within 30 days of notification from Generator that the shipment has been completed. Any balance owed by Generator shall be paid within 30 days of the Authority's final invoice.

3.02 Direct Deposit Information

Payment to be made by direct deposit using the information below:

CANADIAN DOLLARS & FOREIGN CURRENCIES (OTHER F.I.)

Pay Through: RBC Royal Bank, Toronto
Toronto, Ontario
 # ROYCCAT2

For Credit: RBC Royal Bank
1871 Hollis Street, Suite 100
Halifax, Nova Scotia B3J 0C3
Transit & account number 000031004290

US DOLLARS (FROM THE STATES OR FOREIGN COUNTRIES)

Intermediary Bank: JP Morgan Chase
New York, NY
#ABA 021 000021
Swift Code: CHASUS33

Destination Bank: ROYCCAT2
RBC Royal Bank
1871 Hollis Street, Suite 100
Halifax, Nova Scotia B3J 0C3

Beneficiary: Halifax Port Authority
Transit & account number 000031004290

Interest at 1.5% per month will be charged on payments not received within 30 days of issuing of the final invoice.

ARTICLE 4 – ENVIRONMENTAL

4.01 Environmental Regulations

Generator shall strictly adhere to all applicable laws, codes and requirements including but not limited to:

A) Environmental Construction Practice Specifications for the Province of Nova Scotia;
B) Environment Canada;
C) Nova Scotia Department of Environment;
D) Halifax Regional Municipality Noise Control By-Law; and,
E) Sulphide Bearing Material Disposal Regulations.

4.02 Permit

The Authority has completed an environmental assessment and has a Fisheries Act authorization from DFO to place PS and/or ICM as infill material at the Fairview Cove site. Other approvals or permits as may be required for the removal or delivery of the PS, if any, are the responsibility of Generator.

4.03 Water Quality Monitoring

The Authority will be responsible for obtaining and testing any water sampling as requested by the regulatory authorities. The costs for this testing are included in the rate charged for disposal.

ARTICLE 5 – LIABILITY

5.01 Insurance

Generator shall carry general liability insurance coverage which includes emission, release, discharge, dispersal or escape that is caused by accident insofar as Generator is concerned. Prior to acceptance of PS and/or ICM by the Authority, Generator, by submittal, shall provide the Authority with proof of this insurance in the amount of two million dollars ($2,000,000). Generator shall accept liability for, or ensure the independent insurability of the actions of his Haul Units within the Facility.

5.02 Indemnity

Generator shall indemnify and save harmless Her Majesty in right of Canada, the Authority, its successors and assigns, its officers, directors, employees and agents from and against any and all liabilities, damages, costs, counsel and/or legal fees, expenses, causes of action, actions, claims, suits and judgments which Her Majesty in right of Canada, the Authority, its successors and assigns, its officers, directors, employees or agents may incur or suffer or be put to by reason of or in connection with or arising from:

i. any breach, violation or non-performance by Generator of any covenant, condition or term set forth in this Agreement or any misrepresentation made by Generator to the Authority;

ii. any damage to property of the Authority, the Facility or any other person, invitee or any of them, or damage to any other property, occasioned by or in connection with the disposal of PS or ICM by Generator or its employees, subcontractors or any other individual or entity engaged on their behalf;

iii. any injury to any person, including death, resulting at any time therefrom, occurring on or about the Facility or resulting from the disposal of PS or ICM by Generator or its employees, subcontractors or any other individual or entity engaged on their behalf;

iv. any act or omission of Generator or its employees, subcontractors or any other individual or entity engaged on their behalf;

Notwithstanding any other provision of this Agreement, the waiver and indemnification provided for in this Article shall survive any termination of this Agreement (whether by effluxion of time or otherwise).

5.03 Disclaimer

Notwithstanding any other provision of this Agreement, neither Party shall be liable to the other Party or any other person or entity for any special, indirect, incidental, consequential, or punitive damages of any character, including but not limited to loss of use, lost profits (past and future), additional out of pocket expenses incurred by Generator or other parties, or other claims resulting from, arising out of, in connection with or in any way incident to any act or omission of such Party related to the provisions of this Agreement, irrespective of whether claims or actions for such damages are based upon tort, contract, warranty, negligence, strict liability or any other doctrine or remedy, at law or in equity, or otherwise howsoever arising. Each Party has a duty to mitigate damages for which the other Party is responsible.

ARTICLE 6 – TERMINATION/DISPUTE RESOLUTION

6.01 Termination

Either Party may at any time, for its convenience and for any or no reason, terminate this Agreement in its entirety by giving the other Party seven days' notice in writing of such termination. Upon termination, Generator shall pay the Authority, in accordance with this Agreement, all amounts owing to the effective date of the termination notice.

