### **BOW LAKE WIND FARM**

Ministry of Natural Resources Approval and Permitting Requirements Document (APRD) Report

January 31, 2013

Prepared by:

Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership 200, 4723 -1 Street SW Calgary AB T2G 4Y8



### **BOW LAKE WIND FARM**

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### **Executive Summary**

Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership, through their General Partners Shongwish Nodin Kitagan GP Corp. and Shongwish Nodin Kitagan GP Corp., respectively (the "Proponent") are proposing to develop Phase 1 and Phase 2 of the Bow Lake Wind Farm predominantly on Provincial Crown Land within the unorganized Townships of Smilsky and Peever, in the District of Algoma, Ontario (the "Project"). The Project is located approximately 80 km north of Sault Ste. Marie and roughly six kilometers east of Montreal River Harbour. The Project has three Feed-in Tariff Contracts with the Ontario Power Authority for the sale of electricity generated by the Project.

As part of the Project's design, construction, and operational activities, and understanding the Project falls within the territory of the Batchewana First Nation of Ojibways ("BFN"), the Proponent has engaged directly with the BFN. As a result of these efforts, the BFN:

- Has entered the Project as partner;
- Has entered into various business and relationship agreements with the Proponent to guide Project activities; and
- Has issued a Development and Power Generation Permit, which provides the BFN's approval to construct, operate, repower, and decommission the Project.

The English name of the Project is the *Bow Lake Wind Farm*, however, the BFN know and refer to the Project as *Chinodin Chigumi Nodin Kitagan*.

As proposed, the Project will include 36 wind turbines for a total maximum installed nameplate capacity of up to 58.32 megawatts ("MW"). In addition, the operation of the Project will require 34.5 kilovolt ("kV") above and below ground electrical collector lines and communication lines, pad-mounted transformers, crane pads, two permanent meteorological towers, access roads, an operations and maintenance building, welfare buildings, a transformer station, construction compounds and laydown yards, and other ancillary facilities. The Project will connect to the provincial power grid via existing 115 kV transmission lines located adjacent to the Project's transformer station.

This submission has been prepared in accordance with the Ontario Ministry of Natural Resources' ("MNR") *Approval and Permitting Requirements Document for Renewable Energy Projects*, September 2009 ("APRD"). This submission provides the necessary documentation to satisfy MNR information requirements related to the relevant permits, licenses, authorizations and approvals as described in the APRD.



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### 1.0 Introduction

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Under O. Reg. 359/09, the Ontario Ministry of Natural Resources ("MNR") has the responsibility for administering the approvals and permits related to the following resources and land uses:

- Mineral Aggregate Resources
- Harvesting Crown-owned Forest Resources
- Natural Hazard Lands

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- Projects in Provincial Parks or Nature Reserves
- Fish and Wildlife Conservation Act Authorization Requirements
- Petroleum Resources
- Far North Applicability
- Forest Resource Processing Facility Licensing
- Wildfire Prevention and Preparedness Requirements, and
- Species at Risk

This submission describes the applicability of each resource and land use described above and provides the necessary documentation to satisfy MNR information requirements related to the relevant permits, licenses, authorizations and approvals. This report has been prepared in accordance with the MNR Approval and Permitting Requirements Document for Renewable Energy Projects, September 2009 ("APRD").

In addition to the information contained in this report the following REA and MNR required reports have been submitted to the MNR as part of the APRD information requirements:

- Natural Heritage Assessment
- Crown Lands Interest Report
- Project Description Report
- Water Assessment and Water Body Report
- Design and Operations Report
- Construction Plan Report
- Decommissioning Plan Report
- Consultation Report
- Archeology and Heritage Report

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### 2.0 MNR Approval and Permitting Requirements

### 2.1 MINERAL AND AGGREGATE RESOURCES

Based upon record searches completed on 17 September 2012, of the Ministry of Northern Development and Mines (Sault Ste. Marie Mining Division), there are no active mining claims in the unorganized Townships of Smilsky or Peever (See *Crown Lands Interest Report*). Through public consultation efforts, the Proponent has been made aware of mining claims that are located south of the Project, outside the Townships of Smilsky and Peever which would not be impacted by the Project. The various tenure instruments that will be issued by the MNR for the Project area will grant surface rights to the Project, however mineral rights still remain with the Crown and would continue to be managed in accordance with the *Mining Act*. The Bow Lake Wind Farm would be willing to consult with and work with prospecting and mining companies in accordance with the *Mining Act* such that the wind farm operations and potential future prospecting and mining activities could safely coexist in the vicinity of the Project with appropriate consultation and if appropriate mitigation measures are put in place. Further information on Mineral and Aggregate Resources is provided in the *Crown Lands Interest Report*.

Pending test results, it is anticipated that aggregate material for Project construction will be extracted from three pits and one quarry located in the immediate vicinity of the Project, all of which are currently permitted under the Aggregate Resources Act. One pit (i.e., Radon Pit) is located on private land (Aggregate License #625256), the two other pits have Crown Permits (Permit #'s 625249 and #625250), and the quarry also has a Crown Permit (#625248).

### 2.2 HARVESTING CROWN-OWNED FOREST RESOURCES

The Project Location and surrounding area is primarily forested land and is actively harvested by Clergue pursuant to Sustainable Forest License No. 542257. This license was issued by the MNR, which grants Clergue the right to cut and remove timber on and from the area. Overlapping License Agreements have been executed between the Project and Clergue, which address the selective clearing required to facilitate construction of the Project and on-going clearing requirements (e.g., dangerous tree removal and tree re-growth trimming at wind turbine and electrical collector line locations) during operations. Further information regarding the Project and the Sustainable Forest License holder is provided in the *Crown Lands Interest Report*.

The MNR has indicated that the Proponent may need to apply for an exemption(s) under the *Crown Forest Sustainability Act* for the clearing of areas of the Project beyond the allocated 20 m wide corridor width for the approved Forest Management Plan Roads. The Project will work with MNR to ensure the necessary exemption applications are made prior to construction.



### 2.3 NATURAL HAZARD LANDS

No natural hazard lands have been identified in the Project Location.

## 2.4 FISH AND WILDLIFE CONSERVATION ACT AUTHORIZATION REQUIREMENTS

The Proponent will work with MNR to obtain the applicable permits under the *Fish and Wildlife Conservation Act*. Based on the field surveys completed during the site investigation of the Natural Heritage Assessment, no beaver dams or black bear dens were identified in the Project area that would require disturbance or removal. The development of the Project will not affect beavers and/or their dams or the dens of black bears. If new or previously unidentified beaver dams are encountered and require removal, the Proponent will work with MNR to obtain the required permits.

It is anticipated that authorization under the *Fish and Wildlife Conservation Act* will be required for incidental take and collection of protected bird species and bats during the post-construction monitoring activities at the site. The Proponent will work with MNR to obtain the required permit(s) prior to commencement of the bird and bat post construction monitoring activities. In addition to Provincial Authorizations, the Proponent will obtain relevant permits from Environment Canada/ Canadian Wildlife Service under the *Migratory Birds Convention Act*, prior to commencement of post construction monitoring.

### 2.5 FISH AND FISH HABITAT

The Project will require a number of crossings of water bodies located in the Project area for infrastructure such as access roads and collector lines. A summary of water crossings at water bodies providing fish habitat and standard mitigation measures to minimize negative environmental effects to fish and fish habitat that may occur at these crossings are provided in the *Water Assessment and Water Body Report* as part of the REA submission. A copy of the Water Body Report forms part of the APRD submission to MNR.

In addition, a draft water crossing work permit application package, which provides the anticipated locations of proposed water crossings, typical cross sections, and general mitigation measures to minimize potential negative environmental effects to fish and fish habitat that may occur at these crossings, is provided in Appendix B.

### 2.6 PROJECTS IN PROVINCIAL PARKS

The Project is not located in a Provincial Park or Conservation Reserve and accordingly requirements under *The Provincial Parks and Conservation Reserves Act* are not applicable.



### 2.7 PETROLEUM RESOURCES

Public records searches completed on 20 July 2012, of the Ontario Oil, Gas and Salt Resource Library, did not identify any petroleum lease holders or petroleum resources in the vicinity of the Project Location (Ministry of Natural Resources, 2012b). Further information on Petroleum Resources can be found in the *Crown Lands Interest Report*.

### 2.8 FAR NORTH APPLICABILITY

The proposed Project is not located in the Far North of Ontario and thus the Far North Land Use Planning Initiative and an Act with respect to land use planning and protection (*Bill 191*) does not apply to the Project.

### 2.9 FOREST RESOURCE PROCESSING FACILITY LICENSING

The Project is a Class 4 Wind Facility and does not include a biomass, biogas, or biofuel facility that will generate electricity and accordingly Forest Resource Processing Facility Licensing requirements under the APRD are not applicable to the Project.

### 2.10 WILDFIRE PREVENTION AND PREPAREDNESS REQUIREMENTS

Any renewable energy project proposed on Crown Land, or land within a fire region, must follow the MNR's APRD for forest fire prevention and preparedness. The requirements for the Fire Prevention and Preparedness Plan ("FPPP") are defined in Section 7.11 of the MNR APRD. Under the APRD, fire risks are to be addressed through all phases of a project, including land clearing and disposal of debris, providing information on:

- fire hazard assessment (e.g., identification of fuel sources at the project location);
- risk assessment of ignition:
- ignition prevention measures, and if necessary, mitigation of potential for ignitions when operational;
- fire preparedness plan, including a suppression plan and an emergency plan; and
- fire protection of the facility from wildfire threats.

The Modifying Industrial Operations Protocol, 2008 (the "Protocol") has also been used to guide the preparation of FPPP. The FPPP prepared for the Project is provided in Appendix C

The development of a burn plan and the acquisition of a burn permit are required by the MNR for any activities involving burning at the Project site. As Project activities are not presently envisioned to involve burning for the disposal of debris, neither a burn plan or burn permit are required for the Project. However, should this need change, a burn plan will be filed with and permit sought from the MNR.

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### 3.0 Species at Risk

The Endangered Species Act, 2007 ("ESA") came into force in Ontario on June 30, 2008. Species listed as endangered or threatened on the Species at Risk in Ontario ("SARO") List, a regulation under the ESA, are protected by the ESA. Section 9 of the ESA prohibits killing, harming and harassing species that are listed as threatened, endangered or extirpated. Section 10 of the ESA prohibits damaging or destroying habitat of threatened or endangered species. Protected habitat is either based on the general definition in the Act or prescribed through regulation. The ESA defines general habitat as an area on which the species depends, directly or indirectly, to carry out its life processes, including reproduction, rearing, hibernation, migration or feeding.

The Committee on the Status of Species at Risk in Ontario ("COSSARO") has very recently made a recommendation to the Minister of Natural Resources to include two species of bats, the Little Brown Myotis (Myotis lucifugus) and the Northern Myotis (Myotis septentrioalis) on the SARO List. The COSSARO recommendation is that both bat species be designated as endangered in the province. As soon as the SARO List is amended, any potential negative effects to these species and habitat must be avoided or an authorization under the ESA (i.e., permit or agreement) will be required before the project may proceed.

