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*Clearly detail the potential situations (e.g., the possible presence of human remains, a pre-historic artifact, birds, or mammals) that will result in a "stop work' order for different Project activities (e.g., blasting quarrying, shipping) and discuss the procedures that will be followed in these situations.*

**RESPONSE**

Table 1 below sets out the Work Stoppage Scenarios identified.

**Table 1: Work Stoppage Scenarios**

| VEC | Trigger | Activity to be Stopped | Subsequent Action |
|---|---|---|---|
| **Noise and Vibration** | Thermal inversion and foggy, cloudy or overcast days | All blasting | Delay of blasting until weather conditions improve |
| **Heritage Resources - Land Archaeology** | Discovery of items suspected to be of archaeological significance | Earthwork/quarry face development at and near the site of discovery | Contact of qualified archaeologist;<br>Assessment of find;<br>Continuation of work dependent on archaeologist's advice on further steps |
| | Discovery of human remains | Earthwork/quarry face development at and near the site of discovery | Contact of qualified archaeologist and /or local police;<br>Assessment of find;<br>Continuation of work dependent on archaeologist's and/or authorities' advice on further steps |
| **Heritage Resources - Site History** | Discovery of items suspected to be of archaeological significance | Earthwork/quarry face development at and near the site of discovery | Contact with qualified archaeologist<br>Assessment of find;<br>Continuation of work dependent on archaeologist's advice on further steps |
| **Aboriginal Land and Resource Use** | See Heritage | See Heritage | See Heritage |

| | | | |
|---|---|---|---|
| **Marine Ecology – Mammals / Species at Risk- Whales** | Observation of whales within 2500m safety zone | All blasting | Delay of blasting until whales have moved out of safety zone |
| **Marine Ecology – Mammals -Seals** | Observation of seals within 170m safety zone | All blasting | Delay of blasting until seals have moved out of safety zone |
| **Marine Ecology – Waterbirds** | Observation of waterbirds within 170m safety zone | All blasting | Delay of blasting until waterbirds have moved out of safety zone |
| **Marine Ecology - Species at Risk (Leatherback Turtle)** | Observation of Leatherback Turtle within 2500m safety zone | All blasting | Delay of blasting until turtles have moved out of safety zone |

## 11.2 Accidents and Malfunctions

*The Panel requires information that is much more detailed and further analysis concerning:*

- *Potential accidents and malfunctions that may occur in connection with all phases of the Project;*
- *The environmental effects of the potential accidents and malfunctions;*
- *measures proposed to mitigate effects; and*
- *The likelihood that the accidents and malfunctions will result in significant adverse environmental effects.*

*The material provided in the EIS does not meet the requirements of the EIS Guidelines. The Guidelines, the mandate of the Panel and the Canadian Environmental Assessment Act require that the Panel consider the environmental effects of malfunctions and accidents that may occur in connection with the Project in the assessment. Throughout the EIS Guidelines, the Panel has emphasized the importance of predicting the environmental effects of accidents and malfunctions and of considering worst-case scenarios.*

*The Panel requires the Proponent to integrate the assessment of potential effects of accidents and malfunctions into the environmental effect analysis. (For example, the Panel expects the Proponent to present a comprehensive assessment, proposed mitigation and residual effects analysis from accidents and malfunctions that may occur in connection with the Project components related to sediment production, storage, transfer and disposal.)*

*The Panel expects the Proponent to use the results of the effects analysis from accidents and malfunctions to inform the development of management plans.*

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**Specific Comments**

*Whale Watching Operations, Pg 23 – Detail the mechanisms by which communications will occur between the different Project sectors (quarrying, shipping, etc.) and the tourism operators. Explain how the management plan will function to minimize disruption to tourism excursions that are sometimes arranged well in advance yet may be affected by Project activities because of weather delays that alter shipping schedules.*

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RESPONSE

As noted elsewhere in the responses, Bilcon will receive approximately 72 hours notice of the arrival of a ship at the Whites Point Terminal. Bilcon will maintain a dedicated line which will advise both tourism operators and fishers of shipping activities and also planned blasting activities. Also noted in responses under the tourism section of this document is the fact that few tourism excursions are conducted in the vicinity of Whites Cove since few whales have been observed in this area. Please refer to Section 9.2.3. It should also be noted that weather conditions sufficiently severe to disrupt shipping operations would certainly ensure the cancellation of tourism excursions.

*Addendum 4, Emergency Plan, Pg 36 – Explain the relevance of the partial emergency plan from Great Lakes Dredge and Dock Co. to the Environmental Management of this project.*

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RESPONSE

Bilcon's parent company, Clayton Concrete Sand and Gravel, in partnership with Great Lakes Dredge and Dock Co., owns and operates a port facility at South Amboy in New Jersey. Clayton Concrete is the managing partner. The partial emergency plan was to demonstrate their experience in developing such a plan and their experience in managing a port facility.

## 1.0 Accidents and Malfunctions

Accidents and malfunctions have been assessed in the EIS, Vol. VII, Section 11.2. In response to the Panel's request additional information has been generated. This includes:

1. List of potential accidents and malfunctions that may occur in connection with all phases of the project (Table 1);
2. The environmental effects of the potential accidents and malfunctions (Table 1 plus text Items 1.2);
3. Measures proposed to mitigate effects (Table 1 plus Discussion of Mitigation Measures in Items 1.2); and
4. The likelihood that the accidents and malfunctions will result in significant adverse effects (Discussion of Environmental Effects in Item 1.2).

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## 1.1 Accident and Malfunction Scenarios

*Objectives and Approach*

Accidents and malfunctions are considered unplanned events. In contrast to regular Project operations and procedures, accidents and malfunctions can involve temporary non-compliance with applicable criteria. The objective of the assessment of possible environmental effects of accidents and malfunctions are:

- to ensure that abnormal events and/or operational upset conditions are considered in the effects assessment;
- credible events are identified;
- available means to prevent the occurrence or to mitigate the possible effects of events are included in the Project description;
- remedial actions are identified; and
- that the significance of the residual effects (i.e., after remediation) of such events is determined.

The assessment focuses on those events that are considered credible in the context of the Project. The EIS does not intend to address all conceivable abnormal occurrences, but rather, to address only those scenarios that have a reasonable probability of occurring (considering the specific aspects of site conditions and Project design) that may have an environmental effect or consequence.

Accident and malfunction scenarios may be anticipated for all three stages in the Project's lifecycle:

- Construction Phase;
- Operation Phase; and
- Decommissioning.

The assessment of likely effects associated with accidents and malfunctions was conducted in three steps:

- Step 1 – Identification of events that have a reasonable probability of occurring that could result in an environmental effect (i.e., credible events);
- Step 2 – Review the credible events to determine requirement for further assessment; and
- Step 3 – Assessment of events advanced from the screening in Step 2.

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In Step 1 events were identified that have a reasonable probability of occurring. In Step 2 each event was reviewed as to whether it could reasonably be expected to result in residual environmental effects and therefore may warrant a detailed assessment.

The review was conducted on the basis of professional judgment of the EIS Study Team, considering currently available Project design information, experience from other directly relevant or similar projects, and regulatory requirements for design and operation of such projects. Considerations in the review process include:

- design and safety features that will be incorporated in the Project to prevent occurrence of the event;
- training and management procedures incorporated in the Project to prevent occurrence of the event; and
- emergency response and remediation procedures to control and mitigate the event.

Accidents and malfunctions advanced for further investigation are subject to Step 3. In this step, each credible malfunction and accident scenario is assessed in the same manner, and using the same assessment criteria, as for the effects assessment of the normal construction and operational works and activities. Objective of this assessment is to determine if the scenario could reasonably be expected to result in a significant residual environmental effect. Again, this assessment considered Project-specific features that would be available to prevent or control the occurrence itself, as well as to mitigate and remediate possible effects of the event.

The results of Steps 1 to 3 are presented in this response text. The text supports the information presented in the EIS with the intention to clarify and supplement the existing information. Table 1 lists the identified potential accidents and malfunctions considered, together with a description of the circumstances, the materials potentially released, the proposed management features and possible remediation activities, if required. For each scenario, a conclusion is presented as the whether or not the scenario was screened from further consideration.

*Screening Results*

Tables 2a and 2b communicate which of the VECs could be potentially affected by the accident and malfunction scenarios. Table 3 summarizes the outcome of the screening exercise, i.e., the identification of four scenarios for more detailed review and assessment:

Terrestrial Environment

- Accidental explosions;
- On-site spill of chemicals and hazardous material;
- Off-site accident with personal injury and/or spillage of hazardous material;

Marine Environment

- Vessel - whale collision.

The more detailed considerations (Step 3) regarding the selected accident and malfunction scenarios are discussed under Item 1.2 of this response text.

All other scenarios were screened from further consideration. They are considered to represent scenarios associated with one or more of the following characteristics:

- Substances involved are commonly used on construction sites, their characteristics are well known;
- Quantities of released contaminants are small;
- Adverse effects remain localized and are reversible;
- Circumstances are generally well understood;
- Proven technologies are available for effective containment, clean up and remediation; and
- Project-specific operation, environmental management and contingency plans have proven to provide adequate and effective management tools.

The Project will be designed and operated consistent with all applicable engineering and environmental management practices and within the applicable regulatory framework to avoid accidents and malfunctions. In the event that such upset conditions occur, responses will be in compliance with the applicable laws and regulations.

Mitigation measures will be in place to avoid and /or minimize and remediate adverse effects. These measures will be specified in component-specific operational plans and environmental management plans (e.g., specific to marine terminal, quarry material storage area, retention ponds). They will address such issues as:

- Emergency preparedness;
- Emergency response;
- Spill prevention;
- Maintenance and monitoring;
- Containment equipment;
- Clean up procedures;
- Responsibilities;
- Training; and
- Audits; and
- Reporting.

Within Bilcon, overall responsibility for the implementation of these plans will be assigned to the environmental management team and the Health, Safety, Security and Environmental

Supervisor. It is envisaged that Bilcon will periodically review and update these plans in consultation with the CLC.

## 1.2 Detailed Considerations

### 1.2.1 Accidental Explosion

*Information Analysis*
Ammonium Nitrate (AN) is a strong oxidant and as such represents a hazardous good, Hazard Class 5.1. Packing group III (see Attachment 1 to this response) (*Transportation of Dangerous Goods Act* and *Transportation of Dangerous Goods Regulations 1992;* Transport Canada 1992). In itself it is not considered an explosive (i.e., not Hazard Class 1) and is not combustible. However, it is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Contact with oxidizable substances may cause extremely violent combustion. It is also considered sensitive to mechanical impact.

Accidental explosions of AN although rare, are documented from a variety of locations throughout the world over the past century. In all incidents the accidental explosion resulted primarily from lack of knowledge of the explosive nature of the AN, very poor practices to disaggregate AN, collateral effects and damage from acts of war, terrorism or sabotage. Such explosions of unconfined AN can be very damaging.

When properly handled, the AN is very safe and stable. AN is a commonly used agricultural fertilizer that is transported world wide on a daily basis, measured in the millions of tonnes by all forms of transport.

AN is also a very commonly used blasting agent with particular application in the surface mining industry throughout the world including all regions of Canada including many quarry and mining operations in Nova Scotia. Incidents of accidental explosions associated with these industrial blasting applications of AN are exceeding rare. Such materials are safely transported, loaded into blast holes in combination with emulsions and successfully detonated in most surface mining operations requiring blasting to fragment the rock.

Transportation of the explosive materials is regulated by Transport Canada (*Transportation of Dangerous Goods Act* (1992) and *Transportation of Dangerous Goods Regulations*). Despite the fact that the AN itself is not classified an explosive substance, it does represent a component material of the explosive to be used by Bilcon. It is purchased from a single source explosive manufacturer and all containment vessels, storage facilities, and transport vehicles used for storage and shipment require a license by Natural Resources Canada, Minerals and Metals Sector, Explosives Branch. The purpose built transport vehicles are constructed with durable materials, locking hatches; separate compartments specifically

designed to keep the components ammonium nitrate, fuel oil, and emulsion from mixing particularly in the case of a vehicular accident or upset.

Blasting operations and operating personnel are regulated by NSDEL. In short, for the case of any mining operation in NS, only certified, experienced personnel working with approved licensed equipment will attend to blasting operations.

Certified, experienced personnel properly equipped to transport, load and detonate these blasting agents, are the key to routine safe operations without incident. These key features characterize a marked departure towards careful management from the accidental explosions described in the literature.

For every blasting event (about one or two every two weeks) the site will be receiving approximately 15 t of AN. The AN will be transported to the site by licensed vehicles on an as need basis. The required amount of fuel oil that will be mixed with the AN will be transported to the site in the same vehicle. The delivery and mixing system is termed a "process vehicle" and is licensed by NRCan.

Upon arrival, the AN will be unloaded, mixed, and inserted into blasting holes (see also discussions in Section 1.2.2)

***Potential Environmental Effects***
An accidental explosion of this amount of AN has the potential for large scale damage within the vicinity of the accident. The consequences could involve personal injury and perhaps death for near-by personnel and destruction/damage of natural features and built features at the site of impact.

***Mitigation:***
The prime points of mitigation are:

- Use of an intrinsically safe blasting agent;
- Securing reliable suppliers of the blasting materials;
- Transportation in accordance with Transport Canada's *Transportation of Dangerous Goods Act* and its regulations and EMR specifications;
- Contract certified licensed experienced blasting contractors;
- No on-site storage of AN (delivery on-demand);
- Mixing of AN on-site (i.e., not before arrival on-site); and
- Implementation and monitoring of strict explosive handling and operating protocols (through Facility Operation Plans, EMP and HSAPs).

*Conclusion*
Any accidental explosion involving the total amount of AN handled at the Project site could cause significant adverse effects to humans and the biophysical environment in the immediate vicinity of the accident.

With the strict implementation of the proposed mitigation measures the likelihood of such an accident to occur however is considered extremely low. This is supported by the currently wide usage of the AN blasting agents within the quarry and minerals production industry, which operates successfully and safely under close government regulation with experienced certified and licensed contract personnel.

### 1.2.2 (4.) On-site Spill of Chemical or Hazardous Material, and (9.) Off-site Traffic Accident Involving Vehicles Resulting in Personal Injury and/or Spillage of Fuel or Hazardous Materials.

*Information Analysis*
A list of chemicals and hazardous goods that will be used at the Project site is presented in Table 4 (shown at the end of this response text) together with an estimate of the maximum quantities that will be stored on-site.

Of the listed materials, the blasting agent Ammonium Nitrate (AN) is of prime concern in the context of accidental spills. Although not stored on site (see discussion below), the concern is based on the quantity of AN involved, its chemical characteristics as strong oxidant and its potential effects on terrestrial and aquatic environments.

All items listed will be managed in quantities typical for construction sites and industrial quarry operations. Where applicable, they will be handled and stored in containers approved for transport and storage (e.g., oil drums, propane tank) and designated locations within the Project site that meet all applicable government standards and building codes. The diesel fuel will be transported to the site in standard fuel tanker trucks with a capacity of up to 60,000L. The fuel will be stored on-site in one or more above ground fuel tanks, ranging in capacity between 10 and 90,000 L. Again, the tanks will be located in a designated storage area with its own containment systems.

Any spills during transport, handling and storage of any of these materials are considered to involve small quantities that can be addressed with standard environmental management planning such as spill prevention plans and emergency response / clean up plans. This would effectively limit the effects to a small area. Site remediation techniques are available to reverse any effects should they occur.

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As mentioned in the discussion under Item 1.2.1. The material will be delivered by two separate purpose built vehicles (one for the AN, one for the blasting caps) and in compliance with the *Transportation of Dangerous Goods Act* (1992) and *Transportation of Dangerous Goods Regulations*.

AN usually comes in the form of "prills" (small diameter spheres about 2-3 mm diameter that facilitate flow as a solid) It is also toxic if swallowed and causes eye, skin, and respiratory irritation.

When transported and handled for use as explosive, regulated transport equipment present the same precautions and security parameters as stated above (Item 1.2.1). Transportation of the explosive materials is regulated by Transport Canada. Containment vessels, storage facilities, and transport vehicles are licensed by Natural Resources Canada, Minerals and Metals Sector, Explosives Branch (NRCan). These purpose built vehicles are constructed with durable materials, locking hatches; separate compartments specifically designed to keep the components from spill and mixing, particularly in the case of a vehicular accident or upset.
Certified, experienced personnel properly equipped to transport these blasting agents, are the key to routine safe operations without incident. The crews will be trained in the nature of the hazardous materials, clean up and recovery procedures.

*Potential Environmental Effects*
Because AN is soluble in water the concern is that spilled material can enter the surface and groundwater regimes causing environmental impact. It dissolves very quickly in water so there will likely be an acute effect on aquatic species. The acute toxic component is ammonia (NH4) and toxicity increases with water temperature and pH. Critical value is >0.019 mg/L AN as un-ionized ammonia (Canadian Water Quality Guidelines for the Protection of Aquatic Life; CCME, 2000). In the long term it will promote rapid growth of algae and aquatic vegetation, produce anoxic conditions (no dissolved oxygen) and kill more biota.

Dissolved AN will impact soils and groundwater. In high concentrations it will immediately kill all local vegetation and inhibit growth for several months to several years depending on the size of the initial spill. Ammonia (NH4) is strongly adsorbed by soil particles but will be biologically converted to NO3 and become mobile. It could also have a major impact on groundwater. It has two components: Ammonia (NH4) and Nitrate (NO3). The nitrate is immediately and highly mobile in water. Ten 10 mg N as NO3/L is the maximum concentration for drinking water (Health Canada 2006, Guidelines for Canadian Drinking Water Quality).

To avoid and minimize adverse environmental effects it is essential to control the material so that it stays in a solid form. If allowed to come in contact with water and dissolve, a major

environmental problem can result. AN can easily be cleaned up in the solid form, but clean up is essentially impossible once it dissolves. If large amounts of the solid are mixed with organic debris and allowed to react for several days (reaction is exothermic - generating heat) it could catch on fire. To avoid problems, farm handling policies typically require immediate spreading of the material once it comes in contact with soil.

*Mitigation*
The prime points of mitigation are:

- Ensuring awareness among personnel of the hazardous nature of the AN;
- No on-site storage (on demand delivery);
- Transportation in accordance with Transport Canada's *Transportation of Dangerous Goods Act* and its regulations;
- Transportation only in purpose built vehicles and containment in accordance with NRCan specifications;
- Development of emergency response and clean up plans (as part of the EMP) to limit the spread, and to recover the material;
- On-site spill containment and clean up equipment;
- Regular staff education and training in spill prevention, emergency response, spill containment, and clean up measures;
- Ensure availability and make prior arrangements with spill containment and recovery specialists; and
- Monitoring of environmental effects and appropriate remediation response.

*Conclusion*
During all Project phases, a number of chemicals and hazardous materials will be used at the Project site. Of these materials, AN is of key concern with respect to accidental spills of chemicals and hazardous materials.

Given the large quantity of AN that will be regularly transported to the Quarry site, and the potential toxic effects on ecosystems, an accidental spill of AN in terrestrial environments and particularly in aquatic environments could cause significant adverse effects. The significance would obviously depend on the spilled quantity, the particular site conditions, the closeness to open water, and the response time for containment and clean-up.

For such a spill to occur is considered to be extremely unlikely provided all transportation, and handling regulations are followed and the appropriate environmental management plans are in place. This includes in particular, spill prevention, emergency response and clean-up plans. This is further supported by the wide usage of the AN blasting agents within the quarry and minerals production industry. This industry has been operating under close government regulation with experienced certified and licensed contract personnel.

### 1.2.3 Shipping Vessel Collision with Marine Mammals

The general aspects and description of research and analyses related to the potential effects of the Project on Marine Mammals are discussed at length in the EIS, Vol. VI, Chapter 9.2 Biological Environmental and Impact Analysis (Sections 9.2.4.1.7 and 9.2.11). The Maps 21, 24 and 25 and Figure 10 communicate marine mammal survey areas, right whale conservation areas, and right whale density and marine mammal observations respectively. Section 9.2.13 provides details specifically on the potential for adverse effects from Project vessels on the North Atlantic right whale. Map 4 delineates the proposed designated shipping routes for the Project vessels.