The Authority may terminate this Agreement immediately, without notice and without further liability to Generator for cause if Generator otherwise commits any material breach of any obligations under this Agreement.

6.02 Dispute Resolution

If any question, difference or dispute shall arise between the Parties hereto in respect of any matter arising under this Agreement, the resolution of which is not otherwise provided for herein, the Parties hereto agree to first negotiate and discuss the dispute with a view to agreeing on a resolution. If, after ten Business Days of negotiation, the Parties are unable to reach an agreement regarding the dispute, the dispute shall be determined by a single arbitrator if the Parties can agree on such arbitrator. Otherwise each Party shall pick an arbitrator which arbitrators shall pick a third arbitrator for a total of three arbitrators.

The arbitration shall be conducted in accordance with the provisions of the *Commercial Arbitration Act* (Nova Scotia), and the decision of the arbitrator or a majority of the arbitrators, as the case may be, shall be conclusive and binding upon the Parties. The decision of the majority of the arbitrators shall be made within thirty days after the selection of the later of them. The allocation of the costs of the arbitration between the Parties shall form part of the decision of the arbitrators. If either Party fails to appoint an arbitrator within the time limits, or fails to proceed with the arbitration, the arbitrator named may decide the issue. Any arbitration under this Agreement shall be conducted in the City of Halifax, Nova Scotia or at any other location as mutually agreed upon between Parties.

ARTICLE 7 – MISCELLANEOUS

7.01 Non-Assignment

This Agreement shall not be assignable by Generator without the written permission of the Authority.

7.02 Waiver

No waiver of any breach of any provision of this Agreement shall be effective or binding unless made in writing and signed by the Party purporting to give the same and, unless otherwise provided in the written waiver, shall be limited to the specific breach waived.

7.03 Entire Agreement

This Agreement constitutes the entire Agreement between the Parties with respect to the matters contained herein. There are no covenants, representations, warranties, agreements or other conditions expressed or implied, collateral or otherwise, forming part of or in any way affecting or relating to this Agreement, save as expressly set out or incorporated by reference herein, and no amendment, variation or change to this Agreement shall be binding unless the same shall be in writing and signed by the Parties.

7.04 Separate Commercial Identities

This Agreement does not create and shall not be interpreted as creating any partnership or joint venture among the Parties, or any joint liability under the law of any jurisdiction.

7.05 Notices

Any notice, request or demand provided for or given under this Agreement shall be in writing and shall be served to the addresses specified below:

To Generator: Generator's Contact

To The Authority: [redacted]

Attention: Chief Executive Officer
Facsimile: [redacted]

7.06 Further Assurance

Each of the Parties shall, from time to time, do all such acts and things and execute and deliver, from time to time, all such further documents and assurances as may be reasonably necessary to carry out and give effect to the terms of this Agreement, except to the extent that doing any such acts and things and executing and delivering any such further documents would impose any liability or obligation on a Party beyond the liabilities and obligations set forth in this Agreement.

7.07 Successors and Assigns

This Agreement shall be binding upon the Parties hereto and their respective successors and permitted assigns, and shall ensure to the benefit of the Parties hereto, their respective successors and permitted assigns.

7.08 Time

Time shall be of the essence in this Agreement.

7.09 Force Majeure

If by reason of an event of Force Majeure, a Party is not reasonably able to fulfill an obligation in accordance with the terms of this Agreement, then such Party shall:

a) forthwith notify the other Party of such Force Majeure, or orally so notify such other Party (confirmed in writing), which Notice (and any written confirmation of an oral notice) shall provide reasonably full particulars of such Force Majeure;

b) be relieved from fulfilling such obligation or obligations during the continuance of such Force Majeure but only to the extent of the inability to perform so caused, from and after the occurrence of such Force Majeure;

c) employ all reasonable means to reduce the consequences of such Force Majeure, including the expenditure of funds that it would not otherwise have been required to expend, if the amount of such expenditure is not unreasonable in the circumstances existing at such time, and provided further that the foregoing shall not be construed as requiring a Party to accede to the demands of its opponents in any strike, lockout or other labour disturbance;

d) as soon as reasonably possible after such Force Majeure, fulfil or resume fulfilling its obligations

hereunder;

e) provide the other Party with prompt Notice of the cessation or partial cessation of such Force Majeure; and,

f) not be responsible or liable to the other Party for any loss or damage that the other Party may suffer or incur as a result of such Force Majeure.

7.10 Applicable Law

This Agreement shall be construed in accordance with the laws of the Province of Nova Scotia and the federal laws of Canada applicable therein and the Parties attorn to the exclusive jurisdiction of the Courts of Nova Scotia and if applicable, the Federal Court of Canada.

