Environmental Management & Protection Plan

Wocawson Energy Project

October 2018

Table of Contents

Introduction

This report details the Environmental Management and Protection Plan (**EMPP**) for the construction, operation, maintenance, and decommissioning of the Wocawson Energy Project (the **Project** or **WEP**), located between the communities of Springdale and Portage Vale, New Brunswick.

Wocawson Energy Limited Partnership (**the Proponent**) aims to address potential impacts that the project may have on valued ecological components, including but not limited to water quality, wetlands, soil contamination and wildlife. The Proponent is a partnership between Tobique First Nation and Natural Forces. Natural Forces is acting as Developer for the Project.

The EMPP specifically includes management plans and mitigation measures for:

i. Air quality;
ii. Fire management;
iii. Domestic waste management;
iv. Hazardous waste management;
v. Wetland protection;
vi. Watercourse and water quality protection;
vii. Erosion and sedimentation control;
viii. Wildlife interactions;
ix. Spill contingency;
x. Noise management; and,
xi. Emergency Response.

The EMPP is produced by the Proponent for the Project. Any amendments will be issued by the Proponent and the Project Manager will be responsible for providing amendments to the Contractor.

Environmental Management and Protection Plan Objective

This EMPP serves to guide the Contractor during the construction phase of the WEP to avoid and/or minimize potential environmental impacts associated with the proposed works. It is the Contractor's responsibility to familiarize themselves with the document and ensure that all works are undertaken in an environmentally safe and responsible manner, in compliance with all relevant Provincial, Federal and Municipal laws, bylaws and regulations. The EMPP also serves as a guide to avoid and/or minimize environmental impacts throughout the operation, maintenance and decommissioning phases of the Project.

Project Description

The entirety of the Wocawson Energy Project being development by the Proponent consists of 6-12 wind turbines capable of producing 20-40 MW of renewable energy, access roads, an underground and overhead collection system, a substation and a 5.25km 69 KV transmission line connecting it to the existing electrical grid. Although the turbines, roads, collection system and substation will be constructed, owned, operated and maintained by the Proponent, the 5.25km of new transmission line that will connect the turbines and substation to the existing NB Power transmission grid will be constructed, owned, operated and maintained by NB Power.

This project is part of NB Power's LORESS program, which aims to help New Brunswick achieve its mandated targets for renewable energy production.

Scope of Work

The scope of the EMPP includes the construction, operation, maintenance and decommissioning of the portion of the Project that will be owned by the Proponent. The activities proposed for these four phases are further described in the sections below.

The construction work, the operation, maintenance and the decommissioning for the proposed 5.25km transmission line, will be conducted by NB Power. As such, they will follow their Environmental Field Guide while constructing the line to mitigate environmental impacts as described in Appendix A.

Construction work

The construction of the Project consists of the installation of 6-12 wind turbine generators (WTG), WTG foundations, 12.5 kV overhead and underground electrical system, access roads, equipment laydown areas, crane pads and a substation.

There will be three main work packages for the construction of the Project:

1. The civil works will consist of the following:
    a. Clearing of trees;
    b. Construction of the access road, crane pad, substation pad, turning areas and equipment laydown areas;
    c. Excavation, sand placement and backfilling of cable trenching; and
    d. Property restoration.

2. The WTG works will include the following:
    a. Design of the WTG foundation:
    b. Excavation and construction of WTG foundation; and
    c. Install and commission the WTG and Supervisory Control and Data Acquisition (SCADA) system.

3. The electrical works will consist of the following:
    a. Design of the electrical interconnection (Collection System) works to a substation
    b. Design a substation with a step-up transformer; and,
    c. Construction of the collection system which will consist of a section of underground cabling from the WTG to the overhead Collection System which then will be connected to a substation that will be constructed on site.

As it stands, it is not anticipated that concrete will be produced on site.

Operation & Maintenance work

Once the Project is commissioned, minimal vehicle activity will be required. The access road will be used for periodic maintenance and safety checks. A comprehensive SCADA system will be installed within the WTG for remote monitoring and control of the WTG, which will minimize the need for on-site personnel. The SCADA system ensures safe and efficient operation of the WTGs.

Scheduled maintenance work will be carried out several times each year throughout the operational phase as well as routine site visits. Unscheduled maintenance is minimal as the SCADA system allows 24-hour monitoring of the Project by the manufacturer and the operations team at Natural Forces.

Maintenance procedures may require use of small or large cranes for brief periods of time for replacement of blades or other turbine components.

Decommissioning work

The Project will be in operation for approximately 30 years. The lifetime is based on the duration of the Power Purchase Agreement (PPA) signed between NB Power and the Proponent.

Decommissioning will commence within 6 months after the PPA has been terminated unless otherwise decided by NB Power and the Proponent. Should the operational phase of the Project extend past 30 years, applicable permits will be obtained at that time.

Similar traffic movements to those experienced during the delivery of the turbine components are anticipated during this phase; however, overall decommissioning will require considerably lower vehicle support than during the construction phase. The following 4 steps are anticipated:

1. The WTGs will be dismantled and removed from the site for scrap or resale. The foundation, unless the landowner wishes to keep it, will be removed to below plough depth, and the top soil will be reinstated so that the land may be returned to its former use.
2. The substation will be dismantled and removed from the site for scrap or resale.
3. All other equipment will be dismantled and removed, and the land will be returned to its former use.
4. The access roads and site entrance may be removed if required. After removal, the land will be reinstated to its former use.
5. The underground cables will be below plough depth and contain no harmful substances. They may be recovered if economically attractive or left in the ground. Terminal connections will be cut back below plough depth.

Construction Timeline

The timeline for the construction of the Project is outlined in the table below. This schedule is subject to change as necessary to account for unforeseeable events, weather and delays.

Construction Activity	Estimated Timeline
Pre-Construction Activities	Q1 2019
Tree Clearing and Grubbing	Q2 2019
Construction of access road and crane pad	Q2/Q3 of 2019
Installation of Transmission Line	Q2/Q3 2019
Construction of Substation	Q2/Q3 2019
Construction of electrical works	Q2/Q3 of 2019
Construction of turbine foundation	Q2/Q3 of 2019
Wind turbine assembly and installation	Q3 of 2019
Removal of temporary works and site restoration	Q4 of 2019

Potential Environmental Impacts and Mitigation

In the following section, different valued ecological components relevant to the construction, operation, maintenance and decommissioning of the Project are analyzed to determine the potential impacts that

may occur on site. From the list of potential impacts, mitigation measures were identified to avoid and/or minimize the impacts on the valued ecological components.