The sole reason for the status change to these species is the unprecedented mortality in native bat species from Geomyces destructans, the pathogen responsible for White-nose Syndrome ("WNS"). Populations of both species have declined precipitously due to the rapid spread of WNS. WNS was first identified in a cave in New York State in February, 2006. It was discovered in Canada in the winter of 2009/2010 and is now confirmed in Ontario, Quebec, New Brunswick and Nova Scotia. Recent population counts of Little Brown Myotis and Northern Myotis at hibernacula in Canada show declines of 90-99% within two years of exposure.

As part of the Natural Heritage Assessment, an evaluation of significance was undertaken for Bat Maternity Colonies. In keeping with guidance provided by MNR, extensive exit surveys at candidate maternity roost trees were conducted in June, 2012. Seventy exit surveys were completed in accordance with the Bat and Bat Habitats: Guidelines for Wind Power Projects (MNR, July 2011) throughout the project location and adjacent forested habitat. All 70 surveys consisted of two surveyors visually observing for bats exiting candidate roost trees, with 55 of the 70 surveys supported by broad-band acoustic bat detectors and 20 of the surveys supported by infrared video cameras. Over the 70 trees surveyed, no bats were observed exiting candidate maternity roosts, and therefore the Project Location and surrounding forest habitat are not considered significant for Bat Maternity Colonies. Both Little Brown Myotis and Northern Myotis (among other species) were, however, recorded flying around the survey area.

In order to mitigate and protect any potential maternity colonies that may occur within the Project Location from disturbance during the construction phase, Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership have committed to restrict the cutting of

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any candidate roost trees from the beginning of May to the end of July, during the roosting period. Additionally, any direct effects from operating wind turbines on these two species will be assessed during a comprehensive post-construction monitoring program, developed in accordance with the Bat and Bat Habitats: Guidelines for Wind Power Projects (MNR, July 2011).

As of January 24, 2013, both the Little Brown Myotis and the Northern Myotis have been listed as endangered on the SARO List. Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership commits to working closely with MNR Sault Ste. Marie District and MNR's Species at Risk Branch to develop the framework for an Overall Benefit Permit(s) under clause 17(2)(c) of the ESA to ensure construction and operation of the Bow Lake Wind Farm will comply with either sections 9 or 10 of the ESA.

### 4.0 Summary

This report forms part of the APRD submission to address the MNR information requirements for other approval and permitting requirements that may be applicable to the development and/or operation of the Project and not addressed under Ontario Regulation 359/09. This submission has been prepared in accordance with the Ontario Ministry of Natural Resources' ("MNR") Approval and Permitting Requirements Document for Renewable Energy Projects, September 2009 ("APRD").



### 5.0 Signatures

This Crown Land Interests Report has been prepared by the Proponent in accordance with the MNR's APRD.

This Report has been prepared for the sole benefit of the Proponent, and may not be used by any third party without the express written consent of the Proponent.

Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership

Bryan Tripp, P.Eng.

Regulatory Lead - East

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### 6.0 References

Ontario Ministry of Natural Resources, <u>Approval and Permitting Requirements Document for Renewable Energy Projects</u>, September 2009.

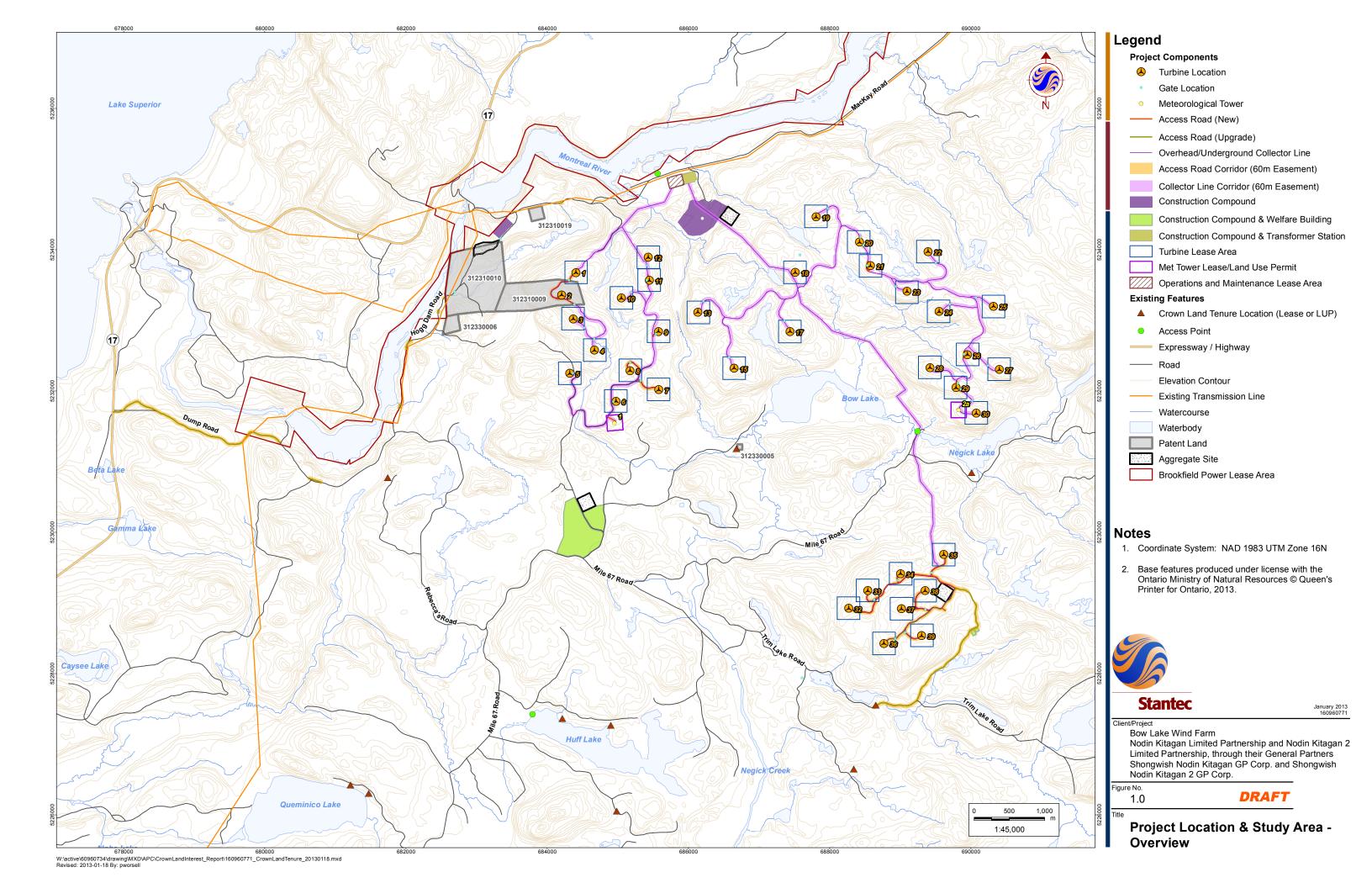
Ontario Ministry of Natural Resources, <u>Bat and Bat Habitats: Guidelines for Wind Power Projects</u>, July 2011.

Ontario Ministry of Natural Resources, *Modifying Industrial Operations Protocol*, MNR#52136, 2008.



## **Appendix A**

Site Plan





## **Appendix B**

# Preliminary Water Crossing Permit Application Package



200 Main St. PO Box 579 Thessalon, ON POR 1L0 T. 705 842.3372 F. 705 842.2658 800 797.2997 thessalon@tulloch.ca

www.TULLOCH.ca

10-212-32 January 30, 2013

Nodin Kitagan Limited Partnerships 34 Harvard Road Guelph, On N1G 4V8

Attention: Mr. Bryan Tripp

Dear Bryan,

**Regarding: Bow Lake Wind Farm** 

**Water Crossing Applications** 

Please find enclosed four application packages for the four types of water crossings associated with the proposed Bow Lake Wind Farm development. The four water crossing types and a brief description are as follows.

Road Crossings New culverts or replacement of existing culverts to facilitate access road

construction or improvements.

<u>Cable Crossings</u> Electrical cable crossing installations to facilitate electrical collection

network.

Roads & Cable Crossings New culvert installations to facilitate access road construction complete

with electrical cable crossing installations at the same location.

<u>Temporary Crossings</u> Temporary culverts or bridge installations to facilitate access trail

construction for electrical transmission line construction.

These application packages are to be considered preliminary for the purposes of identifying the anticipated crossing locations and type, based on preliminary design information and field reviews completed to date.

It should be noted that the final design of each crossing will be completed by the Site Contractor, or Site Contractor's consultant in accordance with regulatory requirements. The final design packages will be submitted for review and approval upon completion of the detailed design activities.

Trusting this information is satisfactory for your purposes at this time. Should you have any questions or concerns please do not hesitate to contact me.

Respectfully Submitted,

Chris L. Kirby, P.Eng.,
TULLOCH ENGINEERING INC.

Encls.



Ministère des Richesses naturelles

### **Application for Work Permit** Demande de permis d'exploitaion

Part 1 Partie 1

Applicant (eg. landowner, licencee, permittee, etc.) (Cannot be a subcontractor)

Demandeur (ex. : propriétaires fonciers, détenteurs de permis, etc.) (Ne doit pas être un sous-traitant)

Name/Nom. Nodin Kitagan Limited Part & Nodin Kitagan 2 Limited	_	Busine	ss Phone/Tél. (Bureau) (403) 66		Residence Phone/Tél. (Résidence)
Mailing Adduses/Aduses protein		4723 -	1st Street SW, Calgary,	AB F	Postal Code/Code postal T2G 4Y8
Site Contractor or Person in Charge/E	Entrepreneur ou re	espon	sable sur place		
	ss Phone/Tél. (Bureau)		Residence Phone/Tél. (R	ésidence)	Radio Contact Available/Radio  Yes/Oui  No/Non
Mailing Address/Adresse postale TO BE I	DETERMINED				Postal Code/Code postal
Type of Work Proposed - Please indicate a	and complete the appropriate	priate ac	dditional part(s)		•
Type de travaux prévus - Préciser et remp ☐ Building Construction ☐ Work on Sho Construction de bâtiments Travaux sur	orelands	Within a x subme nergées			Vater Crossing u traverse de cours d'eau
Location of Work Permit Area/Emplac	ement				
Township, Municipality, Basemap No. or Lot and Canton, municipalité, carte de base n° ou parcel Water Crossings #1, 2, 3, 4, 5, 6, 7 & 8  Other i.e. Waterbody (describe) Water Crossings	I Concession, Location, le, concession, emplace as detailed on the en	ement, s nclosed	ubdivision ou N° du MTU o Summary of Road Cros	ou concessions Table	
Autre p. ex. cours d'eau (décrire)		, . a o,			No. or Workers on Site
Camp Location Emplacement du camp					No. or workers on Site  Nbre de travailleurs sur le site
Private Land/Terres privées					
Private Lands of - Applicant/Appartenant au den  ☐ Yes ☒ No ☐ Other (specify)  Oui Non À d'autres (préciser qui)	nandeur				
Effective Date(s)/Dates				_	
Start Date/Date de début des travaux  Estimated as August 2	Finish Date/Date 0	de fin de Estimat	es travaux ed as December 2014	†	
Equipment to be Used/matériel qui se				_	
5 (5 ( )	ed by the Contractor.				
To be betermine	od by the Contractor.				
Note: The issuance of this permit does not relieve the responsibility of acquiring any other agency, bo approvals as may be required.	pard, government, or o	other	autorisa- tions qui pourra organismes, commission	aient être e ns, etc.	re pas le détenteur d'obtenir les xigées par d'autres gouvernements,
If an applicant requires a copy of this application, h prior to submitting.	e/she should retain copy		Si le demandeur en a besoin, il doit conserver un exemplaire de cette demand avant de la soumettre.		
Personal Information on this form is collected usection 13 of the Public Lands Act, R.S.O. 1990 453/96 as amended and Ontario Regulation 975 information will be used for the purposes of the Questions about this information should be directly office. MNR office addresses and phone number reverse of this form.	and Ontario Regulation as amended, and the Act and Regulations. ected to the local MNR	on R	en vertu de l'article 13 de règlement de l'Ontario 45 l'Ontario tel que modifié. des règlements. Veuillez	la <i>Loi sur</i> 53/96 tel qu Ils seront ( adresser to les bureaux	gés dans les présentes sont recueillis les terres publiques, S.R.O. 1990 et du e modifié et du règlement 975 de utilisés selon les termes de la Loi et oute question à ce sujet au bureau c du MRN avec adresses et numéros de
I/We hereby agree to rely solely upon the terms and work permit issued pursuant to this application. An the written work permit must be approved in writing	y changes, amendment	ts to	ploitation émis pour la prés	sente demar	t aux conditions écrites du permis d'ex- nde. Tout changement ou toute modifi- être approuvé par écrit par le MNR.
I certify the information given in this application is to	rue.		Je certifie que les renseign	ements dor	nnés ici sont véridiques.
Signature of Applicant/Signé par	Position/Poste			Date	
Signature of contractor (if applicable) Signature de l'entrepreneur (s'il y a lieu)  To Be Determined	Position/Poste			Date	
Date Application Received in Office Date de r'éception de la demande					