7.11 Contra Proferentem

The rule of contractual interpretation known as "contra proferentem" shall not apply in the interpretation or construction of this Agreement. For greater certainty, in interpreting this Agreement, it shall be irrelevant which Party drafted any particular provision thereof.

7.12 Confidentiality

The Parties shall keep this Agreement and the terms hereof in strict confidence and shall not disclose such information to any third party other than to such Party's professional advisors and other than as required by law (and then only to the extent necessary).

SIGNATURES

IN WITNESS WHEREOF the Parties have duly executed this Agreement as of the dates set out above.

HALIFAX PORT AUTHORITY

Per: _____

Name: _____

Title: _____

Witness _____

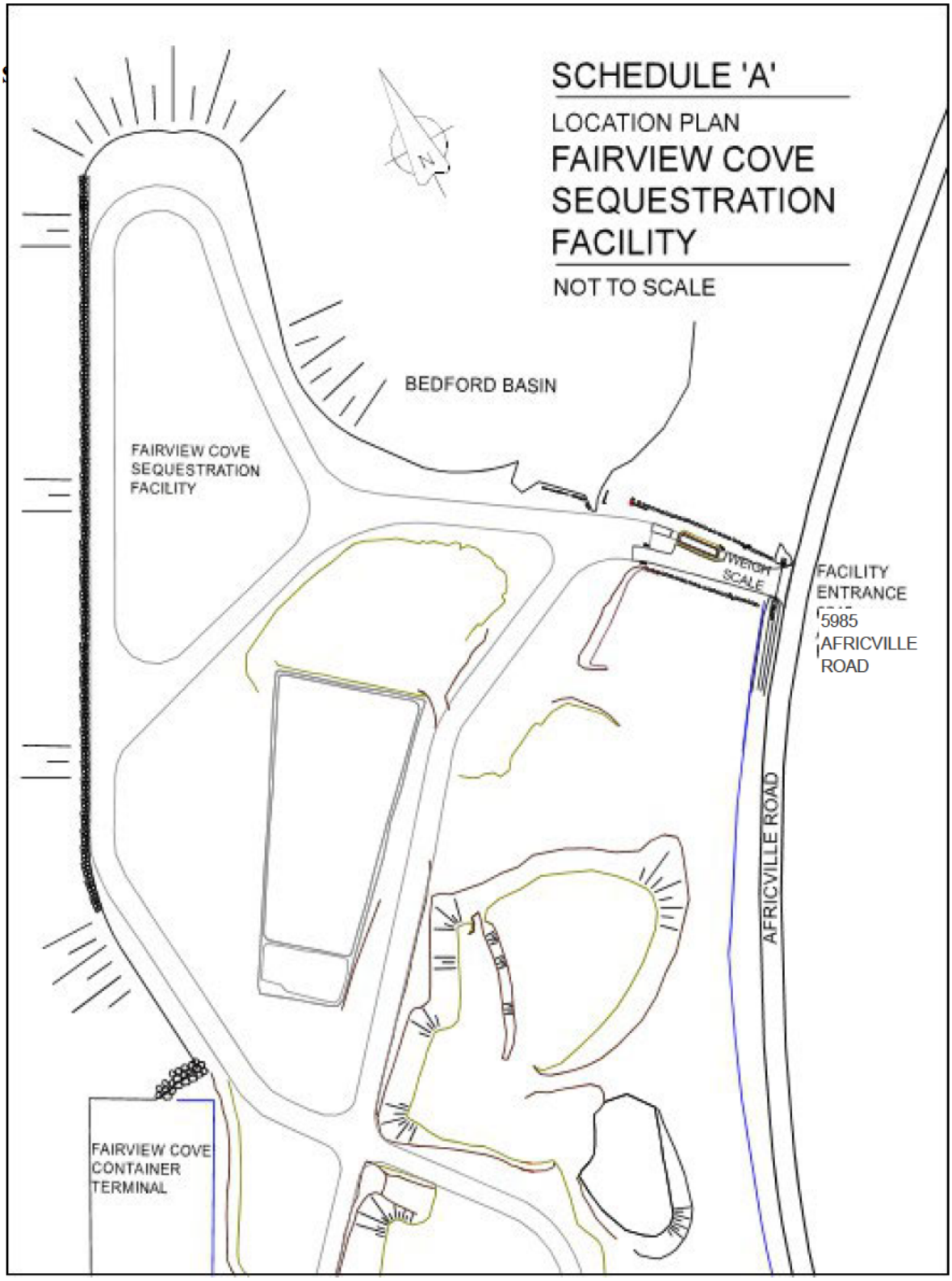
GENERATOR

Per: _____

Name: _____

Title: _____

SCHEDULE "A"


