S.W. Weeks Construction LTD.

Six Mile Brook Pit Expansion and Reclamation of Historic Workings

Six Mile Brook, Pictou County,
Nova Scotia

Registration Document for Class 1
Undertaking Under Section 9 (1) of the Nova
Scotia Environment Assessment Regulations

Prepared by:

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Approved by:

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President, S.W. Weeks Construction Ltd.

TABLE OF CONTENTS

1. PROPONENT INFORMATION

The Proponent is S.W. Weeks Construction ("S.W. Weeks" or "Weeks"). S.W. Weeks is a Nova Scotia Registered company. For S.W. Weeks Nova Scotia Registry of Joint Stocks information refer to Appendix A.

S.W. Weeks Construction Ltd. is a general civil contractor with its base of operations in New Glasgow, NS since 1971. One important aspect of their work is the manufacture and supply of aggregates to other contractors, the general public, and for other projects.

S.W. Weeks Construction Ltd. (S.W. Weeks) currently owns and operates the 6 Mile Brook Pit. The 6 Mile brook Pit operates under a Nova Scotia Environment and Climate Change(NSECC) Industrial Approval (NSECC Approval #2014- 089847). Upon the renewal of the industrial approval, it was noted by NSE that the disturbed area was greater than the 4 Hectares allowed for in the Nova Scotia Pit and Quarry Guidelines. S.W. Weeks has been directed by NSECC to conduct a Class I Environmental Assessment in order to continue aggregate extraction at the 6 Mile Brook Pit. As part of this directive and in good service to the environment, S.W. Weeks is committed to reclaiming historic pit activities which had been inherited upon purchase of the property. The purpose of the proposed pit expansion is to continue to have reserves of speciality aggregate products available to serve the local market. The purpose of the reclamation is to demonstrate environmental stewardship and promote the establishment of diverse ecosystems.

S.W. Weeks has been extensively involved in pit and quarry development since the mid 1970's. Since then, S.W. Weeks has grown from a single pit to now several pits and quarries throughout the maritime provinces. With the depth of knowledge gained through 50 years of operation, S.W. Weeks is confident they can continue to conduct pit and quarry operations harmoniously or with minimal disruption to the local environment.

S.W. Weeks Construction Ltd. Executive Management Team Lead:

• Stephen Weeks, P.Eng, Project Manager, President

S.W. Weeks Construction Ltd. Environmental Assessment Team Lead:

• Kyle MacKenize, P.Eng, Project Manager

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2. THE UNDERTAKING

2.1 Name

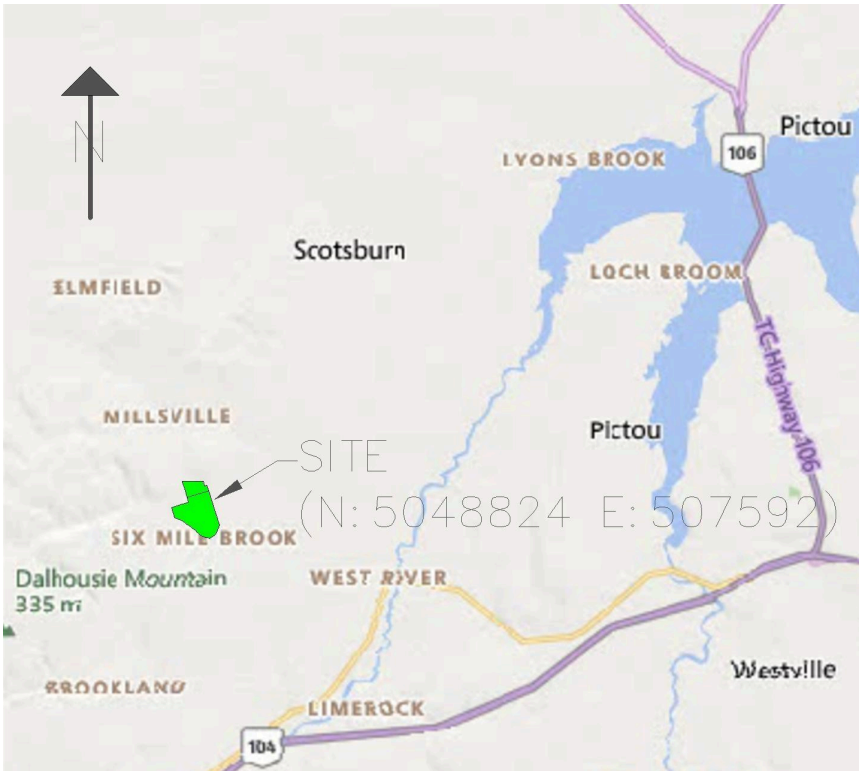
Name of the undertaking: 6 Mile Brook Pit Expansion and Reclamation of Historic Workings

2.2 Location

The existing 6 Mile Brook Pit is located on an unmaintained section of the Six Mile Brook Road, in Six Mile Brook, Pictou County (No civic addressing exists for this section of road). The property is situated 6km Northwest of Salt Springs Provincial Park, 18km Southwest of The Town of Pictou, and 16km West of The Town of Westville. The 6 Mile Brook Road is accessed from NS Trunk 4 or NS Highway 104 via exit 19 Salt Springs. Most of the site is on a parcel of land with PID# 00834739 with the remainder existing on a parcel of land with PID# 00834721, both owned by S.W. Weeks. The pit currently occupies a disturbed area of 27 Ha. Of this disturbed area approximately 10 Ha has been disturbed by historic pit activities conducted by Warren Maritimes many years prior to S.W. Weeks purchasing the property. The remaining area is currently being used by S.W. Weeks for pit activities and can be found in appendix B.