Air quality

Potential Impacts

Air quality can have a detrimental effect on the environment by posing the potential risk of creating difficult breathing conditions, coating the vegetation with dust and being ingested by wildlife.

Objective

The objective of this section of the EMPP is to reduce the amount of dust and pollutants created during the construction, operation, maintenance and decommissioning of the Project.

Management and Mitigation Measures

The mitigation measures below will help address the potential risk of a decrease in air quality surrounding the site.

- The contractor shall enforce a speed limit to reduce unnecessary emissions and reduce dust propagation;
- Vehicle idling will be minimized where possible;
- Contractor car-pooling will be encouraged; and
- Fugitive dust during dry weather conditions will be controlled with the application of water when appropriate.

Fire management

Potential Impacts

Fire hazards may occur on site and can have a detrimental effect on the vegetation and wildlife that surround the project site.

Objective

The objective of this section is to reduce the risk that fires (started on site by project activities) will propagate to the surrounding vegetation and environments during the construction, operation, maintenance and decommissioning of the Project.

Mitigation Measures

The mitigation measures below will help address the potential risk of fire propagation during the construction and decommissioning phases of the Project:

- A work permit will be obtained from the regional DERD office for work within forest fire season;
- Contractors and/or workers will not construct or use campfires on site;
- Heavy equipment operators will be outfitted with fire suppressant equipment; and,
- Fire suppressant equipment will be located on site at all times during the construction phase of the project.

To mitigate the risk of fire propagation during the operation and maintenance phases of the Project, fire suppressant will be located inside the turbines at all times.

Domestic Waste Management

Potential Impacts

Domestic waste can have a detrimental effect on the environment by posing the potential risk of being ingested by wildlife, polluting watercourses and wetlands, and attracting wildlife to the site.

Domestic waste will be defined as waste generated during the construction, operation, maintenance and decommissioning of the Project and may include:

- Day-to-day waste (ex. paper, card board, plastics, food); and
- Construction activities waste (scrap steel, scrap cable, metals, wood debris, surplus concrete and excess soils from cleared areas).

Objective

The objective of this section of the EMPP is to reduce the amount of domestic waste found at the site during the construction, operation, maintenance and decommissioning of the Project and ensure it is properly disposed.

Management and Mitigation Measures

The mitigation measures below will help address the potential risk of domestic waste on site throughout all phases of the project.

- The Contractor shall ensure that the Project area remains clear of waste, and that adequate waste and disposal facilities are provided. The collection and disposal of waste shall be carried out on an appropriate frequency to keep pace with waste generation.
- All waste bins should be kept securely closed, to not attract rodents, bugs or other animals.
- Limbs and timber will be chipped and or crushed and disposed of at the site. Non-combustible material, overburden and rock will be disposed of where their use as fill material is impractical.
- Waste disposal areas, in accordance with regulatory guidelines, will be located away from rivers, watercourses or wetlands.

Hazardous Material and Waste Management

Potential impacts

Exposure or accidental spillage of hazardous materials or wastes might affect employee health and safety; contaminate soils, surface and groundwater; and endanger vegetation, fish and wildlife.

Objective

The objective is to avoid hazardous material disposal into the environment and manage their impact if they are released into the surrounding area. Possible hazardous materials present on site are:

- Fuel;
- Lubricants;
- Paints and solvents;
- Hydraulic fluids; and
- Sewage.

Mitigation Measures

The mitigation procedures below are modelled on the *Workplace Hazardous Materials Information System (WHMIS)* program, which outlines best management strategies in proper handling, storage, disposal and control of hazardous materials.

Hazardous materials (e.g. fuels, lubricants, hydraulic oil) and Hazardous wastes (e.g. sewage, waste oil) shall be managed to minimize the risk of chronic and/or accidental releases. Hazardous petroleum wastes are classified as deleterious and their disposal into the environment and water is illegal. The Contractor shall ensure that the following efforts shall be taken to minimize and mitigate potential impacts from accidental waste spillage:

- Equipment and vehicles shall only operate on areas designated for construction activities.
- Portable toilets will be located at least 30m away from any watercourses, wetlands or environmentally sensitive areas, and the sewage will be disposed of at an approved facility.
- Chemicals and petroleum hydrocarbons will be stored in appropriate containers and in specifically designated areas that are located at least 30m away from any watercourse, wetland or other environmentally sensitive areas.
- Routine maintenance, refueling and inspection of machinery shall be performed off-site whenever possible, 30 m away from wetlands or watercourses and in a contained and safe area.
- Used oil filters, grease cartridge containers and other products associated with equipment maintenance shall be collected and disposed of in accordance with regulatory guidelines.
- Fuel and hydraulic systems on all equipment shall be inspected daily to ensure there are no leaks. All leaks discovered shall be repaired as soon as practically possible.
- No fuel, oil or other hazardous materials shall be stored near watercourses, and storage of such materials shall be restricted to the construction storage compound.
- All potentially hazardous materials present on site shall be handled, labeled and stored responsibly to avoid any spillage or contamination.
- Spill response kits shall be provided by the Contractor and on site to ensure immediate response to a potential waste release.
- Spill response kits will accompany each piece of heavy equipment / machinery, stocked with adequate supplies to address the worst-case scenario in which a spill could occur on the ground, in surface water or in groundwater.
- The Contractor shall make all persons on site aware of the spill contingency plan included in of this document. The Contractor shall be responsible for the implementation of this plan on site.

Wetland Protection

Potential Impacts

Impact to wetlands would potentially occur during clearing, grubbing and excavation activities. Such activities might induce silt run-off, alter flow into the wetlands or see them become repositories of significantly increased water flow, nutrients, or sediments.

Objective

Wetlands have been delineated by a certified wetland delineator and the Project has been carefully designed to minimize impact and avoid these areas where possible. The objective is to protect wetlands from potential impacts as previously described.