### Ministère des Richesses naturelles

### Road or Trail Construction/Water Crossings Construction de routes ou sentiers/traverses d'eau

Part 4
Partie 4

Ontar	io							
1)	Include a sketch showing: - detailed location of ro l'empl.acement dét - all water crossings toutes les traverses d'	ad or trail (i.e. hovailléde la route ou Please se	w close to wa du sentier (de e attached	aterboo c. –à-d Water	. distance à u	ocation D	rawing 10-212-WC1	
2)	Purpose/But  - Access to private propacces aux propriétés  - Access for resource exaccès pour extraction  - Other (specify)  Autres (préciser)	privées	ex. exploration	on mir	nière, exploita	ation minie	Ye ère ou forestière) ☐ C	s No Dui 🗵 Non
3)	<b>Type</b> (check box) Sum <b>Type</b> (cocher) ☐ Été	mmer Winter Hiver	Year I X Tout l'			ıl Road ıte de trans	Trail Piste	Other Autre
4) D	escription					5) Len	gth of Time Required/I	Ourée
Leng	th/Longueur Travelled Road Largeur utile To Be Determined D Tho will be responsible for r	I uring Detailed Des		nprise		Lor X Lor	ng Term Short Tern ng terme Cout terme	No. of Months/Years N Nbre de mois/années
	ate Person, Company, Association					en:		
	Nodin Kitagan Limite	d Partnership & No	odin Kitagan	2 Limi	ted Partnersh	nip		
	ource Gravel/Fill/Source de							
	e indicate intended source, if an Gravel from within a	oproved Right-of-V	Vay, or from	Permit	tted Aggregat			
	<b>'ater Crossing/Traverse d'e</b> m Name/Nom du course d'eau	eau (letters refer to	sample sket	ch on	reverse/les le	ettres corre	spondent à l'exemple de	croquis au verso)
Strea	m Name/Nom du course d'eau	Please see atta	iched summa	ary tab	les			
Road	Name/Nom de la route					Type of F	ill to be Used at Crossing/T	'ype de remblai utilisé
Site (	Conditions/Condition du site							
	l plain width (A)/ eur de la plaine inondable	Water Width (B Largeur de l'eau		Water Depths (C, D, E)/ Profondeur de l'eau		Measured Flow Velocit Vitesse Measurée du courant	(ft/sec or m/sec) pi/s. ou m/s	
Foun	dation Soil Description/Descript	tion du sous-sol						
8 a)	Bridge/Pont N/A							
Propo	osed Bridge – Length (F) t de pont – Longueur du pont	Clearance (G) Dégagement	Clear Span ( Travée	(H)	Crib Height Hauteur du		Crib Width (J) Largeur du berceau	Deck Width (K) Largeur du tablier
String	ger Type/Type de longeron							
String	ger Spacing/Espacement des lon	gerons						
Deck	Details (L)/Détails du tablier							
Wear	Surface (M)/Surface							
Curb	Details (N)/Détails de la chauss	ée						
Guid	e Rail Details (O)/Détails du rail	l de guidage				_		

8 b) Cuivert/Ponceau							
Culvert Diameter/Diamètre du	Culvert Length/Longueur du	Road Fill Height Above Creek Bottom/Hauteur du remblai de la route au					
ponceau Minimum 450mmØ	ponceau Based on Detailed Design	fond du cours d'eau Based on Detailed Design					



Ministère des Richesses naturelles

## Application for Work Permit Demande de permis d'exploitaion

Part 1 Partie 1

Applicant (eg. landowner, licencee, permittee, etc.) (Cannot be a subcontractor)

Demandeur (ex.: propriétaires fonciers, détenteurs de permis, etc.) (Ne doit pas être un sous-traitant)

Name/Nom.	Nodin Kitagan 2 Limi	ed Partnership	Busin	ess Phone/Tél. (Bureau) (403) 668-		sidence Phone/Tél. (Résidence)
Mailing Addre	ess/Adresse postale Blu	Earth Renewables In	nc., 200, 4723	- 1st Street SW, Calgary, Al	В Ро	stal Code/Code postal T2G 4Y8
Site Contra	actor or Person in C	narge/Entreprene	ur ou respor	nsable sur place	•	
Name/Nom		Business Phone/Tél. (		Residence Phone/Tél. (Rési	dence)	Radio Contact Available/Radio
Mailing Addre	ess/Adresse postale	TO BE DETERMINE	D			Postal Code/Code postal
Type of Wo	ork Proposed - Please	indicate and complete t	the appropriate a	additional part(s)		
Type de tra ☐ Building Co	IVAUX prévus - Précise onstruction ☐ Wo	r et remplir la partie app		a Waterbody 🔀 Roads or T ergés Routes ou		ater Crossing traverse de cours d'eau
Location of	f Work Permit Area/	Emplacement				
Canton, mun Water C	crossings #9, 10 & 11 as	ou parcelle, concession detailed on the encl	, emplacement, losed Summar	vision or Mining Claim or U.T.M subdivision ou N° du MTU ou o y of Road Crossing Table	concession	
	cours d'eau (décrire) Wa	ter Crossings #9, 10	& 11, as detail	ed on the enclosed Waterco	ourse De	scription Table
Camp Location Emplacement						No. or Workers on Site Nbre de travailleurs sur le site
Private Lan	nd/Terres privées					
☐ Yes 🛚 N	s of - Applicant/Appartena No ☐ Other (specify) Non À d'autres (précise					
Effective Da	ate(s)/Dates	•				
Start Date/Da	ate de début des travaux Estimated as A	Finish Daugust 2013	ate/Date de fin d Estima	les travaux tted as December 2014		
Equipment	to be Used/matérie	qui sera utilisé				
Please speci	ify/Préciser To Be D	etermined by the Co	ntractor.			
responsibility of approvals as me	of this permit does not re of acquiring any other ag nay be required. requires a copy of this appl	ency, board, governm	ent, or other	autorisa- tions qui pourraier organismes, commissions, Si le demandeur en a besoin,	nt être exi etc.	pas le détenteur d'obtenir les gées par d'autres gouvernements, server un exemplaire de cette demande
Section 13 of the 153/96 as amer information will uestions abo	mation on this form is co the Public Lands Act, R.S nded and Ontario Regula Ill be used for the purpos out this information shou fice addresses and phon	O. 1990 and Ontario F tion 975 as amended, es of the Act and Reg d be directed to the lo	Regulation and the ulations. ocal MNR	en vertu de l'article 13 de la règlement de l'Ontario 453/5 l'Ontario tel que modifié. Ils des règlements. Veuillez ad	Loi sur le 96 tel que seront ut resser tou bureaux	és dans les présentes sont recueillis es terres publiques, S.R.O. 1990 et du modifié et du règlement 975 de ilisés selon les termes de la Loi et ute question à ce sujet au bureau du MRN avec adresses et numéros d
vork permit issu	ree to rely solely upon the ued pursuant to this applic permit must be approved	ation. Any changes, am		ploitation émis pour la présen	te demand	aux conditions écrites du permis d'ex- le. Tout changement ou toute modifi- re approuvé par écrit par le MNR.
certify the infor	rmation given in this applic	ation is true.		Je certifie que les renseignem	nents donn	és ici sont véridiques.
Signature of	Applicant/Signé par	Position	/Poste	C	Date	
Signature de	contractor (if applicable) e l'entrepreneur (s'il y a lieu To Be Determined	Position/	/Poste	С	ate	
	ition Received in Office eption de la demande					

Ministère des Richesses naturelles

### **Road or Trail Construction/Water Crossings** Construction de routes ou sentiers/traverses d'eau

Part 4 Partie 4

1`	Includo o elzotok	showing:/Joindre	un doccin	indiament .
L	include a sketch	SHOWING./JUHIUI C	un aessin	muiquam.

- detailed location of road or trail (i.e. how close to waterbodies, etc.)

l'empl.acement détailléde la route ou du sentier (c. –à-d. distance à

- all water crossings toutes les traverses d		•	<i>N</i> ater	Crossing L	ocation Dr	awing 10-212-WC1	
2) Purpose/But  - Access to private propagates - Access for resource e Accès pour extraction - Other (specify) Autres (préciser)	perty Yes privées Dui xtraction (e.g. min	No  Non ing, logging, ex. exploration	miner	ral exploratio nière, exploita	n) ation minièr	Ye	es No Oui 🏿 Non
3) Type (check box) Sun Type (cocher) ☐ Été	nmer Winter Hiver	Year R X Tout l'			l Road ite de transp	Trail port Piste	Other Autre
4) Description					5) Leng	th of Time Required/	Durée
Length/Longueur Travelled Road Largeur utile To Be Determined D	I	Right-of-Way V Largeur de l'en sign Stage			Long	g Term Short Tern	
6) Who will be responsible for a	maintenance?/Qu	i sera respor	ısable	de l'entretio	en?		
Indicate Person, Company, Associati Nodin Kitagan 2 Limi	ited Partnership	association, ent	treprise	e, etc.			
7) Source Gravel/Fill/Source de							
Please indicate intended source, if an Gravel from within a					e Sites		
8) Water Crossing/Traverse d'o						pondent à l'exemple de	e croquis au verso)
Stream Name/Nom du course d'eau	,	•				<u> </u>	1000 10
	Please see atta	icnea summa	ry tab	es			
Road Name/Nom de la route					Type of Fil	l to be Used at Crossing/	Гуре de remblai utilisé
Site Conditions/Condition du site							
Flood plain width (A)/	Water Width (B	3)/	Water	r Depths (C, D	. E)/	Measured Flow Veloc	itv/
Largeur de la plaine inondable	Largeur de l'eau		Profondeur de l'eau		, — /-	Vitesse Measurée du courant	(ft/sec or m/sec) pi/s. ou m/s
Foundation Soil Description/Descrip	tion du sous-sol						
8 a) Bridge/Pont N/A		T		T		T = 11 == 11 == 1	T = 1 == 1 == 1
Proposed Bridge – Length (F) Projet de pont – Longueur du pont	Clearance (G) Dégagement	Clear Span (I Travée	H)	Crib Height Hauteur du b		Crib Width (J) Largeur du berceau	Deck Width (K) Largeur du tablier
Stringer Type/Type de longeron							
Stringer Spacing/Espacement des lor	ngerons						
Deck Details (L)/Détails du tablier							
Ween Confeed (M)/Sourfeed							
Wear Surface (M)/Surface							
Curb Details (N)/Détails de la chauss	sée						
Caro Detano (11/1/Detano de la cilados)							
Guide Rail Details (O)/Détails du rai	l de guidage						
8 h) Culvert/Ponceau	-						
8 D) Cilivert/Ponceau							