The information assembled is considered adequate for effects assessment purposes and reflects the detailed considerations (Step 3) undertaken as part of the effects assessment of Accidents and Malfunctions (see discussion under response Item 1.1). The key aspects of the inventory and effects assessment are briefly summarized below.

*Information Analysis*
Estimates of incremental commercial vessel traffic within the Bay of Fundy due to the Project are predicted to be in the order of 6 %. Including commercial fishing vessel activity in the estimates will further reduce the value of incremental traffic. If the vessel traffic crossing the known migration routes of the right whale along the Atlantic seaboard, originating from or destined to the major NE USA ports, or the offshore commercial fishing vessel activity were also included, the estimate of incremental traffic due to the Project will be infinitesimal. Therefore, the incremental risk for a vessel collision with a right whale is likewise very small.

The key points of the information and analysis with relevance to Whites Point Quarry shipping activities are listed below:

- Endangered species under consideration is the North Atlantic right whale, which is believed to be vulnerable to ship collision due to known slow swimming speeds and lengthy periods on or near surface between dives.
- The total population of North Atlantic right whales currently numbers about 322 animals (about 220 to 240 mature animals).
- The Bay of Fundy is one of the summer and fall feeding grounds for the right whale from June to December.
- Studies have shown that the highest concentration of the right whale sightings in an area ESE of Grand Manan Island are well north of the Project site and associated planned shipping routes.

- The study team's own marine mammal surveys (EIS, Vol. VI, Section 9.2.4.1.7) resulted in no right whale sightings at or near the Project site during the survey period (July to August; survey area extended over approximately 12 km in length and 1.9 km in width; also no right whales were observed off- or near-shore between May and October 2003 during weekly on-shore site visits);
- After leaving the controlled shipping lanes, vessels transiting from the shipping lanes to the Project site will be operating at much reduced speeds on approach to the dock (in the order of 12 to less than 1 km).
- Recognized experts in the field have assessed the probability of whale mortality based on rule vessel speed and the observed whale distribution en route to the Project terminal to be "practically zero".

*Environmental Effects*
Vessel whale collisions may result in an injury, perhaps even mortality of the marine mammal involved. Given the low population numbers for right whales, this may adversely affect the whale population and the success of the Canadian North Atlantic Right Whale Recovery Plan.

*Mitigation*
The prime points of mitigation are:

- Vessels navigate within designated in and outbound shipping lanes (as per Canadian Hydrographic Charts)
- Project vessels follow designated shipping routes between the shipping lanes and the marine terminal;
- Vessels travel at reduced speed between the shipping lanes and the marine terminal;
- Monitoring and responding to reports of whale sightings (e.g., Bilcon onshore observations; St. John Vessel Traffic Service) prior to vessel arrival and departure; and
- Cooperation and communication between whale research organizations operating in the Bay of Fundy and also whale watching operators.

Another general (i.e., not Project-specific) mitigation measure has been implemented in July 2003 and involves the relocation of the main shipping channel to the east of the NARWCA. The relocation has been implemented by Transport Canada to reduce the potential for adverse effects on whales from all ship movements entering and departing the Bay of Fundy. Vessels destined for or departing from the Whites Point marine terminal will comply with the latest channel alignments. Typically however, Bilcon vessels will entirely avoid the Conservation Area since they leave/enter the shipping lane southeast of the Conservation Area (see Map 25, EIS, Vol. III, Maps).

*Conclusion*
With the proposed vessels traffic navigating to and from the Project site, there is the potential for vessel-whale collisions. The effects of such collision could be significant if it involves the North Atlantic right whale, an endangered species with a population of only about 300 to 350 individuals.

However, given the proposed mitigation measures the likelihood of such a collision to occur, is considered very low. Further, the proposed vessel traffic would constitute a very small (6%) incremental increase in large vessel traffic in the Bay of Fundy. This is considered an insignificant increase in the current risk for vessel-whale collisions.

## 2.0 Other Issues and Specific Comments Raised by the Panel

### 2.1 Considering Worst-case Scenarios

The accident and malfunction assessment takes worst – case scenarios into account. For example, as discussed in this response text (Section 1), this includes such aspects and scenarios as:

- Maximum quantities of chemicals and hazardous goods transported and stored on site;
- Accidental explosions of Ammonium Nitrate;
- Spills of Ammonium Nitrate into water courses; and
- Vessel-(right) whale collisions.

Similarly, mitigation and monitoring measures have been developed to prevent such worst case scenarios, to minimize the likelihood of such occurrence and to limit the significance of adverse effects should such an accident or malfunction occur.

### 2.2 Integration of the Assessment of Potential Effects and Malfunctions into the Environmental Effects Assessment

Response Item 1 provides the integration of the assessment of accidents and malfunctions into the environmental effects assessment in that it:

- Identifies accidents and malfunctions scenarios;
- Identifies potential for environmental effects;
- Develops mitigation and follow-up (monitoring) measures; and
- Provides an assessment of the significance of the residual effects.

The additional information provided on the environmental effects assessment of accident and malfunctions does not change the overall conclusion of the EIS. None of the Project's routine activities is expected to cause significant adverse environmental effects. Four accident scenarios were identified as potentially causing significant adverse environmental effects. However, the likelihood of such events to occur was determined to be very low.

## 2.3 Sediment Production, Storage, Transfer and Disposal

The accidents related to sediments are addressed in Table 1. The breach of the containment berm around a stormwater retention pond and the breach of a berm around the sediment storage area were identified as credible failure scenarios associated with the on-site sediment management.

The failure scenarios for the berms around the retention ponds and the storage area were assessed to not cause significant adverse environmental effects. Standard engineering approaches, in combination with additional precautionary engineering features, environmental management, mitigation and monitoring measures were considered to reduce effects to insignificant levels and to reduce the likelihood of the occurrence of such events to acceptable levels.

## 2.4 Inform the Development of Management Plans

The analysis of accidents and malfunctions determined the necessity of developing

- Mitigation measures;
- Monitoring programs; and
- Operating procedures for the quarry, terminal and marine transport.

Key provisions have been discussed under the response Items 1.2.1 to 1.2.3 presented above. Further information on management plans including, operating protocols, environmental management plans, monitoring plans etc. are discussed in response to IR-2 on Follow-up Programs (IR-2, Section 11.6). Bilcon is committed to establish these plans and protocols during the detailed Project design and in consultation with the regulatory agencies.

## 2.5 Whale Watching Operations and Mechanisms of Communications

The Project's designated environmental and safety supervisor will have all schedule information on blasting events and vessel arrival and/or departure. It is envisaged that Bilcon will post and update these schedules on its dedicated phone line with daily message updates daily. The local fishing community and tour boat operators will be initially informed about the availability of and access to this information. Discussions with the Community Liaison Committee will be held to identify further information needs or opportunities for improved communication.

Schedule changes related to vessel arrivals/departures and blasting activities are possible due to weather conditions. Similarly, weather conditions may force tour boat operators to change schedules and/or tour routes on short notice. Consequently all parties need to maintain close contact and exchange up-to-date information on their respective operations. As mentioned above Bilcon will solicit input on its communication with tour boat operators and the fishing community through CLC meetings and direct contacts.

## 2.6 Emergency Plan Relevance to the Environmental Management of this Project

Table 1 identifies the collision of a vessel servicing the Bilcon terminal with the terminal, another vessel or grounding as a credible accident scenario. One of the consequences of such an accident could be the release of the oil that the vessel carries as fuel for its main engine and ancillary aggregates (Bunker "C" and Marine Diesel oil (MDO- Petroleum Distillate Fuel).

As stated in the Table, measures to avoid and minimize the effects of any such event include:

- Contracting of reputable ship charter operators using in class vessels;
- Operation and maintenance of owned vessels to the highest standards of seaworthiness and officer and crew training;
- Development and implementation of an emergency response plan (including spill prevention) for the Bilcon marine terminal (including staff training, availability of containment and clean-up equipment and materials at the terminal; provisions for follow-up assessment and implementation of remediation measures); and
- Require contracted vessel owner/operator to maintain and enforce a vessel/fleet-specific spill prevention and emergency response plan covering the event of a collision and grounding and the associated release of fuel to the marine environment.

Addendum 4 presented on page 36 (EIS, Vol. VII, Section 11.2) provides an example for the content of a vessel/fleet-specific spill prevention and emergency plan (Shipboard Oil Pollution Emergency Plan). Bilcon will require vessel owner's/operators to maintain and enforce such an emergency plan as part of the contract conditions.

It is of note that Addendum 3 "Spill Prevention Control and Countermeasure (SPCC) Plan" (EIS, Vol.VII, Chapter 11, p.30) presents an example for the site-specific spill prevention and emergency response plan mentioned in the above listed environmental management measures. This type of plan will be developed specifically for the Whites Point Quarry site and the associated marine terminal.

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**TABLE 1a: Screening of Malfunction and Accident Scenarios - Land Site Environment**

| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| **1. Accidents resulting in personal injury (on-site)** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• This type of event would involve personal injury resulting from slips, falls, crushing by equipment and impact by vehicles.<br>**Materials released and quantities:**<br>• No materials are expected to be released during this event.<br>**Management features:**<br>• All work will be undertaken in accordance with the requirements of the NS *Occupational Health and Safety Act*, applicable regulations and codes and will conform to specific design and construction protocols developed to minimise the potential for personal injury.<br>• HASPs will be developed and implemented for all Project activities.<br>• A Project Health Safety, Security and Environment Officer will be designated to oversee the implementation of the HASPs and ensure compliance.<br>• Construction staff and supervisors will be trained appropriately for the work being undertaken and with respect to the requirements of *Occupational Health and Safety Act*.<br>• All on-site personnel will be equipped with appropriate PPE.<br>**Remedial action:**<br>• NA | Work-place accidents with effects on worker's health and safety are considered to be avoided and minimized to non-significant levels by compliance with provincial regulations.<br><br>No further consideration is required. |
| **2. Accidental explosion** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• Explosives will be used in small quantities during construction to prepare the site for equipment foundations and necessary infrastructure.<br>• Explosives will be used in larger quantities during production activities. The actual quantity of explosive to attain the desired rock fragmentation will have to be determined on site, under actual full-scale operations. It is predicted that the explosive use will be in the order of 15 t per blast cycle (one to two blast cycles every second week).<br>• Although rare, an accidental discharge of explosive material could occur under two circumstances; during delivery of the explosive to the quarry site, and as the blasting agents are being loaded into the blast holes within the quarry. | Accidental discharge of explosive components being delivered to the site - although considered extremely unlikely - is a possibility. Any such event could be of particular concern to human health and safety.<br>**The scenario has been identified as requiring** |

## *11.0 Environmental Management*

| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | • The common explosive ammonium nitrate fuel oil mixture, or equivalent gel are mixed at the site just prior to placing in the blast hole. These materials are not considered an explosive until final mixing and therefore may be transported safely in accordance with Federal transport regulations.<br>• All of the blast materials blasting agents, detonators and booster caps are transported separately therefore the prospect of an accidental explosion while in transport is highly unlikely.<br>• Accidental detonation of surface mine blast hole is a very rare event. Modern blast management practices incorporate highly skilled and experienced personnel (in this case contract blasters) following strict operating practices regulated and licensed by NSDEL in common daily practice throughout NS and Canada by numerous operators.<br>**Materials released and quantities:**<br>• In each case outlined above materials released would be the products of combustion of the components; nitrogen gasses, water, carbon dioxide and monoxide.<br>**Management features:**<br>• Operational Plans will be developed and implemented for the Operational Phase of the quarry relative to the delivery, handling and loading of explosive components. Blasting contractors will be carefully screened for expertise and certification prior to selection.<br>**Remedial action:**<br>• NA | **further consideration.**<br><br>Accidental discharge of blast hole while loading is considered part of the Scenario 1 (Accidents resulting in personal injury) and is considered to be adequately addressed by operational plans and HASP (see discussion under Scenario 1). |
| **3. Vehicle accident and fuel spill (on-site)** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• Vehicular movements will be one of the most common activities on site in relation to personnel movements, aggregate excavation, loading, hauling, service activities etc.<br>• The most critical time will be during construction activities when additional vehicles by construction contractors are present on the developing site.<br>• During operational phases of the Project the personnel operating vehicles become more familiar with routes, routine procedures and management has had more opportunity to effect sound training procedures.<br>• Vehicular accidents on site roads and in the quarry could result in spill of pit run aggregate, spill of fuel, or spill of hazardous materials depending on the service of the vehicle<br>• The severity of the consequences would depend on the location (e.g. spill into a watercourse) and the time of year (e.g., spawning of fish, fishing seasons, seasonal occupations).<br>**Materials released and quantities:**<br>• Fuel tanks on large off highway haulage units, excavators and dozers contain 500 L to 1,200 L of diesel fuel. | Despite precautions, it is likely that a vehicular accident will occur resulting in the potential for an environmental effect due to fuel spillage.<br>EMP and established practices will mitigate the risks to insignificant levels.<br><br>No further consideration is required. |

## *11.0 Environmental Management*

| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | Other vehicles will have fuel tanks similar to commercially available industrial equipment less than 500 L capacity. Should the accident involve a fuel transfer vehicle, the quantity could be larger – in the order of less than 60,000L.<br>**Management features:**<br>• EMPs (including spill prevention and emergency response plans) will be developed and implemented for all phases of the Project with special emphasis on the construction phase.<br>• Immediately following efforts to rescue and assist any injured personnel, rapid reaction to contain the spills is mandatory (priorities and actions will be specified in the emergency response plans).<br>• Storage of spill containment, recovery, and site clean up equipment and materials on-site as per the provisions of the spill prevention and emergency response plans.<br>• Site drainage management provisions for the capture of any liquid materials migrating into drainage ditches and ultimately in the sediment ponds.<br>**Remedial action:**<br>• Contaminated soil and/or water will be remediated to the appropriate standards | |
| **4. On-site release or spill of construction or operating related equipment fuel or lubricants.** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• Spills may occur either at the storage locations, from ruptured fuel lines, from tanker truck accidents or during refuelling and maintenance operations.<br>**Materials released and quantities:**<br>• The volumes that could be released are:<br>o Stored fuels (e.g., diesel, gasoline, propane): less than 90,000 L.<br>o Lubricants (e.g., oil): less than 100 L.<br>o Fuel tank spill (e.g., diesel, gasoline): less than 500 L<br>o Fuel line rupture - variable quantity<br>o Bulk tanker truck- less than 60,000 L<br>**Management features:**<br>• Storage of limited volumes of fuel and lubricants on site.<br>• Fuel storage methods will conform to all applicable regulatory requirements.<br>• Operating plans and EMPs, following applicable regulations, will prescribe detailed protocols for management of fuels and lubricants.<br>• As part of the EMPs, development of spill prevention and emergency response provisions to further reduce | Given the volumes of materials that could be spilled and the environmental management features that will be in-place, including immediate spill recovery efforts environmental effects are unlikely.<br><br>Fuel delivery by bulk tanker will be an infrequent event by certified experienced personnel.<br><br>No further consideration is required. |

## *11.0 Environmental Management*

| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | likelihood and consequences of release to the environment.<br>**Remedial action:**<br>• Contaminated soil and/or water will be remediated to the appropriate standards. | |
| **5. On-site spill of chemical or hazardous material** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• Spills may occur either at the stored material locations or during all operational or maintenance operations.<br>**Materials released and quantities:**<br>• Common chemicals that would be used at the sites include chemicals used for water treatment, such as lime or alum, chemicals used for dewatering, such as polymers, binders such as portland cement for sludge solidification process, cleaners or solvents used during site maintenance and restoration operations such as acids or bleaches, or residue non-radioactive sludges or residues.<br>• Other materials would include; engine coolant, hydraulic fluid, de-icing compound (glycol based), flocculent, cleaning solvents and paints, propane, acetylene, cement and concrete additives.<br>• It is expected that the volume of spilled chemicals or a hazardous material will be less than about 200 L (i.e., one drum).<br>• Blasting agents ammonium nitrate (AN) (NH4. HN02), fuel oil or an emulsion equivalent will be delivered to the site by licensed carriers in bulk quantities up to 15 t per blast event in preparation for routine blasting operations.<br>• These materials will be in solid prill or emulsion form either of which will not readily spread from point of spillage and can be readily contained and cleaned up.<br>**Management features:**<br>• Operating Plans and EMPs will be developed and implemented for the construction phase and operational phases of the Project and remediation activities will observe best management practices (BMPs).<br>• Operating Plans and EMPs, following applicable regulations, will prescribe detailed protocols for management of hazardous materials (e.g., emission control, safe storage practices, spill containment, emergency response, regulatory compliance, containment measures as per Material Safety Data Sheets (MSDSs).<br>**Remedial action:**<br>• Contaminated soil and/or water will be remediated to the appropriate standards. | Given the small volumes of most of the materials that could be spilled and the environmental management features that will be in-place, including immediate spill recovery efforts environmental effects are unlikely. No Further consideration is required.<br><br>The exception to the above is the relatively large quantity of blasting agents that is being handled on a frequent basis. If spilled effects on terrestrial and aquatic environments can be significant.<br>**Therefore, the scenario of a spill of AN has been identified as requiring further consideration.** |
| **6. Oil spill at on-site fuel storage** | Construction:<br>all | **Overview of circumstances:**<br>• This event considers a spill at one of the fuel storage facilities due to overfilling, rupture of the containment | Even with the relatively large quantities of liquid fuels, common and well- |

## *11.0 Environmental Management*

| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| **facilities** | Operation:<br>all<br>Decommissioning:<br>all | vessel, breakage of control valve or fuel delivery pipe. Spills could also result from human error during delivery of fuel to the oil storage tanks (e.g., overfilling, leaving valves open).<br>**Materials released and quantities:**<br>• Storage facilities will be for 90,000 L diesel fuel, and 500 L recovered waste oils, which will be the upper limit of potential spills.<br>**Management features:**<br>• Development of designated fuel storage site at the compound area adjacent to the shop and office location in clear view of management and maintenance personnel. .<br>• Fuel storage site to be within the permanent site drainage collection system that will direct drainage to the site water and sediment retention pond. This provides for containment of accidentally spilled fuels that enter the site drainage system.<br>• Fuel storage tanks and facilities will be designed to conform to the NSDEL regulations for petroleum storage tank installations. Key design features include the installation of impervious mats, containment dykes, and the installation of sump and collection systems.<br>• On site inventory of necessary collection and pumping equipment and supplies of absorbent materials.<br>• Development and implementation of Operating Plans and EMPs including spill prevention, clean up procedures and reporting protocols for internal documentation and information of regulators.<br>• Personnel trained in spill containment and recovery operations or in the alternative, contracts in place with commercial firms certified to conduct such work.<br>**Remedial action:**<br>• Stop the spill at source and recover the product within the containment dyke.<br>• Contaminated soil and/or water will be remediated to the appropriate standards. | practiced fuel handling arrangements are expected to reduce the effects of spills to insignificant levels.<br><br>No further consideration is required. |
| **7. Facility fire** | Construction:<br>all<br>Operation:<br>Q,P<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• The most obvious locations for fire potential will be; vehicles, fuel storage facilities and buildings, mechanical shops, processing plants, and materials handling facilities particularly conveyor systems.<br>• From an environmental impact perspective, the most critical of these is the fuel storage where there may be sufficient fuel to sustain a fire event for long periods of time.<br>**Materials released and quantities:**<br>• Products of combustion will be smoke and carbon particulates. Duration of fire will be limited to several hours except in the case of a fuel depot, which could burn for longer times. | Facility fire at WPQ does not present any abnormal environmental hazard or risk beyond any other location. Fire surveillance, response measures and adequate crew training will mitigate the extent of the fire damage and reduce any environmental insult. |

| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | **Management features:**<br>• Establishment of "Fire Safe "operating procedures.<br>• Fire detection and protection systems will be provided in critical locations such as fuel and lubricant storage tanks.<br>• Fire fighting water supply at the plant site will be available for use.<br>• Development and implementation of EMPs including site-specific emergency response plans and training provisions for Bilcon employees.<br>**Remedial action:**<br>• The emergency response procedure will be implemented immediately upon the detection of a fire.<br>• Fire fighting equipment and an emergency response vehicle equipped with fire fighting equipment will be deployed immediately. | No further consideration is required. |
| **8. Breach of berm around stormwater management/ sediment ponds** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• This event contemplates a breach of the berms around one of the stormwater retention/sediment ponds located along the northwest side of the operating site resulting in a discharge of silty water to the on-site environment and, potentially, the marine environment.<br>• A breach could be the result of extreme weather conditions (e.g., extreme rainfall events combined with ice built up), inadequate or faulty engineering design, poor construction, maintenance and inspection practices.<br>**Materials released and quantities:**<br>• The sediment ponds # 1 to 5 will allow a combined maximum storage of approximately 240,000 $m^3$ of water with an allowance for 96,000 $m^3$ of sediment before clean out is required. Sediment Pond #6 will have a total storage capacity of 35,000 $m^3$ with a sediment storage allowance of 10,000 $m^3$. Should a major breach occur in one of the ponds all of the pond water (about 10,000 $m^3$) and a portion of the pond's sediments (e.g., 25% equals about 800 to 2500 $m^3$) could escape confinement. This may lead to temporarily increase of turbidity in the marine environment near the project site.<br>**Management features:**<br>• Design and operation of a series of individual sediment ponds (6 ponds) with controlled discharge points, rather than one large pond.<br>• Provision of continuous maintenance of sufficient capacity at individual ponds to allow for extra storage: Bilcon proposes a storage capacity of 2,350 $m^3$ /ha for ponds #1-5 and 970 $m^3$ /ha for pond #6 (the typical pond size in the mining industry is 500-600 $m^3$ /ha);<br>• Provision of sufficient additional capacity e.g., in the event of a 100 year storm and/ or requirement for storage | Although this event is possible, extensive excess capacity will be provided by the pond system to address failure in one of the ponds and to accommodate 100 year storm events. I<br><br>In addition, the proposed perimeter berm, approach to engineering and operation of the ponds will minimize the risk for any environmental effects to acceptable levels.<br><br>No further consideration is required. |

| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | from other pond: the pond sizes and storage capacity (see above) proposed by Bilcon allow for on-site storage of run off from a 100 year storm;<br>• Establishment of perimeter run-off collection channel/drain along the western property line (Bay of Fundy shoreline) with drainage into pond system (this will prevent direct discharge into the marine environment and allows for recollection/-direction of water originating from a berm failure back into the pond system or the constructed wetland.<br>• Fail safe engineering design to the highest professional engineering standards incorporating high factor of safety, low tolerance specifications of construction materials, ample freeboard, erosion protected wave zone, emergency over topping structures, perimeter spill containment berm surrounding the ponds.<br>• Determination of the pond details (for example, baffles) to provide adequate retention time to settle the fines (this is best determined during the detailed design phase and in parallel with the final stormwater management plan development).<br>• Stringent construction inspection and management procedures.<br>• Implementation of Operating Plans with provisions for frequent routine berm and pond inspections and follow up maintenance procedures.<br>**Remedial action:**<br>• Recovery of the discharged sediments and placement in the sediment disposal area. | |
| **9. Breach of berm around sediment disposal area** | Operation:<br>all | **Overview of circumstances:**<br>• This event contemplates a breach of the berm around the sediment disposal area located first in the south (year 1-20) and later in the southwest (year 21-49) of the site, resulting in a discharge of water and sediments.<br>• A breach could be the result of extreme rainfall event, inadequate or faulty engineering design, poor construction, and maintenance and inspection practices.<br>• Based on the current design, the water and sediment would discharge either to cell 2 of the storage area, or, in case of a failure of an outside berm, into the perimeter drain system and from there into the stormwater retention pond system. No direct discharges would be experienced.<br>**Materials released and quantities:**<br>• The sediment storage area will encompass two cells, each 100 m x 400m (4 ha) in size and 4 m deep providing a capacity of 140,000 $m^3$. Should a major breach occur all of the water and, depending on their consistency, part of the stored sediments could escape confinement.<br>**Management features:**<br>• Design and operation of two individual containment systems rather than one large storage area: Bilcon proposes | A number of preventative measures are proposed that will avoid any direct discharges of water and sediments into off-site environment. These measures include the provision of a back-up storage cell, spill and overflow perimeter drains and discharges to the stormwater management system.<br><br>In addition, the proposed approach to engineering and |

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| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | to establish two independent storage cells each with the above capacity;<br>• Provision of a back-up containment system in case of failure in the containment of the first system: Bilcon dimensioned the two cells of the storage area so that cell # 2 will function as back-up storage cell, in case of malfunctions in cell # 1;<br>• Diversion of surface water site run off away and around the storage area; i.e., the storage area will not provide stormwater management functions;<br>• Provision of a controlled overflow and discharge point to manage and direct discharge from the storage area to the on-site stormwater management system; this may only be required in case of excessive stormwater accumulation in the storage area;<br>• Establishment of perimeter spill drains around the storage area in the event that water is seeping through or overflowing the berms of the storage area;<br>• Fail safe engineering design for the berms and storage surface to the highest professional engineering standards incorporating high factor of safety, low tolerance specifications of construction materials, ample freeboard, emergency over topping structures.<br>• Finalization of the storage are size to provide adequate evaporation rates and drying time to solidify the sediments settle the sediments for use in the reclamation process (this is best determined during detailed design phase and in parallel with the final stormwater management plan development).<br>• Stringent construction inspection and management procedures.<br>• Implementation of Operating Plans with provisions for frequent routine berm inspections and follow up maintenance procedures.<br>**Remedial action:**<br>• Recovery of the discharged materials and return to sediment disposal area. | operation of the storage area will minimize the risk for any environmental effects to acceptable levels.<br><br>No further consideration is required. |
| **10. Off-site traffic accident involving vehicles resulting in personal injury and/or spillage of fuel or hazardous materials.** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• This event considers a traffic accident along the access road between the quarry and marine terminal. Such an event could result in personal injury and/or the spillage of fuel and hazardous material.<br>• In addition, the event also considers an accident involving a fuel delivery vehicle or the blasting agent delivery vehicle resulting in an unscheduled release of the blasting agents ammonium nitrate (AN) (NH4. HN02), fuel oil or an emulsion to the site access road or to local highway NS 217 and related drainage systems.<br>• The AN, commercial grade fertilizer, is soluble in water; the emulsion is not soluble.<br>• All other off site accidents that may occur involving vehicles other than those identified above are considered to be outside the scope intended for this analysis. | Even with the relatively large quantities of liquid fuels, common and well-practiced fuel transport arrangements by NS licensed carriers will reduce the risk of spills and mitigate the potential for adverse effect.<br>The proposed fuel transport |

## *11.0 Environmental Management*

| Scenario | Project Phase & Component (Q-Quarry & Related Infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, Loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | **Materials released and quantities:**<br>• In the case of a fuel delivery vehicle licensed in NS, the materials are gasoline and diesel fuel in quantities up to 60,000 L.<br>• For bulk delivery of blasting agents the quantities will be in the order of 14,000 kg per NS licensed vehicle.<br>• See discussion of Scenario 5 for a listing of other hazardous materials.<br>**Management features:**<br>• Bulk carrier operation on NS public highways requires licensed operators.<br>• Bilcon will contract only certified and licensed carriers for these services.<br>• Results of accidents on public highways are managed and supervised by local police and fire response authorities. Bilcon will support these efforts within its capacity.<br>• On approaches to Bilcon property, strict protocols for fuel and blasting agent deliveries on Bilcon project property will ensure safe practices.<br>• Bilcon employees will be trained for rapid first response to spill and fire events until local fire fighting crews and contract spill response arrive on site.<br>**Remedial action:**<br>• Contaminated soil and/or water will be remediated to the appropriate standards. | operations are no different from those in common use throughout the Province for other industrial sites and service stations.<br>All other hazardous materials will be handled in rather small quantities limiting the extent of any spill-related effects and providing for successful site remediation.<br>The transport of AN is considered less common than the fuel delivered to the site, involves large quantities and, if spilled, can cause significant effects on terrestrial and aquatic environments.<br>**Therefore, the scenario of a spill of AN has been identified as requiring further consideration.** |

## *11.0 Environmental Management*

**TABLE 1b: Screening of Malfunction and Accident Scenarios - Marine Environment**

| Scenario | Project Phase & Component (Q-Quarry & related infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| **1. Basalt aggregate product spillage** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• This event considers the accidental spillage of basalt rock aggregate resulting from mishandling of materials, conveyor malfunction or breakage, and any other unintentional discharge of the material to the marine environment.<br>**Materials released and quantities:**<br>• Material released will be basalt rock aggregate<br>• Using a vessel loading rate of 5,000 tph a possible undetected spill for 10 minutes could result in a 1000 tonne / 400 $m^3$ discharge.<br>**Management features:**<br>• Spill trays will be installed under conveyor<br>• The material spilled, non-reactive basalt aggregate is not considered a great hazard to the environment. Any spills will be within the immediate vicinity of the dock.<br>• Operating Plans to establish protocols for maintenance and loading procedures to reduce the risk of equipment failure.<br>**Remedial action:**<br>• Spill tray on conveyors<br>• Minor spills will have little or no effect on the environment<br>• Large spills can easily be recovered allowing the affected area to return to pre spill conditions. | Minor product spills will have little or no effect on the environment. Large spills can be recovered to mitigate any effect.<br><br>No further consideration is required. |
| **2. Oil spills at marine terminal** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning: | **Overview of circumstances:**<br>• This event considers accidental discharge of miscellaneous oils in association with routine maintenance operations on the ship loader and or the transport carrier at dock.<br>• No vessel fuelling operations are planned at the Quarry terminal; therefore, there is no opportunity for vessel fuel oil spill at dockside. | The petroleum products will float on the surface of the water however will be prone to dispersion by wave action. Minor spills can be readily attended by |

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| Scenario | Project Phase & Component (Q-Quarry & related infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | all | **Materials released and quantities:**<br>• Lubricating oils, hydraulic oils or cleaning fluids etc. Quantities would be less than 100 L.<br>**Management features:**<br>• Spill trays will be installed under all lubrication points.<br>• Operating Plans to establish protocols for maintenance procedures to reduce the risk of spillage.<br>• EMPs (including spill prevention and emergency response plans) will be developed and implemented specifically for the Quarry's marine terminal. See example Spill Prevention Control and Countermeasure (SPCC) Plan provided in Addendum 3, EIS, Vol.VII, Chapter 11, p.30.<br>• Storage of spill containment, recovery, and site clean up equipment and materials (e.g., containment booms, oil absorbent materials).<br>• Arrangements for the provision of emergency response will be made with the closest available service provider.<br>• Initial response by Bilcon crews can be immediate followed by off site response if necessary, in a matter of hours. Spill response teams are available in Digby, Yarmouth, St. John, NB, and Halifax.<br>**Remedial action:**<br>• Emphasis will be on immediate containment. Subsequently contaminated shoreline segments and sediments will be remediated to the appropriate standards. | containment and application of absorption materials. Larger spills will need a similar but increased effort to mitigate.<br><br>Such practices are effective and are in very common use throughout the region to deal with such spills.<br><br>No further consideration is required. |
| **3. Fire on board of ships servicing the quarry site** | Operation:<br>MT | **Overview of circumstances:**<br>• This event considers the possibility of fire on board the bulk cargo transport vessel.<br>**Materials released and quantities:**<br>• Products of combustion of a steel hulled vessel with a partial load of fuel; Bunker C and Marine Diesel fuel MDO such as smoke and particulates, carbon dioxide , carbon monoxide.<br>**Management features:**<br>• Fire on board these vessels is not a common event and is not considered a major environmental hazard.<br>• The fuel for these vessels, bunker "C" and MDO require flame source to start and are not easily sustained.<br>• In the case of a mineral aggregate cargo, the fuel for a conveyor fire would be very limited.<br>• In the case of fire on board ship operators fire response protocol will govern actions.<br>• All ships are equipped with fire fighting system operated by trained crews.<br>**Remedial action:**<br>• NA | Shipboard fire that cannot be controlled by the ship's crew supported by shore based fire fighting resources is considered unlikely.<br><br>No further consideration is required. |

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| Scenario | Project Phase & Component (Q-Quarry & related infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| **4. Vessel collisions; collisions with dock and grounding** | Operation:<br>MT | **Overview of circumstances:**<br>• This event considers the accidental collision with the dock and or grounding of the shipping vessel.<br>• Accidents with other support and service vessels are considered to be too small to cause a significant environmental effect.<br>**Materials released and quantities:**<br>• Except in the case of a total vessel break up, no materials will be discharged.<br>• With the use of with double-hulled vessel, the exterior hull can be ruptured without jeopardizing the integrity of safe vessel operations.<br>• Discharge of vessel cargo (basalt rock aggregate) is not likely.<br>• Vessel fuel tanks are positioned in safe locations within the interior of the ship. In any event, the bunker 'C" product requires heating to allow the fuel to be moved. In the worst case event of the vessel sinking, the bunker "C' would stay contained within the fuel tanks. The cool water temperature would not permit the bunker 'C' to migrate far, if at all.<br>• The Marine Diesel Oil (MDO- Petroleum Distillate Fuel) would flow in the case of a tank rupture. In the worst-case scenario, 100 tons of the MDO fuel would be discharged to the environment. In calm seas this can be contained by booms and collected by absorbent materials. In the more likely case of rough seas causing the hypothetical accident, dispersal of the MDO would be extensive particularly in the wave zone near the shoreline. The MDO like all diesel fuel oils will evaporate quickly. The spilled material and any contaminated materials may be hazardous to animal/aquatic life.<br>**Management features:**<br>• Engage only reputable ship charter operators using in class vessels.<br>• Operate and maintain owned vessels to the highest standards of seaworthiness and officer and crew training.<br>• Enforce strict communications, approach speed and docking procedures.<br>• As part of the contract conditions, Bilcon will require vessel owner's/operators to maintain and enforce spill prevention and emergency plans (Shipboard Oil Pollution Prevention Plan - see example provided in Addendum 4, page 36, EIS, Vol. VII, Section 11.2)<br>• EMPs will be developed and implemented specifically for the Quarry's marine terminal. These will include spill prevention and emergency response protocols (see example Spill Prevention Control and Countermeasure (SPCC) Plan provided in Addendum 4 on page 36, EIS, Vol. VII, Section 11.2).<br>• If MDO is spilled or leaked, actions specified in the emergency response protocols will involve: containment of spill. Removal of all ignition sources and stoppage of flow of spill. In natural environments, seek advice from | Modern vessels equipped with advanced communications, radar, weather forecasting, and navigational equipment operated by certified and experienced do not present a significant hazard for accidental dock collision and or grounding. Navigation route between main shipping channel and Quarry terminal is without particular obstacles or other navigational issues.<br><br>The potential for environmental damage is considered low.<br><br>No further consideration is required. |

| Scenario | Project Phase & Component (Q-Quarry & related infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | ecologists. Evacuate all non-essential personnel. Use proper protective equipment. Pads/absorbent material can be used. Comply with all applicable laws. The spilled material and any contaminated materials may be hazardous to animal/aquatic life.<br>• Potential Treatment and disposal methods include land farming, incineration and land disposal, if permitted.<br>**Remedial action:**<br>• Waste disposal methods: maximize product recovery for reuse or recycling. Use approved treatment, transporters, and disposal sites in compliance with all applicable laws.<br>• Recovered product to be disposed in approved manner. | |
| **5. Failure to properly exchange ballast water** | Operation:<br>MT | **Overview of circumstances:**<br>• The Canadian Ballast Water Control and Management Regulations require the vessel operator to exchange ballast water at sea, which in this case would be while in transit through the Gulf of Maine. Should the vessel be unable to exchange ballast water at sea, e.g., due to weather and/or safety considerations or failure of the on-board ballast water pump system, ballast originating outside of the Bay of Fundy (e.g., the South Amboy region (Raritan Bay), New Jersey, USA, where the vessels will be unloading) may be discharged in Canadian waters outside of prescribed exchange zones or at the Whites Point Quarry marine terminal (ballast water will be discharged as part of the normal loading procedure as the vessel takes on cargo).<br>**Materials released and quantities:**<br>• Ballast water; 50,000 tonnes originating from outside of the Bay of Fundy<br>**Management features:**<br>• Ballast exchanges are mandated by the International Maritime Organization (IMO) ballast water guidelines and the Canadian Ballast Water Control and Management Regulations under the Canada Shipping Act. The implementation of these guidelines and regulations are the responsibility of the shipper.<br>• In accordance with the regulations, vessel operators must carry a ballast water management plan on board. The plan must specify such aspects as:<br>o ballast water management processes to be used and procedures to be followed;<br>o procedures to be followed for co-ordinating ballast water management with Canadian authorities;<br>o detailed description of the on-board ballast water system and the system's design specifications;<br>o On-board responsible officer;<br>o Ballast water reporting form and reporting requirements. | The likelihood of exceptional circumstances to arise that prevent the proper ballast water exchange is considered low.<br>Existing Transport Canada regulations are considered to provide effective procedures for the implementation, monitoring and reporting of ballast water exchange and for the determination of mitigation measures for discharge/exchange under exceptional circumstances.<br>No further consideration is required. |

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| Scenario | Project Phase & Component (Q-Quarry & related infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | • The implementation of the ballast water management plan is the responsibility of the vessel operator;<br>• In accordance with the Canadian Ballast Water Control and Management Regulations, if exceptional circumstances (equipment failure, weather/ safety considerations) prevent a proper ballast water exchange, Transport Canada is to be notified as soon as possible by the vessel. The Minister of Transport determines in consultation with the master of the ship mitigation measures prior to the discharge / exchange of ballast water in Canadian waters. This will involve considerations of the nature of the ballast water, the likelihood of introduction of harmful aquatic organisms, safety and environmental conditions, and may result in decisions such as ballast water retention, discharge at sea in an alternate exchange zone, treatment prior to discharge etc.<br>• Compliance monitoring as part of Transport Canada's routine ship inspections;<br>• Bilcon to monitor proper implementation of ballast water exchange practices (Bilcon to stipulate in its shipping contracts, that the vessel operator provides Bilcon with a copy of the completed ballast water reporting form for each voyage to and from the Whites Point).<br>• Maintenance of baseline database on phytoplankton and zooplankton in the vicinity of the Whites Point Marine terminal by Bilcon for future reference and decision making related to ballast water exchange/discharge under exceptional circumstances.<br>Remedial action:<br>NA | |
| **6. Damage to fishing gear** | Construction:<br>all<br>Operation:<br>all<br>Decommissioning:<br>all | **Overview of circumstances:**<br>• This event considers potential damage to fishing gear, buoys, and lobster traps by the shipping vessel approaching the WPMT dock.<br>• Such fishing gear could be damaged, dislocated or lost .<br>**Materials released and quantities:**<br>• Nil<br>**Management features:**<br>• Vessels will transit at slow speed along pre-established routes that will be made known to the local fishers.<br>• Coordination of a designated ship route to and from the marine terminal to the inbound / outbound shipping lanes in the Bay of Fundy with all stakeholders<br>• Communication of the vessel approach / departure times to local fishers and tour boat operators<br>• Re-establishment of the Community Liaison Committee with a local representatives of the fishing and tour boat operators to maintain lines of communication<br>• Bilcon will make arrangements with a local fishers association to administer and pay damage claims on their | There is some risk of vessel collision with and damage to stationary fishing gear. Arrangements between shippers and fishers elsewhere in the province function quite effectively to compensate fishers for loss of fishing gear in case of accidental damage or loss. It is not expected that the fishers or their communities will sustain any significant economic impact.<br><br>No further consideration is |

## *11.0 Environmental Management*

| Scenario | Project Phase & Component (Q-Quarry & related infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | behalf.<br>**Remedial action:**<br>• In the event that some gear is damaged, Workable protocols will be developed to bring damage claims forward for quick and satisfactory resolution. | required. |
| **7. Facility fire** | Construction:<br>MT<br>Operation:<br>MT<br>Decommissioning:<br>MT | **Overview of circumstances:**<br>• This event considers a fire within the Marine terminal.<br>• For analysis please refer to Table 1a, Land Site Environment, and Scenario 7. | Facility fire at WPMT does not present any abnormal environmental hazard or risk beyond any other location. Fire surveillance, response measures and adequate crew training will mitigate the extent of the fire damage and reduce any environmental insult.<br><br>No further consideration is required. |
| **8. Collision with marine mammals** | Operation:<br>MT | **Overview of circumstances:**<br>• This event considers a collision between the shipping vessel and a marine mammal.<br>• Bilcon estimates 40 to 50 aggregate shipments per year, approximately 3.5% to 6 % incremental ship transits within the relevant areas.<br>• Existing commercial traffic in the Bay of Fundy / Gulf of Maine will number approximately 2300 transits per year including Yarmouth, Bayside, St. John, Hantsport not including fishing vessels.<br>**Materials released and quantities:**<br>• NA<br>**Management features:**<br>• The vessels will navigate the Bay of Fundy along established shipping lanes exiting to transit to the Bilcon dock along pre-established routes over a distance of approximately14 km.<br>• Limiting sailing speed for the vessels in open water to 13.5 knots (nautical miles) per hour slowing to less than 3 knots during transit to berth area and less than 1 knots during the approach to the dock<br>• Additional vigilance will be applied during those times of year when large marine mammals are known to | Given the serious nature of the loss of even one individual animal is important.<br><br>**This scenario has been identified as requiring further consideration.** |