SCHEDULE 'A'
LOCATION PLAN
FAIRVIEW COVE SEQUESTRATION FACILITY
NOT TO SCALE
N
BEDFORD BASIN
FAIRVIEW COVE SEQUESTRATION FACILITY
WEIGH SCALE
FACILITY ENTRANCE
5985
AFRICVILLE ROAD
AFRICVILLE ROAD
FAIRVIEW COVE CONTAINER TERMINAL

SCHEDULE "B"

Port of Halifax

Acceptance Application

Section A **Generator Information**

Generator Name: _____ Generating Location: _____

Address: _____ Site Address: _____

_____ _____

Contact Name: _____ Site Contact Name: _____

Contact Title: _____ Site Contact Title: _____

Contact Phone: _____ Site Contact Phone: _____

Email Address: _____

Billing Address: _____

_____

Generator will provide proof of general liability insurance coverage YES / NO (Circle One)

Generator will provide proof of workers compensation coverage for each Haul Unit operator YES / NO (Circle One)

Section B **Consultant Information**

Consultant: _____ Phone: _____

Address: _____ Email Address: _____

_____

Contact Name: _____ Contact Title: _____

Section C **Characterization of Material**

Current Zoning: Commercial/Industrial/Residential (circle one)

Prior Uses of Site: _____

Current/Planned Use of Site: _____

Estimated Quantity (metric tonnes): _____

Pyritic Slate or Inert Construction Material (circle one)

If pyritic slate, will all material to be transported to Facility have been excavated within fifteen calendar days prior to delivery?: YES / NO (Circle One)

Do historical environmental site assessment reports exist? YES / NO (Circle One)

If yes, list title and date of all and provide copies to HPA for review.

Written confirmation material has been tested for Total Petroleum Hydrocarbons (BTEX/TPH), Polyaromatic Hydrocarbons (PAHs) and applicable metals: _____

_____

Section D **Certification** *(Completed by Generator)*

I hereby certify that the above and attached description is complete and accurate to the best of my knowledge. No deliberate or willfull omissions of composition or properties exist, and all known information has been disclosed.

_____ _____ _____

Name & Title Signature Date

Section E **Approval** *(Completed by Halifax Port Authority)*

FCSF # : _____ Material: _____

_____ _____ _____

Name Signature Date

APPENDIX C

Pyritic Slate Process for HRM Property

HALIFAX
REGIONAL MUNICIPALITY

P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Environment & Sustainability Standing Committee
October 6, 2011

TO: Chair and Members of Environment & Sustainability Standing Committee

SUBMITTED BY: [redacted]

Phillip Townsend, Director, Infrastructure and Asset Management

DATE: September 23, 2011

SUBJECT: **Pyritic Slate Process for HRM Property**

INFORMATION REPORT

ORIGIN

March 3, 2011, Item 10.1, Councillor Sloane re: Request for Staff Report on Pyritic Slate Process

BACKGROUND

Over the past two years, HRM has developed three sites that "Acid Generating Rock" has been encountered. These sites are Washmill Comi Bridge, Central Library and the Dmimouth Bridge Terminal. The attached map (Attachment 1) indicates that the risk of encountering "Acid Generating Rock" is high and predictable. Excavation of "Acid Generating Rock" is regulated to minimize the impacts to the environment that could result in the changing of the ph of the water and adversely affecting flora and fauna.

It is standard operating procedure, in the scoping of Projects, to engage Geotechnical Consultants to prepare a Geotechnical Report at the commencement of the Project to mitigate the risk of encountering "Acid Generating Rock". Having identified the presence of "Acid Generating Rock", a Slate Management Plan can be prepared and submitted to the Province of Nova Scotia for review and acceptance.

The presence of "Acid Generating Rock" increases the cost of developing the site to achieve regulatory compliance; the construction procedures to deal with the "Acid Generating Rock" are incorporated into the tender documents and are included in the contracts.

DISCUSSION

"Acid Generating Rock" is regulated in the Province of Nova Scotia by the Sulphide Bearing Materials Disposal Regulations, made under Section 66 of the Environment Act.

Process of Acid Generation:

When sulphide-bearing rock is exposed to oxygen and water, oxidation reactions produce sulphuric acid; non-sulphide forms of sulphur in rock do not contribute to acid generation. These oxidation reactions may occur continuously under natural conditions, but over the long-term, the reaction rates slow as all the sulphide sulphur is oxidized on exposed rock surfaces. However, any mechanism that disturbs the rock, such as fracturing by weathering processes, excavation, or blasting, may expose new sulphide and lead to renewed oxidation. This renewed acid generation may continue for many years **until** the available sulphide sulphur on exposed rock surfaces again becomes fully oxidized and stabilizes.

Construction activities often trigger new releases of acid from rock that has previously been relatively stable. The greater the degree of new and sudden disturbance, the greater and more prolonged will be the newly created release of acid.