Figure 2-1 Project Location Regional Context

(Coordinates are in NAD83 UTM20, Lat 45.593077, Long -62.904341)



3. SCOPE

3.1 Scope of the Undertaking

S.W. Weeks proposes to increase their existing approved area at the 6 Mile Brook Pit. In addition to this S.W. Weeks is proposing to remediate a large section of historic pit activities, inherited upon acquiring the property from Warren Maritimes in 1997.

Proposed expansion will take place on the North East portion of the property and will disrupt approximately 3.5Ha of forested land. The pit floor has been established at 119m (CSRS 2010 NAD 83 UTM20). The material to be extracted is in a mounded shape with the peak elevation being 156m and side slopes of approximately 2H:1V. Total estimated volume of extraction is approximately 500,000 m^3. The expansion area shall be grubbed and cleared to allow for material extraction. The grubbing's and topsoil will be stockpiled for use in rehabilitation of the area upon completion of material extraction.

The elevation of the groundwater table has been established at 112.5 m. Due several geologic factors including, high permeability of the native soil, proximity to watercourses, watershed isolation, and watershed relief, the groundwater table is much further below the surface than would be expected for this area of the province. As such the extraction of this native material will have very little effect on the groundwater table and no pumping of groundwater will be required.

Approximately 17Ha of clear land is required for operation of the pit. This 17 Ha is already cleared and in operation at the 6 Mile Brook Pit. No additional land will be cleared for pit related activities beyond the 3.5Ha expansion area.

Table 3-1 Major Site Activities

Activities					
Clearing	Grubbing	Material Extraction	Screening	Washing	Stockpiling

Table 3-2 Site Facilities

Facilities						
Wash Plant	Screener	Scale & Scale House	Tool Trailer	Wash Ponds	Storage Buildings	Portable Washroom

The site can only be accessed through the 6 Mile Brook Road. The primary route for truck traffic is from Trans Canada Highway #104 Exit 19. The secondary route for truck traffic is through Nova Scotia Highway Trunk 4. While other possible truck traffic routes exist they are unfeasible due to maximum weight restriction on various sections of these alternate routes.

The rate at which native material is extracted and the frequency at which processed material is shipped is highly dependent on local market demands. Planned production rate is a somewhat difficult metric to measure even if year over year local market demands were consistent. The difficulty arises in the

question of what sort of material is the market requesting and how much by-product is created in the production of this material. For example, a customer may require 100 tonnes of 3/4" to 1-1/4" washed stone, by mass the native material is 10% of 3/4" to 1-1/4" stone resulting in 90% byproduct. The remaining 90% of material is not wasted, it is processed into different types of aggregate for future use, however these different aggregates may not be purchased for several years. The overall production rate cannot be accurately estimated due to fluctuation in local market demand for certain aggregates. The production rate of individual aggregate types is dependent on the gradation of native material and the production of by-products. The timeline for this project is difficult to predict with certainty due to the highly variable production rate and variability of the native material.

3.1.1 Purpose and Need for the Undertaking

The purpose of the undertaking is to continue to meet the supply of specialty aggregates for both local and regional customers. The 6 Mile Brook pit is somewhat unique in its geological makeup because the native material is poorly sorted and well graded. In addition, the material lacks significant silt and clay sized particles. This allows S.W. Weeks to create a wide range of aggregate products from one location with very little of the extracted material being wasted.

The processing facility for the native material (wash plant) must remain in close proximity to the native material for economic and efficiency purposes. The same is true for stockpiling facilities. Processing and stockpiling material at its place of origin decreases the need for transporting material via truck and/or "backtracking" with this material. Ideally material will not leave the facility until it is purchased by a customer. Any movement of material by S.W. Weeks prior to the sale of that material is directly reflected in the cost of production. Unnecessary transportation is also accompanied by significant increases in fossil fuel consumption and thus increased CO2 emissions.

The 6 Mile Brook Pit and the surrounding areas have been continuously used for aggregate extraction since the early 1970's. Since that time demand for aggregate products has continuously increased. Continuing operations in this area prevents S.W. Weeks or others from disrupting other areas which have not been exposed to pit activities.

3.1.2 Consideration of Alternatives

Alternate sites were not considered for this project. The existing facility at 6 Mile Brook is currently in operation with minimal disruption to wildlife and local residents. There is a good quantity of native material that can still be extracted along with permanent infrastructure on site that would be very inefficient to relocate. Selecting a different site would be highly impractical on not only financial grounds but also ecological ones. Disturbing a new area for laydown, stockpiling and pit activities would be inconsiderate to the environment when 17Ha has already been cleared at 6 Mile Brook.

Alternant extraction techniques were not considered for this project. The native material at 6 Mile Brook is loose sandy gravel often referred to as "Bank Gravel". It requires no special techniques to extract. It can be easily extracted from the base of the bank with a front end loader, no blasting or breaking required.