Mitigation Measures

During construction of the roads, the Contractor shall employ all mitigation measures shown in this EMPP to ensure ditches direct surface water from the road away from the wetlands, maintain a silt fence between the wetland and any disturbance areas, and install effective drainage structures.

Although no wetlands were identified in the areas surrounding the turbines, collection system, roads or substation this section is being included to guide NB Power in their work on the transmission line.

Watercourse and Water Quality Protection

Potential Impacts

Improper water crossings can result in permanent diversion restriction or blockage of natural drainage, or have the potential to impact surface water quality, quantities, or flow.

Watercourses

Watercourses have been delineated by a certified watercourse delineator and the Project has been designed to minimize impact and avoid these areas.

Mitigation Measures

Watercourse alteration permits will be obtained prior to any works within 30m of any watercourses identified within the Project footprint.

Erosion and Sediment Control

Potential Impacts

The mitigation measures below are to minimize the quantity and duration of exposed or transferred soil, as well as to mitigate potential impacts on nearby water quality.

Objective

The Proponent acknowledges that proper erosion and sedimentation control is necessary to maintain water quality and reduce environmental impact on the Project area. The mitigation measures will be implemented based on *New Brunswick's Guidelines for Roads and Watercourse Crossings – Section 3: Erosion and Sedimentation Control Measures*. Measures are intended to minimize the impacts erosion and sedimentation have on the nearby watercourses, wetlands and on the species that live within them.

Mitigation Measures – Erosion Control

The Contractor shall comply with the following best management practices on erosion control.

- Steep slopes and erodible soils near watercourses or wet areas shall be stabilized immediately after excavation to reduce the velocity of surface runoff.
- Excavation shall be managed in sections or stages such that the time between disturbance of soil and seeding of finished slopes is minimized.

- Excavations will be timed with weather forecasts to minimize open excavations during wet periods to the extent possible, which minimizes the possibility of erosion and sedimentation.
- Topsoil stockpile locations shall be prepared and used as early as possible. If any topsoil stockpiles are stored on site, then they will be protected from precipitation using anchored polyethylene tarps, and erosion and sedimentation control structures will be placed to capture any potential runoff.
- A speed limit on site access roads shall be enforced to help reduce soil loss.
- Existing culvert passages shall be maintained.
- Slope grades shall be minimized during construction. Unprotected cut or fill slopes shall be stabilized by gravel or geo-textile fabric if they are deemed likely to erode.

Mitigation Measures – Sediment Control

While Erosion control measures are inherent in the design of the works and will be employed in the construction as a priority, the sediment control measures outlined here will be employed at the Project site. The Contractor shall be responsible and ensure that these control measures are followed. These control measures include the following:

- Ditches are designed to take off water at low velocities and redirect it to vegetated areas;
- Outflows from ditches must cross dispersion berms at ~1% grade to keep flow slow;
- Culverts and ditches are aligned to follow existing natural drainage;
- Culvert outflows will feed into stone rip rap aprons at shallow grades to minimize erosion;
- Silt fence is to be employed along edge of excavations in areas where onward drainage is possible;
- Damaged erosion and sediment control (ESC) measures (ex. fallen fences) shall be repaired immediately;
- Accumulated sediment shall be cleaned out at regular intervals after heavy rain falls;
- Straw-bale barriers and silt curtains will be used in ditches where necessary to provide a barrier to silt movement;
- If it is deemed necessary to limit surface run-off during construction, sediment pools shall be installed and maintained. Any water with large sediment concentrations shall be directed to such basins and released when appropriate;
- The Contractor shall ensure that all ESC measures are in place prior to site disturbance;
- The ESC measures shall be maintained during Project activities and shall remain in place once area is stabilized; and
- The installation of any erosion protection materials is to be carried out by starting on the upstream side of a watercourse and progressing downstream, using clean, durable, non-ore bearing and non-toxic materials obtained from a non-watercourse source.

Monitoring Program

There are no watercourses within the area surrounding the turbines, collection system, roads or substation, surface waters are limited to rain water draining off the road surfaces. The Contractor shall inspect all sediment control barriers each week and before and after heavy rain events to ensure they are working as intended and fix or modify any ineffective barriers as soon as possible. During rain events, the Contractor shall monitor culvert outflow to ensure that the rain water does not bring excess sediment and take corrective actions as necessary.

Wildlife Interactions

Potential Impacts

Terrestrial wildlife may be disturbed throughout the construction phase but it is likely the wildlife will return to the site during operation. The wind turbines may also present a hazard to avian and bat populations in the area through collision or barotrauma (for bats).

A post-construction monitoring plan will be developed and implemented by a third-party consultant in consultation with Department of Energy and Resource Development (DERD), DELG and Canadian Wildlife Services (CWS), and will follow the Post-Construction Bat and Bird Mortality Survey Guidelines for Wind Farm Development in New Brunswick (DERD, 2011).

Objective

The objective of the wildlife interaction plan is to reduce the unanticipated hazards to avian and bat species as well as terrestrial wildlife on site.

Mitigation Measures

During the construction phase, wildlife interactions will be mitigated by ensuring that food waste and other garbage is stored so that it is not accessible by wildlife. The garbage will also be disposed properly to avoid attracting wildlife to the site.

Effort will be made to avoid tree clearing during the breeding bird season. If clearing is required during this time, a qualified biologist will be onsite to conduct monitoring to identify possible breeding birds in the area and their active nests. These monitoring efforts will follow Environment and Climate Change Canada's (ECCC) specific considerations related to determining the presence of nests. A biologist will observe the bird species in the area and determine if there is presence of suitable nesting habitat within the proposed clearing area. As well, they will observe bird behaviour including, but not limited to, territorial males and individuals carrying food to determine the potential for active nests in the area.

Post-construction monitoring will help identify the impact of the Project on birds and bats. Should significant mortality occur during operation, consultation with DERD, DELG and CWS will occur to determine the best course of action. Mitigation that may be implemented could include the following:

- Increasing the WTG rotor 'cut-in' speed preventing the rotor from spinning at low wind speeds when some species are more active
- Submitting annual reports to regulators and if required, consult to determine any necessary mitigation action (e.g. increasing cut-in speed, and other operational adjustments)
- At the request of DERD and CWS the Proponent can also develop an Adaptive Management Plan for bird and bat mortality monitoring to ensure a plan is in place should unanticipated avian or bat impacts occur during operation.
- In addition to these mitigation measures and measures outlined in the EIA, the Proponent will also submit post-construction data to the Wind Energy Bird and Bat Monitoring Database to support national efforts to better understand wind turbine effects on birds and bats.