Acid produced at rock surfaces leaches away, driven by gravity and infiltrating water flow. If the disturbed, acid producing rock is above natural ground level (e.g. grade or ve1iical cuts), the acid may enter the surface water flow regime directly and be transported rapidly to the nearest down-gradient water body. Alternatively, the acid may enter the groundwater flow regime and be transported more slowly. Environmental effects may occur consequently in two primary ways:

(1) acidified groundwater is intercepted by and contaminates wells; and/or
(2) acidified ground or surface water enters aquatic ecosystems causing fish kills and habitat destruction.

Bedrock Geology

The main documented sulphide-bearing geological formation within HRM that typically contributes to acid generation is the "Halifax Slate Formation". The attached Bedrock Geology Map shows the general areas of the formation. For this specific map, the slate formation is identified with white shading and designation Lp. As shown on the map, the Halifax Slate Formation is prevalent throughout peninsula Halifax and a zone through Daiimouth and beyond (see Attachment **1** for the full extent of the formation). It should be noted that the mapping provides only a guide and that acid generation, or lack thereof, can only be definitively assessed by testing.

Disposal of sulphide bearing materials is regulated under Section 66 of the Nova Scotia Environment Act (Attachment 2, complete regulations of the Act). Three key statements in the Act are:

(1) "sulphide bearing material" means aggregate having a sulphide sulphur content equal to or greater than 0.4%;

(2) No person shall dispose of a sulphide bearing material in the Province where the total volume excavated is greater than 500 m3 in situ or 1300 tonnes, unless the person responsible for the disposal holds a valid approval issued under these regulations; and
(3) The regulations do not apply to an excavation site where less than 500 m3 or 1300 tonnes of aggregate is to be removed, unless the Administrator believes on reasonable and probable grounds that an adverse effect may be caused by the excavation.

Practise indicates that the sulphide sulphur content of the Halifax Slate Formation is almost always above 0.4%. Further, as noted in the third statement, even if less than 500 m3 of material is excavated, the regulation may still apply if there is potential for adverse effects caused by the excavation. Therefore, this regulation often applies for any excavation work where the slate bedrock will be exposed and/or disturbed.

A geotechnical investigation completed on a site, during the planning and design stage of a project, would normally identify if a site contains Halifax Formation Slate. Slate bedrock samples recovered from boreholes/test pits put down for geotechnical investigation, are typically submitted to the Dalhousie University Minerals Engineering Laboratory for testing of sulphide sulphur concentration. Caution should be taken when interpreting test results within the Halifax Slate Formation when the results are below the 0.4% sulphide sulphur regulation. The main reason for this is that a sample is typically a very small representation of the larger rock formation. The prudent approach for excavation work in the Halifax Slate Formation is to assume the rock is acid generating, unless extensive testing at the time of construction is able to demonstrate otherwise.

The most common disposal facility that accepts clean sulphide bearing materials around HRM is the Bedford Waterfront Site, operated by Waterfront Development Corporation Limited. In general, the material has to be free of Total Petroleum Hydrocarbons (TPH) and Polynuclear Aromatic Hydrocarbons (PAI-Is).

Cun-ent costs for disposal at the Bedford site is $15/cubic yard and they generally need one week of notice to prep a delivery contract, etc. Their recent contracts for disposal have led them to use estimates of 15.5 tonnes of material in a tandem and 24 tonnes in a trailer. This would mean (using a conversion factor of 1.292 cubic yards/tonne) that if they are load counting, that they would use the following figures: 12 cubic yards/tandem and 19 cubic yards/trailer. Our experience is that the in situ rock volume will swell about 50% (+/-) from blasting/breaking so" that will have to be calculated into the disposal volume. From haulers they require:
(2) An environmental approval from NS Environment, certifying that the acid bearing slate is not contaminated. This may require testing from an independent lab, depending on the site; and
(2) Proof of insurance for the hauling and work on the site. With these documents in hand, they can draft a contract outlining the provision of slate placement.

NSE, under certain circumstances, will also accept on-site management of materials such as encapsulation in an engineered contaimnent cell.
Current practise in the scoping of construction projects is to have prepared a Geotechnical and

Enviromnental Report, which is incorporated into the contract documents for tendering and the permitting regulations with the Province of Nova Scotia.

BUDGET IMPLICATIONS

There are no Budget Implications from this Rep01i

FINANCIAL MANAGEMENT POLICIES/ BUSINESS PLAN

This repo1i complies with the Municipality's Multi-Year Financial Strategy, the approved Operating, Project and Reserve budgets, policies and procedures regarding withdrawals from the utilization of Project and Operating reserves, as well as any relevant legislation.