While alternate water treatment methods exist for the type of effluent released from the wash plant; these methods are not feasible for such an operation. The wash plant releases effluent that is heavily

laden with suspended solids. The solids in the effluent are not harmful to human or ecological health in terms of organic harm (i.e. poisonous, cancerous, acidic, etc.) The solids are harmful to the environment through physical means. Once the solids are removed from the effluent and properly disposed of, they pose no risk. The current wash pond settling system has been effective in removing suspended particles, S.W. Weeks proposes no alternative water treatment options. S.W. Weeks proposes to measure water quality using National Turbidity Units (NTUs) rather than Total suspended solids (TSS) in milligrams per liter(mg/L) as prescribed in the Nova Scotia Pit and Quarry Guidelines. The reasoning for this is both an operational purpose and a regulatory purpose. Operationally, measuring water quality in NTUs is much more effective because sampling and testing is done via a relatively inexpensive handheld testing device. These devices can be given to site personnel and provide instant results. Measuring in mg/L means that samples must be sent to a certified laboratory to analyze for results, this leads to significant delays in test results and a cost associated with each sample. In terms of regulation, turbidity is a much easier measure of water quality for Environment Nova Scotia and Climate Change to regulate for the same reasons it is more beneficial for S.W. Weeks to use it. Enforcement officers can also be equipped with a turbidity meter and quickly test water quality, potentially in time for action to be taken prior to a large discharge of sediment laden water. When a concentration measurement of a particular chemical/physical water quality parameter is not a concern, turbidity is a superior measure of overall water quality than TSS and is recognized as such in the *Guidelines for Canadian Drinking Water Quality*.

3.2 Scope of the Environmental Assessment

The scope of the Environmental Assessment informed by the *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia* provided by the Nova Scotia department of Environment and Climate Change. This document provides a structure for proponents to follow during the undertaking.

The intention of S.W. Weeks is to expand the existing 6 Mile Brook pit into the proposed 3.5Ha expansion area and to remediate 10Ha of the historic workings. The scope of the environmental assessment in regards to environmental studies is contained to two properties PID# 00834739 and PID# 00834721. The environmental studies will capture a complete picture of the existing terrestrial/aquatic vertebrates, invertebrates, flora, and fauna. Archeological studies will also be undertaken on these properties to determine their significance to local history and the Mi'kmaq peoples.

4. PUBLIC INVOLVEMENT

4.1 Methods of Involvement

To help ensure that public involvement remains constructive S.W. Weeks has established four guiding principles on which to base public involvement in this undertaking. They are honesty, inclusivity, integrity and transparency. S.W. Weeks believes that the four principles are what allows for their long-standing admirable reputation within the local community.

The first method of involvement was with regulatory stakeholders. A virtual project kickoff meeting for the undertaking was held on April 26, 2023 between S.W. Weeks, MacCallum Environmental, Nova Scotia department of Environment and Climate Change, and Nova Scotia Office of L'nu Affairs. This was an exceptionally collaborative meeting in which project details were shared by the proponent and met with constructive feedback from regulatory officials.

The next method of involvement engaged Kwilmu'Kw Maw-Klusuaqn (KMKNO) and was performed by Black Spruce Heritage Services on October 17 2023. Information regarding communication with KMKNO can be found in the ARIA report.

On February 20th 2024 S.W. Weeks notified Pictou West MLA Constituency Office, Municipality of Pictou County, and Pictou Landing First Nations of their intention to register an EA document. Each stakeholder was encouraged to contact S.W. Weeks with questions or comments regarding the project and undertaking. To date S.W. Weeks has not received a response from the contacted stakeholders.

On February 22nd S.W. Weeks reached out to the owners of the local business Apple Brook Campground to notify them of the undertaking and inquired to see if they had any comments/concerns. The owners mentioned that they had no concerns with the undertaking itself. They did express they previously had one issue with pit operations. The issue was elevated noise levels from generators running in the early hours of the morning disrupting campers. At the time the owners went to the site and discussed the issue with the foreman. The foreman recognized the issue and reconfigured the site layout placing the generators further away from the campground. They also placed a large stockpile between the generators and the campground to act as a noise buffer. These two changes resolved the issue to the satisfaction of the owner. During pit operators noise levels will be kept below the decibel level prescribed in the *Nova Scotia Pit and Quarry Guidelines* however S.W. Weeks understands that sounds below those levels can be disruptive in a rural setting. The owner was provided with the contact information of an S.W. Weeks superintendent and informed to contact them should any further issues arise during continued operations.

Upon submission of the registration document to NSECC S.W. Weeks will place advertisements with a brief description of the project in the Pictou Advocate and Saltwire. This is the minimum requirement as per NSE guidelines for this type of project. A copy of the newspaper advertisement can be found in appendix C.

4.2 Public Comments

No comments have been brought to the attention of S.W. Weeks during the public information processes.

5. DESCRIPTION OF THE UNDERTAKING

5.1 Geographical Location

5.1.1 Existing Communities

The 6 Mile Brook Pit is in the rural community of 6 Mile Brook, Pictou County, Nova Scotia. The following Table 5-1 shows the number of residents within 500m, 1 km , 1.5 km, and 2km of the pit (Measured from the outermost property line of the pit to the nearest property line of a residential property).

Table 5-1 Residence in Proximity to Pit

Distance	Residence	Total
500m	5	5
1000m	4	9
1500m	9	18
2000m	14	32

5.1.2 Water Supply

There are no wells at the 6 Mile Brook Pit. Water for washing operations is provided by rainfall and subsequent surface water collection. Surface runoff is collected from the disturbed area and directed to the wash pond system via two swales. One swale is located directly south of the existing wash plant and one directly east of the wash plant. Upon entering the wash plant the velocity of the runoff is slowed which allows any suspended soil particles to settle to the bottom of the wash pond. Due to an impermeable clay liner the wash ponds do not lose water due to infiltration. The wash ponds are a closed loop system when the wash plant is in operation. When the wash plant is not in operation the wash ponds are allowed to overflow.

5.2 Physical Components

5.2.1 Screening and Washing

Screening will be completed periodically throughout the construction season by mobile screen decks. The screen decks will be placed in close proximity to the expansion area working face. There is currently a wash plant on site in a state of disrepair. Should it prove economical to restore the washplant S.W. Weeks will do so. If not it shall be disassembled and removed prior to final reclamation of the site.