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| Scenario | Project Phase & Component (Q-Quarry & related infrastructure; P-Crushing & Screening Plant ; MT – Marine Terminal, loading and Shipping ) | Description | Conclusion |
|---|---|---|---|
| | | frequent the waters late spring to early winter.<br>**Remedial action:**<br>NA | |

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**Table 2a:**
**Malfunctions & Accident Scenarios and Potentially Affected VECs**
**(Land Site Environment)**

| **Accident and Malfunction Scenarios**<br><br>**VECs** | **Accidents & Personal Injury** | **Accidental Explosion** | **On-site Vehicle Accident and Fuel Spill** | **On-site release or spill of equipment fuel or lubricants** | **On-site spill of chemical or hazardous material** | **Oil Spill at Fuel Storage Facilities** | **Facility Fire** | **Breach - Containment Ponds** | **Breach -Sediment Storage Area** | **Off-site traffic accident with personal and/or spillage of fuel or hazardous material** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Climate** | | | | | | | ● | | | |
| **Geology and Hydrogeology** | | | | | | | | | | |
| Basalt Rock | | | | | | | | | | |
| Residential well water yields | | ● | | | | | | | | |
| Residential well water quality | | | ● | ● | ● | ● | | ● | ● | ● |
| **Surficial Geology and Soils** | | ● | | | | | | | | |
| **Surface Water** | | | | | | | | | | |
| Little River Watershed | | | ● | ● | ● | | | ● | ● | ● |
| On-site Surface Water Drainage/Wetlands | | | ● | ● | | | | ● | ● | ● |
| On-site Surface Water Quality | | | ● | ● | | ● | | ● | ● | ● |
| Turbidity | | ● | | | | | | ● | ● | |
| Tides and currents | | | | | | | | | | |
| **Air Quality** | | | | | | | ● | | | |
| **Noise and Vibration** | | ● | | | | | | | | |
| **Light** | | | | | | | | | | |
| **Terrestrial Ecology** | | | | | | | | | | |
| Habitat(incl. plants, wildlife) | | ● | ● | ● | ● | | | | | ● |
| Wetlands | | ● | ● | ● | ● | | | | | ● |
| Migratory Birds | | ● | ● | ● | ● | | | | | ● |
| Species at Risk | | ● | ● | ● | ● | | | | | ● |
| **Aquatic Environment - Freshwater** | | | | | | | | | | |
| Fish Habitat | | | ● | ● | ● | | | ● | ● | ● |
| Fish Species | | | ● | ● | ● | | | ● | ● | ● |
| **Aquatic Environment – Marine** | | | | | | | | | | |
| Marine Fish Habitat incl. Species (Intertidal, Nearshore) | | | ● | ● | ● | | | ● | ● | ● |
| Marine Mammals (incl. NARWCA) | | | ● | ● | ● | | | ● | ● | ● |
| American Lobster | | | ● | ● | ● | | | ● | ● | ● |
| Marine Waterbirds | | | ● | ● | ● | | | ● | ● | ● |
| Marine Species at Risk (fish, mammals, reptiles, waterfowl) | | | ● | ● | ● | | | ● | ● | ● |
| **Heritage Resources** | | | | | | | | | | |

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| **Accident and Malfunction Scenarios**<br><br>**VECs** | **Accidents & Personal Injury** | **Accidental Explosion** | **On-site Vehicle Accident and Fuel Spill** | **On-site release or spill of equipment fuel or lubricants** | **On-site spill of chemical or hazardous material** | **Oil Spill at Fuel Storage Facilities** | **Facility Fire** | **Breach - Containment Ponds** | **Breach -Sediment Storage Area** | **Off-site traffic accident with personal and/or spillage of fuel or hazardous material** |
|---|---|---|---|---|---|---|---|---|---|---|
| Marine Archaeology | | | | | | | | | | |
| Land Archaeology | | • | | | | | | | | |
| Heritage Properties | | | | | | | | | | |
| Site History | | • | | | | | | | | |
| **Aboriginal Land and Resource Use** | | | • | | | | | • | • | |
| **Aesthetics** | | | | | | | | | | |
| On-shore (HWY 217) | | | | | | | | | | |
| Bay of Fundy | | | | | | | | | | |
| **Transportation** | | | | | | | | | | |
| Land | | | | | | | | | | |
| Sea | | | | | | | | | | |
| **Economics** | | | | | | | | | | |
| Employment | | | | | | | | | | |
| GDP | | | | | | | | | | |
| Municipal Taxes | | | | | | | | | | |
| Fishery - Aquaculture | | | | | | | | • | • | |
| Fishery - Intertidal | | | • | • | • | • | | • | • | |
| Fishery - Nearshore | | | • | • | • | • | | • | • | |
| Tourism | | | | | | | | | | |
| Land Value | | | | | | | | | | • |
| **Socio-Cultural Environment** | | | | | | | | | | |
| Quality of Life | • | | | | | | | | | |
| Social Capital | | | | | | | | | | |
| Commercial Patterns | | | | | | | | | | |
| Community Infrastructure; Institutional Capacity | | | | | | | | | | |
| Education, Training, Skills | | | | | | | | | | |
| **Human Health and Wellness** | | | | | | | | | | |
| Drinking Water Quality | | • | • | | | | | • | • | • |
| Marine Contaminants | | | • | | | | | • | • | |
| Land Contaminants | | | • | | | | | • | • | |
| Country Foods | | | | | | | | • | • | |

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**Table 2b:**
**Malfunctions & Accident Scenarios and Potentially Affected VECs**
**(Marine Environment)**

| Accident and Malfunction Scenarios / VECs | Basalt Aggregate Spillage | Oil Spills at Marine Terminal | Fire on Board | Vessel Collision with Dock and Grounding | Failure to Properly Exchange/Discharge Ballast Water | Damage to Fishing Gear | Collision with Marine Mammals |
|---|---|---|---|---|---|---|---|
| **Climate** | | | | | | | |
| **Geology and Hydrogeology** | | | | | | | |
| Basalt Rock | | | | | | | |
| Residential well water yields | | | | | | | |
| Residential well water quality | | | | | | | |
| **Surficial geology and soils** | | | | | | | |
| **Surface Water** | | | | | | | |
| Little River Watershed | | | | | | | |
| On-site Surface Water Drainage/Wetlands | | | | | | | |
| On-site Surface Water Quality | | | | | | | |
| **Physical Oceanography** | | | | | | | |
| Turbidity | ● | | | ● | | | |
| Tides and currents | ● | | | ● | | | |
| **Air Quality** | | | ● | | | | |
| **Noise and Vibration** | | | | | | | |
| **Light** | | | | | | | |
| **Terrestrial Ecology** | | | | | | | |
| Habitat(incl. plants, wildlife) | | | | | | | |
| Wetlands | | ● | | | | | |
| Migratory Birds | | ● | | | | | |
| Species at Risk | | | | | | | |
| **Aquatic Environment – Freshwater** | | | | | | | |
| Fish Habitat | | | | | | | |
| Fish Species | | | | | | | |
| **Aquatic Environment – Marine** | | | | | | | |
| Marine Fish Habitat incl. Species (Intertidal, Nearshore) | | ● | | ● | ● | | |
| Marine Mammals (incl. NARWCA) | | ● | | ● | ● | | ● |
| American Lobster | | ● | | ● | ● | | |
| Marine Waterbirds | | ● | | ● | ● | | |
| Marine Species at Risk (fish, mammals, reptiles, waterfowl) | | ● | | ● | ● | | |
| **Heritage Resources** | | | | | | | |
| Marine Archaeology | | | | | | | |

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| **Accident and Malfunction Scenarios**<br><br>**VECs** | **Basalt Aggregate Spillage** | **Oil Spills at Marine Terminal** | **Fire on Board** | **Vessel Collision with Dock and Grounding** | **Failure to Properly Exchange/Discharge Ballast Water** | **Damage to Fishing Gear** | **Collision with Marine Mammals** |
|---|---|---|---|---|---|---|---|
| Land Archaeology | | | | | | | |
| Heritage Properties | | | | | | | |
| Site History | | | | | | | |
| **Aboriginal Land and Resource Use** | | | | | | | |
| **Aesthetics** | | | | | | | |
| On-shore (HWY 217) | | | | | | | |
| Bay of Fundy | | | | | | | |
| **Transportation** | | | | | | | |
| Land | | | | | | | |
| Sea | | | | • | | | |
| **Economy** | | | | | | | |
| Employment | | | | | | • | |
| GDP | | | | | | | |
| Municipal Taxes | | | | | | | |
| Fishery/Aquaculture | | | | | • | | |
| Fishery/Intertidal | | | | • | • | • | |
| Fishery/Nearshore | | | | • | • | • | |
| Tourism | | | | • | | | • |
| Land Value | | | | | | | |
| **Socio-Cultural Environment** | | | | | | | |
| Community Profile | | | | | | | |
| Quality of Life | | | | | | | |
| Social Capital | | | | | | | |
| Commercial Patterns | | | | | | | |
| Community Infrastructure; Institutional Capacity | | | | | | | |
| Education, Training, Skills | | | | | | | |
| **Human Health and Wellness** | | | | | | | |
| Drinking Water Quality | | | | | | | |
| Marine Contaminants | • | • | | • | • | | |
| Land Contaminants | | | | | | | |
| Country Foods | | | | | | | |

## Table 3: Overview - Accident and Malfunction Scenarios

| # | Scenarios Identified | Screened | Forwarded for Further Investigations |
|---|---|---|---|
| | **Land Site Environment** | | |
| 1 | Accidents resulting in personal injury. | ✔ | |
| 2 | Accidental explosion | ✔ | ✔ |
| 3 | Vehicle accident and fuel spill | ✔ | |
| 4 | On-site release or spill of construction or operating related equipment fuel or lubricants. | ✔ | |
| 5 | On-site spill of chemical or hazardous material | | ✔ |
| 6 | Oil spill at fuel storage facilities | ✔ | |
| 7 | Facility fire | ✔ | |
| 8 | Breach of berm at stormwater retention pond | ✔ | |
| 9 | Breach of berm at sediment storage area | ✔ | |
| 10 | Off-site traffic accident involving vehicles resulting in personal injury and/or spillage of fuel or hazardous materials. | | ✔ |
| 11 | Failure of the plant dust control system | ✔ | |
| | | | |
| | **Marine Environment** | | |
| 1 | Basalt aggregate product spillage | ✔ | |
| 2 | Oil spills at marine terminal | ✔ | |
| 3 | Fire on board | ✔ | |
| 4 | Vessel collision with dock and grounding | ✔ | |
| 5 | Failure to properly exchange ballast water | ✔ | |
| 6 | Damage to fishing gear | ✔ | |
| 7 | Facility fire | ✔ | |
| 8 | Collision with marine mammals | | ✔ |

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**Table 4: Hazardous Material Stored On-Site**

| | Hazardous Material | Project Phase | | | Quantity stored on-site (approximate) |
|---|---|---|---|---|---|
| | | Construction | Operation | Decommissioning | |
| | Diesel fuel | • | • | • | 90,000 L |
| | Gasoline | - | - | - | No storage |
| | Heating oil | - | - | - | 2000 L |
| | Motor oil | • | • | • | 2,000 L |
| | Lube oil | • | • | • | 2,000 L |
| | Waste oil | • | • | • | 2,000 L |
| | Engine coolant | • | • | • | 1,000 L |
| | Hydraulic fluid | • | • | • | 2,000 L |
| | De-icing compound (glycol based) | | | | none |
| | De-icing road salt | • | • | • | < 5 t |
| | Explosives (ANFO, emulsions, primers) | - | - | - | No on-site storage |
| | Flocculent | - | • | - | 4,000 L |
| | Cleaning solvents and paints | • | • | • | < 1,000 L |
| | Propane | • | • | • | 3,000 L |
| | Acetylene | • | • | • | 1,000 L |
| | Cement and concrete additives | • | - | - | No storage on site |

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## 3.0 Literature Cited

CCME 2000. Canadian Water Quality Guidelines for the Protection of Aquatic Life. In: Canadian Environmental Quality Guidelines. Canadian Council of Ministers of the Environment, 1999, updated 2002. Winnipeg.

Health Canada 2006. Guidelines for Canadian Drinking Water Quality. http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index_e.html

Transport Canada 1992. Transportation of Dangerous Goods Act. http://www.tc.gc.ca/tdg/menu.htm

Transport Canada 1992 a. Transportation of Dangerous Goods Regulations. http://www.tc.gc.ca/tdg/menu.htm

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# Attachment 1: Hazardous Class and Packing Group

**Source: TC -Transport Dangerous Goods Act 1992**

**Subject: Definition of Classes (Condensed for Relevance)**

*(a) Class 5.1, Oxidizing Substances, which consists of substances that yield oxygen thereby causing or contributing to the combustion of other material, as determined in accordance with section 2.5.2 of Chapter 2.5 of the UN Recommendations; and*

*(b) Class 5.2, Organic Peroxides, (not relevant in this instance )*

**Source: TC -Transport Dangerous Goods Act 1992**

**Subject: Definition of Packing Groups (Condensed for Relevance)**

*2.25 Packing Groups*

*(1) The determination of packing groups for Class 5.1, Oxidizing Substances, must be made*

*(a) for solids, using a test sample of a 4:1 or 1:1 mixture of substance and cellulose by mass, prepared and tested in accordance with section 2.5.2.2 of Chapter 2.5 of the UN Recommendations; or*

*(2) Substances included in Class 5.1, Oxidizing Substances, are included in one of the following packing groups:*

*(a) for solids,*

*(i) Packing Group I, if the test sample exhibits an average burning time less than the mean burning time of a 3:2 mixture by mass of potassium bromate and cellulose,*

*(ii) Packing Group II, if the test sample exhibits an average burning time less than or equal to the mean burning time of a 2:3 mixture by mass of potassium bromate and cellulose and the criteria for inclusion in Packing Group I are not met, or*

*(iii) Packing Group III, if the test sample exhibits an average burning time less than or equal to the mean burning time of a 3:7 mixture by*

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*mass of potassium bromate and cellulose and the criteria for inclusion in Packing Group I or II are not met; or*

**11.6 Follow-up Program**

*The information provided in the EIS does not fulfill the requirements of the Guidelines nor does it address the objectives of the Guidelines. Develop a follow-up program as instructed by the Guidelines.*

**Table ECM – 1**

*The Environment Component Mitigation Summary Table does not follow the requirements of the Guidelines. Restructure the table and insert the required information to present the proposed mitigation aligned with a potential effect for each component of the Project over the lifespan of the Project. Wherever possible, each proposed mitigation should be tied to a regulatory instrument or other process to ensure implementation.*

*Specific errors noted in the existing table include:*

*Pg 2, last Proposed Mitigation – Should 'salt water intrusion" read 'salt' water invasion"?*
*Pg 3, last Proposed Mitigation – What environmental effect of the Project is this proposed to mitigate? Provide evidence that this mitigation would be effective or remove it from the table.*
*Pg 17, Heritage Resources, Land Archaeology – A commitment to stop work should be made if archaeological resource presence is suspected.*

*Commitments are made in the EIS that are not necessarily mitigation measures. See 10.0.4 Development by the Proponent or Others that May Appear Feasible Because of the Proximity of the Project's Infrastructure, for example, where the Proponent states that it does not intend to make the shiploader available to others.*

*The Panel requires this and all other commitments on behalf of the Proponent that do not appear in the Mitigation Summary Table to be complied in a separate table.*

**RESPONSE**

The response to the above information request has been organized in two components. In response section 1, the follow-up program is addressed. In response section 2 the mitigation measures are discussed and summarized in table format together with the potential effects.

**1.0 Follow-up Program**

The Whites Point Quarry and Marine Terminal Project will include the implementation of comprehensive monitoring programs. The proposed program components and activities

have been discussed in the EIS, Vol.VII, Section 11.6 and Table ECM-1. In response to the Panel's request the proposed Follow-up Programs are further described below.

## 1.1 Need

The environmental assessment has identified the potential for Project-related environmental effects on various VECs. Further, a catalogue of mitigation measures has been developed to avoid and/or minimize adverse effects and to maximize beneficial effects. In compliance with CEAA, the proponent considers Follow-up Programs necessary in order to verify effect predictions and the effectiveness of the proposed mitigation measures (see discussion of more specific objectives below).

## 1.2 Implementation and Enforcement, Roles and Responsibilities

These monitoring programs are the responsibility of the Proponent and will be integrated into contractual arrangements with contractors and site workers. Contracts will include appropriate penalty clauses for non-compliance.

As stated in Section 11.0.1 (EIS, Vol. 7) Bilcon will establish an environmental management team under the overall direction of the Operations manager. This team will be responsible for ensuring that all monitoring programs (and mitigation measures) will be implemented, and that results are documented, disseminated and reviewed, and that corrective action is initiated if required.

The monitoring programs will be detailed in Monitoring Plans which will become part of the Project's Environmental Management Plan (EMP). The EMP will be part of the operations manual addressed in Section 11.0.1 of the EIS (Vol.VII) and become a standard condition of all sub-contracts (see also discussion under Item 2 – Mitigation Measures).

In addition, as per the requirements of the CEAA (Section 38(2)), to develop a follow-up program and to ensure its implementation is also the responsibility of the Federal RAs. The specifics of these follow-up programs will be determined by the applicable agencies upon review of their jurisdictional responsibilities as they relate to the Project, and as a result of their review of the EIS regarding effects predictions and mitigation effectiveness. Provincial government inspectors will also conduct be responsible to verify regulatory compliance in accordance with any licenses or permits issued.

Table 1 summarizes all proposed follow-up and monitoring programs and indicates roles and responsibilities. It represents an updated and edited version of Table ECM-2 of the EIS (Vol. VII, Chapter 11) and also includes information on the objectives of the monitoring (see discussion below) and supplementary information on monitoring

parameters, frequency, and location where available (see item 1.4.3 below for development of a final monitoring program).

Bilcon proposes to involve the community in the design of the monitoring program, the review of monitoring results and the development of program adjustments. This is expected to be one of the roles of the proposed new Community Liaison Committee (EIS, Volume VII, Section 11.0.1, p.4).

## 1.3 Program Objectives

Objectives of the monitoring programs are to:

- ensure the proper operation of the quarry, the marine terminal and the shipping component of the Project;
- assist in verifying effects predictions of the EIS;
- confirm effectiveness of the mitigation measures proposed in the EIS;
- determine the need for new mitigation strategies as required to address unanticipated adverse effects and/or ineffective mitigation;
- ensure proper implementation of the mitigation measures outlined in the EIS; and
- ensure compliance with regulatory permits, approvals, and requirements.

The first objective is addressed as part of the Project design and as such, is not addressed in the EIS. This includes monitoring of all engineering and operational requirements to ensure the Project operates as intended and within all applicable regulatory standards, policies and guidelines and is referred to as performance monitoring. This includes such monitoring as proper operation of the crushing facility, the screening and storage components, the power supply, and the conveyor system.

The remaining objectives are divided into two categories of monitoring: Environmental Effects Monitoring (EEM) and Environmental Compliance Monitoring (ECM). The following sections describe these monitoring and follow up programs as a feature of Project implementation.

## 1.4 Main Components and Structure

### 1.4.1 Environmental Effects Monitoring (EEM) Programs

The EIS has identified potential effects on the environment from the Project and, where applicable, provided mitigation measures to avoid and minimize any adverse effects. EEM programs will be used to verify these effect predictions and the effectiveness of the mitigation measures.