Should a mortality of an individual migratory bird species at risk, or 10 or more migratory birds in one night, CWS will be contacted within 24 hours (Environmental Emergencies 1-800-565-1633). The New Brunswick Department of Energy and Resource Development will also be notified.

More details on the mitigation measures for bird and bat mortalities can be seen in the Adaptive Management Plan submitted to DELG.

Should an impact be seen on terrestrial wildlife on regular site visits through construction, operation, maintenance and decommissioning, DELG and ERD will be notified and consulted to determine the best approach for each specific issue.

Spill Contingency Planning

Potential Impacts

The potential impacts to soil, surface water and ground water could occur during the construction, operation, maintenance and decommissioning of the Project.

Objective

This contingency plan reflects on potential accidents and malfunctions during project work. The Canadian Standards Association publication, *Emergency Preparedness and Response,* was used in developing this plan that will aim to contain spills should they occur despite using the approaches discussed in this EMPP.

Spill response procedures

The Contractor shall ensure spill kits accompany each piece of heavy equipment / machinery and that there are adequate supplies in each kit to address the worst-case scenario in which a spill could occur on the ground, in surface water or in groundwater. All spills or leaks such as those from machinery or storage tanks must be promptly contained, cleaned up and reported. Within a week of the accidental spill or leakage, a report will be submitted to the DELG by the Proponent. As demonstrated in the spill response report form included as Appendix B, the report will outline:

- The cause of the release,
- Adequacy of the response to the release by the persons responsible,
- Plans to remediate land that was directly impacted,
- Manners of collection and dispose of the contaminant, and;
- Plans to prevent a reoccurrence of the unauthorized release.

Emergency contacts

All accidental spills and leaks, regardless of the amount, shall be reported to the DELG's Saint John Regional Office at (506) 856-2374 during regular business hours and to the environmental emergencies reporting system (Maritime Provinces 1-800-565-1633) outside of regular business hours.

Noise management

During the construction, maintenance and decommissioning phases of the Project the ambient noise will be elevated as a result of the use of equipment and machinery such as excavators, dump trucks and bulldozers. Elevated noise levels can disturb fauna and local residents.

To mitigate the risk of annoyance due to the elevated construction and equipment noise, the following mitigative measures will be applied, as discussed in the Complaint Resolution Plan (Appendix C):

- Noise impacts will be limited by restricting construction and decommissioning activities to daytime hours when feasible;

- Complaints will be discussed with workers or contractors involved;
- Solutions to the complaints will be established on a case by case basis with workers and contractors;
- Complainants will be informed of how the issues was or will be addressed; and,
- If the complaints persist, the worker(s) and contractor(s) may be dismissed.

To address elevated noise impacts during the operational phase, the turbines has been sited to minimize the impact this additional noise will have on residences and local businesses surrounding the project. Should a community member have any concerns regarding the noise emissions from the turbines during the operation of the Project, their complaint will be addressed following the Complaint Resolution Plan (Appendix C). Should the issue persist, or multiple instances of noise complaints occur that cannot be addressed with the Complain Resolution Plan, the Proponent will hold discussions with DELG. A noise monitoring plan may be developed as a result of the discussions with DELG should it be required.

Emergency Response

The following provides contact numbers in the case of emergencies involving: worker safety, public safety and environmental emergencies.

Emergency Contact List

Organization	**Contact Name**	**Contact Number**
Fire Department	-	911
Ambulance	-	911
RCMP Police	-	911
Sussex RCMP	-	506.433.7700
Natural Forces Project Manager	Don Bartlett	902.220.7918
Sussex Health Centre	-	506.432.3100
DELG Saint John Office	-	506.658.2558
Canadian Coastguard	Environmental Emergencies	1.800.565.1633
Canadian Wildlife Services	-	1.800.668.6767
Archaeology Services Branch	-	506.453.2738

Appendix A

NB Power's Environment Field Guide

Environmental **FIELD GUIDE**

A quick reference to key day-to-day activities that are associated with the construction, operation and maintenance of transmission facilities.

June 2013

Énergie NB Power

Saint John River Valley - Tony Crawford

INTRODUCTION

The Environmental Field Guide has been developed to provide a quick reference to key day-to-day activities that are associated with the construction, operation and maintenance of transmission facilities. The Field Guide is designed specifically for field activities and does not describe the regulatory processes that are involved in acquiring the necessary permits and approvals to perform the work.

The information contained in the Field Guide has been derived from various documents associated with the Environmental Management System (EMS) (i.e., Environmental Protection Plan, procedures and other manuals). If there are any discrepancies between this Field Guide and the official approved version of the EMS documents, the information in the EMS documents shall prevail.

For additional information, please contact EMS Coordinator.

TABLE OF CONTENTS

International Power Line Project - Tony Crawford

PRE-JOB ASSESSMENT AND TAILBOARD

Prior to initiating work, site conditions should be reviewed to ensure that all environmental issues have been addressed or taken into consideration in the work plan/work order(s).

Tailboard meetings with contractors and work crews provides the opportunity to review the environmental issues and to determine if site conditions have changed significantly from the work plan or work order.

During the tailboard meeting, the following items should be addressed by the Site Coordinator:

- Are spill kits and spill clean-up material on-site and readily available?
- If environmental approval and permits are required to perform the work, are they available on-site?
- Is all the equipment and material required to minimize environmental impacts available on-site (i.e., silt fence, pumps, hay bales, seed mix, temporary bridge, etc.)?
- Are personnel working on-site familiar with the spill response procedure?

Grand Lake Marsh - Tony Crawford

TEMPORARY WETLAND CROSSINGS

Temporary wetland crossing options include wood mats, corduroy and swamp mats. Temporary wetland crossings should be avoided unless absolutely necessary. Successful crossings are enhanced with root and slash mat to provide additional support for equipment and geotextile to segregate the crossing from underlying soil and provide floatation.