5.2.2 Settling Ponds

There are currently 6 settling ponds on site which treat effluent from the wash plant and surface water runoff from the working area. The ponds do not collect surface water runoff from a small section of the

working area and the proposed expansion area. An additional pond is required more information regarding the additional pond can be found in Section 6.2.1.

5.2.3 Stock Piles

Stock piles shall be maintained in the working area through the duration of pit activities. They shall be placed on the north and south sides of the road leading to the expansion area working face.

5.2.4 Roadways

There is a single roadway in and out of the pit. The roadway extends west to east and leads directly from the entrance gate to the expansion area. While a multitude of unmaintained access roads exist on the same property no other roadways shall be maintained by S.W. Weeks for the purposes of pit activities.

5.3 Site Preparation and Construction

5.3.1 Site Orientation

Orientation of the site is dictated by the location of existing infrastructure and location of the native material. The wash plant and wash ponds represent the most critical infrastructure on the site. Their current location is not optimal for this section of native material however their location was optimal for much of the historic material extraction. Due to the impracticality of moving these structures with each phase of development they must remain in place. The target native material is located on the North Eastern section of the site. The material was deposited by a meltwater channel in the last ice age. Traditionally this material would be referred to as an esker however eskers in Nova Scotia were not formed in the typical manner (Prese 1919). The Nova Scotia Geoscience Atlas from Geonova does not provide a high enough resolution to determine exactly what type of surficial geology the material most closely resembles. The material is in a mound shape approximately 230m long and 37m tall with side slopes of 2H:1V.

5.3.2 Cut and Fill Activities

Cut and fill activities are distributed into three distinct phases with overlapping timelines. The first phase is preparation, the second phase is operation, and the third phase is reclamation. For the preparation stage approximately 10,000cu.m of overburden will be removed from the expansion area and stockpiled for use during the third stage. In the second stage material will be removed from the expansion area to be processed. In the third stage the stockpiled overburden material from stage one will be spread on the expansion area to promote vegetative growth. It should be noted that overburden material will be removed as required, likely over the course of several years. The entirety of the expansion area will not be stripped at one time. Cut and fill activities will be completed with a payloader, bulldozer, excavator and rock truck.

5.3.3 Removal of Vegetation

The only section that shall be completely stripped of vegetation is the expansion area, totalling 3.5 Ha. Removal of vegetation will be completed by a local forestry contractor and will be completed in a continuous operation until the entirety of the expansion area is cleared of vegetation.

5.3.4 Topsoil Storage

The soil layer within 300mm of the surface of the expansion area will be stockpiled and used as topsoil for remediation efforts. S.W. Weeks expects to remove approximately 10,000 cu.m of topsoil from the 3.5 Ha expansion area. The topsoil shall be stored on site. For this type of pit topsoil and overburdened and interchangeable.

5.3.5 Scales, Wash Pad, Lay-Down and Stockpile Areas

The existing scale and scale house shall remain in place. The lay-down and wash pad area will remain in the palace just north of the scale house. Stockpile areas will be on either side of the road leading to the working face.

5.3.6 Sedimentation Ponds and Drainage Ditches

The existing sedimentation ponds shall remain in place. Although washing operations are not likely to occur at this location in the future the ponds serve as a buffer for sediment laden stormwater to be cleaned prior to entering the receptive environment. Sedimentation ponds and drainage ditches are sized to accommodate the 1 in 10 year rainfall event.

5.3.7 Site Access Road

The site has gated access directly from the Six Mile Brook Road and is orientated in such a way that it does not possess a traditional access road. The entrance gate opens directly to the Scalehouse and stockpiling area. The driveway entrance is not a standard NSDPW entrance. There is no driveway culvert and the site access is between 1-3% slope from the edge of the road to the scale house.

5.3.8 Sewage Treatment

There is no on site sewage disposal system for the project facilities. Sanitary facilities are provided via portable restrooms.

5.3.9 Dangerous Goods Storage

Dangerous goods will not be present on site unless there are washing or screening operations occurring. If such operations are occurring onsite, all dangerous goods shall be in portable job trailers stored in accordance with the requirements on their respective MSDS's and Section 84 of the Environment Act *Dangerous Goods Management Regulations*.

5.3.10 Stream Crossings and Diversions

All activities in this project will occur further than 30m from a watercourse, water body, or wetland. For the purposes of this project there shall be no stream crossings, stream diversions, lake dewatering, or any other activities which may require a notification for the alteration of a wetland or water course. Furthermore should any incident occur which could pose risk or possesses perceived risk to aquatic ecology S.W. Weeks shall immediately notify NSECC.

5.3.11 Structures

Currently there are 5 permanent structures on the project site, the wash plant, two storage buildings, the scale and the scalehouse. Due to frequent trespassing, vandalism and theft the two storage buildings are unfit for occupation and will be demolished upon reclamation of the site. The wash plant requires extensive repairs due to hurricane Fiona and will be repaired should it be deemed feasible to do so. The wash plant will be dismantled and removed upon final reclamation of the site. The scale and scale house are existing and in good condition.

5.3.12 Utilities

There are no public utilities available at the project site. Power for operations is supplied by large three phase diesel generators. Power is supplied to the scale and scale house by small generators.

5.3.13 Erosion and Sedimentation Control

For current operations there is no defined and sedimentation control plan. For the purposes of this project an erosion and sedimentation control plan was created in accordance with the Nova Scotia Pit and Quarry Guidelines. A berm composed of impermeable material (Permeability < 3e-6 m/s) shall be constructed around the entirety of the project site. The interior toe of the berm shall be sloped as to direct surface water toward the sedimentation ponds. All disturbed areas not being used for pit activities shall be vegetated.