Table 1 (inserted at the end of this response text) provides a summary of the main monitoring and follow-up actions. The programs are structured around the Project VECs and the following phases:

- pre-construction phase: monitoring intended to supplement or strengthen baseline data;
- construction phase: monitoring undertaken to test and confirm EIS predictions and to verify effectiveness of mitigation measures;
- operation phase: same as for construction period; and
- decommissioning and abandonment phase: same as for construction period, plus monitoring of the effectiveness of the decommissioning and reclamation works.

In addition to the EEM activities, where applicable, baseline monitoring has been included in the Table 1 to the extent that this will be conducted during the pre-construction phase. Since the purpose of this monitoring is to strengthen or supplement the baseline data against which effects can be measured, it is considered part of the EEM. Monitoring following completion of the site decommissioning (i.e., during site abandonment) has been included as part of the monitoring for the decommissioning phase.

### 1.4.2 Environmental Compliance Monitoring (ECM)

ECM will be conducted during the construction and operation of the Project. Compliance monitoring will ensure that all regulatory requirements and other commitments made to regulatory agencies, (including conditions of approval and applicable permits) as well as landowners and other stakeholders, are carried out. Many of these regulatory requirements are described throughout the EIS; others may be stipulated as subsequent approval conditions. The EMP is the primary vehicle for documenting all regulatory requirements and to ensure that all appropriate personnel and contractors are aware of these requirements.

ECM will be the responsibility of the Proponent and it's designates, but will also be the responsibility of all Project personnel and contractors. Compliance monitoring is typically conducted using field inspectors who use a combination of site inspections, a review of records and reports and interviews to ensure compliance with all commitments and BMP.

Environmental issues will be tracked using a system of daily reports and/or incident reports. These reports will be made available to regulatory agencies as well as the public to allow a transparent record of compliance issues. Incident reports are conducted when warranted, including the reporting of spills, a non-compliance report, operational upsets,

or reports that relate to health and safety infractions. Follow-up or corrective measures will also be outlined to ensure that incidents are addressed in an appropriate fashion. Government inspectors will also conduct ECM to verify regulatory compliance.

### 1.4.3 Framework for Developing a Final Monitoring Program

As Project planning continues, the monitoring programs will remain subject to review by the design and EIS teams, stakeholders, the municipality, regulators, and the public. The program outlined in the EIS and elaborated on in this IR response, therefore, is considered preliminary. Input received during the review process, recommendations made by the Panel, subsequent requirements made by governments, as well as ongoing Project consultation, will be used to finalize the program. As previously outlined, these final details of the monitoring programs, will be outlined in the Project EMP, prior to Project implementation.

It is also anticipated that the programs will remain dynamic throughout their full implementation and remain responsive to the evolving nature of their purpose and objectives. Refining and detailing of the program will occur in context of:

- detailed Project design;
- detailed monitoring plans (e.g., location, timing, frequency, parameters, action trigger);
- approval and permitting process; and
- consultation with stakeholders.

To ensure the implementation of the monitoring programs, Bilcon has allocated funds for monitoring within the overall Project budget.

### 1.4.4 Information Management

Follow-up monitoring is an integral element of the environmental assessment process. All monitoring data will therefore be provided to the RAs, and provincial regulatory agencies as required. Monitoring reports will also be made available to the municipality, stakeholder groups, and the general public.

The form and frequency of the reporting will be refined as part of the program finalization outlined above. Reporting mechanisms for the public will be designed to allow easy access to this information, and will ensure that it is presented in an appropriate manner. Examples of the types of reporting mechanisms that may be used, are web-based portals and web-cams, and regular newsletter. It is anticipated that the data will also be assembled into a formal monitoring report, submitted on a regular basis to regulatory agencies, and made available on the public registry.

Over the course of the Project operation, formal publication of the data may, by agreement, become less frequent (e.g., annually) depending on the significance of the monitoring results, stakeholder and public interest, and frequency of the sampling events.

EIS follow-up monitoring results together with results of the performance monitoring will also be used to facilitate the "adaptive management approach" introduced in Section 11.0.1 (Vol. VII, Section 11, page 5). The monitoring programs themselves will be subject to re-evaluation and adjustments as site conditions evolve or the need to focus on specific operational aspects or issues.

Results of both EEM and ECM will be essential input to actively managing the construction activities, the operational aspects and the decommissioning and abandonment of the Project, and their effects on the environment.

In response to the Panel's IR on the Follow-up Programs, the monitoring programs presented in Table ECM-2 of the EIS have been reformatted and information added. This is presented in the attached Table 1.

## 1.5 Monitoring Advancement towards Sustainability

The EIS guideline lays out the Panel's criteria for the evaluation of the Project's contribution to sustainability. These criteria are:

- the extent to which the Project makes a positive overall contribution toward the attainment of ecological and community sustainability, both at the local and regional levels;
- the effort made to enhance positive effects of the Project on the physical, biological and human environment as well as mitigation of adverse effects;
- how the planning, design and operation of the Project will strengthen local and regional capacities and opportunities to a achieve a sustainable future;
- how monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability; and,
- appropriate indicators to determine whether this progress is being maintained

Most monitoring parameters identified in Table 1 provide information on whether or not progress towards sustainability is made. However, Bilcon considers the following indicators particularly appropriate:

Environmental indicators (examples – see full monitoring program proposed in EIS Report Vol. VII, Section 11.4, Table ECM-2):

- Water discharge quality
- Soil chemistry (for reclamation purposes)
- Contaminants in terrestrial and marine biota
- Presence and abundance of terrestrial and marine species at risk

- Noise and vibration levels

Economic indicators

- Number of employees
- Tax contributions to local, provincial and federal government levels
- Property values in site vicinity
- Application for compensation for lost/damaged gear
- Complaint records from tour boat operators and fishermen

Human – environment indicators

- Company records on training and education programs
- Contaminants in country foods
- Issues raised by CLC
- Complaint records

Bilcon will review and finalized these criteria and associated parameters in discussion with the CLC.

*11.0 Environmental Management*

## Table 1: Follow-up and Monitoring Programs – Summary

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| **Climate** | Climate:<br>• Precipitation<br>• Wind (speed & direction)<br>• Temperature<br>• Fog<br>• Ceiling, visibility, and presence of thermal inversion from (EC Weather Service | EEM/ECM | C, O, D | Daily | Project site | Bilcon | NSDEL Pit and Quarry Guidelines (no blasting under thermal inversion conditions) |
| **Geology & Hydrogeology** | | | | | | | |
| Basalt Rock | Rock subsurface delineation:<br>• Contact of UFU and MFU (additional boreholes)<br>• Blast hole samples prior to blasting<br>• Structural geology and stratigraphy of quarry face | EEM | C, O, | Additional boreholes during pre-development; other activities in association with blasting events | Project site | Bilcon | NA |
| Residential Well Water Yields | Groundwater:<br>• Level<br>• Discharge rate | EEM | C, O, D | Completion of domestic well water survey prior to construction; Monthly at on and off-site monitoring wells (water level | Residential wells and 6 groundwater monitoring wells | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | | | | weekly) | | | |
| Residential Well Water Quality | Groundwater Quality:<br>• Trace metals<br>• Bacteriology<br>• Chemistry | EEM/ECM | C, O, D | Once prior to construction as part of domestic well water survey; subsequently every 5 years;<br>Annually at monitoring wells until 3 years following completion of site decommissioning;<br>at on-site supply well 2 x per year for bacteriology and once per year for general chemistry and trace metals | Residential wells; 6 groundwater monitoring wells; one on-site water well used for supply of office | Bilcon | Yes-NSDEL |
| **Surficial Geology and Soils** | Soil chemistry (testing prior to application in site reclamation):<br>• PH<br>• General chemistry<br>• Nutrients | EEM | D | Every 5 years | Quarry site - soil storage area and reclamation sites | Bilcon | No |
| **Surface Water** | | | | | | | |
| Little River Watershed | Surface water drainage:<br>• Water level<br>• Flow | EEM | C, O, D | 2 x per year (Spring run off; low flow conditions) | Off-site station at Little River | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| On-site Surface Water Drainage/Wetlands | Surface water measurements:<br>• Water levels<br>• Discharge quantity<br>• Nutrient levels (at discharge points to freshwater environments) | EEM | C, O, D | Monthly | Open swales; retention ponds; on-site wetlands | Bilcon | No |
| | Surface water measurements:<br>• Quantity | EEM | C, O, D | 4 x per year (seasonally) during temporary disruption of bog watershed) | Inflow and outflow points to on-site bog | Bilcon | No |
| On-site Surface Water Quality | Water quality sampling and analysis:<br>• Total suspended solids (TSS)<br>• PH<br>• General chemistry incl. metals<br>• Nutrient levels | EEM/ECM | C, O, D | Weekly for TSS and PH; monthly for general chemistry; (metal analysis to be sunsetted if levels show to be of no concern; in particular copper levels); yearly for 3 years following completion of site decommissioning | Retention Ponds (at controlled outlet) | Bilcon | Yes-NSDEL (retention ponds) |
| **Physical Oceanography** | | | | | | | |
| Turbidity | Turbidity (visual inspection) | EEM | C, O, D | Monthly | Near site discharge point | Bilcon | No |
| Tides and currents | None proposed | NA | NA | NA | NA | NA | NA |
| **Air Quality** | Particulate Emissions (TSP, PM2.5, PM10) | EEM/ECM | C, O, D | (visual inspection); daily;<br>Real time monitoring (hi-volt samplers with gravimetric weighing): once /month during | Site perimeter, receptor locations (in consultation with NSDEL) | Bilcon | Yes-NSDEL |

*11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | | | | morning, afternoon and nighttime conditions (to be finalized in consultation with NSDEL) | | | |
| **Noise and Vibration** | | | | | | | |
| | | | | | | | |
| Noise and Vibration (land) | Measurements of concussion and ground vibration levels (blasting-land) | EEM/ECM | O | every blast event | Three stations at site perimeter/ off-site | Bilcon | Yes- NSDEL |
| Noise and Vibration (land) | Sound levels (Quarry operations - land) | EEM/ECM | O | Daily | Property line | | Yes- NSDEL |
| Noise and Vibration (marine) | Underwater blast sound levels (CONWEP model verification) | EEM/ECM | C | Initial blast event for model verification followed by a one year monitoring period (4 seasons) | At edge of tidal zone, 170m, 500m, 1000m, 2500m, and at margin of right whale conservation area | Bilcon | No |
| | Underwater sound levels (levels of background and vessel arrival and departure times; to be integrated with monitoring of blast sound levels) | EEM | O | Tbd in consultation with DFO (to be integrated with above; background sound level measurements prior to and after blast event) | See above (to be integrated with above) | Bilcon | No |
| **Light** | Night light<br>• visual observations<br>• # and nature of complaint calls received<br>• bird strikes (carcass count | EEM | C, O | Monthly | Quarry site | Bilcon/ CLC | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | – see migratory birds) | | | | | | |
| **Terrestrial Ecology** | | | | | | | |
| Habitat (incl. plants and wildlife) | Habitat loss and replacement, fauna; visual appraisal and photographic documentation:<br>• Vegetation communities<br>• Plant species<br>•<br>• Invasive plants<br>• Odonata<br>• Lepidoptera<br>• Vertebrate Fauna<br>• Breeding Birds (point counts) | EEM | C,O,D | Once prior to construction, then every 5 years; one survey 5 years after decommissioning and complete site reclamation | Quarry site | Bilcon | No |
| Wetlands | Wetland habitat appraisal<br>• Vegetation communities (transects and plots)<br>• Plant species incl. invasive plants | EEM | C, O, D | Once prior to construction then every 5 years; once 5 years after decommissioning and complete site reclamation | On-site wetlands | Bilcon | No |
| | Bog area<br>• Soil depth, type, storage capacity<br>• Salinity<br>• Flows (in and out)<br>• Water quality (TSS, PH, general chemistry) | EEM | C, O | Prior to construction (soil and salinity if requested by Panel); seasonally (spring, summer, fall) flows until end of year 14 | Bog environment within Environmental Preservation Zone; in and outflow points; | Bilcon | No |
| Migratory Birds | Nest-survey (only if vegetation clearing required during nesting season) | EEM | C,O | prior to clearing (if during nesting season) | Sites designated for clearing | Bilcon | MBCA |

*11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | Bird strikes (carcass count) | EEM | C,O | Seasonal (fall and spring migration) | Quarry site | Bilcon | No |
| Species at Risk | Species at Risk: Targeted surveys (i.e., species-specific); presence, abundance, distribution; target species include: Glaucous Rattle-snake Root, Mountain Sandwort,Hemlock Parsley, Boreal Felt Lichen, Downy Rattlesnake Plantain, Northern White Cedar, Purple Leaf Willow-herb, Grass-leaf rush, Round-leaved Liverleaf, Fountain Miner's-lettuce, Small Flower Bitter-cress, Slender Blue-flag | EEM | C,O,D | Once prior to site development in all areas scheduled for development in first 10 years of operation; once 5 years prior to development of all other areas; known locations annually during first 5 years of operation; then every 5 years; once five years after decommissioning and complete site reclamation: | Quarry site | Bilcon | No |
| | Invasive species | EEM | C,O,D | Once prior to site development; then annually as part of Species at Risk survey; every 5 years general survey | Quarry site (Species at Risk habitat; reclaimed areas; Environmental Preservation Zone) | | |
| **Aquatic Ecology – Freshwater** | | | | | | | |
| Fish Habitat | Quality of fresh water fish habitat<br>• Water quality (see on-site and Little River Watershed water quality monitoring) | EEM | C,O,D | See frequency for Surface Water Quality - Little River Watershed and On-site Surface Water Quality | On-site water courses and Little River | Bilcon | No |
| Fish Species | Fish communities | EEM | C,O,D | Once prior to | Little River | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | • fish survey (species, abundance) in Little River Watershed | | | construction phase; then annually for first 5 years of operation; then every 5 years | | | |
| **Aquatic Ecology - Marine** | | | | | | | |
| Marine Fish Habitat and Species (Intertidal, Nearshore) | Marine habitat:<br>• Turbidity (visual inspection) | EEM/ECM | C,O,D | Monthly for construction phase | Intertidal and nearshore zones at marine terminal (Stations- tbd) | Bilcon | Yes- DFO |
| | Marine habitat:<br>• Quality<br>• Species<br>(incl.video transects) | EEM/ECM | C, O | Prior to construction (baseline conditions); annually for 5 years following completion of compensation measures (or as specified in approved compensation plan) | Marine environment at ship loader | Bilcon | Yes- DFO |
| | Marine Habitat<br>• Disease organisms from ballast water | EEM | O | Seasonally during first year of shipping activities; then once per year for five years | Waters at marine terminal | Bilcon | No |
| American Lobster | Lobster:<br>• Effects on health / behaviour/population<br>(For underwater blast sound levels (CONWEP model verification), see monitoring of Noise Environment) | EEM | O | TBD in consultation with DFO | Nearshore waters at marine terminal | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| Marine Mammals | Noise and vibration measurements:<br>• Peak pressure and ground vibration<br>• Noise measurements<br>• Mammal behaviour (video documentation)<br>• # of whale sightings by observer on ship loader | EEM | C,O | Noise and vibration measurements during initial blasting events;<br>video documentation during initial blasting events and ongoing for one year (i.e., 4 seasons; including seal pupping season) | At edge of tidal zone, 170m, 500m, 1000m, 2500m, and at margin of right whale conservation area; video documentation at Crowells Cove | Bilcon | No |
| | Presence of marine mammals (active observation and review of sighting reports from Fundy Traffic and tour boat operators) | EEM | C,O | Prior to vessel approach/departure | Presence within designated shipping lane from on-shore observation station (ship loader);<br>Work boat if reported in area and during times of poor visibility (e.g., high wave, rain, snow, fog, low light) | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | Presence of marine mammals (active observation and review of sighting reports from Fundy Traffic and tour boat operators) | EEM | C,O | Prior to blasting event (one hour prior to blast – observer on ship loader); routine observation trip by boat during morning of blast day | Presence within 500m safety radius from on-shore observation station (ship loader); from work boat as routine observation trip in morning hour or if reported in area and during times of poor visibility; | Bilcon | No |
| | Seal colony:<br>• Behaviour(possibly other marine mammal behaviour; tbd in consultation with DFO) | EEM | C,O | Ongoing for one year (4 seasons); including seal pupping season | Crowells Cove; other locations for other marine mammals tbd in consultation with DFO | Bilcon | No |
| Marine Waterbirds | Bird species<br>• Presence of water birds<br>• Bird survey (species, abundance) | EEM | C,O | Presence of water birds prior to every blast event;<br>Bird survey once at end of construction phase; yearly for first five years of operation; then every five years | 170 m safety zone around blast site (for simple monitoring of presence);<br>Nearshore and intertidal marine environment for comprehensive species survey | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | Bird species:<br>• Presence | EEM | C,O | Prior to vessel approach/departure | Presence within designated shipping lane from on-shore observation station (ship loader); Work boat (during times of poor visibility) | Bilcon | No |
| Marine Species at Risk | Marine Species at Risk<br>• Presence of whales within 2500m safety zone | EEM | C,O | Every blasting event | Monitoring of 2500m safety zone from on-shore observation station (ship loader); if presence of whale is reported or during times of poor visibility, monitoring will be conducted from work boat. | Bilcon | No |
| | Marine Species at Risk:<br>• Presence within designated shipping lane (active observations and monitoring of reports from Fundy Traffic and tour boat operators) | EEM | C,O | Prior to vessel approach/departure | Presence within designated shipping lane from on-shore observation station (ship loader); from work boat if presence is reported in area and during times of poor visibility | Bilcon | No |
| | Marine Species at Risk: | EEM | C,O | Every trip of vessel | Shipping route | Bilcon; | No |

*11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | • Ship/whale interaction; sightings | | | | within Bay of Fundy | vessel operator | |
| **Heritage Resources** | Land Archaeology:<br>• Site survey | EEM/ECM | C,O | Once before construction | Site area | Bilcon | Yes- NS Museum |
| | Land Archaeology<br>• | EEM/ECM | C,O | Once before construction | Hersey House plus area within 250 m radius around house | | Yes- NS Museum |
| | Marine Archaeology:<br>• Marine survey (shipwrecks and submerged First Nations archaeological sites) | EEM | C | Once before construction | Nearshore marine bottom in vicinity of terminal | Bilcon | Yes- NS Museum |
| | Heritage Properties and Site History | EEM | C, O | see Land Archaeology | see Land Archaeology | Bilcon | Yes- NS Museum |
| **Aboriginal Land and Resource Use** | Artifacts and resources<br>• Site survey | EEM | C,O | Once before construction | Site area | Bilcon | No |
| **Aesthetics** (Hwy 217 and Bay of Fundy) | • Visual inspection of screening elements:<br>o Environmental preservation zone<br>o Reclamation work<br>• # and nature of complaint calls received | EEM | C,O,D | Once at end of construction; every 5 years during operation | Site area (including Hwy 217 and nearshore marine locations) | Bilcon/CLC | No |
| **Transportation (Land)** | No monitoring proposed | NA | NA | NA | NA | NA | NA |
| **Transportation (Marine)** | Inconvenience/conflict with fishing vessels:<br>• # of vessels using Bilcon | EEM | C,O | Annually | Shipping lanes and marine terminal area; | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | terminal<br>• # of claims for compensation for loss of fishing gear<br>• # and nature of complaint calls received<br>• feedback from fishery representative on community liaison committee | | | | local fishing community | | |
| **Economy** | | | | | | | |
| Employment | Employment levels<br>• Number of employees | EEM | C,O | yearly | Quarry and terminal operation | Bilcon | No |
| GDP | • Product value | EEM | C,O | yearly | Quarry and terminal operation | Bilcon | No |
| Municipal Tax Revenues | • Tax contributions | EEM | C,O | yearly | Quarry and terminal operation | Bilcon | No |
| Fishery - Aquaculture | Concern of aquaculture operators:<br>• # and nature of complaint calls received<br>• feedback from fishery representative on community liaison committee | EEM | C,O | yearly | Local community | Bilcon | No |
| Fishery/Intertidal | Harvest activities:<br>• # of parties accessing intertidal zone via quarry (registration at the quarry office of those harvesting in the inter-tidal zone) | EEM | C,O | Daily | Coastal zone around marine terminal | Bilcon | No |
| Fishery/Nearshore | • Frequency and duration of | EEM | C,O | Daily | Marine terminal | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | vessels at marine terminal<br>• # of claims for compensation for loss of fishing gear<br>• # and nature of complaint calls received | | | | | | |
| Tourism | Tourism in area<br>• # and nature of complaint calls received;<br>• feedback from tourism representative on community liaison committee | EEM | C,O | Monthly | Vicinity of marine terminal | Bilcon/CLC | No |
| | Tourism:<br>• Tourism statistics (in consultation with tourism industry representatives) | EEM | O | Yearly | Region | Bilcon | No |
| Land Value | Residences<br>• Residential property values | Baseline; EEM | C,O | Once prior to construction; Re-evaluation 5 years later | within 800 m of active quarry | Bilcon | No |
| | Residences:<br>• Vibration levels | EEM; ECM | C,O | Initial blast | Nearest residence | Bilcon | Pit and Quarry Guideline |
| Recreation | Use:<br>• # of visitors (registration at the quarry office when accessing the coastal zone below high water mark) | EEM | C,O | Daily | Coastal zone at marine terminal | Bilcon | No |
| **Socio-Cultural Environment** | | | | | | | |
| Quality of Life | • # and nature of complaint | EEM | C,O,D | Daily | Local Community | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| | calls received;<br>• feedback from community liaison committee | | | | | | |
| Social capital | None<br>(if an issue this is expected to be raised by community liaison committee) | NA | NA | NA | NA | NA | NA |
| Commercial Patterns | • Municipal and Statistic Canada parameters<br>• feedback from community liaison committee | EEM | C,O | Yearly | Municipality | Bilcon (data compilation) | No |
| Community Infrastructure, Institutional Capacity | Municipality<br>• feedback from community liaison committee<br>• # and nature of complaint calls received | EEM | C,O | Yearly | Municipality | Bilcon | No |
| Education, Training, Skills, | Education and training activities:<br>• # of training and/or educational sessions/program participants | EEM | C,O | Yearly | Quarry and Marine Terminal | Bilcon | No |
| **Human Health and Wellness** | | | | | | | |
| Drinking Water Quality | Groundwater Quality:<br>• Bacteriology<br>• Chemistry | EEM/ECM | C,O,D | 2 x per year | On-site supply well | Bilcon | Yes- HC |
| Marine Contaminants | Contamination levels:<br>• Periwinkles (metal content) | EEM | C,O,D | first year of operation, then every 5 years | adjacent to marine terminal | Bilcon | No |