Culvert Dia	meter/Diamètre du	Culvert Length/Longueur du	Road Fill Height Above Creek Bottom/Hauteur du remblai de la route au
ponceau	Minimum 450mmØ	ponceau Based on Detailed Design	fond du cours d'eau Based on Detailed Design

Bow Lake Wind Farm
Summary of Road Crossings

**Prepared By: Tulloch Engineering** 

January 28, 2013

Water Body	Crossing	Crossing Type		Crossing Crossing Type		Location	NAD 83 UT	M Zone 16	Watercourse	Characteristics
Number	Number	Crossii	ig Type	Location	Northing	Easting	Thermal	Flow		
0-3	1	Culvert	New	Dump Road	5231688	678524	Unknown	Intermittent		
0-2	2	Culvert	New	Dump Road	5231541	678783	Unknown	Intermittent		
9B-10	3	Culvert	Replacement	Hogg Dam Rd	5231799	681917	Cold	Permanent		
9B-8	4	Culvert	Replacement	Hogg Dam Rd	5232704	682052	Cold	Permanent		
9B-5	5	Culvert	Replacement	Hogg Dam Rd	5233218	682504	Unknown	Permanent		
9B-2	6	Culvert	Replacement	Hogg Dam Rd	5233341	682573	Unknown	Intermittent		
9B-3	7	Culvert	Replacement	Hogg Dam Rd	5233352	682589	Unknown	Intermittent		
9B-1	8	Culvert	Replacement	Hogg Dam Rd	5233362	682625	Cold	Permanent		
9F-9	9	Culvert	Replacement	2b Access	5227574	688808	Unknown	Intermittent		
9F-3	10	Culvert	New	2b Access	5228259	689791	Cold	Intermittent		
9F-3	11	Culvert	New	2b Access	5228757	690075	Cold	Intermittent		

### Notes

- 1. Water Body Number as identified in the Water Assessment and Water Body Report; Stantec
- 2. Crossing Number as identified on Water Crossing Locations Drawing, 10-212-WC1; Tulloch Engineering
- 3. Watercourse Description and Photographs Attached for Additional Information

Bow Lake Wind Farm
Watercourse Descriptions for Road Crossings
Prepared By: Tulloch Engineering

January 28, 2013

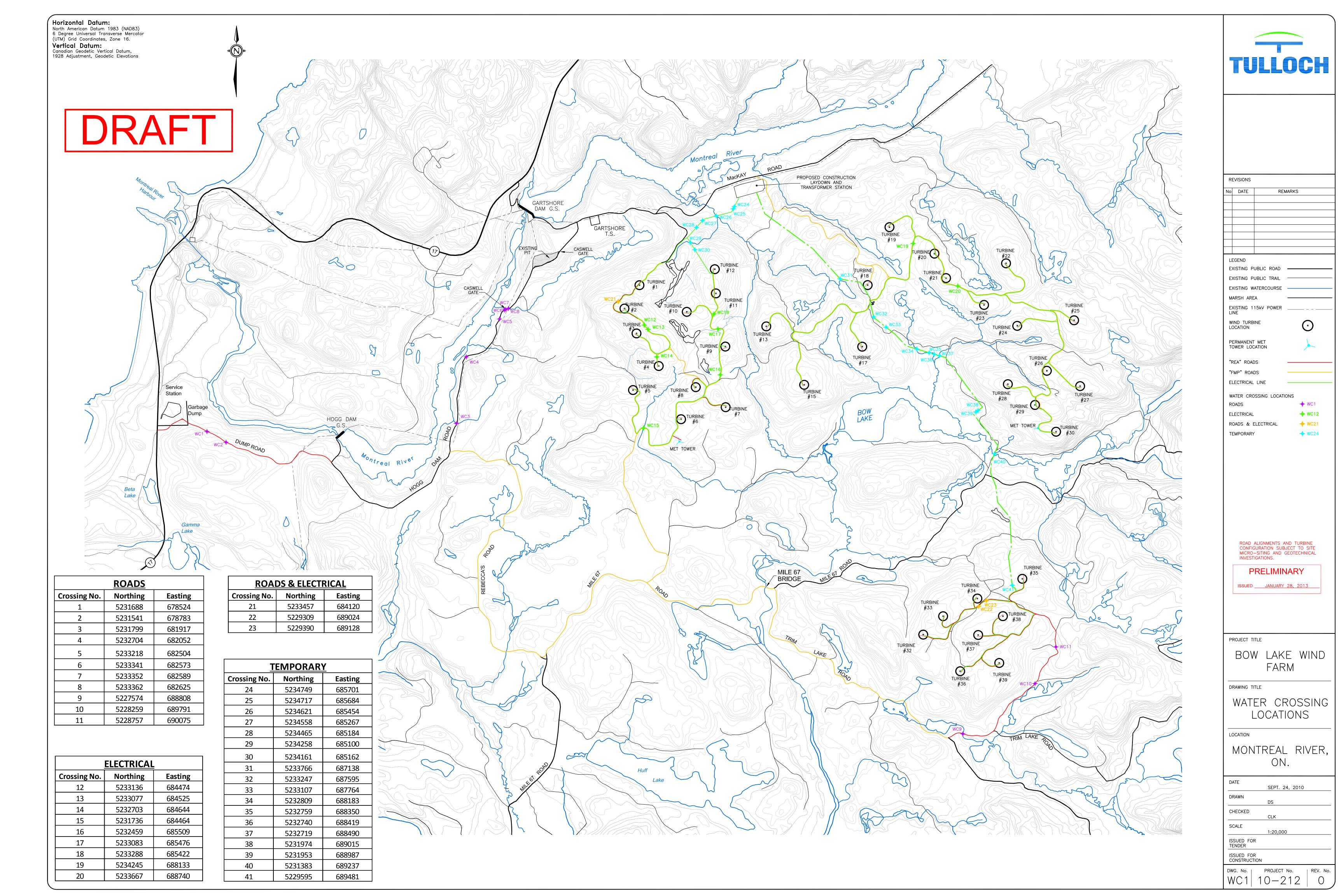
Water Body Number	Crossing Number	Watercourse Description	Photo
0-3	1	Dry during field investigations. Steep gradient. Riparian area dominated by sugar maple and birch. Substrate= Sand, detritus, cobble, gravel, silt, and boulder. Bankfull width = 1.2 m.	
0-2	2	Isolated pools observed during field investigations. Steep gradient. Riparian area dominated by sugar maple and birch. Bankfull width = 0.6m, Wetted width = 0.4m, water depth = 2cm. Substrate= sand, silt, gravel, detritus, cobble and boulder.	
9B-10	3	Dominant riffle morphology. Upstream riparian dominated by white birch, sugar maple, eastern white cedar. Steep slopes and sparse vegetation downstream. Currently perched culvert.  Bankfull width= 2.5m ,wetted width= 1.2m, water depth = 8cm. Substrate= Sand, cobble, gravel and detritus.	
9B-8	4	Dominant pool morphology. Riparian areas dominated by black spruce and white birch. Upstream watercourse is ponded and deep (>1m). Downstream is narrow and very shallow. Bankfull width (U/S) = 10m, Bankfull width (D/S)= 1 m Wetted width (U/S)= 10 m, wetted width (D/S)= 0.5 m, water depth = 5 cm. Substrate= cobble, gravel(U/S); silt, detritus, muck and sand (D/S).	
9B-5	5	Permanent flow along east side of Hogg Dam Road. Water body disappears approximately 5 m downstream of Hogg Dam Road. Currently perched culvert. Riparian dominated by mountain maple and mountain ash. Bankfull width = 0.7m, wetted width=0.6, water depth = 10cm. Substrate= gravel, sand, cobble, detritus, and boulder.	

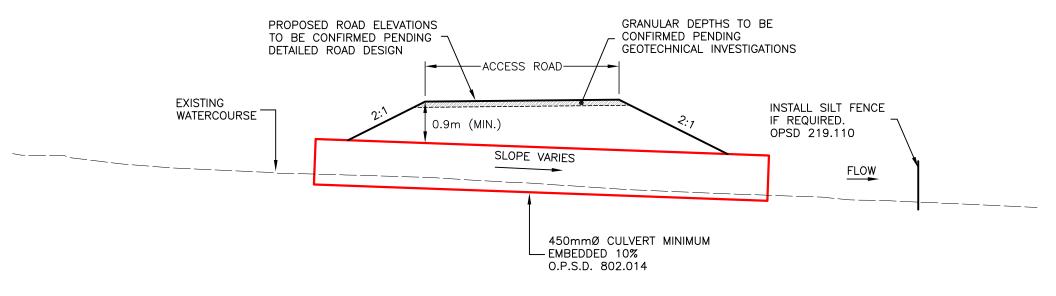
Water Body Number	Crossing Number	Watercourse Description	Photo
9B-2	6	Isolated pools observed during field investigations. Pools contained floating pondweed. Riparian dominated by yellow birch. Bankfull width = 0.3m, wetted width = 0.3m, water depth = 5cm. Substrate= sand, gravel, silt, and cobble.	
9B-3	7	Dry during field investigations. Riparian area dominated by eastern white cedar, yellow birch. Bankfull width = 0.6m, substrate= sand, gravel, silt and cobble.	
9B-1	8	Dominant riffle and run morphology. Occasional undercut banks. Riparian area dominated by sugar maple and ferns.  Bankfull width = 2.5m. Wetted width= 1.2m, water depth= 20cm, substrate= cobble, gravel, sand, boulder and detritus.	
9F-9	9	Cobble, gravel, sand and silt dry at the time investigations; signs of erosion and sediment transport throughout Riparian vegetation consisting of mixed forest. Bankfull width = 4 m	
9F-3	10	Dominated by flat morphology. Riparian vegetation dominated by maple and fern. Bankfull width = 1.6m, wetted width = 1.2m, water depth = 10cm. Substrate = cobble, gravel, sand, boulder and detritus.	