COMMUNITY ENGAGEMENT

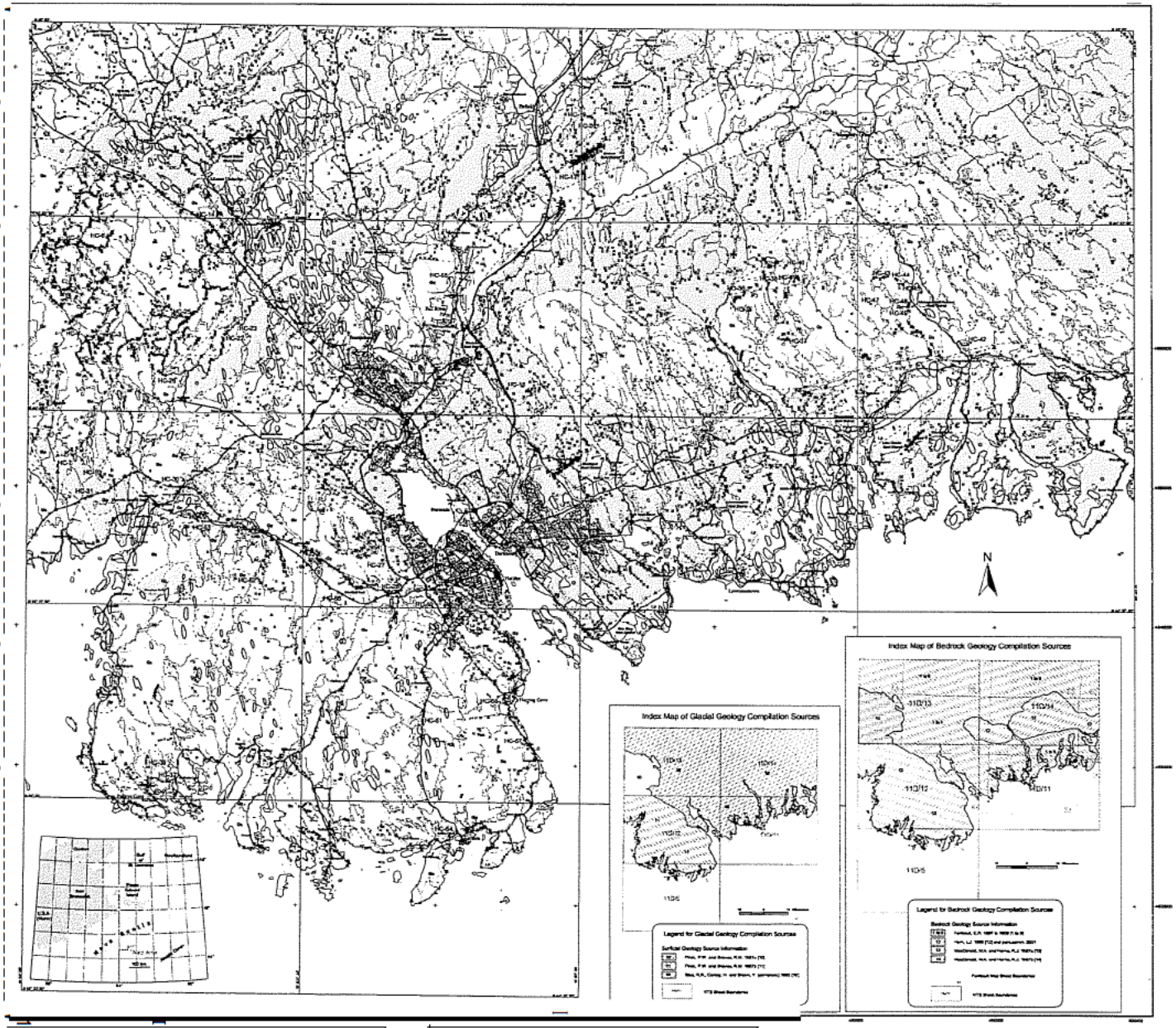
None required for this rep01i

ATTACHMENTS

1) Bedrock Geology Map
2) Nova Scotia Environment Act Regulations

A copy of this report can be obtained online at http://www.halifax.ca/commcoun/cc.html then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

Report Prepared by: Terry Gallagher, Manager Facility Development, Ph. 476-4067



Map Notes

Descriptive Notes

Sources of Information

Plot produced by Jeff Poole, March 5, 2002

Sulphide Bearing Material Disposal Regulations

made under Section 66 of the

Environment Act

S.N.S. 1994-95, c. 1

O.I.C. 95-296, N.S. Reg. 57/95

April 11, 1995

Printed by
the Registrar of Regulations

Halifax, Nova Scotia
1995

Sulphide Bearing Material Disposal Regulations
made under Sectio,n 66 of the
Environment Act
S.N.S. 1994-95, c, **l**
Order in Council 95-296 (April 11, 1995), N.S. Reg. 57/95