## *11.0 Environmental Management*

| VEC | Monitoring (Components, Parameters) | Objective (EEM/ ECM)* | Project Phase** C, O, D | Time/ Frequency | Location | Respon-sibility | Regulatory Requirement |
|---|---|---|---|---|---|---|---|
| Land Contaminants & Country Foods | Contamination levels:<br>• wild raspberries (metal content) | EEM | O | first year of operation, then every 5 years | On-site and adjacent to quarry / terminal site | Bilcon | No |

* EEM=Environmental Effects Monitoring; ECM=Environmental Compliance Monitoring

** Project Phases; C=Construction/Site development; O=Operation; D=Decommissioning (incl. Reclamation and Abandonment)

## 2.0 Mitigation Measures

The implementation of a series of mitigation measures has been proposed for the implementation of the construction, Operation and decommissioning phases of the Project. The mitigation measures are discussed in the EIS, Vol. VI and VII, Sections 9.1, 9.2 and 9.3 for each individual VEC. In the EIS, Vol. VII, Sections 11.5, the mitigation measures have been summarized and presented in Table format (Table ECM-1). In response to the Panel's request and based on the EA Guidelines, this tables has been revised and is re-issued herein as Mitigation - Commitment Summary (Table 2, presented at end of this response text). The supplementary information includes the

- environmental effects the mitigation relates to; and
- proposed implementation mechanisms.

Mitigation measures have been identified for the construction phase and operation phase. Activities associated with the decommissioning phase have been included (incl. reclamation and abandonment) where these activities may cause adverse environmental effect (e.g., noise from machinery, concussions from the use of explosions). For the most part however, the activities of the decommissioning phase are considered to represent mitigation measures for effects of the construction and operating phases and are addressed in the mitigation column of Table 2 (e.g., re-establishment of vegetation communities, rehabilitation of landscape aesthetics etc.).

## 2.1 Environmental Effects and Mitigation

The environmental assessment process identified a number of effects that could result from the implementation of the Project. A number of potential environmental effects of the quarry Project have been largely avoided through environmentally sensitive project planning. This involves such measures as scheduling of vegetation clearing outside of the bird nesting season. Where adverse effects were unavoidable, mitigation measures have been developed to minimize the effect. For positive effects of the Project measures have been identified to maximize the Project benefits.

## 2.2 Implementation Mechanisms

Bilcon will be ultimately responsible for the implementation of all mitigation measures. Mechanisms for implementing all mitigation involve the following key mechanisms:

1. Environmental Management Team (EMT) & Environmental Liaison Officer
2. Community Liaison Committee (CLC)
3. Project Planning/Design

4. Detailed Design
5. Stormwater Management Plan (SMP)
6. Quarry and Terminal Operational plans (including employment and procurement policies)
7. Environmental Management Plan (EMP)
8. Erosion and Sediment Control Plan
9. Decommissioning Plan
10. Reclamation Plan (incl. habitat management plan)
11. Forest Management Plan
12. Environmental Audits/ Environmental Quality Assurance Plan
13. Environmental Effects Monitoring (EEM)
14. Environmental Compliance Monitoring (ECM)
15. Environmental Complaint Records & Action Plan
16. Compensation

These mechanisms have been presented in the EIS, Vol. VII, Section 11.0.1., and 11.3 to 11.8. Given the particular significance of the Environmental Management Plan for the implementation of all mitigation measures, the Plan's key content is listed in Table 3.

Table 2 (presented at the end of this response text) identifies the main implementation mechanisms for each of the proposed mitigation measures.

**Table 3: Environmental Management Plan – Key Content**

| Environmental Management Plan Components | Key Content and Subjects (Minimum) |
|---|---|
| Definition of Roles and Responsibilities | • Overall Project management structure<br>• Health, Safety, Security and Environmental (HSSE) Supervisor<br>• Environmental Management Team<br>• Contractors<br>• Other Staff<br>• Community Liaison Committee |
| General and component-specific Environmental Protection Plans | • Clearing and grubbing<br>• Work near watercourses and marine coastline<br>• Earth excavation<br>• Quarry face development<br>• Topsoil management<br>• Equipment maintenance and fuelling<br>• Product storage and handling<br>• Erosion and sediment control installation and maintenance<br>• Dust control<br>• Noise control |

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| **Environmental Management Plan Components** | **Key Content and Subjects (Minimum)** |
|---|---|
| | • House keeping<br>• Access control<br>• Storm water and wastewater management<br>• Waste management<br>• Environmental monitoring activities |
| Monitoring Plan: Environmental Effects Monitoring (EEM) | • see Table 1 plus<br>• station location<br>• sampling techniques<br>• parameters<br>• frequency, scheduling<br>• data analysis, threshold values<br>• reporting<br>• data dissemination |
| Monitoring Plan: Environmental Compliance Monitoring/Inspections (ECM) | • see above |
| Environmental Inspections and QA/QC | • Government and proponent inspection<br>• Bilcon Inspector training |
| Environmental Audits | • Key issues of Project<br>• Evaluation of Project against Bilcon's environmental policies<br>• Documentation<br>• Employee awareness of environmental issues |
| Contingency and Emergency Response Planning (Operational Emergencies and Natural Events) | • Hazard analysis and risk determination<br>• Project-specific policies and procedures for events such as fires, explosions, spills, operational upsets, equipment malfunctions, severe weather, power outages, transport accidents;<br>• Minimum plan requirements (prevention, preparedness, response, recovery/clean up) |
| Training and Education | • Inspection staff training<br>• Worker orientation training<br>• Health and safety Training<br>• Waste management training<br>• Transport of Dangerous Goods training |
| Communications and Reporting | • Document control (distribution and updating of EMP)<br>• Public information and communication<br>• Community Liaison Committee<br>• Reporting (environmental report with summary of monitoring results and compliance audits report) |

## 2.3 Proven vs. Experimental Character of the Mitigation Measure

All of the proposed mitigation measures are considered proven approaches to environmental effects management.

It is of note that all aspects of the Whites Point Quarry and Terminal Project, from construction activities to full quarry and ship loading operations and cargo vessel transits are already in progress in numerous locations in Nova Scotia, elsewhere in Atlantic Canada, along the Eastern Seaboard and throughout the world. Many similar operations can be viewed operating within environmental compliance and safety on a routine daily basis. A list of a few similar operations located in Nova Scotia are identified in the EIS,Vol.VII, Section 11.2.

## 2.4 Corrections to Table ECM-1

In the response to Panel's specific questions pertaining to Table ECM-1, please note (Panel comments are in *italics*):

- *Pg2, last proposed Mitigation – Should "salt water intrusion" read "salt water invasion"? :* This has been edited to read "salt water influx".

- *Pg3, last proposed mitigation – What environmental effect of the Project is this proposed to mitigate?... ":* This measure has been removed from the table (see Table 2);

- *Pg17, Heritage resources, land archaeology – A commitment to stop work should be made if archaeological resource presence is suspected."* : This measure has been added to the table (see Table 2);

## 2.5 Other Commitments

Commitments made by Bilcon that are not considered mitigation measures and therefore not explicitly stated in Table ECM-1 and Table 2 of this response document include:

- Use of Shiploader: "Bilcon has no intention of making the shiploader available to other producers in the area..." (EIS, Vol. VII, Section 10.0.4, p.10).
- Partnership: "Bilcon will welcome the opportunity in partnerships with academe or others to further practical research and the Clayton companies have a history of such participation..." (EIS, Vol. VII, Section 11.0.1, p.5);

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- Product Quality Control: "Quality control is, therefore, imperative … and will be continuously monitored for quality. All products… will meet the requirements of the finishing process… in the markets in which they are distributed." (EIS, Vol. VII, Section 11.0.1, p.6).

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## Table 2: Mitigation - Commitment Summary

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| Climate | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Clearing and quarry face development;<br>• Drilling and blasting (aggregate production);<br>• Crushing, screening, and wash plant operation;<br>• Aggregate stockpiling<br>• Vessel transport<br>Decommissioning/Reclamation:<br>• Removal of infrastructure<br>• Slope reduction<br>• Re-vegetation | Increase in greenhouse gas emissions from use of machinery | • Creation of a permanent environmental preservation zone of approx. 32 hectares (80 acres)<br>• Maintaining over 120 hectares (300 acres) of land surrounding the quarry property in managed forest land<br>• Incremental forest clearing and reclamation procedures to maximize carbon dioxide uptake and oxygen production<br>• Reduction of greenhouse gas emissions by chipping and composting wood fibre from land clearing activities rather than burning<br>• Heavy operational equipment diesel engines meeting EPA Tier 3 emission specifications<br>• Stationary equipment using electrical energy<br>• Transport of quarry products directly by ship once per week rather than by ground transportation to port<br>• Speed restrictions on roads<br>• Ongoing examination of evolving technologies for reducing or offsetting emissions (e.g., opportunities for energy conservation, use of biodiesel, contribution to carbon capture initiatives) | 1, 3, 4, 6, 7, 10, 11, 12, 14 | para. 9.1.1 |
| Geology and Hydrogeology - Basalt Rock | Construction and Operation:<br>• Drilling and blasting (aggregate production) | Irretrievable loss of Basalt Rock | • Production of high grade aggregate for value added construction industry products<br>• Rock extraction will not be carried out below sea level to eliminate the possibility of salt water influx<br>• Rock extraction will not be carried out below the contact of the middle and upper flow units | 1, 3, 4, 6, 14 | para. 9.1.2 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| Geology and Hydrogeology - Residential Well Water | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Clearing and quarry face development;<br>• Drilling and blasting (aggregate production)<br>Decommissioning/Reclamation:<br>• Slope reduction (blasting) | Deterioration of residential well water quality and quantity | • Quarrying and adjacent water wells will occur in different geological horizons or hydro-stratigraphic units<br>• Adjacent water wells will be located hydraulically down gradient of the quarry and/or on opposite sides of the ground water divide<br>• Recharge and discharge areas for the quarry and adjacent water wells will be located in different watersheds<br>• Quarrying will be carried out above the natural water table and will not require mine dewatering and pumping or associated ground-water withdrawal or drawdown<br>• Rock extraction will not be carried out below the contact of the middle and upper flow units<br>• Quarrying will maintain a 1 to 2 m cap of the UFU above the MFU;<br>• If MFU is inadvertently intersected Bilcon will stop quarrying the MFU<br>• Quarrying will be a non-consumptive water use as only water that enters the quarry watershed will be used<br>• Bilcon of Nova Scotia Corporation will conduct a pre-blast survey of adjacent water wells in the immediate area of the quarry in consultation with the NSDEL<br>• Water table levels will be monitored as quarrying proceeds<br>• Bilcon of Nova Scotia Corporation will replace at their expense any existing water supply within 800m of the active quarry which has been affected either in supply or quality on a no litigation basis and at no cost to the property owner | 1, 3, 4, 5, 6, 7, 12, 13, 15, 16 | para. 9.1.3 |
| Surficial Geology and Soils | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Clearing and quarry | Increased erosion | • Implementation of an erosion and sediment control plan<br>• Conserving soil resources with a permanent environmental preservation zone around the quarry site with approximately 32 hectares (80 acres) in permanent vegetative cover to reduce runoff and potential soil loss from erosion | 1, 3, 4, 5, 7, 8, 10, 11, 13, | para. 9.1.4 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | face development; | | • Construction of an organic disposal area for clearing and grubbing materials before site construction begins<br>• Sediment and organic disposal areas will be dyked to control soil erosion and dykes will receive erosion control measures during construction<br>• Storage and recycling of waste materials (sediments and organics) for reclamation purposes<br>• Incremental forest clearing and reclamation to minimize potential soil loss from erosion<br>• Mixing of composted organics with mineral sediments for a healthy, productive, soil regime for reclamation<br>• Follow up monitoring to ensure success of reclamation work | | |
| Surface Water - Little River Watershed | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Development of infrastructure<br>• Construction of buildings and plant facilities<br>• Clearing and quarry face development<br>• Drilling and blasting (aggregate production)<br>• Storm and waste water management | Damage to Little River Watershed | • All of the Little River watershed on the quarry property, approximately 8.5 hectares (21 acres), will be within an environmental preservation zone and no quarrying will take place in the Little River watershed<br>• Surface water drainage from the quarry compound area within the Little River watershed will be routed toward the active quarry area<br>• Design and implementation of a stormwater management plan in accordance with regulatory requirements<br>• Design and implementation of an erosion and sediment control plan<br>• Follow up monitoring of water level and flow in Little River Watershed | 1, 2, 3, 4, 5, 6, 7, 8, 13, 14, 15 | para 9.1.5 |
| Surface Water- Drainage and Wetlands | Construction and Operation:<br>• Quarry and terminal site clearing | Change in site drainage and wetlands | • Design and implementation of a stormwater management plan in accordance with regulatory requirements<br>• Prior to land construction, sediment retention ponds will be constructed to retain surface water runoff from disturbed land | 1, 3, 4, 5, 6, 7, 8, 12, 13, 14 | para 9.1.6 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | • Development of infrastructure<br>• Construction of buildings and plant facilities<br>• Clearing and quarry face development<br>• Drilling and blasting (aggregate production)<br>• Storm and waste water management | | areas<br>• Berms for sediment retention ponds will receive erosion control measures during construction to reduce soil erosion<br>• Retention ponds to be designed with sufficient capacity for 100 year frequency storm event<br>• Water overflows from the sediment retention ponds will drain into a constructed wetland to provide greater retention time before entering the Bay of Fundy<br>• Drainage channels will be constructed as required to direct surface water runoff to the sediment retention ponds<br>• All runoff from the working area of the quarry will enter sedimentation ponds before entering the constructed wetlands or bog area.<br>• Alteration or diversion of any watercourse on basis of NSDEL approval<br>• Monitoring of water quality and flow at stormwater inflow and outflow points | | |
| Surface Water-Water Quality | • See above | Impairment of on-site water quality | • See above<br>• Controlled discharge with water quality monitoring station<br>• All hazardous substances to be stored in designated, contained areas<br>• Monitoring of water quality and flow at stormwater inflow and outflow points<br>• All outflows from the sediment retention ponds and/or constructed wetlands into the Bay of Fundy will meet the NSDEL "Pit and Quarry Guidelines" for Total Suspended Solids and pH | 1, 3, 4, 5, 6, 7, 8, 12, 13, 14, 15 | para 9.1.6 |
| Physical Oceanography - (Turbidity) | Construction and Operation:<br>• Construction of marine shipping terminal<br>• Storm and waste water | Impairment of marine water quality (incl. turbidity) | • The bottom of the Bay in the location of the marine terminal is mainly exposed bedrock affording good foundation conditions with little sediment deposits for resuspension during marine construction activities<br>• The bathymetry of the marine terminal location provides | 1, 2, 3, 4, 6, 7, 13, | para. 9.1.7 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | management (discharges to marine environment)<br>• Vessel transport | | adequate water depth without underwater blasting, dredging or dredge spoil disposal<br>• Bottom sediment contaminates including metals, PCBs, PAHs, and pesticides are within CCME Guidelines reducing the possibility of contaminate resuspension during marine construction activities<br>• If unexpected turbidity conditions develop during installation of the pipe piles for the marine terminal exceeding CCME Guidelines, controls such as silt curtains will be implemented<br>• The pipe pile construction method for the marine terminal causes less turbidity than placing rock infill in intertidal and sublittoral zones<br>• Recycling of washwater; on-site sediment retention ponds; controlled water discharge and effluent monitoring; all discharges to meet applicable regulatory standards<br>• No re-fueling of vessels at Bilcon terminal<br>• Ballast water management in compliance with Canadian Ballast Water Control and Management Regulations under the Canada Shipping Act<br>• Aggregate spill prevention (containment) during ship loading | | |
| Physical Oceanography - Tides and Currents | Construction and Operation:<br>• Construction of marine shipping terminal | Changes in tides and currents | • The pipe pile construction method for the marine terminal will have minimal effect on intertidal and nearshore tides and currents allowing practically unobstructed movement and flows with no infilling – no other mitigation required | 1, 3, 4 | para. 9.1.7 |
| Air Quality | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Development of infrastructure | Increased particulate emissions | • Quarry products will be transported by water, thereby eliminating heavy trucks traveling and raising dust on rural/residential roads<br>• A paved access road from Highway 217 to the quarry site will be constructed thereby practically eliminating dust generated by employee and delivery vehicles commonly | 1, 2, 3, 4, 6, 7, 8, 10, 12, 13, 14, 15 | para. 9.1.8 |