5.3.14 Risk Management

There is no permanent on site fuel storage for this project. All fuel for pit activities will be supplied by a fuel truck on an as needed basis. While screening and washing activities are taking place fuel will be delivered daily. During regular operation, fuel will be supplied on a weekly basis or less as required. In the event of an uncontrolled release S.W. Weeks has SWP’s in place.

5.3.15 Visual Impact Management

The site is not currently subject to any view plane easements or restrictive covenants of a visual nature. The portion of the site bounded by the 6 Mile Brook Road has been allowed to naturally vegetate to provide a visual barrier. Upon final reclamation of the site the ground surface shall be sloped to resemble natural topography and vegetated.

5.4 Operation and Maintenance

5.4.1 Drilling and Blasting

At no point will blasting occur on site. Blasting is not required to extract the material on this site.

5.4.2 Screening and Washing

The primary components of the operation are extraction and screening of material. These operations will occur almost exclusively during daylight hours and periodically throughout the construction season.

5.4.3 Equipment

Equipment to be used on site during normal operations is summarized below in Table 5-2.

Table 5-2 Equipment Summary

Type	Quantity	Model (or similar)
Loader	2	Cat980
Excavator	1	Cat345
Screener	1	Sandvik QA335

5.4.4 Stockpiling

Stockpiling will occur in conjunction with extraction and screening. It is expected a total area of 12Ha shall be used for stockpiling.

5.4.5 Water Management

Surface runoff shall be controlled through drainage ditches surrounding exposed soils. These ditches shall be sized to accommodate the 1:100 year 24hr rain event. The ditches will outfall to the existing sedimentation pond system on site. Refer to Section 6.1.2 for a detailed plan of the surface water management system.

5.4.6 Waste Management

Overburden on the site is the target commodity. In the extraction area vegetation shall be stripped and stockpiled to be used for topsoil during remediation. While the bedrock on site is acid-generating the overburdened is not. Sediment shall be managed through careful shaping of the land to direct sediment laden waters to the wash pond system where sediment will be allowed to settle out of the water. The wash ponds will require periodic maintenance.

5.4.7 Transportation

All transportation to and from the site will occur via the Six Mile Brook Road. Truck traffic is not expected to be increased beyond currently established usage.

5.4.8 Noise Management

Due to the remote location of the site noise has not been a concern for local stakeholders except for the one previously mentioned incident. Should further concerns arise S.W. Weeks will work with the affected party to resolve the issue in a satisfactory manner. All noise shall be kept below 65dBa during daylight hours as per the “Nova Scotia Pit and Quarry Guidelines”.

5.4.9 Dust Control

Dust control on site shall be accomplished through road wetting. In the past dust has not been an issue for local stakeholders. Should the need for dust control arise a water truck will be filled at the S.W. Weeks shop from the Town of Stellarton municipal water supply.

5.4.10 Utilities

There are no public utilities on site. Employees are provided with portable restrooms and bottled drinking water. All power is supplied via generators.

6. VALUED ENVIRONMENTAL COMPONENTS AND EFFECTS MANAGEMENT

6.1 Biophysical Environment

6.1.1 Geology

6.1.1.1 Geology Information

The study area is situated wholly on the Boss Point Bedrock Formation. This formation is composed of fluvial sandstone, calcrete limestone, conglomerate and mudstone. The Boss point formation formed in the late carboniferous period and its parent formation is the Cumberland Group (Nova Scotia Geoscience Atlas).

The surficial geology of the study area is composed of three different units, a Silty Till Plain to the East, a Colluvial Deposit to the North, and an Outwash Fan to the west (“Nova Scotia Geoscience Atlas” n.d.). The dominant landscape feature and target for extraction is a large esker in the Colluvial Deposit Deposit to the North. Soils in all three units are very rapidly draining.

6.1.1.2 Geology Mitigation

Beyond the removal of material from the expansion area there shall be no further excavation at the site and excavation into bedrock or below the groundwater table. Therefore it is unlikely there will be any mitigation required relating to geology.

6.1.2 Surface Water

6.1.2.1 Surface Water Information

No watercourses will be altered as part of the proposed pit expansion. Given the high permeability of existing soils and relatively small expansion area, infiltration rates and by extension surface water runoff are not expected to be altered by any measurable quantity. Several watercourses were identified in the study area by McCallum Environmental. Most of those watercourses have no risk of being disturbed due to the pit expansion. There is however an elevated risk of sediment entering a particular watercourse if a high degree of caution is not exercised. The primary area of concern in regards to surface water is the upper reaches of water course #2 which wraps around the eastern side of the expansion area. The catchment area of WC#2 is 41.7Ha with an expected discharge of 0.73 Cu.m/s during a 1 in 100 year rainfall event.

6.1.2.2 Surface Water Mitigation

The primary method of mitigation used to reduce potential effects of the pit expansion is avoidance. There shall be vegetated buffers between all exposed ground and adjacent watercourses. Appendix D shows a detailed surface water management plan that shall be implemented to mitigate any potential effects to WC#2. All surface water from the working area shall be collected by drainage ditches and directed to sedimentation ponds.

6.1.3 Groundwater

6.1.3.1 Groundwater Information

There are two surficial groundwater regions within the study area. In the south is a glaciofluvial aquifer and to the north is a glaciolacustrine aquifer. All current excavation occurs above the groundwater table and this is expected to continue in the expansion area. During the lengthy history of pit activities there have been no reports from local residents of wells or water supply being affected from the pit activities. It is unlikely that expansion of the pit will affect groundwater in any measurable quantity. Drilling of monitoring wells could introduce further possibility of groundwater contamination on the aquifer because it is confined and the bedrock is acid generating. Should the department deem it pertinent to install monitoring wells and develop a pre and post expansion groundwater monitoring plan then S.W. Weeks shall do so without question.