Wood Mats

Wood mats provide surfaces that protect wetlands during traveling of equipment. They are made from hardwoods or round logs that are cabled together and placed on top of geotextile or brush.

Wood mats should be used on flat surface (maximum grade 4 percent) and surface that is free of high spots (e.g., stumps and large rocks). Mats can also help stabilize approaches to stream crossings.

Source: Internet

When building and installing a wood mat, consider the following:

1. Logs at least 10 feet long, 4 inches by 4 inches should be used. Longer logs should be used for weak soils.
2. Holes should be drilled about 1/4-inch through each log about 1 to 2 feet from each end. The logs should then be stringed close together with a 3/16-inch galvanized steel cable.
3. Make loops at the end of each cable for ease of transport. Secure loops with 3/16-inch cable clamps. Tuck loops under the mats during installation and use so that they don't get caught by vehicles.
4. If needed for stability or to reduce movement, connect mats using quick links or other heavy-duty connectors.
5. Mats should be installed on top of geotextile or brush that covers the crossing area. On a haul road, smooth out high spots and fill ruts to protect the geotextile fabric and the mats. Do not disturb the root mat of any vegetation because it provides additional support.
6. Use the size of wood mat needed to meet anticipated loads, soil strength, and installation equipment. Use larger mats on very weak soils with low bearing strength (e.g., muck or peat) to spread the weight over a larger area.
7. Wood mats should be inspected during and between uses to make sure no sections are broken. Repair broken pieces by disconnecting the cable clamps and sliding off and replacing broken sections.

Corduroy

In areas with weak soils, vehicles and equipment can rut or disturb those soils, damage vegetation, and alter wetland hydrology. Properly planned and constructed crossings can protect wetlands.

Corduroy crossings are useful on most wetland soils and wet areas on a trail/road with level topography (slopes up to 4 percent). Avoid firm, high spots (e.g., stumps and large rocks) which may break the corduroy.

Line 3016

When constructing a corduroy crossing, consider the following:

1. High spots should be smoothed out and ruts should be filled within the crossing area. Root or vegetation mat should be left in place to add stability to the crossing.
2. The crossing area should be covered with nonwoven geotextile.
3. Pieces of roundwood, mill slabwood, brush, or slash should be laid onto the geotextile, perpendicular to the direction of travel. Each piece of corduroy should be as long as the equipment using the crossing to provide maximum flotation.
4. Once access to the work area is no longer required, material should be removed from the wetland.

Swamp Mats

Swamp mats may be constructed of old tires, fabric or wooden portable bridging. Geo-textile fabric may be placed between the mat and the surface of the wetland to provide additional support.

Mats should be placed end-to-end to form a continuous span for the entire length of the area to be protected and should be inspected regularly and maintained as necessary to ensure their proper function. Swamp mats are for temporary use only and should be removed once access to the work area is no longer required. Swamp mats are the preferred crossing method over brush mats and corduroy.

Line 1236

TEMPORARY WATERCOURSE CROSSINGS

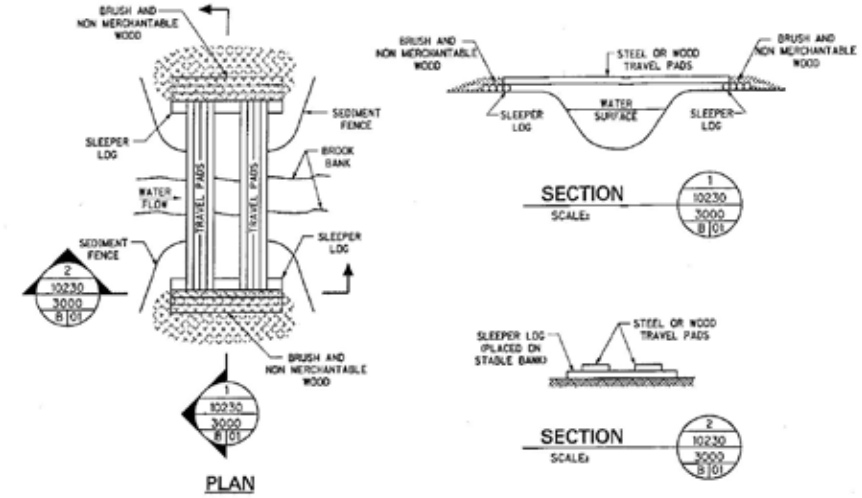
A temporary watercourse crossing is used when heavy equipment must be moved from one side of a stream channel to another, or where light-duty construction and maintenance vehicles have to cross the stream channel frequently for a relatively short period of time.

Bridge

Bridges are the preferred method to cross watercourses.

Maintenance Guidelines

1. A periodic inspection of the bridge should be performed to ensure that the bridge, streambed, and stream banks are maintained and not damaged.
2. Maintenance should be performed, as required, to ensure that the structure complies with the specifications noted above. This includes removal and disposal of any trapped sediment and debris (i.e., shovel mud). Sediment should be disposed of outside the buffer zone and stabilized.
3. When the bridge is no longer required, all bridging material (sleeper logs, pads, etc…) should be removed and placed outside the buffer zone.
4. Brush and non merchantable wood used to install the bridge should be removed to an area where it cannot re-enter the watercourse.
5. Removal of the bridge and stabilization of any disturbed areas should be accomplished without construction equipment working in the channel.
6. All disturbed areas will be reclaimed.



Ice Bridges

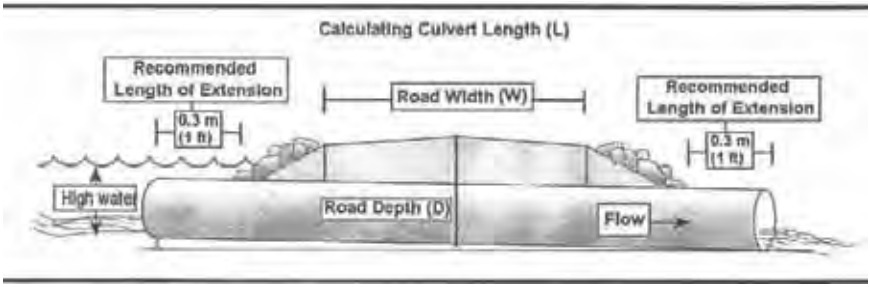
Choose a time frame of at least 15 consecutive days that the night temperatures are below 0 degrees F. This will make certain that the ground is completely frozen all the way through and not just in few layers.