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | • Construction of buildings and plant facilities<br>• Construction of marine shipping terminal<br>• Clearing and quarry face development<br>• Drilling and blasting (aggregate production)<br>• Crushing, screening and wash plant operation<br>• Aggregate stockpiling, reclaim and loading<br>• Aggregate/ Vessel transport<br>Decommissioning/Reclamation:<br>• Removal of infrastructure<br>• Slope reduction (blasting)<br>• Revegetation | | associated with gravel access roads<br>• Water sprays will be used to control dust on quarry roads and work areas caused by quarry mobile equipment and on stockpiles and the organic and sediment disposal areas<br>• The processing plant will be located 1000m from the nearest residence<br>• Crusher and screens to be completely enclosed in a building and conveyors covered to avoid dust emissions;<br>• Vertical separation and vegetative buffer zones will further separate the processing plant from adjacent residences<br>• Quarry products will be washed during processing with state of the art mist systems<br>• Load out tunnels will be used to reduce product handling and associated dust generation; conveyors will be hooded to reduce fugitive dust<br>• All heavy mobile equipment will have approved emission controls and be well maintained<br>• Use of electric power for stationary land operations<br>• Brush will be chipped and composted instead of burned<br>• Dust emissions to remain within regulatory standards | | |
| Noise and Vibration (on-shore, blasting) | Construction and Operation:<br>• Development of infrastructure;<br>• Construction of marine shipping terminal.<br>• Clearing and quarry face development; | Increased noise and vibration levels from blasting | • Infrequent blasting is proposed to be approximately once every two weeks during production for a duration of less than one second per blast event<br>• Blasting will not be conducted during times of thermal inversion, on foggy, cloudy or overcast days to minimize sound propagation<br>• No blasting will be conducted within 800 m of residential structures not located on quarry property without written permission of the property owner | 1, 2, 3, 6, 7, 13, 12, 14, 15 | para. 9.1.9, para. 9.1.10, para. 9.1.11 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | • Drilling and blasting<br>Decommissioning/Reclamation:<br>• Slope reduction (blasting) | | • An environmental preservation zone will be maintained around the perimeter of the quarry to further reduce sound levels by absorption from blasting activities<br>• Noise and vibration from blasting will meet the requirements set forth in the NSDEL "Pit and Quarry Guidelines"<br>• Each blast will be monitored for concussion and ground vibration | | |
| Noise and Vibration (on-shore, machinery) | Construction and Operation:<br>• Development of infrastructure;<br>• Quarry and terminal site clearing;<br>• Construction of buildings and plant facilities;<br>• Construction of marine shipping terminal.<br>• Clearing and quarry face development;<br>• Crushing, screening, and plant operation.<br>Decommissioning/Reclamation:<br>• Removal of infrastructure<br>• Revegetation | Increased noise levels from use of machinery | • Crusher and screens to be completely enclosed in a building and conveyors covered to minimize noise emissions;<br>• A minimum 30m wide environmental preservation zone will be maintained around the perimeter of the quarry property to further reduce sound levels by absorption<br>• Equipment such as truck bodies and screens will be rubberized to reduce sound levels when loading and screening rock products<br>• Noise and vibration from the quarry will meet the requirements set forth in the NSDEL "Pit and Quarry Guidelines" at the quarry property line<br>• Noise levels at nearest residential receptor to be remain well below provincial noise limits<br>• Monitoring of sound levels at property line | 1, 2, 3, 6, 12, 13, 14, 15 | para. 9.1.9, para. 9.1.10, para. 9.1.11 |
| Noise and Vibration (marine | Operation:<br>• Aggregate/ Vessel transport (loading) | Increased noise levels from ship loading | • A horizontal separation distance of about 1.5km will be maintained between the ship loading activity and the nearest residence with vegetative buffer zones to further reduce | 1, 2, 3, 6, 7, 12, 13, 14, 15 | para. 9.1.11.5 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| terminal) | | | sound levels by attenuation and absorption<br>• Infrequent ship loading is proposed once per week during production for a duration of approximately 8 hours using double-hulled vessels to minimize noise during loading<br>• Noise levels at nearest residential receptor to be remain below provincial noise limits | | |
| Noise and Vibration | Operation:<br>• Vessel transport. | Increased noise levels from large vessel traffic | • Large vessel traffic is minimal in waters between the shipping lanes and marine terminal and cumulative noise from the quarry vessel is not expected to be as great as presently experienced in the North Atlantic right whale conservation area - no mitigation proposed<br>• Large vessel size minimizes trip frequency to one per week<br>• Underwater noise monitoring (ambient noise and sound levels associated with vessel transport) | 1, 2, 3, 6, 7, 13, 15 | para. 9.2.15 |
| Light | Construction and Operation:<br>• Development of infrastructure;<br>• Quarry and terminal site clearing;<br>• Construction of buildings and plant facilities;<br>• Construction of marine shipping terminal;<br>• Clearing and quarry face development;<br>• Crushing, screening, and wash plant operation; | Change in light environment in the area including night sky glow | • Adjacent residences will receive no direct light from quarry lighting infrastructure due to horizontal and vertical separation and visual buffers<br>• Quarry production will be concentrated during seasons of longer daylight hours, thereby reducing requirements for artificial light and for energy savings<br>• Except for regulatory navigational lighting, quarry lighting will be placed in buildings or be shielded whenever feasible to reduce "light spill";<br>• On-land lighting plans will be developed considering the criteria proposed by the International Dark-Sky Association (IDA). Design criteria would include:<br>o keeping artificial lighting to a minimum<br>o reduction of "light trespass" on to neighbouring properties<br>o selection of luminaries (lighting fixtures) that reduce glare | 1, 2, 3, 4, 6, 7, 13, 15 | para. 9.1.12 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | | | o selection of luminaries that are designed to not pollute the night sky<br>• Each fixture will be provided with shields to prevent light spill beyond the area of illumination and to contain all lighting effects within the property line of the quarry | | |
| Terrestrial Ecology – Habitat and Species | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Clearing and quarry face development<br>Decommissioning/ Reclamation:<br>• Revegetation | Change/loss of on-site habitat; potential for spread of invasive plant species | • Approximately 32 hectares (80 acres) of quarry land is proposed to be conserved and managed as a permanent environmental preservation zone<br>• Over 120 hectares (300 acres) of non-quarry land within the same ecosystem is proposed to be managed as forest/wildlife resource land for the 50 year life of the quarry project<br>• Incremental forest clearing and reclamation will be carried out during the 50 year life of the quarry project to maintain habitat diversity<br>• Construction of sediment retention ponds and associated constructed wetlands will contribute to on-site habitat diversity<br>• Yearly review (and implementation if warranted) of new guidelines and action plans with respect to invasive alien species and approaches to control/management of these species. | 1, 3, 4, 6, 7, 10, 11, 13 | para. 9.2.1 |
| Terrestrial Ecology - Wetlands | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Clearing and quarry face development<br>• Storm and Waste Water Management | Impairment/ Loss of on-site Wetlands | • Wetlands on the quarry site identified by the NSDNR wetlands database will be included in the permanent environmental preservation zone<br>• Intermittent surface water flow will be maintained to the "coastal bog" and the environmental preservation zone expanded in the bog area to conserve this natural wetland habitat<br>• Monitoring of wetland/bog environments (species, water regime) | 1, 3, 4, 6, 7, 10, 12, 13 | para 9.1.6<br>para 9.2.1 |
| Terrestrial Ecology – | Construction and Operation: | Disruption of migratory birds | • In accordance with *Migratory Birds Convention Act* no clearing of vegetation within nesting season of migratory | 1, 2, 6, 7, 13 | para: 9.2.1.1.3 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| Migratory Birds | • Quarry and terminal site clearing<br>• Clearing and quarry face development | | birds<br>• To reduce the possibility of migratory bird collisions with lighted structures, night lighting will be kept to a minimum and shielded whenever possible to direct light downward<br>• Security lighting will be motion activated<br>• Nest survey and mitigation (if clearing required during nesting season) | | |
| Terrestrial Ecology - Species at Risk | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Clearing and quarry face development | Disruption/ loss of species at risk | • Three provincially designated plant species at risk will be permanently preserved in an environmental preservation zone for the 50 year life of the quarry project<br>• Targeted surveys and periodic monitoring for Species at Risk<br>• No federal or provincial designated vertebrate species at risk are expected to breed on the quarry site - no mitigation proposed<br>• Preservation and creation of wetland habitats will provide potential habitat for some Odonata species at risk<br>• Maintaining early successional stages of vegetation on dykelands will provide potential habitat for some Lepidoptera species at risk<br>• Yearly review (and implementation if warranted) of new guidelines and action plans with respect to invasive alien species and approaches to control/management of these species. | 1, 3, 4, 6, 7, 10, 11, 12, 13 | para. 9.2.1 |
| Aquatic Ecology (Freshwater) – Fish Habitat | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Development of infrastructure<br>• Construction of marine shipping terminal<br>• Clearing and quarry | Impairment/ loss of fish habitat (freshwater) | • The two watercourses at the north and south property lines of the quarry will be included in the environmental preservation zone<br>• If required, alteration or diversion of any watercourse will be undertaken on the basis of NSDEL and DFO approval<br>• The watercourse in the active quarry was determined to be not suitable fish habitat by DFO, however, surface water flow to the coastal bog will be maintained<br>• All outflows from the sediment retention ponds and/or | 1, 3, 4, 6, 7, 8, 10, 12, 13 | para. 9.2.2 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | face development<br>• Storm and Waste Water Management | | constructed wetlands into the Bay of Fundy will meet the NSDEL "Pit and Quarry Guidelines" for Total Suspended Solids and pH | | |
| Aquatic Ecology (Freshwater) – Fish Species | Construction and Operation:<br>• See above | Disruption/ loss of fish species (freshwater) | • See above | 1, 3, 4, 6, 7, 8, 10, 12, 13 | para. 9.2.2 |
| Aquatic Ecology (Marine) – Fish Habitat including Species | Construction and Operation:<br>• Construction of marine shipping terminal<br>• Drilling and blasting<br>• Vessel transport | Disruption/ loss of fish habitat; Introduction of disease organisms from ballast water | • The conveyor system for ship loading quarry products will be designed to span the majority of the intertidal zone with only one group of pipe piles installed directly in the intertidal zone affecting 4 $m^2$ (0.001 acres) of intertidal bottom habitat<br>• The conveyor over the intertidal zone will be hooded to control dust and equipped with spill containment to catch any product from entering the intertidal zone<br>• The surface of selected pipe piles will be equipped with wire cages to enhance pelagic fish food sources<br>• The foundation system selected for the ship loader and mooring dolphins in nearshore waters will be pipe piles anchored to the bedrock bottom resulting in minimal effect on bottom habitat of approximately 32 $m^2$ (0.008 acres)<br>• A fish habitat compensation plan has been approved in principle by DFO at three times the loss of bottom habitat in the nearshore waters and with pelagic fish food enhancements<br>• Installation of the marine terminal infrastructure will be done from shore and floating platforms to minimize disturbance to the nearshore bottom habitat<br>• Socket drilling for anchoring the pipe piles will be done to produce aggregate size waste material with minimal fines and turbidity<br>• Blasting will be guided by "Bilcon of Nova Scotia | 1, 3, 4, 6, 7, 8, 10, 12, 13, 14, 15, 16 | para. 9.2.2<br>para. 9.2.3<br>para. 9.2.9<br>para. 9.2.10 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | | | Corporation's 'Blasting Protocol'" and adhere to the Department of Fisheries and Oceans "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters"<br>• Blasting will be conducted infrequently, once every two weeks during production, with a duration of each blast event of less than one second, blasts will be conducted when no atmospheric inversions are present and as close to low tide as feasible to maximize setback distances from the blast and fish habitat<br>• An additional mitigative measure will be adopted of three times the designated setback indicated in the "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters" from the blast to fish habitat during times of the year when inner Bay of Fundy Atlantic salmon could be present in these coastal waters<br>• Implementation of Canadian Ballast Water Control and Management Regulations under the Canada Shipping Act<br>• Monitoring of alien disease organisms at/near marine terminal | | |
| Aquatic Ecology - Marine Mammals | Construction and Operation:<br>• Construction of marine shipping terminal<br>• Drilling and blasting<br>• Vessel transport<br>Decommissioning/Reclamation:<br>• Slope reduction (blasting) | Disruption/ loss of marine mammals | • During the infrequent, once per week, vessel arrival and departure, a trained observer will be stationed on the ship loader and if marine mammals or waterbirds are sighted, their location will be communicated to the ship's captain; routine work boat observation tours will be conducted the day of the ships arrival/departures; the work boat will also be used during times of poor visibility for whale observations within the designated shipping route;<br>• Testing of effectiveness of visual observation method at 2500m from blast site (including consideration of average visibility) (results may require increased use of work boat for observations)<br>• Blasting will be guided by "Bilcon of Nova Scotia Corporation's 'Blasting Protocol'" and adhere to the | 1, 2, 3, 6, 7, 12, 13, 14, 15 | • para. 9.2.11 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | | | Department of Fisheries and Oceans "*Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters*"<br>• Blasting will be conducted infrequently, approximately once every two weeks during production, with a duration of each blast event of less than one second, blasts will be conducted when no atmospheric inversions or low atmospheric visibility (fog, rain, snow) are present and as close to low tide as feasible to maximize setback distances from the blast and fish habitat<br>• Blasting will not be conducted if marine mammals (whales, porpoises, or dolphins) are observed within 500m of the detonation site or if seals are within 170m of the detonation site<br>• Blasting will not be conducted if marine mammal species at risk (fin, blue or North Atlantic right whales) are observed within 2500m of the detonation site<br>• An experienced marine mammal observer will be employed to verify any marine mammals present within the safety radii and will communicate with the blast coordinator an "all clear" signal if no marine mammals are observed; the work boat will also be used during times of poor visibility (e.g., high waves) for whale observations within the 2500m safety zone;<br>• Bilcon to ensure adequate training / qualification of its marine mammal observer (s)<br>• Monitoring of an initial blast is proposed to verify modeling procedures with results from this initial blast being used to further define mitigative setback distances from the detonation to a marine mammal<br>• Coordination during initial and subsequent one year monitoring phase with DFO on details of monitoring program for CONWEP model verification and finalization of safety zone distances. | | |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | | | • Prescription of a ship route to and from the marine terminal and the shipping lanes that passes through an area of low sightings of North Atlantic right whales, humpback, fin and minke whale, and harbour porpoises<br>• Limitation of vessel speed in waters between the shipping lanes and the marine terminal to less than 12 knots/ hour (10 knots when whales have been reported in the area), i.e., significantly less than the speed of most severe and lethal ship strikes<br>• Coordination with whale and seabird cruises operating in the waters of the Bay of Fundy between the shipping lanes and the marine terminal on days when vessels are due to arrive and depart for reports of marine mammal sightings<br>• Investigation of opportunities to link up with research initiatives pertaining to such topics as marine mammal distribution, behavior, protection | | |
| Aquatic Ecology (Marine ) – American Lobster | Construction and Operation:<br>• Construction of marine shipping terminal<br>• Drilling and blasting<br>Decommissioning/Reclamation:<br>• Slope reduction (blasting) | Disruption/ loss of lobster habitat and effects on population | • see mitigation for "Physical Oceanography"<br>• Implementation of fish habitat compensation plan with approval by DFO for intertidal and nearshore bottom habitat<br>• Development of lobster monitoring and mitigation program in consultation with Fisheries and Ocean Canada should negative effects on lobster population be identified | 1, 2, 3, 4, 6, 7, 8, 13, 15, 16 | para. 9.2.10 |
| Aquatic Ecology (Marine ) - Water Birds | Construction and Operation:<br>• Construction of marine shipping terminal<br>• Drilling and blasting<br>• Vessel transport | Disruption of marine water bird populations | • The loading of vessels at night will be avoided whenever possible to minimize the possibility of lights attracting coastal migrant water birds and subsequent collisions<br>• During the infrequent, once per week, vessel arrival and departure, a trained observer will be stationed on the ship loader and if marine mammals or water birds are sighted, | 1, 3, 6, 13 | para. 9.2.12 |

## *11.0 Environmental Management*

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | Decommissioning/Reclamation:<br>• Slope reduction (blasting) | | their location will be communicated to the ship's captain<br>• An experienced water bird observer will be employed to verify any water birds present within the 170m safety radii and will communicate with the blast coordinator an "all clear" signal if no water birds are observed | | |
| Aquatic Ecology - Marine (Species at Risk: fish, mammals, waterfowl, reptiles) | Construction and Operation:<br>• Construction of marine shipping terminal<br>• Drilling and blasting<br>• Vessel transport<br>Decommissioning/Reclamation:<br>• Slope reduction (blasting) | Disruption/ loss of marine species at risk | • Three federally designated fish species at risk may frequent nearshore waters at the marine terminal: Bilcon of Nova Scotia Corporation will work with the appropriate Recovery Teams in their efforts to re-establish fish species at risk populations such as the inner Bay of Fundy Atlantic salmon, Atlantic cod, and striped bass<br>• Application of three times the designated setback indicated in the *Guidelines for Use of Explosives in or near Canadian Fisheries Waters* to be applied from May to October (i.e., during iBoF Atlantic salmon migration, which may bring salmon into Whites Point Cove (as per meeting Bilcon/DFO-HMD Dec. 10, 2004).<br>• A fish habitat compensation plan has been approved in principal by DFO for intertidal and nearshore bottom habitat at three times the direct loss and for alteration of pelagic fish habitat<br>• Two federally designated waterfowl species at risk may occur in nearshore waters at the marine terminal: Bilcon of Nova Scotia Corporation will continue to coordinate with the Canadian Wildlife Service in their efforts to re-establish waterfowl species at risk populations such as the Harlequin duck and Barrow's Goldeneye<br>• One federally designated marine reptile species at risk could occur in nearshore waters at the marine terminal: Bilcon of Nova Scotia Corporation will communicate any sightings of leatherback turtles to the Nova Scotia Leatherback Turtle Working Group and will consult the group with respect to | 1, 3, 6, 7, 13, 16 | para. 9.2.5, para.. 9.2.6 para. 9.2.7 para. 9.2.8 |

## *11.0 Environmental Management*

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | | | requirements for temporary mitigation measures<br>• No blasting activities if endangered leatherback turtles or marine mammals were observed within 2500m safety radius<br>• During vessel arrival and departure, a trained observer will be stationed on the ship loader and if marine mammals or waterbirds are sighted, their location will be communicated to the ship's captain;<br>• Routine work boat observation tours will be conducted the day of the ships arrival/departures; the work boat will also be used during times of poor visibility for whale observations within the designated shipping route and, prior to blasting, within the 2500m safety zone;<br>• Testing of effectiveness of visual observation method at 2500m from blast site (including consideration of average ) (results may require increased use of work boat for observations)<br>• Reduced vessel speed (10 knots or less) and/or alteration of course in case of sighting of marine mammals within designated shipping route<br>• Adjustment/ alteration to mitigation measures (species-specific and in consultation with government agencies), should monitoring identify that mitigation measures are ineffective<br>• Consideration of new information on the protection of Species at Risk (e.g., results of Allowable Harm Assessment for right whale; recovery strategy for iBoF salmon; other restrictions of critical habitat; recovery strategies or action plans) throughout the life of the Project; and implementation of the new information into Project management if feasible;<br>• Regular consultation with regulatory agencies to ensure Project remains in compliance with SARA<br>• Bilcon to ensure adequate training / qualification of its | | |

## *11.0 Environmental Management*

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | | | marine mammal observer (s)<br>• Coordination during initial and subsequent one year monitoring phase with DFO on details of monitoring program for CONWEP model verification and finalization of safety zone distances<br>• Implementation of Canadian Ballast Water Control and Management Regulations under the Canada Shipping Act.<br>• Monitoring of alien disease organisms at/near marine terminal | | |
| Heritage Resources – Marine Archaeology | Construction and Operation:<br>• Construction of marine shipping terminal | Damage/loss of marine archaeological resources | • The location of the marine terminal and of the shipping route will avoid the possible archaeological sensitive underwater ridge extending from Sandy Cove west during either construction or subsequent shipping activities<br>• Prior to marine construction, Bilcon of Nova Scotia Corporation will have the appropriate archaeological investigations conducted under permit with the Nova Scotia Museum: if archaeological resources are discovered as a result of this investigation, appropriate mitigation actions will be taken in consultation with the Nova Scotia Museum | 1, 2, 3, 4, 7, 13 | para. 9.3.1 |
| Heritage Resources – Land Archaeology | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Development of infrastructure<br>• Construction of buildings and plant facilities<br>• Clearing and quarry face development | Damage/loss of land-based archaeological resources | • An on-site archaeological survey will be conducted<br>• Archaeological recording and limited testing of the Hersey House foundation plus an area within a 250m radius around the house will be conducted under permit with the Nova Scotia Museum if the foundation cannot be avoided during quarry construction or operations<br>• Before construction and operation of the quarry, an educational briefing concerning archaeological and historical resources will be conducted for all quarry employees; training program to be established in consultation with regulatory agency | 1, 2, 3, 4, 7, 13 | para. 9.3.2<br>para. 9.3.3 |