Due to the highly permeable nature of the existing soils there is an increased risk of spills or leaks from fuel/oil rapidly polluting the water table.

6.1.3.2 Groundwater Mitigation

Excavation in the expansion area will not occur below the ground water table additionally no pumping of groundwater will be required for the proposed expansion. Potential effects to groundwater through

physical means are expected to be negligible. There is a risk of groundwater contamination due to spills of fuel/oil, S.W. Weeks has prepared an emergency response plan for spills.

6.1.4 Wetlands

6.1.4.1 Wetlands Information

McCallum Environmental, commissioned by S.W. Weeks Construction, conducted wetland identification as part of the baseline biophysical assessments for the proposed Six Mile Brook Pit Expansion Project. A copy of their report can be found in appendix E. The objectives of these surveys were to identify wetlands and determine their significance as freshwater aquatic habitat. A comprehensive survey within the Study Area identified a total of five wetlands, comprising swamps and complexes with combinations of swamps and marshes. These wetlands cover a total area of 7.07 Ha. Treed swamps dominate the wetland types, representing 9.6% of the total wetland area in the Study Area. Additionally, two freshwater marshes were delineated within the Study Area, present throughout the complexes. Most wetlands are hydrologically isolated, lacking defined surface water connections such as inlets, outlets, or throughflows.

Wetland 5 within the Study Area supports Species at Risk habitat, indicating its potential designation as Wildlife Significant Sites pending review by Nova Scotia Environment and Climate Change. The Wetland Evaluation and Scoring Protocol-Aquatic Component results indicate moderate to high function and benefit scores for the wetlands in the Study Area.

6.1.4.2 Wetlands Mitigation

Impact to wetlands due to pit activities is expected to be negligible. Pit activities will not disturb any of the wetlands identified in the survey. Potential impacts to wetlands will be mitigated by avoidance using vegetated buffers and directing surface water runoff to the sedimentation pond system.

6.1.5 Flora and Fauna Species and Habitat

6.1.5.1 Flora and Fauna Species and Habitat Information

McCallum Environmental commissioned by S.W. Weeks, conducted avian and terrestrial biophysical surveys. The surveys encompassed the EA Study Area, which spans 96.9 hectares, bordered by Stillman Road to the south and within 300 meters of Four Mile Brook Rd to the east. The Study Area includes the entirety of PIDs 65173437, 00834622, and 00834721, along with a portion of PID 00834739 and a 100-meter buffer on a mapped watercourse south of the proposed expansion.

Avifauna surveys were conducted from April to October 2023, totaling 16.18 hours of survey effort, covering various seasons and migratory periods. A copy of the report can be found in appendix F. The objectives of these surveys were to identify avian species, with a focus on Species at Risk and Species of Conservation Interest. Also to determine trends in species composition and bird group usage throughout

different seasons. A total of 1139 individuals representing 90 bird species were observed within the Study Area. The majority of species belonged to passerines, accounting for 87.18% of the observed species diversity, followed by other landbirds, waterfowl, and nocturnal and diurnal raptors. Notably, six avian SAR species and seven avian SOCI were observed, including Canada warbler, Eastern wood-pewee, and Peregrine falcon. Forested edges and open areas such as swamps and ponds exhibited the highest individual and species counts, likely due to habitat variability and structure attracting diverse avian species.

McCallum Environmental also conducted baseline biophysical surveys for terrestrial flora and fauna. A copy of the terrestrial baseline report can be found in appendix G. The surveys were conducted between April 2023 and September 2023, covering a range of forest types and wildlife habitats within the study area. The surveys aimed to assess flora, fauna, and habitat inventory to support the provincial Environmental Assessment and Review Process. Objectives included identifying Species at Risk and Species of Conservation Interest, compiling a general inventory of flora, fauna, and habitat, and understanding seasonal trends in species composition. The study area encompassed approximately 96.9 hectares, including both historical and current pit areas. The area predominantly consisted of mixedwood forests, which are vital for numerous wildlife species. It also included habitat for mainland moose, though no moose were observed during surveys. However, suitable habitat for moose activities like foraging and cover was identified. Field surveys identified 148 vascular plant species, including two priority plant species: Meadow Horsetail and American Beech. Additionally, two SOCI lichens were identified: Fuscopannaria sorediata and Spotted Camouflage Lichen.

6.1.5.2 Flora and Fauna Species and Habitat Mitigation

In total only 3.5Ha of land will be stripped of vegetation to allow for the pit expansion. To mitigate potential impacts on fauna species and habitat the two measures that shall be implemented are avoidance and compensation. Avoidance shall be achieved by ensuring stripping of vegetation will only occur in the expansion area. Compensation will be provided by the reclamation of the 10Ha area that was used by the previous property owner for pit activities. By incorporating these mitigation measures, the Six Mile Brook Pit Expansion Project aims to minimize adverse effects on fauna/avifauna species and habitat, ensuring the long-term conservation of biodiversity in the project area.

6.1.6 Fish and Fish Habitat

6.1.6.1 Fish and Fish Habitat Information

McCallum Environmental Ltd. conducted baseline biophysical reports for the proposed Six Mile Brook Pit Expansion Project in Nova Scotia, commissioned by S.W. Weeks Construction Limited. A copy of their report can be found in appendix H. The assessments aimed to support provincial regulatory applications and understand potential impacts on fish and fish habitat. Field evaluations in 2023 included delineating watercourses, conducting fish community surveys, characterizing fish habitat, and sampling water quality. Results revealed the presence of three fish species, including Atlantic salmon and brook trout, with certain areas identified as priority habitat. Despite suitable conditions for cold-water species, limitations in habitat complexity were noted, particularly for salmonid spawning. Beaver dams in certain

watercourses could impede fish passage during low water levels. Overall, most aquatic features were deemed important fisheries resources.