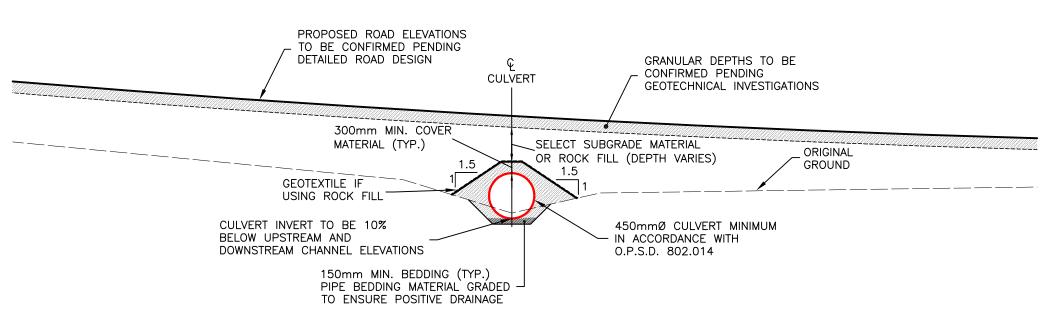
Water Body Number	Crossing Number	Watercourse Description	Photo
9F-3	11	Dominated by flat morphology. Riparian vegetation dominated by maple and fern. Bankfull width = 1.6m, wetted width = 1.2m, water depth = 10cm. Substrate = cobble, gravel, sand, boulder and detritus.	

### <u>Notes</u>

- 1. Water Body Number as identified in the Water Assessment and Water Body Report; Stantec
- 2. Crossing Number as identified on Water Crossing Locations Drawing, 10-212-WC1; Tulloch Engineering







# BOW LAKE WIND FARM WATER CROSSINGS FIGURE 1 - TYPICAL ROAD CROSSING

N.T.S.

### BOW LAKE WIND FARM WATER CROSSINGS TYPICAL ROAD CROSSING

### **GENERAL NOTES**

- 1. FINAL CROSSING LOCATION AND ALIGNMENT TO BE DETERMINED PENDING DETAILED DESIGN OF ROAD AND GEOTECHNICAL INVESTIGATIONS.
- 2. ALL WORK SHALL ADHERE TO THE MNR'S GUIDELINES FOR ACCESS ROADS AND WATER CROSSINGS.
- 3. ALL WORK SHALL CONFORM TO THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) LATEST
- 4. CONTRACTOR TO VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
- 5. THE CONSTRUCTOR IS TO ADHERE TO THE REQUIREMENTS OF ALL REGULATORY WORK PERMITS.

### SEDIMENT CONTROL

- 1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED WHERE NECESSARY TO MINIMIZE ENVIRONMENTAL IMPACTS.
- 2. THE CONTRACTOR WILL BE IN CHARGE OF AND RESPONSIBLE FOR ALL ON-SITE WORK.
- 3. THE SITE SUPERVISOR WILL HOLD A MEETING OF ALL EQUIPMENT OPERATORS WORKING AT THE SITE TO MAKE THEM AWARE OF MINISTRY CONCERNS AND MEASURES TO CONTROL SEDIMENT. EXISTING
  VEGETATION IS TO BE PROTECTED TO THE MAXIMUM EXTENT POSSIBLE.
- 4. TO THE MAXIMUM EXTENT POSSIBLE, NO SEDIMENTS SHALL ENTER THE WATER DURING ANY ASPECT OF THE WORK. SHORT TERM INTRODUCTION OF SEDIMENTS SHALL BE KEPT TO THE LOWEST PRACTICAL LEVEL AND THERE SHOULD BE NO LONG TERM SOURCES OF SEDIMENT FROM THE COMPLETED PROJECT.
- 5. ANY EQUIPMENT WORKING NEAR THE WATER MUST BE FREE FROM ANY LEAKS OF OIL, GREASE OR OTHER CONTAMINANTS. THE EQUIPMENT SHALL BE CLEANED OF ALL CONTAMINATES PRIOR TO BEING BROUGHT ON SITE.
- 6. CONSTRUCTION OPERATIONS WILL BE UNDER THE DIRECTION OF THE SITE SUPERVISOR FOR THE CONTRACTOR AND INSPECTED BY THE SITE INSPECTOR FOR THE OWNER. ANY PROBLEMS OR CONCERNS WILL BE RESOLVED ON SITE WITH THE ENGINEER.

### CONSTRUCTION SEQUENCING (DRY CONDITION)

- 1. INSTALL SEDIMENT CONTROL MEASURES.
- 2. EXCAVATE FOR CULVERT BEDDING. EXCAVATED MATERIAL SHALL BE STOCKPILED FOR REUSE AWAY FROM WATERCOURSE.
- 3. INSTALL, COMPACT AND SHAPE BEDDING MATERIAL TO RECEIVE CULVERT.
- 4. INSTALL CULVERT AND EMBEDMENT MATERIAL COMPLETE WITH COMPACTION.
- 5. IF REQUIRED, INSTALL GEOTEXTILE PRIOR TO PLACING ROCK FILL.
- 6. COMPLETE PLACEMENT OF FILL MATERIAL TO SUBGRADE ELEVATION.
- 7. EXCAVATE CHANNEL REALIGNMENT, IF NECESSARY TO MATCH EXISTING CHANNEL DIMENSIONS.
- 8. RELOCATE ABANDONED CHANNEL SUBSTRATE TO REALIGNED CHANNEL. IF NECESSARY.

### CONSTRUCTION SEQUENCING (FLOWING CONDITION)

SHOULD INSTALLATION OF THE CULVERT BE REQUIRED DURING FLOWING CONDITIONS, THE DRY CONDITION SEQUENCING WOULD APPLY WITH THE FOLLOWING MODIFICATIONS FOR SITE DEWATERING.

- 1A. EXCAVATE SMALL SUMP IMMEDIATELY UPSTREAM OF
- CROSSING LOCATION.

  1B. INSTALL APPROPRIATELY SIZED PUMPS AND HOSES, DISCHARGING TO A SEDIMENT DEWATERING BAG.
- 1C. SEDIMENT DEWATERING BAG SHALL BE LOCATED PRIOR TO THE DOWNSTREAM SEDIMENT CONTROL MEASURES.

ONCE FLOW HAS BEEN DIVERTED TO CULVERT, REMOVE THE PUMPS AND DEWATERING BAG AND REHABILITATE THE UPSTREAM SUMP TO PRECONSTRUCTION CONDITIONS.

### **CULVERT INSTALLATION**

- 1. CULVERT INSTALLATION WILL BE BY OPEN CUT.
- BEDDING MATERIAL WILL BE GRANULAR A.
   COVER AND EMBEDMENT MATERIAL WILL BE GRANULAR A, OR SAND WITH NO STONES LAGER THAN 25mm.
- 4. BACKFILL WILL BE SELECT SUBGRADE MATERIAL OR ROCK FILL.
- 5. CULVERT TO BE EMBEDDED 10% BELOW PROPOSED CHANNEL ELEVATIONS WITH INFILL COMPLETED BY NATURAL SEDIMENTATION.
- 6. PREFERRED INSTALLATION TO BE COMPLETED DURING DRY CONDITIONS. INSTALLATION DURING FLOWING CONDITION IS PERMISSIBLE WITH MODIFICATIONS TO THE CONSTRUCTION SEQUENCING, PENDING MNR APPROVAL.
- 7. CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH OSPD 802.014.
- 8. SEDIMENT CONTROL MEASURES TO BE MONITORED CONTINUOUSLY DURING CONSTRUCTION.



Ministère des Richesses naturelles

## Application for Work Permit Demande de permis d'exploitaion

Part 1 Partie 1

Applicant (eg. landowner, licencee, permittee, etc.) (Cannot be a subcontractor)

Demandeur (ex. : propriétaires fonci	ers, détenteurs de permis, etc.) (N	le doit pas être un sous-traitant)	
Name/Nom. Nodin Kitagan Lim		Business Phone/Tél. (Bureau) (403) 668-1578	
Mailing Address/Adresse postale	BluEarth Renewables Inc., 200	, 4723 - 1st Street SW, Calgary, AB	Postal Code/Code postal T2G 4Y8
Site Contractor or Person in	Charge/Entrepreneur ou r	responsable sur place	
Name/Nom	Business Phone/Tél. (Bureau)	Residence Phone/Tél. (Résidence	☐ Yes/Oui ☐ No/Non
Mailing Address/Adresse postale	TO BE DETERMINED		Postal Code/Code postal
Type of Work Proposed - Plea		opriate additional part(s)	
Construction de bâtiments	Work on Shorelands Travaux sur des terres ravau subi	⟨ Within a Waterbody	or Water Crossing e ou <u>t</u> raverse de cours d'eau
Location of Work Permit Are			
Canton, municipalité, carte de base	nº ou parcelle, concession, emplac	n, Subdivision or Mining Claim or U.T.M. No. cement, subdivision ou № du MTU ou conce n the enclosed Summary of Cable Cros	ession minère
Autre p. ex. cours d'eau (decrire)	Nater Crossings #12, 13, 14, 19	5, 16, 17 & 18, as detailed on the enclo	· · · · · · · · · · · · · · · · · · ·
Camp Location Emplacement du camp			No. or Workers on Site  Nbre de travailleurs sur le site
<b>Private Land/Terres privées</b>			
Private Lands of - Applicant/Apparte  Yes No Other (specify) Oui Non À d'autres (préci			
Effective Date(s)/Dates			
Start Date/Date de début des travau Estimated a	rix Finish Date/Date	e de fin des travaux Estimated as December 2014	
Equipment to be Used/maté	•		
Places enseifu/Drésiser	e Determined by the Contractor	r.	
Note: The issuance of this permit does no responsibility of acquiring any other approvals as may be required.			onère pas le détenteur d'obtenir les re exigées par d'autres gouvernements,
If an applicant requires a copy of this a prior to submitting.	pplication, he/she should retain cop	py Si le demandeur en a besoin, il do avant de la soumettre.	it conserver un exemplaire de cette demande
Personal Information on this form is Section 13 of the Public Lands Act, I 453/96 as amended and Ontario Reg information will be used for the purp Questions about this information sh office. MNR office addresses and ph reverse of this form.	R.S.O. 1990 and Ontario Regulati ulation 975 as amended, and the poses of the Act and Regulations rould be directed to the local MNF	en vertu de l'article 13 de la <i>Loi</i> : règlement de l'Ontario 453/96 tel l'Ontario tel que modifié. Ils sero R des règlements. Veuillez adresse	exigés dans les présentes sont recueillis sur les terres publiques, S.R.O. 1990 et du l que modifié et du règlement 975 de ont utilisés selon les termes de la Loi et er toute question à ce sujet au bureau eaux du MRN avec adresses et numéros d
I/We hereby agree to rely solely upon t work permit issued pursuant to this app the written work permit must be approv	olication. Any changes, amendmer	nts to ploitation émis pour la présente de	ment aux conditions écrites du permis d'ex- mande. Tout changement ou toute modifi- loit être approuvé par écrit par le MNR.
I certify the information given in this ap	plication is true.	Je certifie que les renseignements	donnés ici sont véridiques.
Signature of Applicant/Signé par	Position/Poste	Date	
Signature of contractor (if applicable Signature de l'entrepreneur (s'il y a To Be Determine	lieu) d	Date	
Date Application Received in Office Date de r'éception de la demande			