Source: Internet

1. Pick a place for your bridge that is level or almost level and has a low flow. Or the area can be completely dry or completely frozen. Any of the places mentioned will do the trick.
2. Put snow that does not have dirt or any other debris in it, into the channel to back the water up. Add water to the bridge so it will ice over. Make sure you do not add any limbs, sticks, or debris to the ice because this can weaken the structure or cause the stream to be blocked once it begins to flow again.
3. Continue the above mentioned process until the bridge reaches the length and depth you need it to be. It should be designed so that the traffic meets it at a level approach, but also strong enough to support the traffic you are expecting to cross it.

Culvert

Temporary culvert is effective in controlling erosion but will cause erosion during installation and removal. Temporary culvert can only be installed by Installers who have been certified under the Watercourse Alteration Certification Program.



Source: New Brunswick Department of Environment, Watercourse Alteration Certification Training Manual

Culvert length will be determined by using the following formula:

L (m) = W + 4D + 0.6 m or L (ft) = W + 4D + 2 ft where;

L =	length of culvert required
W =	road width
D =	total depth from stream bed to road surface, including height of cover.
0.6 m	it is recommended that a length of 0.3 m (1 ft) of culvert extend beyond the toe of the fill at both the upstream and downstream ends.

In the event that the roadway meets the watercourse crossing at an angle, it will be necessary to add 10% to the culvert length for each 10° skew from the perpendicular. Where the culvert has been stabilized by cribbing or shear wall, a 2:1 slope requirement will apply to the area from the top of the cribbing or shear wall to the road surface.

Culvert

Maintenance Guidelines

Line 1212

1. A periodic inspection of the culvert should be performed to ensure that the culvert, streambed, and stream banks are not damaged, and the sediment is not entering the stream or blocking fish passage.
2. Maintenance should be performed, as required, in a timely fashion to ensure that the structure complies with the specifications noted above. This includes removal and disposal of any trapped sediment and debris. Sediment should be disposed of outside the buffer zone and stabilized.
3. When the culvert is no longer required, all material should be removed and placed outside the buffer zone.
4. Removal of the culvert and stabilization of any disturbed areas should be ac complished without construction equipment working in the channel.
5. All disturbed areas will be reclaimed.

Ford

A ford or low-water crossing uses the stream bed as part of the road or access trail. A ford should only be considered as an alternative to constructing a bridge or installing a culvert. They are best suited for short-term, limited traffic. Use should be limited to periods of low flow when the water is less than 2 ft (0.6 m) deep.

Little River Hill

Because the spawning beds of many fish species occur within the same areas that make a good ford crossing, fords should not be constructed or used during periods of fish spawning. Also, construction should not occur during fish migration periods. Fords should maintain the natural shape and elevation of the stream channel to avoid creating obstructions to the movement of fish and other aquatic organisms.

1. Fording locations must be chosen to minimize disturbance to the banks.
2. Fording must take place perpendicular to the watercourse.
3. Equipment utilizing fords are to be clean and free of leaks.
4. The number of crossings shall be kept to a minimum and confined to the low flow period between June 1st and September 30th
5. Approaches to the crossing shall be stabilized and access roads to crossing shall be covered with clean gravel.
6. Exposed soils must be stabilized at crossing locations.
7. Felled trees, slash and/or debris shall not be hauled through or allowed to enter the watercourse.
8. Crossings shall be removed as soon as they are no longer necessary and approaches shall be mulched or otherwise stabilized so as to minimize any sediment runoff into the watercourse.
9. The crossing area shall be restored to a condition equivalent to the condition prior to construction.
10. Fords are prohibited in watercourses located in designated drinking water supply watersheds.

Newcastle Stream - Tony Crawford

EROSION AND SEDIMENTATION CONTROL MEASURES

When determining the proper temporary erosion control measure to implement at a specific site, you must decide which of the following three design objectives is most suitable:

- Keep the soil at its original location.
- Keep the soil close to its original location.
- Keep the soil on site.

Keeping the soil at its original location is the preferred objective because it causes the least amount of harm to the environment. Soil transported off-site can cause far-reaching damage to the downstream environment. Loss of soil from the site should be avoided to the extent practicable.

Silt Fences

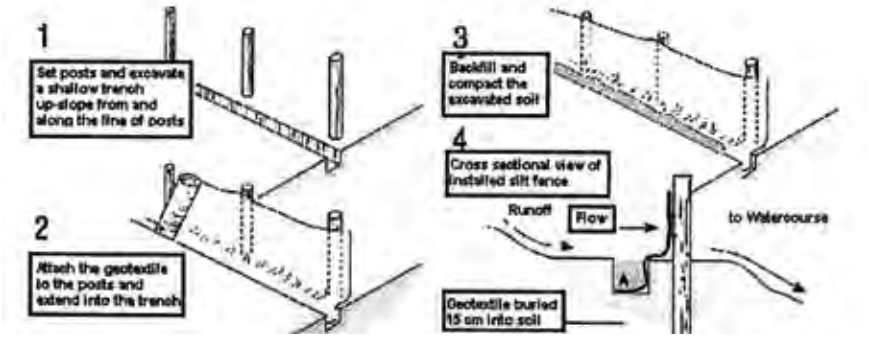
Silt fences have a useful life of one season. Their principle mode of action is to slow and pond the water and allow soil particles to settle. Silt fences normally cannot filter the volumes generated by channel flows. When installed across a concentrated flow path, undercutting of the fence often occurs. Silt fences should

Line 3016

not be designed to impound sediment or water more than 18 inches (0.5 m) high. Sediment shall be cleaned from behind the fence when it reaches 50% of the designed impoundment height (9 inch (0.2 m)).