6.1.6.2 Fish and Fish Habitat Mitigation

The primary mitigation measure to address potential impacts on fish and fish habitat is avoidance. No fish habitat will be disturbed due to the pit expansion. Vegetated buffers shall be maintained between pit activities and fish habitat.

6.1.7 Atmospheric Conditions / Air Quality

6.1.7.1 Atmospheric Conditions / Air Quality Information

Dust emissions from screening and truck transportation of materials are primary concerns. These emissions can lead to the release of particulate matter into the atmosphere, which may pose risks to human health and the environment. Additionally, other air emissions, including those from heavy equipment exhausts, may contain pollutants such as nitrogen oxides, sulfur dioxide, volatile organic compounds, and carbon monoxide, further impacting air quality.

6.1.7.2 Atmospheric Conditions / Air Quality Mitigation

To mitigate potential negative impacts on atmospheric conditions/air quality, the following measures will be implemented, dust control, emission reduction, and operational best practices. Dust control measures shall be implemented as required. This will include the use of water suppression systems and covering materials during transportation to reduce fugitive dust emissions. Emission reduction shall be accomplished by emission control technologies on heavy equipment such as diesel particulate filters, catalytic converters, and low-emission engines to minimize air pollutant emissions. Operational best practices will be employed to optimize vehicle routing on surfaces with a low content of fine material, minimizing dust generation and air emissions. Measures such as regular maintenance of equipment, proper tire inflation, and reduced idling times will also be implemented to mitigate emissions.

6.1.8 Noise Levels

6.1.8.1 Noise Levels Information

Predicted effects of increased noise levels on wildlife include disruption of nesting and breeding behaviors, habitat displacement, and changes in species distributions. Similarly, residents near the site may experience annoyance, sleep disturbance, and reduced quality of life due to elevated noise levels. Apart from the previously mentioned incident in Section 4.1, S.W. Weeks has not received any complaints from locals regarding noise levels. Noise levels are not expected to increase from previously established acceptable levels. No blasting will occur on site.

6.1.8.2 Noise Levels Mitigation

To mitigate the potential impacts of noise levels, the use of sound barriers, mufflers, and enclosures for noisy equipment to attenuate noise levels at the source. Operational controls will be implemented to limit the reversing of equipment to avoid activating back up beepers. By implementing these mitigation measures the project aims to minimize adverse effects on wildlife and residents, ensuring compliance with the noise limits set out in the “Nova Scotia Pit and Quarry Guidelines” and promoting harmonious coexistence with the surrounding environment.

6.2 Socio-Economic Conditions

6.2.1 Economy

6.2.1.1 Economy Information

The primary economic activities in the area surrounding the pit are forestry, sand/gravel extraction, camping, and small-scale agriculture. The economic activity which stands to be most affected by the pit expansion is the camping industry, more particularly the Apple Brook Campground located approximately 500m south of the project site and 1km south of the expansion area.

6.2.1.2 Economy Mitigation

There are no expected negative effects on the local economy apart from the potential effects to the Apple Brook Campground. There are no expected physical effects to the Apple Brook Campground from continued pit operations and expansion. S.W. Weeks shall maintain open lines of communication with the campground and address any concerns as they arise.

6.2.2 Land Use and Value

6.2.2.1 Land Use and Value Information

Prior to the 1960’s the Six Mile Brook area was mostly used for small scale agricultural purposes. The area has been extensively used for aggregate production and extraction since at least the 1960’s. The surface geology of the area lends itself well to sand and gravel extraction, evident by the multiple small pits in the surrounding areas. Sand and gravel extraction appears to increase the perceived value of the land for the purposes of recreation and tourism. Without the industry in the area it likely wouldn’t have the drastic landscape which attracts local off road enthusiasts.

During the EA process it was discovered that near the southern border of the property a local septic tank pumping company, at one time, had a disposal site for residential sewage. The disposal site functioned much the same as a residential septic system. It consisted of three large fiberglass septic tanks and a disposal field. Upon further investigation it was revealed that this septic system was known to at least one long time employee of S.W. Weeks. Its installation predates S.W. Weeks purchase of the property however there is no written documentation of the system.

6.2.2.2 Land Use and Value Mitigation

S.W. Weeks shall continue to comply with applicable regulations in the “Nova Scotia Pit and Quarry Guidelines”.

As per NSECC’s “On-Site Sewage Disposal System: Technical Guidelines” the tanks of the septic system were pumped out by a registered septic tank cleaner, crushed and buried. The remainder of the system shall remain in-situ as per the policy for abandoning a septic system.

6.2.3 Transportation

6.2.3.1 Transportation Information

Continued operations and expansion at the pit is not expected to increase truck traffic volume beyond current levels. Dust from truck traffic on the graveled section of the Six Mile Brook Road may become a concern for local residents. The graveled section of the Six Mile Brook Road may require additional surface maintenance beyond usual maintenance by NSDPW.

6.2.3.2 Transportation Mitigation

S.W. Weeks shall provide dust control to the gravel section of the Six Mile Brook road should the need arise. S.W. Weeks shall also regrade the graveled section of the Six Mile Brook road in the event NSDPW cannot provide maintenance in a timely manner.