Ministère des Richesses naturelles

### Road or Trail Construction/Water Crossings Construction de routes ou sentiers/traverses d'eau

Part 4
Partie 4

Ontar	io								
1)	Include a sketch showing - detailed location of l'empl.acement d - all water crossings toutes les traverses	road or trail (i.e. létailléde la route Please	how close to w ou du sentier (	aterboo c. –à-d Water	. distance à un Crossing Lo	cation D	d'eau, etc.); rawing 10-212-W0	01	
2)	Purpose/But  - Access to private pr Accès aux propriété - Access for resource Accès pour extractio - Other (specify) Autres (préciser)	és privées C extraction (e.g. 1 on de ressources	Oui X Non mining, logging	ion mir	nière, exploitat	ion miniè	re ou forestière) [	Yes □ Oui	No ▼ Non
3)	Type (check box) Su Type (cocher) Ét	ımmer Wint é 🗌 Hive		Round 'année		Road e de trans	Trail Piste		Other Autre
4) D	escription					5) Leng	gth of Time Requir	ed/Dur	rée
	th/Longueur Travelled Ros Largeur utile To Be Determined	During Detailed		mprise		Lor X Lon	ng Term Short	N Term	No. of Months/Years N <sup>bre</sup> de mois/années
	ho will be responsible for					n?			
Indic	ate Person, Company, Associa Nodin Kitagan Limi	ation, etc./Particuli ited Partnership	er, association, er	ntrepris	e, etc.				
7) Sc	ource Gravel/Fill/Source o		lai						
	e indicate intended source, if	any/Nommer la so	urce prévue, le ca						
	Gravel from within								
	ater Crossing/Traverse d		er to sample ske	tch on	reverse/les let	tres corres	spondent à l'exempl	le de cro	oquis au verso)
Strea	m Name/Nom du course d'eau	u Please see	attached summa	ary tab	les				
Road	Name/Nom de la route					Type of Fi	ll to be Used at Crossi	ing/Type	e de remblai utilisé
	Conditions/Condition du site								
	l plain width (A)/ eur de la plaine inondable	Water Widt Largeur de l			r Depths (C, D, indeur de l'eau	E)/	Measured Flow Ve Vitesse Measurée du courant		(ft/sec or m/sec) pi/s. ou m/s
Foun	dation Soil Description/Descri	ription du sous-sol							
8 a)	Bridge/Pont N/A								
Propo	osed Bridge – Length (F) t de pont – Longueur du pont	Clearance (G) Dégagement	Clear Span Travée	(H)	Crib Height (1 Hauteur du be		Crib Width (J) Largeur du berceau		Deck Width (K) Largeur du tablier
String	ger Type/Type de longeron	- 1					1	<u> </u>	
String	ger Spacing/Espacement des le	ongerons							
Deck	Details (L)/Détails du tablier								
Wear	Surface (M)/Surface								
Curb	Details (N)/Détails de la chau	ıssée							
Guid	e Rail Details (O)/Détails du r	ail de guidage							

8 b)	Culvert/Poncea	au
------	----------------	----

Culvert Dia	meter/Diamètre du	Culvert Length/Longueur du	Road Fill Height Above Creek Bottom/Hauteur du remblai de la route au
ponceau	Minimum 450mmØ	ponceau Based on Detailed Design	fond du cours d'eau Based on Detailed Design



Mailing Address/Adresse postale

Ministère des Richesses naturelles

Name/Nom. Nodin Kitagan 2 Limited Partnership

## Application for Work Permit Demande de permis d'exploitaion

BluEarth Renewables Inc., 200, 4723 - 1st Street SW, Calgary, AB

Business Phone/Tél. (Bureau) (403) 668-1575 Part 1 Partie 1

Residence Phone/Tél. (Résidence)

Postal Code/Code postal T2G 4Y8

Applicant (eg. landowner, licencee, permittee, etc.) (Cannot be a subcontractor)

**Demandeur** (ex. : propriétaires fonciers, détenteurs de permis, etc.) (Ne doit pas être un sous-traitant)

	Charge/Entrepreneur ou respo	onsable sur place	
Name/Nom	Business Phone/Tél. (Bureau)	Residence Phone/Tél. (Résidence)	Radio Contact Available/Radio  Yes/Oui  No/Non
Mailing Address/Adresse postale	TO BE DETERMINED		Postal Code/Code postal
Type of Work Proposed - Pleas	e indicate and complete the appropriate	additional part(s)	
Type de travaux prévus - Précis		additional part(s)	
	ork on Shorelands	n a Waterbody 🛛 🗓 Roads or Trails or W	ater Crossing
Construction de bâtiments Tr	avaux sur des terres ravaux subr		traverse de cours d'eau
	submergée	es	
Location of Work Permit Area	/Emplacement		
Township, Municipality, Basemap No.	or Lot and Concession, Location, Subd		
•		t, subdivision ou Nº du MTU ou concessio	n minère
Water Crossings #19 & 20 as	detailed on the enclosed Summary	of Cable Crossing Table	
Other i.e. Waterbody (describe) W	ater Crossings #19 & 20, as detaile	ed on the enclosed Watercourse Desc	ription Table
Autre p. ex. cours d'eau (décrire)  Camp Location			No. or Workers on Site
Emplacement du camp			Nore de travailleurs sur le site
Private Land/Terres privées			
Private Lands of - Applicant/Apparten	ant au demandeur		
☐ Yes ☒ No ☐ Other (specify)			
Oui Non À d'autres (précis	ar qui)		
Effective Date(s)/Dates  Start Date/Date de début des travaux	Finish Date/Date de fin	dos travaux	
Estimated as	August 2013 Estim	nated as December 2014	
Equipment to be Used/matéri	el qui sera utilisé	<u> </u>	
Please specify/Préciser To Be	Determined by the Contractor.		
	,,		
Note:		Remarque:	
The issuance of this permit does not	elieve the applicant from the	La délivrance de ce permis n'exonèr	e pas le détenteur d'obtenir les
responsibility of acquiring any other a	gency, board, government, or other	autorisa- tions qui pourraient être ex	igées par d'autres gouvernements,
approvals as may be required.		organismes, commissions, etc.	
If an applicant requires a copy of this ap	olication, he/she should retain copy	Si le demandeur en a besoin, il doit cor	
prior to submitting.			iserver un exemplaire de cette demande
		avant de la soumettre.	nserver un exemplaire de cette demande
Personal Information on this form is o	ollected under the authority of	avant de la soumettre.	·
Section 13 of the Public Lands Act, R.	S.O. 1990 and Ontario Regulation	avant de la soumettre.  Les renseignements personnels exigen vertu de l'article 13 de la <i>Loi sur l</i>	yés dans les présentes sont recueillis es <i>terres publiqu</i> es, S.R.O. 1990 et du
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Natural

Ministry of Ministère des Richesses naturelles

## Road or Trail Construction/Water Crossings Construction de routes ou sentiers/traverses d'eau

Part 4 Partie 4

Ontai	rio Resources naturent	23						
1)	Include a sketch showing  - detailed location of r l'empl.acement de  - all water crossings toutes les traverses of	oad or trail (i.e. ho étailléde la route ou Please se	ow close to w a du sentier (d ee attached	aterbo c. –à-c Wate	l. distance à ur	cation E	e d'eau, etc.); Drawing 10-212-WC1	
2)	Purpose/But  - Access to private produce Accès aux propriétés  - Access for resource of Accès pour extraction  - Other (specify)  Autres (préciser)	s privées	ning, logging ex. explorati	on mi	nière, exploita	tion mini		es No Oui X Non
3)	Type (check box) Sur Type (cocher) Été	mmer Winter Hiver	Year I			Road te de tran	Trail sport Piste	Other  Autre
4) D	escription					5) Len	gth of Time Required	/Durée
Leng	th/Longueur Travelled Roa Largeur utile To Be Determined I	coloring Detailed Detailed Detailed		mprise		Lo X Lo	ong Term Short Tenng terme Cout term	No. of Months/Years rm N <sup>bre</sup> de mois/années
	Who will be responsible for tate Person, Company, Associat Nodin Kitagan 2 Lim	tion, etc./Particulier,				<u>n?</u>		
7) S	ource Gravel/Fill/Source d							
Pleas	se indicate intended source, if a Gravel from within a	ny/Nommer la source approved Right-of-V	e prévue, le ca Way, or from	Permi	tted Aggregate			
	Vater Crossing/Traverse d		o sample ske	tch on	reverse/les let	tres corre	espondent à l'exemple d	le croquis au verso)
	m Name/Nom du course d'eau	Please see atta	ached summa	ary tab	oles	T. C.		
	l Name/Nom de la route  Conditions/Condition du site					Type of F	Fill to be Used at Crossing	Type de remblai utilisé
Site	Conditions/ Condition du site							
	d plain width (A)/ eur de la plaine inondable	Water Width (F Largeur de l'ea			ater Depths (C, D, E)/ bfondeur de l'eau  Measured Flow Velocity Vitesse Measurée du courant		(ft/sec or m/sec) pi/s. ou m/s	
Four	dation Soil Description/Descrip	ption du sous-sol					<u> </u>	•
8 0)	Dridge/Dent N/A							
Prop	Bridge/Pont N/A osed Bridge – Length (F)	Clearance (G)	Clear Span	(H)	Crib Height (	T)	Crib Width (J)	Deck Width (K)
	et de pont – Longueur du pont	Dégagement	Travée		Hauteur du b		Largeur du berceau	Largeur du tablier
	ger Type/Type de longeron							
Strin	ger Spacing/Espacement des lo	ngerons						
Deck	Details (L)/Détails du tablier							
						_		
Wea	r Surface (M)/Surface							
C1	Dataila (NI)/Dát-il- J- I- I	2040						
Curb	Details (N)/Détails de la chaus	5500						
ı								

8 P)	Culvert/Ponceau	

Guide Rail Details (O)/Détails du rail de guidage

Culvert Diameter/Diamètre du	Culvert Length/Longueur du	Road Fill Height Above Creek Bottom/Hauteur du remblai de la route au
ponceau Minimum 450mmØ	ponceau Based on Detailed Design	fond du cours d'eau Based on Detailed Design

Bow Lake Wind Farm
Summary of Cable Crossings

**Prepared By: Tulloch Engineering** 

January 28, 2013

Water Body	Crossing	Crossing Type		Location	NAD 83 UT	M Zone 16	Watercourse	Characteristics
Number	Number	CIUSSIII	giype	Location	Northing	Easting	Thermal	Flow
10-6	12	Cable	New	P1	5233136	684474	Cold	Permanent
10-7	13	Cable	New	P1	5233077	684525	Cold	Permanent
10-2	14	Cable	New	P1	5232703	684644	Cold	Intermittent
11-4	15	Cable	New	P1	5231736	684464	Unknown	Intermittent
11-3	16	Cable	New	P1	5232459	685509	Cold	Permanent
12-1	17	Cable	New	P1	5233083	685476	Unknown	Permanent
10-21	18	Cable	New	P1	5233288	685422	Unknown	Intermittent
2-1	19	Cable	New	2a	5234245	688133	Unknown	Unknown
2-3	20	Cable	New	2a	5233667	688740	Cold	Intermittent

### Notes

- 1. Water Body Number as identified in the Water Assessment and Water Body Report; Stantec
- 2. Crossing Number as identified on Water Crossing Locations Drawing, 10-212-WC1; Tulloch Engineering
- 3. Watercourse Description and Photographs Attached for Additional Information

Bow Lake Wind Farm
Watercourse Descriptions for Cable Crossings
Prepared By: Tulloch Engineering