Citation

1 These regulations may be *cited* as the "Sulphide Bearing Material Disposal Regulations".

Definitions

2 In these regulations

(a) "Act" means the Environment Act;

(b) "Administrator" means a person appointed by the Minister pursuant to these regulations, and includes an acting Administrator;

(c) "aggregate" means all consolidated and unconsolidated material excluding minerals, gypsum or limestone for which a mining approval is required under the Mineral Resources Act;

(d) "approved disposal 3ite" means a disposal site that *is* designed to prevent an adverse effect resulting from the disposal of sulphide be-,aring material and is approved by the Minister or Administrator under these regulations;

(e) "Department" means the Department of the Environment;

(f) "developer" means a person who develops or proposes to develop land that contains a sulphide bearing material and includes any agent or contractor who works for the developer;

(g) "development" means any disturbance of land which contains a sulphide bearing material;

(h) "disposal site" means a parcel of land used for the disposal of sulphide bearing materials;

(i) "excavation" means the process used for the removal of a sulphide bearing material by mechanical means;

G) "excavation site" means the area or site where a sulphide bearing material is removed by mechanical means;

(k) "impervious material" means a 750 mm layer of clay with a hydraulic conductivity less than 1 x 1o-6 cm/sec or any other material with an equivalent hydraulic conductivity;

(I) "inspector" means a person appointed pursuant to Section 21 of the Act;

(m) "Minister" means the Minister of the Environment;

(n) "site plan" means an accurate drawing of I:2000 scale that includes

(i) a key ·map showing the location of the site,

(ii) the shape, dimensions, topography, size and type of geology of the site,

(ill) any existing or proposed roads on the site,

(iv) the location of any watercourse or well on the site and separation distances noted in Section 10, and

(v) the location of a centralized collection point and contours to prevent ponding noted in Section 11;

(o) "sulphide bearing material" means aggregate having a sulphide sulphur content equal to or greater than 0.4% (12.51 kg H_2S0/tonne);

(p) "watercourse" means a watercourse as defined *in* the Act.

Administrator

3 The Minister may appoint an Administrator to administer these regulations.

Application of regulations

4 **(1)** Subject to subsection (2), no person shall dispose of a sulphide bearing material in the Province where the total volume excavated is greater than 500 m^3 *in situ* or 1300 tonnes unless the person responsible for the disposal holds a valid approval issued under these regulations.

(2) A developer of land which contains a sulphide bearing material shall ensure that sulphide bearing material is disposed of at

(a) an approved disposal site owned and operated by the developer;

(b) an approved disposal site owned and operated by a person other than the developer;

(c) a disposal site under the jurisdiction of the Government of Canada and approved by the appropriate federal authority to receive a sulphide bearing material, provided the evaluation, excavation and disposal of the sulphide bearing material are conducted in a manner which is consistent with Sections 6 to 11 of these regulations.

Exemptions

5 These regulations do not apply to

(a) an excavation site where less than 500 m^3 *in situ* or 1300 tonnes of aggregate is to be removed unless the Administrator believes on reasonable and probable grounds that an adverse effect may be caused by the excavation;

(b) a sulphide bearing material where the arithmetic mean and the majority of samples analyzed contain less than 0.4% sulphide by weight or 12.51 kg H_2SO/tonne;

(c) a sulphide bearing material that is found not to be net acid producing based on the test results provided under subsection 8(5);

(d) a pit which contains a sulphide bearing material and is used primarily as an aggregate source, if the evaluation, excavation and disposal of the sulphide bearing material are conducted in a manner that is consistent with Sections 6 to 11 of these regulations; or

(e) any mining activities under approval or otherwise permitted by the Department of Natural Resources, if the evaluation, excavation and disposal of the sulphide bearing material are conducted in a manner that is consistent with Sections 6 to 11.

initial screening

6 **(1)** Where a developer of any proposed development knows or ought to know that the proposed development will involve the physical disturbance or disposition of aggregate in a measure greater than 500 m^3 *in situ* or 1300 tonnes and which contains a sulphide bearing material, the developer shall immediately notify an Administrator of the proposed development.

(2) The developer identified in subsection (1) shall supply an Administrator with a map number and grid reference (1:50 000 map series) that identifies the location of the proposed development.

(3) An Administrator shall use information provided under subsection (2), ground trothing or any other data to conduct an initial screening to determine whether the land to be developed contains a sulphide bearing material.

(4) If an Administrator is satisfied that the land to be developed does not contain a sulphide bearing material, the Administrator shall advise the developer.

(5) If an Administrator informs the developer that the Administrator is uncertain on an initial screening whether the land to be developed contains a sulphide bearing material, the developer shall provide the Administrator with the analysis of the samples that are required to be taken under these regulations.