Silt fence will be constructed as follows:

1. Set wooden or steel posts a minimum of 3 m (10 ft) apart and drive into the ground a minimum of 30 cm (12 in). Wooden posts should be 150 cm (60 in) in length and at least 10 cm (4 in) in diameter.
2. Excavate a trench, approximately 15 cm (6 in) deep up-slope from and along the line of the posts.
3. Attach filter fabric to the posts on the uphill side and extend into the trench approximately 15 to 20 cm (6 to 8 in).
4. Fence height should not exceed 90 cm (36 in).
5. Backfill the trench over the fabric and compact the excavated soil.



Straw Bale Barrier

A straw bale barrier is a temporary sediment barrier consisting of a row of entrenched and anchored straw bales used to retain sediment from runoff in small drainage areas of disturbed soil.

The straw bale barrier will be constructed as follows:

1. Excavate a trench, approximately 10 cm (4 in) deep and the width of a straw bale.
2. Place bales in the trench and tightly butt the ends.
3. Stack each bale twice, with either wooden or rebar stakes angled into the adjacent bale.
4. Fill in the gaps by wedging loose straw between bales to create a continuous barrier and prevent sediment from escaping through the spaces.
5. Backfill and compact the excavated soil.
6. On the downhill side, backfill should be built level to the ground.
7. On the uphill side, built the backfill up approximately 10 cm (4 in) above the ground.
8. Remove the straw bale barrier once site is stable.

Straw Bale Barrier

Inspection and Maintenance

1. Inspect straw bale barriers prior to forecast rain, daily during extended rain events, after rain events, and at two-week intervals during the non-rainy season to ensure that they are intact.
2. Straw bales degrade, especially when exposed to moisture. Rotting bales will need to be replaced on a regular basis.
3. Replace or repair damaged bales as needed.
4. Repair washouts or other damages as needed.
5. Sediment that accumulates in the barrier should be periodically removed in order to maintain the effectiveness of the barrier. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
6. Remove straw bales when no longer needed. Remove sediment accumulation, and clean, regrade, and stabilize the area. Removed sediment should be incorporated in the project or disposed of.

Keswick Terminal

SPILL RESPONSE AND REPORTING

In the event of a spill at the work site, the following steps should be taken:

1. STOP THE FLOW of the spill, if safe to do so, taking precautions to avoid personal injury.
2. Perform a quick ASSESSMENT of the spill:
   - _ Is there a concern for human health? If so, should the area be cordoned off?
   - _ How extensive is the spill?
   - _ Are there any watercourses, wetlands, or other sensitive environmental features nearby and down gradient of the spill?
   - _ Are there drainage systems that lead to these features?
3. CONTROL and CONTAIN the spill, if it can be done safely, using on-site materials.
4. CONTACT the PSO at 1 800 756-8411
5. NOTIFY other NB Power designated representative.
6. CLEAN-UP the spill by removing contaminated materials and soils.
7. STORE waste material in leak-proof, sealed containers and POST label on the containers for proper disposal.
8. RECORD the details of the spill on Form 590 "Spill Report" and send it to the EMS Coordinator.

Additional information can be found in the Spill Response, Clean-up and Reporting Procedure SU2-A65400-0005 located on Transmission's Manuals site.

Barred Owl - Tony Crawford

WILDLIFE MANAGEMENT

Wildlife encounters may occur during line construction or maintenance activities.

These encounters can potentially disturb wildlife and disrupt work activity. In most cases, interaction with wildlife is of short duration, with minimal consequences. However, wildlife species often have critical periods in their life-cycles when any disturbance may result in displacement from their normal habitat, desertion of young, or other harmful reaction. NB Power Transmission personnel and contractors will not harass wildlife and will keep encounters to a short period of time.

Osprey Nests

Ospreys are protected in New Brunswick. The osprey population nesting on transmission and distribution lines has grown over the years. When nests pose immediate threat to the reliability of the system, notify the Biologist at Department of Natural Resources ((506)-453-7111) that the nest must be removed

and contact the EMS Coordinator to advise where the nest is located (i.e., structure number and line number).

Every reasonable effort should be made to transfer the nest to a platform as opposed to destroying the nest. If the nest can't be relocated intact, place a few twigs or branches from the nest on the new platform to encourage the osprey to rebuild the nest the following season. Note: The platform pole height needs to be equal or greater than the existing structure. Please refer to drawing number STDL-20140-3000-001-DD-D-00.

If the nest does not pose immediate threat, identify the area (e.g. structure number, line number, etc.) and schedule an inspection following fledging of the osprey chicks (typically after August 15) but before the following nesting season (i.e., April 15). After the chicks have fledged, the nest can be removed from the structure following the steps outlined above.

Additional information can be found in the Guidelines for Dealing with Osprey Nests on NB Power Structures SU2-A65400-0020 located on Transmission's Manuals site.

Migratory Birds

Migratory birds are protected under the Migratory Birds Convention Act its Regulations. Under the Act, it is against the law to:

Mallards - Tony Crawford

- deposit or permit to be deposited, oil, oil wastes or any other substances harmful to migratory birds in any waters or any areas frequented by migratory birds; and
- disturb, destroy or take migratory birds, their nests or their eggs during the nesting season (i.e., typically May 1 to August 1).

If an active nest is identified during the nesting season, the following steps should be taken by staff:

1. The nest location will be clearly marked using survey tape and a 3 m buffer will be left around the nest.
2. The area will be left untouched until after the nesting season.
3. The nest location (i.e., line or structure number, etc.) will be documented and reported to the EMS Coordinator.

Additional information can be found in the Avian Protection Plan SU2-A65500-0004 located on Transmission's Manuals site.

Beaver Dam Removal

Beaver dam removal may occur partially or completely depending on the purpose of the removal. The removal should cause a gradual release of water in order to minimize any scouring of the downstream channel and the amount of sediment released into the watercourse.

Carleton County - Tony Crawford

Beaver dams can be removed by an Installer who has been certified under the Watercourse Alteration Certification Program during the ice-free period which would normally be between May and November. Beaver dams can be removed only if the dam and associated flooding is causing property damage or is an immediate threat of damage to property of an infrastructure. Removal of beaver dams by hand is the preferred method. This involves using only hand tools in the wetted perimeter of the flooded area and limiting the use of machinery to winching material out with equipment stationed outside the wetted area.