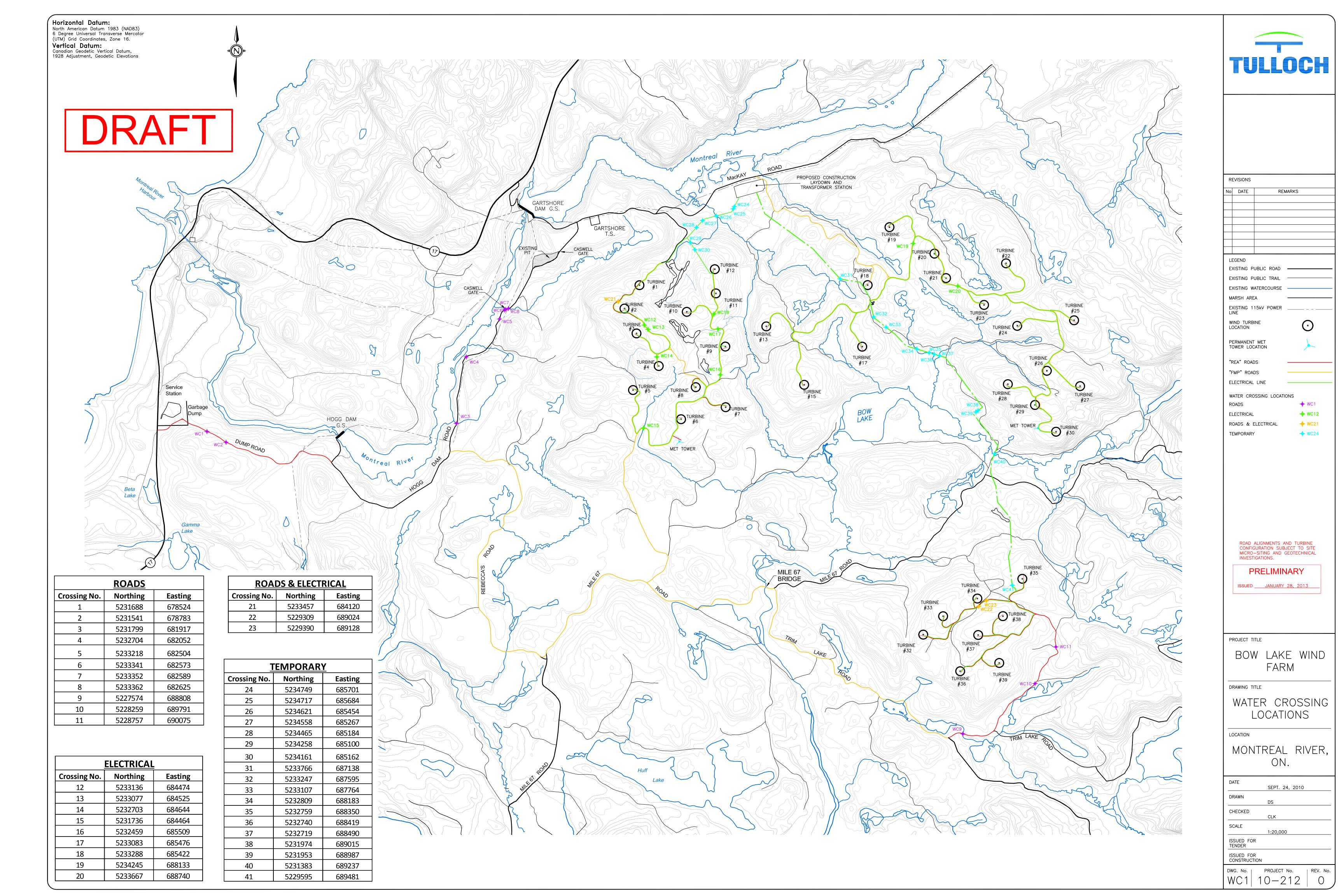
January 28, 2013

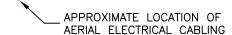
Water Body Number	Crossing Number	Watercourse Description	Photo
10-6	12	Flow originating from a seep, channel dominated by pool and run morphology. Riparian area dominated by sugar maple, white birch, jewelweed. Bankfull width = 1m, Wetted width = 0.4m, Water depth = 5cm, Substrate = Gravel, cobble, detritus, bedrock, boulder, and muck	
10-7	13	Flow originating from a seep. Channel dominated by pool morphology. Riparian area dominated by sugar maple, white birch, and jewelweed. Bankfull width = 0.6m, wetted width = 0.4m, substrate= detritus, sand, gravel, cobble and muck.	
10-2	14	Groundwater seepage at origin with steep grade and isolated pools separated by frequent falls. Riparian vegetation consisted of mature mixed forest. Bankfull width =0.5m, wetted width = 0.3m, water depth = 15cm. Substrate= boulder, cobble and detritus.	
11-4	15	High gradient, dominated by step-pool morphology. Riparian vegetation dominated by sugar maple. Bankfull width= 1m, wetted width= 0.4m, water depth = 5cm. Substrate= cobble, boulder, gravel, sand and detritus	
11-3	16	Flow originating from a seep. Dominated by step pool morphology. Riparian vegetation consisting of mixed forest.  Bankfull width= 1.4m, wetted width= 1.2m, water depth = 3cm, substrate= boulder, cobble, gravel, detritus and silt.	

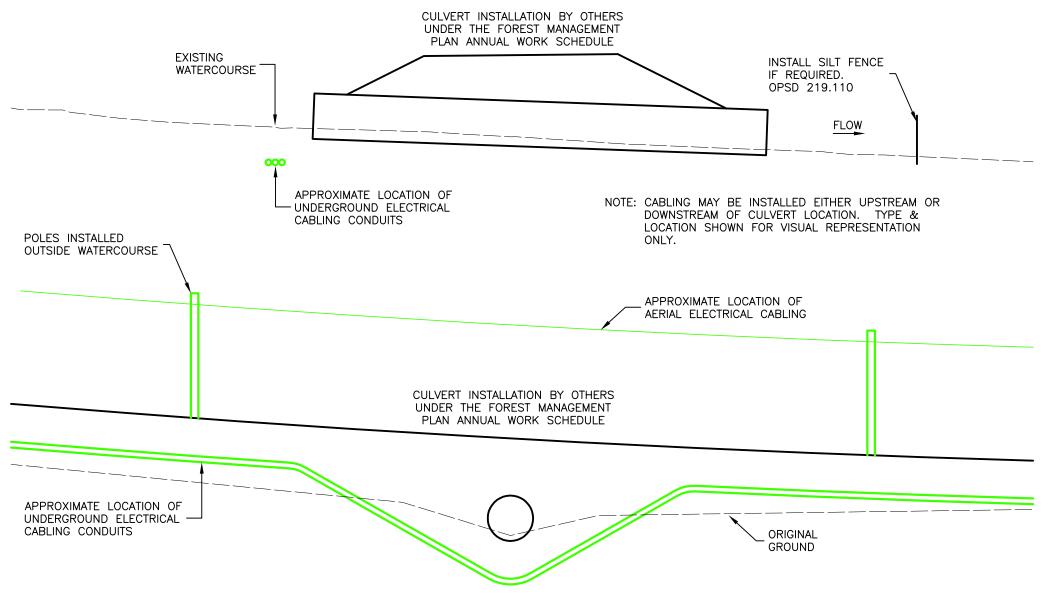
Water Body Number	Crossing Number	Watercourse Description	Photo
12-1	17	Dominant pool morphology. Riparian vegetation consisting of mature deciduous forest. Bankfull width= 1.4m, wetted width = 0.8m, water depth = 5cm. Substrate= gravel, silt, sand, boulder and detritus	
10-21	18	High gradient, dominated by steep-pool morphology. Riparian vegetation dominated by sugar maple. Bankfull width= 1.0m, wetted width = 0.4m, water depth = 5cm. Substrate = cobble, boulder, gravel, sand and detritus.	
2-1	19	no information; ephemeral watercourse?	not available
2-3	20	Pool, riparian vegetation fern and sugar maple. Bankfull width= 1.6m, pool depth = 15cm. Substrate = cobble, boulder, gravel, detritus.	

### <u>Notes</u>

- 1. Water Body Number as identified in the Water Assessment and Water Body Report; Stantec
- 2. Crossing Number as identified on Water Crossing Locations Drawing, 10-212-WC1; Tulloch Engineering







# BOW LAKE WIND FARM WATER CROSSINGS FIGURE 2 - ELECTRICAL CABLING

# BOW LAKE WIND FARM WATER CROSSINGS ELECTRICAL CABLING

#### **GENERAL NOTES**

- 1. FINAL CROSSING LOCATION AND ALIGNMENT TO BE DETERMINED PENDING DETAILED DESIGN OF ROAD AND GEOTECHNICAL INVESTIGATIONS.
- 2. ALL WORK SHALL ADHERE TO THE MNR'S GUIDELINES
- FOR ACCESS ROADS AND WATER CROSSINGS.

  3. ALL WORK SHALL CONFORM TO THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) LATEST REVISION.
- 4. CONTRACTOR TO VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
- 5. THE CONSTRUCTOR IS TO ADHERE TO THE REQUIREMENTS OF ALL REGULATORY WORK PERMITS.

#### SEDIMENT CONTROL

- 1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED WHERE NECESSARY TO MINIMIZE ENVIRONMENTAL IMPACTS.
- 2. THE CONTRACTOR WILL BE IN CHARGE OF AND
- RESPONSIBLE FOR ALL ON—SITE WORK.

  3. THE SITE SUPERVISOR WILL HOLD A MEETING OF ALL EQUIPMENT OPERATORS WORKING AT THE SITE TO MAKE THEM AWARE OF MINISTRY CONCERNS AND MEASURES TO CONTROL SEDIMENT. EXISTING VEGETATION IS TO BE PROTECTED TO THE MAXIMUM EXTENT POSSIBLE.
- 4. TO THE MAXIMUM EXTENT POSSIBLE, NO SEDIMENTS SHALL ENTER THE WATER DURING ANY ASPECT OF THE WORK. SHORT TERM INTRODUCTION OF SEDIMENTS SHALL BE KEPT TO THE LOWEST PRACTICAL LEVEL AND THERE SHOULD BE NO LONG TERM SOURCES OF SEDIMENT FROM THE COMPLETED PROJECT.
- 5. ANY EQUIPMENT WORKING NEAR THE WATER MUST BE FREE FROM ANY LEAKS OF OIL, GREASE OR OTHER CONTAMINANTS. THE EQUIPMENT SHALL BE CLEANED OF ALL CONTAMINATES PRIOR TO BEING BROUGHT ON SITE.
- 6. CONSTRUCTION OPERATIONS WILL BE UNDER THE DIRECTION OF THE SITE SUPERVISOR FOR THE CONTRACTOR AND INSPECTED BY THE SITE INSPECTOR FOR THE OWNER. ANY PROBLEMS OR CONCERNS WILL BE RESOLVED ON SITE WITH THE ENGINEER.

#### **CABLING**

- 1. UNDERGROUND CABLING IS PROPOSED TO BE INSTALLED BELOW GROUND, OUTSIDE OF THE PROPOSED CULVERT OCCUPATION.

  2. UNDERGROUND CABLING WILL BE INSTALLED VIA THE
- DRY OPEN-CUT STREAM CROSSING OR ISOLATED OPEN-CUT STREAM CROSSING METHOD DEPENDING ON THE FLOW CONDITIONS AT TIME OF INSTALLATION.