Sampling

7 **(1)** Unless exempted under Section 5, a developer shall

(a) have samples collected;

(b) take two samples that are representative of the lands to be developed for each hectare or part thereof to be developed;

(c) analyze the samples collected under clause (b) as required in Section 8; and

(d) send the results to the Administrator.

(2) A sample provided under subsection (I) may be taken by

(a) the test pit method at 0.5 m intervals for the first 2 m depth of sulphide bearing material and thereafter at 1 m intervals to the depth of the proposed excavation site;

(b) the core method with the sample being split along its axis half and the core analyzed along its entire length; or

(c) the trenching method with the sample being analyzed along its entire length.

(3) *An* Administrator or an inspector may require angled boring or a slight modification to the procedures and frequencies prescribed in subsections (1) and (2) based on heckling planes or any other relevant variables.

(4) The developer sha11 pay all costs of sampling and analysis required under these regulations.

Analysis and evaluation

8 (1) Each sample gathered under Section 7 shall be analyzed to determine the total sulphur and sulphate sulphur content.

(2) Sulphide sulphur content shall be determined by calculating the difference between total sulphur and sulphate sulphur.

(3) Test results obtained under subsection (2) shall be expressed as kg H_2SO/tonne.

(4) Sample testing analysis under subsection (1) shall be conducted using test methods approved in writing by an Administrator.

(5) No person shall fail to forward test results obtained under subsection (1) to an Administrator before work commences on a development.

(6) Where test results indicate a sulphide bearing material, the deve1oper may have the sample rearutlysed for net acid production by using the British Columbia Research Confirmation Test (Duncan 1972) or by another test approved in writing by an Administrator.

Excavation requirements

9 (1) No person shall excavate land that contains a sulphide bearing material unless the following conditions are met:

(a) the removal of any vegetation or soil overlying aggregate is limited to satisfy a construction or operational requirement;

(b) surface run-off is diverted away from the disturbed area where the sulphide bearing material is exposed or wiU be exposed so that no adverse effect is caused or may be caused;

(c) the volume of aggregate disturbed is minimized in all cases;

(d) excavated 1riaterial is removed immediately and disposed of in accordance with these regulations unless written approval is obtained from the Administrator authorizing the temporary storage of the material on the land for reuse;

(e) all construction activities are scheduled to rnini.:-nize exposure time of the sulphide bearing material; and

(f) run-off from the disturbed area is diverted to a centralized point before leaving the property and, if required by a written direction made by the Administrator, is monitored so that no adverse effect is caused or may be caused.

(2) No person shall store or use a sulphide bearing material on or near an excavation site without the written approval of the Minister or an Administrator.

Disposal of excavated sulphide bearing material

1O (1) Subject to Sections 4 and 5, no person shall dispose of a sulphide bearing material other than at an approved disposal site.

(2) No disposal site shall be approved unless the disposal site is located

(a) a minimum distance of 60 rn from a watercourse or well; or

(b) a minimum distance from a watercourse or well to be established by the Minister where the Minister believes on reasonable and probable grounds that the requirement set forth in clause (a) will not prevent an adverse effect.

(3) No person shall dispose of a sulphide bearing material in marine waters located within the jurisdiction of the Province *unless* the disposal is approved by the Minister.

(4) No person shall dispose of a sulphide bearing material in fresh water.

Operation of a disposal site

11 An approved disposal site shall meet the following conditions of operation:

{a) effluent or runoff must be directed to a centralized collection point and monitored for pH, aluminum, conductivity and other items detailed in the approval;

(b) effluent from the centralized co1lection point must meet the following criteria:

(i) pH .O,

(ii) aluminum s0.8 mg/1

(iii) conductivity s500 micromhos/cm;

(c) unless authorized in writing by the Administrator, the sulphide bearing material must be covered with an impervious material no later than 30 days after the first load of sulphide bearing material is deposited on the disposal site; and

(d) the disposal site surface must be contoured to prevent ponding.

Approval application infonnation/approval

12 (1) The owner, operator, developer or person responsible for a disposal site shall supply the following infonnation to an Administrator when an application for an approval is made:

(a) an estimate of the total volume of sulphide bearing material to be deposited at the disposal site; and

(b) information, design and site plans showing how the owner, operator or developer intends to address all items required under Sections l O and 11 of these regulations and rehabilitate the site.

(2) The amount of security required for an approved disposal site shall be in the amount of $25.00 per m^3 of disposed sulphide bearing material.

(3) The form of security required under subsection (2) shall be as prescribed in the Approvals Procedure Regulations.

(4) Upon receipt of the infonnation required under subsection (1) and the security required under subsection (2) and subject to the provisions of the Approvals Procedure Regulations, the Minister or Administrator may issue an approval for a disposal site.

Effective date

13 These regulations shall come into force on, from and after April 11, 1995.