## *11.0 Environmental Management*

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | | | • Bilcon to further investigate location of the historic Indian Hill Camp *referenced in study by the Confederacy of Mainland Mi'kmaq<br>• In the event of discovery of items suspected to be of archaeological significance, the earthwork/quarry face development will stop and a qualified archaeologist informed to assess the find and to advise on further steps | | |
| Heritage Resources - Heritage Properties | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Development of infrastructure<br>• Construction of buildings and plant facilities<br>• Clearing and quarry face development | Effects on heritage properties | • Registered or designated heritage properties are not located within view planes of the quarry - no mitigation proposed Heritage Properties | 2 | para. 9.3.5 |
| Heritage Resources – Site History | Construction and Operation:<br>• Quarry and terminal site clearing<br>• Development of infrastructure<br>• Construction of buildings and plant facilities<br>• Clearing and quarry face development | Damage/loss of historical resources | • As part of the educational briefing concerning archaeological and historical resources, training with respect to the requirements of the Cemeteries Protection Act will be conducted for all quarry employees; training program to be established in consultation with regulatory agency;<br>• In the event of discovery of items suspected to be of archaeological significance, the earthwork/quarry face development will stop and a qualified archaeologist informed to assess the find and to advise on further steps. | 1, 2, 7 | para. 9.3.4 |
| Aboriginal Land and | Construction and Operation: | Damage/loss of aboriginal | • Bilcon of Nova Scotia Corporation will continue its efforts to consult with First Nations and address their concerns | 1, 2, 3, 4, 12, 15, 16 | para. 9.3.3 |

## *11.0 Environmental Management*

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| Resource Use | • Quarry and terminal site clearing<br>• Development of infrastructure<br>• Construction of buildings and plant facilities<br>• Clearing and quarry face development | artifacts or resources | • An on-site archaeological survey will be conducted<br>• If artifacts are discovered during site preparation or operation work will be stopped until a qualified archaeologist investigate<br>• Fishing gear lost through quarry activities will be compensated for | | |
| Aesthetics – Hwy 217 | Construction and Operation:<br>• All construction activities<br>• All operational activities | Impairment of visual quality of landscape | • The quarry will not be visible in a view plane from the land along Highway 217 - no mitigation proposed<br>• The operational schedule proposes limiting site disturbance to 2.5 hectares a year<br>• Reclamation will be implemented on a 5 year schedule | 2, 3, 6, 10, 11, 12, 13, 15 | para. 9.3.6 |
| Aesthetics – Bay of Fundy | Construction and Operation:<br>• See above | Impairment of visual quality of coastline | • same as above, plus<br>• A minimum 30m wide environmental preservation zone will be maintained along the coastline of the quarry as a buffer to enhance visual qualities when viewed from the Bay of Fundy with incremental forest clearing and incremental reclamation<br>• The buildings at the processing plant be gray or dark green in colour and made of non-reflective materials to blend with the surrounding forest and rock outcrops.<br>• The ship loader components are to be a "battle ship" gray colour to blend with the marine environment. | 2, 3, 6, 10, 11, 12, 13, 15 | para. 9.3.6 |
| Transportation - Land | Construction and Operation:<br>• All quarry and terminal construction activities<br>• All operation activities(material | Increased road transportation; alterations/ upgrades to Whites Cove Road | • Shipping quarry products directly by water will eliminate heavy truck traffic on rural, two-lane highways, truck traffic inconveniences for residents and tourists, and associated noise and vibration for those residents and school along Highway 217<br>• Upgrading of the intersection of the quarry entrance road and Highway 217 will be done to meet Nova Scotia Department | 3, 4, 6, 7, 15 | para. 9.3.8 |

*11.0 Environmental Management*

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | supply) | | of Transportation and Public Works standards<br>• Consultation with TPW prior to any upgrades to Whites Cove Road | | |
| Transportation - Marine | Construction and Operation:<br>• Vessel transport | Disruption of /inconvenience for local boat traffic | • The location of the marine terminal will provide a short distance and direct route to and from the designated in bound/outbound shipping lanes with minimal shipping penetration into the outer Bay of Fundy<br>• The location of the marine terminal will be along a homogenous section of the coastline without islands or other physical navigational hazards<br>• Definition of vessel approach / departure course in consultation with local fishermen<br>• Completion of Port Procedures Manual at least six months before arrival of first vessel in conjunction with Transport Canada Marine Safety Group;<br>• Consultation with Transport Canada Marine Safety Group (Mr. Mihai Balaban) re implementation of Canadian Ballast Water Control and Management Regulations under the Canada Shipping Act | 6, 7, 15 | para. 9.3.8<br>9.3.13<br>9.3.14 |
| Economy - Employment | Construction and Operation:<br>• All quarry and terminal construction activities<br>• General quarry operation (material supply) | Increased job opportunities | • Use of local labour markets to extent possible<br>• Implementation of employment policy that favours local labour market: hiring priority will be given to Digby Neck residents with emphasis on education and skill development to introduce and maintain women in the workforce<br>• Implementation of employment policy that ensures gender equality including provisions for review of workplace by a gender specialist to ensure that no barriers to women's participation at the workplace are readily apparent; | 2, 6, 12, 15 | para. 9.3.9 |
| Economy - GDP | Construction and Operation:<br>• All quarry and terminal construction | Increased GDP | • Purchase of goods and services from local markets | 2, 6, 15 | para. 9.3.9 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | activities<br>• General quarry operation (material supply) | | | | |
| Economy – Municipal Taxes | Construction and Operation:<br>• All quarry and terminal construction activities<br>• General quarry operation (material supply) | Increased municipal tax base | • Purchase of goods and services from local markets | 2, 6, 15 | para. 9.3.9 |
| Economy - Aquaculture | Construction and Operation:<br>• Drilling and blasting<br>• Marine terminal construction<br>• Vessel transport | Disruption of local aquaculture | • Blasting in proximity to land and water based aquaculture will be subject to the same setbacks as outlined in DFO's "Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters" | 1, 2, 3, 6, 7, 14, 15 | para. 9.3.10, para. 9.3.11 |
| Economy - Intertidal Fishery | Construction and Operation:<br>• Drilling and blasting;<br>• Marine terminal construction<br>• Vessel transport | Disruption of intertidal fishery | • Continued access through quarry property to the beach for harvesting will be provided for beach harvesters upon appropriate arrangements with quarry management | 1, 2, 6, 7, 15 | para. 9.3.12 |
| Economy - Nearshore Fishery | Construction and Operation:<br>• Drilling and blasting;<br>• Marine terminal construction<br>• Vessel transport | Disruption of nearshore fishery | • Coordination of a designated ship route to and from the marine terminal to the inbound / outbound shipping lanes in the Bay of Fundy is proposed with all stakeholders<br>• Definition of vessel approach / departure course in consultation with local fishermen<br>• Establishment of toll-free phone number for fishers and tour boat operators to obtain up-to-date information on vessel | 1, 2, 3, 6, 7, 15, 16 | para. 9.3.13 |

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | | | arrivals and departures;<br>• Re-establishment of the Community Liaison Committee with a local fisherman representative is proposed to maintain lines of communication between the quarry and fishing industries<br>• To minimize possible inconvenience to local fishers, advance notice of shipping schedules will be made available<br>• A "lobster trap fund" will be established and funded by Bilcon of Nova Scotia Corporation and administered by a designated fisher group to compensate for fishing gear destroyed as a result of the vessel transporting quarry products<br>• Development of lobster monitoring and mitigation program in consultation with Fisheries and Ocean Canada should negative effects on lobster population be identified | | |
| Economy – Tourism | Construction and Operation:<br>• Marine terminal construction<br>• Clearing and quarry face development<br>• Drilling and blasting<br>• Vessel transport | Disruption of tourism | • Re-establishment of the Community Liaison Committee with a local tourism representative is proposed to maintain lines of communication between the quarry and tourism industries<br>• Mitigation related to coordination of vessel traffic as suggested for "Economy - Nearshore Fishery" will also be applied to tour boat operators<br>• Establishment of toll-free phone number for fishers and tour boat operators to obtain up-to-date information on vessel arrivals and departures;<br>• See also comments under mitigation for Transportation – Marine and Aesthetics<br>• Bilcon to explore, together with representative of local tourism industry, options for contributing to enhancement of the area's tourism and recreation opportunities | 2, 3, 6, 7, 9, 10, 11, 15 | para. 9.3.14 |
| Economy – Land Value | Construction and Operation:<br>• Marine terminal construction | Decrease in land value for adjacent properties | • Compensation will be paid to adjacent property owners within 800m of the active quarry if property values are shown to be diminished due to Quarry activities | 2, 3, 7, 10, 15, 16 | para. 9.3.15 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| | • Clearing and quarry face development<br>• Drilling and blasting<br>• Crushing, screening, and plant operation<br>• Vessel transport | | | | |
| Economy - Recreation | Construction and Operation:<br>• Marine terminal construction<br>• Clearing and quarry face development<br>• Drilling and blasting<br>• Vessel transport | Decreased opportunities for recreation at the Project site | • Continued access through quarry property to the beach will be provided for non-motorized recreation users upon appropriate arrangements with quarry management<br>• A minimum 30m wide environmental preservation zone will be maintained along the coastline of the quarry as a buffer to enhance visual qualities when viewed from the Bay of Fundy with incremental forest clearing and incremental reclamation<br>• A security fence will be installed along public property lines for public safety | 1, 2, 3, 4, 6, 10, 11, 15 | para. 9.3.16 |
| Socio-Cultural Environment - Quality of Life | Construction and Operation:<br>• Clearing and quarry face development<br>• Drilling and blasting (aggregate production)<br>• Crushing, screening, and wash plant operation<br>• Operation of marine terminal and marine – based aggregate transport | Decrease in quality of life | • Communication and community involvement of the pre-project environmental assessment and pre-project engineering will be continued by Bilcon of Nova Scotia Corporation through open houses, newsletters, and direct communication with interested individuals<br>• Bilcon of Nova Scotia Corporation intends to re-establish the Community Liaison Committee and invite an adjacent property owners to be members of the Committee<br>• A complaint process will be established by Bilcon of Nova Scotia Corporation to address environmental matters and any quality of life issues<br>• Environmental monitoring and disclosure of monitoring results | 1, 2, 3, 7, 12, 13, 14 | para. 9.3.22 |
| Socio-Cultural | Construction and Operation: | Disruption of community | • Community involvement in planning and approval process<br>• Transparent decision making and planning documents | EIS plus 1, 2, 15 | |

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| Environment - Social Capital | • Project Planning and Approval | cohesion | • On-going community involvement during Project implementation<br>• See also mitigation proposed under "Quality of Life" | | |
| Socio-Cultural Environment - Commercial Patterns | Construction and Operation:<br>• Marine terminal construction<br>• Clearing and quarry face development<br>• Operation of marine terminal and marine – based aggregate transport | Change in commercial patterns | • See mitigation under "Economy" and "Aquaculture, Intertidal Fishery, Nearshore Fishery, Tourism, and Recreation" | 1,2, 3, 6, 15, 16 | |
| Socio-Cultural Environment - Infrastructure and Institutional Capacity | Construction and Operation:<br>• Quarry operation | Increased use levels for infrastructure and institutional capacity | • No burden on existing infrastructure or institutional capacity is anticipated and no mitigation is proposed | 2, 15 | para. 9.3.24 |
| Socio-Cultural Environment - Education, Training and Skills | Construction and Operation:<br>• Quarry operation | Increased opportunities for education, training and skills | • Training for quarry employees will be provided by Bilcon of Nova Scotia Corporation at the Company's expense<br>• Hiring priority will be given to Digby Neck residents with emphasis on education and skill development to introduce and maintain women in the workforce | 2, 6, 15 | para. 9.3.23 |
| Human Health and Wellness – | Construction and Operation:<br>• Clearing and quarry | Effects on drinking water quality | • All wells constructed on-site for domestic water supply will meet the NSDEL requirements for the construction of water wells | 2, 15 | para. 9.3.18 |

| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| Drinking Water Quality | face development<br>• Drilling and blasting (aggregate production) | | • Bi-annual monitoring of on-site supply well<br>• For off-site well water, see Residential Well Water Quality VEC | | |
| Human Health and Wellness - Marine Contaminants | Construction and Operation:<br>• Clearing and quarry face development<br>• Drilling and blasting (aggregate production)<br>• Crushing, screening, and wash plant operation<br>• Operation of marine terminal and marine – based aggregate transport | Increase in concentrations of contaminants in marine environment | • On-land environmental control structures and quarry operating procedures will be designed to control any on-site contaminates from entering the marine environment<br>• Closed circuit recycling of aggregate wash water;<br>• No refueling of vessels at marine terminal<br>• Electrical motors for the conveyor systems will be used over the intertidal and near shore waters which require minimal lubricants and will be equipped with drip pans and maintained<br>• Monitoring of contaminant levels in periwinkles | 1, 3, 6, 7, 13, 14 | para. 9.3.19 |
| Human Health and Wellness – Land Contaminants | Construction and Operation:<br>• Clearing and quarry face development<br>• Drilling and blasting (aggregate production)<br>• Crushing, screening, and wash plant operation | Increase in concentrations of contaminants in terrestrial environment | • Only pesticides, herbicides, and other chemical agents registered for their particular use and application by licensed persons will be used on-site<br>• Explosives will not be stored on-site and will be delivered and handled by qualified persons in accordance with provincial and federal regulations<br>• Fuels, oils, lubricants, and coolants will be stored on-site in spill containment areas and vehicle fueling will be done using closed systems with dry break disconnect couplings<br>• Sewage disposal will be by on-site sewage disposal systems designed and maintained in accordance with NSDEL guidelines<br>• Monitoring of contaminant levels in raspberries | 1, 3, 6, 7, 12, 13, 14 | para. 9.3.20 |
| Human Health and Wellness - | Construction and Operation:<br>• Clearing and quarry | Increase in concentrations of | • Mitigation measures regarding potential pathways (air, water, and soil) for country food contaminates are presented in previous paragraphs | 1, 3, 6, 7, 12, 13 | para. 9.3.21 |

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| VEC | Project Phase and Component | Potential Effect | Mitigation | Implementation (See Codes in Text Item 2.2) | Ref Paragraph |
|---|---|---|---|---|---|
| Country Foods | face development<br>• Drilling and blasting (aggregate production)<br>• Crushing, screening, and wash plant operation | contaminants in country foods | • Monitoring of contaminant levels in raspberries | | |

Implementation:

1. Environmental Management Team (EMT) & Environmental Liaison Officer
2. Community Liaison Committee (CLC)
3. Project Planning/Design
4. Detailed Design
5. Stormwater Management Plan (SMP)
6. Quarry and Terminal Operational plans (including employment and procurement policies)
7. Environmental Management Plan (EMP)
8. Erosion and Sediment Control Plan
9. Decommissioning Plan
10. Reclamation Plan (incl. habitat management plan)
11. Forest Management Plan
12. Environmental Audits/ Environmental Quality Assurance Plan
13. Environmental Effects Monitoring (EEM)
14. Environmental Compliance Monitoring (ECM)
15. Environmental Complaint Records & Action Plan
16. Compensation

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**WP 1625 – Partnership for Sustainable Development**

**EIS Guidelines – Section 12.0 - Environmental Management**
**Deficiency Statement 78**
**EIS Guidelines**
*Section 12.2 - Accidents and Malfunctions - 'Identify and discuss, for each Project phase and activity, the potential accidents or malfunctions that may occur as a result of the Project, including consideration of risks such as spills of hazardous materials (on land and in water), explosion and/or fire, use of explosives and timing of blasts, transportation accidents, destruction of fishing gear, collision with marine mammals, release of invasive or hazardous species through ballast-water. 'Evaluate worst case-scenarios." 'Where potentially significant impacts could occur as a result of an accident or malfunction, assess the probability of such an occurrence, taking into account weather or external events that present contributing factors."*
*Section 8.1 - Methods - 'Indicate the degree of certainty in the impact predictions and determination of significance (identify measures used)."*
**EIS**
*Section 11.2.5 - Accidental or Malfunction Events – In a single sentence, the EIS addresses the likelihood and implications of severe weather on shipping at the marine terminal. 'If storm conditions are forecast, the master has other options; to stay at sea, go to anchor, to delay docking or departure awaiting more favourable conditions."*[173] *The Bay of Fundy is a body of water subject to high winds, significant nearshore currents and considerable tidal action. The EIS is inadequate in its examination of the implications of severe weather on its operations.*
*In order to address the above noted sections of the EIS Guidelines, the Proponent should revise the EIS to:*

- *examine the predicted frequency and duration that severe weather will hamper ship docking, loading and departure at the marine terminal,*
- *clearly address what alternative measures will be taken in which situations,*
- *examine the environmental effects of these alternatives. For example, should the vessel go to anchor, what will be the predicted impact on bottom habitat? If the vessel opts to stay at sea, what will be the predicted impact on fouling of fishing gear, interactions with marine mammals, etc?*

*The EIS fails to address the likelihood of a failure of main engines or thrusters during docking and departure and the associated environmental implications.*

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**RESPONSE**
Please refer to responses to the Panel in this section.

*11.0 Environmental Management*

**Deficiency Statement 83**
**EIS Guidelines**
*12.4 – Monitoring – "Identify the role of community members and government agencies in the monitoring process." "Identify the approaches, methods, and consultants to be used to analyze monitoring data." "Describe reporting and response mechanisms, including criteria for initiating a response, the procedures to be followed, and the reasons for selecting these criteria."*
**EIS**
*9.1.3.4 – Monitoring – The EIS states that, "Water quality monitoring will be performed by Bilcon of Nova Scotia Corporation on an annual basis..." It is unclear as to who is responsible for monitoring residential water quality/quantity – residential wells do not appear to be part of the Proponent's monitoring well network. The EIS states that monthly Committee will be re-established. The EIS does not meet the requirements set out in section 12.4 of the EIS Guidelines because there is no clear process discussed as to how results will be communicated to neighbouring residents whose wells may be impacted.*

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**RESPONSE**
As noted in the answer to the Panel's question regarding the Community Liaison Committee (CLC) representation, a resident in close proximity to the quarry property would be appointed to the CLC. Monitoring results with respect to water quality / quantity will be presented to the CLC and the specific member representing neighbouring residents with wells will be provided with sufficient copies of the monitoring results to distribute to local residents with wells.

**Deficiency Statement 84**
**EIS Guidelines**
*12.4 - Monitoring - "Provide information on all proposed monitoring activities and a framework for taking action to respond to monitoring results."*
**EIS**
*9.2.1.4 – Monitoring - According to the EIS, the populations of the three at-risk plant species, the Glaucous rattlesnake–root (Prenanthes racemosa), Mountain sandwort (Arenaria groenlandica) and Hemlock parsley (Conioselinum chinensis) would be monitored. However, there is no specific commitment in the EIS to undertake helpful mitigations should the monitoring find that the populations of the rare plants are declining.*

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**RESPONSE**
The botanist who will be engaged by Bilcon to monitor the three (3) at-risk plant species will provide Bilcon with a quantity and health assessment for each of the species. Should it be found that the populations of the three plant species are declining, the botanist will be asked to prepare a plan to remedy the situation.

*11.0 Environmental Management*

**Deficiency Statement 87**
**EIS Guidelines**
*12.5 - Mitigation Measures - 'Evaluate the effectiveness of mitigation measures by demonstrating how they contribute positively to sustainable development objectives." 'Indicate which mitigative measures are proven and which are experimental."*
**EIS**
*The EIS identifies 151 mitigation measures to address environmental effects to VECs. The EIS fails though to assess the effectiveness of the proposed mitigation measures. No indication is provided as to which are proven and which are experimental. Based on these deficiencies, it is impossible to determine the level of residual effects remaining after mitigation*

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**RESPONSE**
No proposed mitigation measures will be experimental; however, should mitigation measures fail to meet the standard expected, an adaptive management process will be undertaken.

**Deficiency Statement 88**
**EIS Guidelines**
*12.5 - Mitigation Measures 'Identify trigger points when an adverse effect uncovered by monitoring will result in remedial action, mitigation or cessation of activity."*
**EIS**
*The EIS states 'The proposed environmental monitoring program is designed to detect potential Project impacts measured against an established baseline or threshold as described under each VEC. Exceeding a baseline or a threshold is a trigger for action and requires the Operations Manager to undertake adaptive management (developing improved techniques while conducting management activities) to reduce or eliminate environmental impacts."*
*Adaptive management is not an acceptable substitute for clear monitoring trigger points. A review of Table ECM – 2 (Environmental Component Follow-up Monitoring) has failed to identify any monitoring trigger points and corresponding actions. References are provided to impact analysis for VECs. Upon reviewing the section that addresses terrestrial ecology (Section 9.2.1.4), the only actions arising from monitoring is the preparation of a written report for submission to Nova Scotia Department of Environment and Labour. The lack of clear, explicit monitoring trigger points for all monitoring programs represents a clear deficiency with respect to Section 12.5 of the EIS Guidelines.*

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**RESPONSE**
Please refer to responses to the Panel in this section.