The following conditions will be implemented, where applicable, when removing beaver dams:

1. The Certified installer will ensure all conditions under the Watercourse Alteration Certification Program are adhered to. The Department of Environment will be notified and provided with information (i.e., GPS coordinates, before and after photos) within 72 hrs.
2. The removal of the dam will be limited to the debris used to build the structure.
3. An application for a standard permit will be submitted on a site-specific basis to remove a beaver dam outside the ice-free period.
4. The beavers will be removed prior to removal of the dam. A licensed Nuisance Wildlife Control Operator or a licensed trapper will ensure the activity is conducted in compliance with applicable legislation.
5. The impounded water will be released over an extended period so as to minimize silt flushing from the impounded area and reduce channel erosion due to the increased discharge and water velocities.

Beaver Dam Removal

6. Debris removed from the beaver dam will be placed above the high water mark or disposed of in such a way it cannot get washed back into the water course by flooding.
7. All mechanical equipment used to carry out this activity will be located outside of the wetted portion of the watercourse. No fill or structures will be placed within the wetted perimeter to facilitate removal of the beaver dam.
8. For beaver dams affecting existing roadways, excavators and backhoes may be stationed on the roadbed due to their ability to only remove the debris with out disturbing the bed or banks.
9. If heavy equipment cannot be stationed on an existing roadway, and the machinery does not rut the ground, it may be stationed upland of the edge of the wetted impounded area 6 m (20 ft) from the shoulder of the natural channel. Equipment will not be allowed to enter the water body or be stationed on its banks.
10. All exposed areas will be seeded if possible and blanketed with hay/straw mulch.

York County - Tony Crawford

GOOD HOUSEKEEPING PRACTICES

Good housekeeping practices make the work site a cleaner and safer place. Keeping a work site relatively clean of debris can further reduce hazards. Housekeeping is a continuous process that should involve everyone on a job site. The best time to clean up is immediately after the debris has been created.

Housekeeping Checklist:

- ☐ Is the work site clean and orderly?
- ☐ Is debris remove debris in a timely fashion?
- ☐ Are household garbage, debris, waste oil, and sediments, disposed properly?
- ☐ Are spill cleanup materials readily available and in a known location?
- ☐ Is spill cleanup material properly disposed of?
- ☐ Is loose scrap or light materials that may be blown by high winds, properly secured?
- ☐ Are materials and wastes stored outdoors contained and covered when not in use?
- ☐ Is all debris and trash picked up and placed in their proper containers?

Appendix B

Spill Response Report Form

Spill Response Reporting Form

General information	
Date (dd/mm/yyyy)	
Contact person	
Consultant or Contractor	
Address	
City	
Postal Code	
Tel	
Email	
Details of incident	
Date of spill (dd/mm/yyyy)	
Time of spill (hh:mm)	
Weather conditions at the time of the spill	
Name of person who reported the spill	
Name of person who responded to the spill	
Type of contaminant spilled	
Description of spill (size, location, environment, source of spill, extent of contamination, etc.)	
Cause of spill	
Response to the spill (in detail)	

Names of organization, departments or local authority contacted	
Adequacy of the response (by person responsible)	
Are further steps required to remediate the land (y/n)	
If yes, describe the future plans to remediate the land that was impacted	
How was the containment collected and disposed	
Describe the steps or approach that will be implemented to prevent a reoccurrence of this incident	
Additional detail	

Appendix B

Complaint Resolution Plan

(as shown in the Wocawson Project Environmental Impact Assessment)

Formal Complaint and Concern Procedure for the Wocawson Energy Project

Wocawson Energy Limited Partnership (the Proponent) and owner of the Wocawson Energy Project, is committed to addressing any public concerns regarding the Project located in Kings County, New Brunswick. The intention is that this plan can inform the public on the ways that they can communicate their concerns to the Partnership and how concerns will be addressed.

1.0 PURPOSE

The purpose of this policy is to ensure all public concerns are dealt with consistently and effectively. Wocawson Energy Limited Partnership aims to:

- Manage concerns and complaints openly, promptly and properly;
- Resolve concerns and complaints as soon as possible; and
- Learn from the issues and improve our commitment to minimize any impacts on the community.

2.0 SCOPE

This policy will address any concerns complaint; written or spoken expression of dissatisfaction that are brought forward to the Partnership regarding the Wocawson Energy Project.

3.0 PROCEDURE

All concerns or complaints of the Wocawson Energy Project will be directed to the Community Liaison Officer, Amy Pellerin:

Amy Pellerin | Development Engineer
Natural Forces Wind Inc.
1801 Hollis Street | Suite 1205 | Halifax | NS | B3J 3N4
Tel: +1 902 422 9663 x 211
Fax: +1 902 425 7840
Website www.naturalforces.ca

Complainant will be notified upon receipt of the complaint. The Community Liaison Officer will investigate complaints within 20 days of being receiving; upon which complainant will be notified of how the concern was or will be addressed.

3.1 Noise and Shadow Flicker

Complaints regarding noise and shadow flicker will be assessed on a case by case basis. The specific date and time frame at which the noise or shadow flicker was perceived as well as the local weather conditions will be noted. The Operations Team will then be contacted to determine the direction of the wind, the status of the turbine and the speed of the wind at he time of the perceived impact.

All the details will be included in a concern and complaint tracker.

The complainant will also be asked to record any additional incidents or occurrences.

If several occurrences of issues regarding noise and/or shadow flicker that arise from the Wocawson Energy Project, an assessment of the causes of the impacts will be conducted and a monitoring program will be developed and implemented in consultation with the complainant.

Mitigation measures to reduce noise and shadow flicker have been described in the Environmental Impact Assessment and will be discussed with the wind farm's Operations Team.

Complainant(s) will be informed of noise and shadow flicker mitigation strategies and will be contacted periodically throughout the first year of the implementation of the noise or shadow flicker reduction strategies to determine the success of the strategy.

3.2 Construction and Operation

Complaints regarding construction and operation activities will be discussed with workers or contractors involved.

Solutions to the complaints will be established with worker(s) and contractor(s). Complainant will be informed of how issue was addressed.

If complaints persist, then worker(s) and contractor(s) may be dismissed.

4.0 CLOSURE

If the complainant is not satisfied with the initial response, the complaint will be referred to a higher authority within the company to further resolve the issue.