6.2.4 Recreation and Tourism

6.2.4.1 Recreation and Tourism Information

The Six Mile Brook Trail trailhead is located just north of the pit entrance. This trail is frequently used by local hikers to enjoy nature and admire the historic pit/quarry activities. The planned expansion of the Six Mile Brook pit will have little to no effect on the existing trail because it was established long after the pit was in operation. A prominent feature of this trail is the historic quarry activities to the west of the site. It provides hikers with an uncommon, distinct landscape to view and explore.

Snowmobilers use Six Mile Brook and surrounding areas to enjoy their sport. There is a strong presence of snowmobilers in the area with many kilometers of trails being maintained thanks to the extensive efforts of local snowmobile clubs. A section of the 553 Trail runs just to the west of the site. Expansion of the Six Mile Brook Pit is not expected to affect snowmobilers because the pit will not be operating in the winter.

Another type of recreation commonly enjoyed by locals in the area surrounding the pit is the use of off road vehicles. This activity is not condoned by S.W. Weeks. All people partaking in the activity are trespassing and in violation of the law. Despite extensive effort from local law enforcement, the Six Mile Brook pit and the historic workings surrounding it have become a gathering spot for off-road vehicle enthusiasts. Remediation of the pit will help to reduce the effects of this activity on wildlife.

The Six Mile Brook area is remote and offers ample opportunity for hunters and fishermen to enjoy their sports. There are two parcels of crown land 1.5km to the west of the site which any hunter can enjoy. It is very unlikely the proposed expansion will have any effects on the hunting opportunities in those areas.

Fishermen can enjoy the Six Mile Brook so long as they follow the restrictions set out in the Nova Scotia Anglers Handbook for the reaches of the west river downstream from the Highway 104 Bridge. Due to the topography of the site it is unlikely to have sediment from pit activities released into the Six Mile Brook.

Apple Brook Campground is located approximately 500m from the site. To date there have been no comments or complaints from campers regarding pit activities. Continued operations are not expected to affect enjoyment of the campground.

6.2.4.2 Recreation and Tourism Mitigation

The effects on tourism, recreation and viewscapes from continuing operations are expected to be negligible. There are currently ample opportunities to engage in tourism and recreation in the surrounding areas which have been continuously utilized during the long working history of the pit.

6.3 Cultural and Heritage Resources

The site and surrounding areas have been worked extensively for timber, farming and gravel extraction since colonization. It is unlikely to find any evidence of pre colonial habitation or use in the areas that have been previously worked. Despite this S.W. Weeks retained professional archeologist Fred Schwarz from Black Spruce Heritage Services to determine the historical significance of the area. Upon completion of background research and field investigation, including two archeological excavations, it was determined there was a low probability of the proposed expansion area being archaeologically significant.

7. EFFECTS OF THE UNDERTAKING ON THE ENVIRONMENT

During the initial phase of expansion, activities such as trucking, and equipment operation may generate dust and noise, potentially impacting air quality and noise levels in the surrounding area. Additionally, vegetation removal associated with site preparation may disrupt terrestrial habitats, leading to habitat loss and fragmentation for wildlife species within the 3.5Ha expansion area. However, implementation of dust control measures and operational best practices will help mitigate these negative effects, promoting environmental sustainability during the initial phase.

Throughout the operational phase of the project, continued material extraction and processing activities may result in ongoing noise and dust emissions, affecting nearby wildlife habitats, local community and local business. Increased truck traffic associated with material transportation may also contribute to air pollution and noise pollution, potentially disrupting wildlife behaviors and causing annoyance to residents. Adherence to emission reduction technologies, operational controls, and community engagement strategies will be crucial in minimizing these adverse impacts on the environment, ensuring the long-term ecological integrity of the area.

During the reclamation stage restoration of disturbed areas will provide opportunities for habitat rehabilitation and ecosystem restoration. Reclamation efforts, including revegetation, will help restore biodiversity and ecological functions, promoting habitat connectivity and resilience.

In summary, while the Six Mile Brook Pit Expansion Project may pose challenges to the environment during its expansion, operation, and reclamation stages, proactive measures and mitigation strategies will be employed to minimize adverse impacts and maximize environmental benefits. By integrating environmental considerations into project planning and implementation, the project aims to achieve a balance between resource extraction and environmental protection, promoting sustainable development and long-term environmental stewardship.

8. EFFECTS OF THE ENVIRONMENT ON THE UNDERTAKING

Pit activities will adhere to the terms and conditions of this Environmental Assessment, NSE Industrial Approval, and the *Nova Scotia Pit and Quarry Guidelines*, ensuring compliance with relevant legislation, policies, and guidelines.

By implementation of mitigative measures and rehabilitation efforts outlined in this assessment, along with adherence to existing provincial guidelines and approvals, no significant adverse residual environmental or socioeconomic effects are expected. Effects are anticipated to be of small-negligible magnitude, local extent, rare to intermittent frequency, and short-term duration.

Economic benefits, including employment opportunities and a sustainable source of quality aggregate for local demand markets.

Environmental effects associated with the project include the loss of habitat within the proposed expansion area. Only a small area of vegetation removal is required to complete the project, minimizing habitat disturbance.

In summary, while the environment may influence certain aspects of the undertaking, mitigative measures and adherence to environmental regulations will help minimize potential adverse effects.

Citations

Nova Scotia Environment. 2013. *On-Site Sewage Disposal Systems Technical Guidelines*.

“Nova Scotia Geoscience Atlas.” n.d. Nova Scotia Geoscience Atlas Viewer. https://fletcher.novascotia.ca/DNRViewer/?viewer/?viewer=Geoscience.

Prest, Walter H. 1919. “On The Nature and Origin of The Eskers of Nova Scotia.” *Nova Scotia Institute of Science*