  3. UNDERGROUND CABLING WILL BE INSTALLED
- WITHIN CONDUITS SET APPROXIMATELY 1.0m BELOW GRADE AND COMMUNICATIONS CABLING MAY BE INSTALLED WITHIN THE SAME TRENCH.
- 4. LOCATION OF CABLING MAY BE EITHER UPSTREAM OR DOWNSTREAM OF THE CULVERT.
- 5. POLES FOR AERIAL CABLING WILL BE OUTSIDE THE WATERCOURSE.

#### CONSTRUCTION SEQUENCING (DRY CONDITION)

- 1. INSTALL SEDIMENT CONTROL MEASURES
- 2. EXCAVATE FOR CULVERT BEDDING. EXCAVATED MATERIAL SHALL BE STOCKPILED FOR REUSE AWAY FROM WATERCOURSE.
- 3. INSTALL, COMPACT AND SHAPE BEDDING MATERIAL TO RECEIVE CULVERT.
- 4. INSTALL CULVERT AND EMBEDMENT MATERIAL COMPLETE WITH COMPACTION.
- 5. IF REQUIRED, INSTALL GEOTEXTILE PRIOR TO PLACING ROCK FILL.
- 6. COMPLETE PLACEMENT OF FILL MATERIAL TO SUBGRADE ELEVATION.
- 7. EXCAVATE CHANNEL REALIGNMENT, IF NECESSARY TO MATCH EXISTING CHANNEL DIMENSIONS.
- 8. RELOCATE ABANDONED CHANNEL SUBSTRATE TO REALIGNED CHANNEL, IF NECESSARY.

#### CONSTRUCTION SEQUENCING (FLOWING CONDITION)

SHOULD INSTALLATION OF THE CULVERT BE REQUIRED DURING FLOWING CONDITIONS, THE DRY CONDITION SEQUENCING WOULD APPLY WITH THE FOLLOWING MODIFICATIONS FOR SITE DEWATERING.

- 1A. EXCAVATE SMALL SUMP IMMEDIATELY UPSTREAM OF CROSSING LOCATION.
- 1B. INSTALL APPROPRIATELY SIZED PUMPS AND HOSES. DISCHARGING TO A SEDIMENT DEWATERING BAG.
- 1C. SEDIMENT DEWATERING BAG SHALL BE LOCATED PRIOR TO THE DOWNSTREAM SEDIMENT CONTROL MEASURES.

ONCE FLOW HAS BEEN DIVERTED TO CULVERT, REMOVE THE PUMPS AND DEWATERING BAG AND REHABILITATE THE UPSTREAM SUMP TO PRECONSTRUCTION CONDITIONS.



Ministry of Natural Resources

Ministère des Richesses naturelles

#### **Application for Work Permit** Demande de permis d'exploitaion

Part 1 Partie 1

Applicant (eg. landowner, licencee, permittee, etc.) (Cannot be a subcontractor) Demandeur (ex. : propriétaires fonciers, détenteurs de permis, etc.) (Ne doit pas être un sous-traitant)

Name/Nom.	Nodin Kitagan Limite	ed Partnership	Busin	ess Phone/Tél. (Bureau) (403) 668-		esidence Phone/Tél. (Résidence)
Mailing Addres	ss/Adresse postale Blu	uEarth Renewables Inc., 20	00, 4723	- 1st Street SW, Calgary, AE	_	ostal Code/Code postal T2G 4Y8
Site Contrac	ctor or Person in C	harge/Entrepreneur ou	respor	nsable sur place	I.	
Name/Nom		Business Phone/Tél. (Burea		Residence Phone/Tél. (Résidence Phone/Tél. (	dence)	Radio Contact Available/Radio  Yes/Oui No/Non
Mailing Addres	ss/Adresse postale	TO BE DETERMINED				Postal Code/Code postal
Type of Wor	k Proposed - Please	indicate and complete the app	oropriate a	additional part(s)		
☐ Building Con	nstruction	avaux sur des terres rav		0		Vater Crossing traverse de cours d'eau
Location of	Work Permit Area	Emplacement				
Township, Mu Canton, munic Water Cro Other i.e. Wate	nicipality, Basemap No. cipalité, carte de base n° ossing #21 as detaile erbody (describe)	or Lot and Concession, Locatic ou parcelle, concession, empl d on the enclosed Summary	acement, y of Road	rision or Mining Claim or U.T.M. subdivision ou N° du MTU ou c ds & Cable Crossing Table enclosed Watercourse Des	oncessio	
Autre p. ex. co	ours d'eau (decrire)					No. or Workers on Site
Emplacement						Nor de travailleurs sur le site
	d/Terres privées					
	of - Applicant/Appartena o ☐ Other (specify) on À d'autres (précise					
Effective Da		. 40./				
	te de début des travaux Estimated as	Finish Date/Da	ite de fin d Estima	les travaux ted as December 2014		
Equipment t	to be Used/matérie	•				
Please specify	/Drácicos	Determined by the Contract	or			
	10 Be I	betermined by the Contract	oi.			
responsibility of approvals as ma	f acquiring any other a ay be required.	elieve the applicant from the gency, board, government, o	r other	autorisa- tions qui pourraien organismes, commissions, e	it être ex etc.	re pas le détenteur d'obtenir les kigées par d'autres gouvernements,
f an applicant records		lication, he/she should retain o	сору	avant de la soumettre.	II doit cor	nserver un exemplaire de cette demande
Section 13 of the 453/96 as amend information will Questions abou	e Public Lands Act, R.: ded and Ontario Regul be used for the purpos It this information shou ce addresses and phor	ollected under the authority of S.O. 1990 and Ontario Regulation 975 as amended, and the ses of the Act and Regulation and the directed to the local Mile numbers are listed on the	ation ne ns.	en vertu de l'article 13 de la règlement de l'Ontario 453/9 l'Ontario tel que modifié. Ils des règlements. Veuillez adr	Loi sur Ì 6 tel que seront u esser to bureaux	gés dans les présentes sont recueillis les terres publiques, S.R.O. 1990 et du e modifié et du règlement 975 de utilisés selon les termes de la Loi et oute question à ce sujet au bureau du MRN avec adresses et numéros de
work permit issue		terms and conditions of the water cation. Any changes, amendm In writing by MNR.		ploitation émis pour la présent	e deman	aux conditions écrites du permis d'exde. Tout changement ou toute modifi- tre approuvé par écrit par le MNR.
certify the inform	mation given in this appli	cation is true.		Je certifie que les renseignem	ents don	nés ici sont véridiques.
Signature of A	applicant/Signé par	Position/Poste		D	ate	
Signature de l'	ontractor (if applicable) 'entrepreneur (s'il y a lie To Be Determined	Position/Poste		D	ate	
	on Received in Office otion de la demande					

Ministère des Richesses naturelles

# **Road or Trail Construction/Water Crossings** Construction de routes ou sentiers/traverses d'eau

Part 4 Partie 4

1	Translando o obrotol	n showing:/Joindre		i di 4 .
	inciliae a skeici	i snawinoy,iainare	iin aeccin	inanani '
•	include a sixetel		uii ucbbiii	maiquant .

- detailed location of road or trail (i.e. how close to waterbodies, etc.) l'empl.acement détailléde la route ou du sentier (c. –à-d. distance à une surface d'eau, etc.); all water crossings Please see attached Water Crossing Location Drawing 10-212-WC1 toutes les traverses d'eau. as well as Figure 3 - Typcial Road Crossing c/w Electrical Cabling & Notes 2) Purpose/But Access to private property Yes No Accès aux propriétés privées Oui X Non Access for resource extraction (e.g. mining, logging, mineral exploration) No Yes ☐ Oui X Non Accès pour extraction de ressources (p. ex. exploration minière, exploitation minière ou forestière) - Other (specify) Renewable Energy (Wind Farm) Development Autres (préciser) Haul Road Other 3) **Type** (check box) Summer Winter Year Round Trail Type (cocher) X Tout l'année Été Hiver Route de transport Piste Autre 5) Length of Time Required/Durée 4) Description Length/Longueur Travelled Road Width/ Right-of-Way Width/ No. of Months/Years Largeur de l'emprise Long Term Short Term N<sup>bre</sup> de mois/années Largeur utile e Determined During Detailed D esign Stage X Long terme Cout terme 6) Who will be responsible for maintenance?/Qui sera responsable de l'entretien? Indicate Person, Company, Association, etc./Particulier, association, entreprise, etc. Nodin Kitagan Limited Partnership 7) Source Gravel/Fill/Source de gravier/remblai Please indicate intended source, if any/Nommer la source prévue, le cas échéant Gravel from within approved Right-of-Way, or from Permitted Aggregate Sites 8) Water Crossing/Traverse d'eau (letters refer to sample sketch on reverse/les lettres correspondent à l'exemple de croquis au verso) Stream Name/Nom du course d'eau Please see attached summary tables Road Name/Nom de la route Type of Fill to be Used at Crossing/Type de remblai utilisé Site Conditions/Condition du site Flood plain width (A)/ Water Width (B)/ Water Depths (C, D, E)/ Measured Flow Velocity/ Largeur de la plaine inondable Largeur de l'eau Profondeur de l'eau Vitesse Measurée (ft/sec or m/sec) du courant pi/s. ou m/s Foundation Soil Description/Description du sous-sol 8 a) Bridge/Pont Proposed Bridge – Length (F) Clear Span (H) Crib Width (J) Deck Width (K) Clearance (G) Crib Height (I) Travée Projet de pont – Longueur du pont Dégagement Hauteur du berceau Largeur du berceau Largeur du tablier Stringer Type/Type de longeron Stringer Spacing/Espacement des longerons Deck Details (L)/Détails du tablier Wear Surface (M)/Surface Curb Details (N)/Détails de la chaussée Guide Rail Details (O)/Détails du rail de guidage 8 b) Culvert/Ponceau

Road Fill Height Above Creek Bottom/Hauteur du remblai de la route au

fond du cours d'eau Based on Detailed Design

ponceau

Culvert Diameter/Diamètre du

Minimum 450mmØ

Culvert Length/Longueur du

ponceau Based on Detailed Design



Ministry of Natural Resources

Ministère des Richesses naturelles

#### **Application for Work Permit** Demande de permis d'exploitaion

Part 1 Partie 1

Applicant (eg. landowner, licencee, permittee, etc.) (Cannot be a subcontractor)

Demandeur (ex. : propriétaires fonciers, détenteurs de permis, etc.) (Ne doit pas être un sous-traitant)

Name/Nom. Nodin Kitagan 2 Limited F	Partnership	Business Phone/Tél. (Bureau) (403) 6	68-1575	Residence Phone/Tél. (Résidence)
Mailian Addus a / Adus a a santala	l l	4723 - 1st Street SW, Calgary		Postal Code/Code postal T2G 4Y8
Site Contractor or Person in Cha	rge/Entrepreneur ou re	sponsable sur place	L	
	Business Phone/Tél. (Bureau)	Residence Phone/Tél. (F	Résidence)	Radio Contact Available/Radio  Yes/Oui No/Non
Mailing Address/Adresse postale TC	) BE DETERMINED			Postal Code/Code postal
Type of Work Proposed - Please inc	dicate and complete the approp	priate additional part(s)		
	on Shorelands			Water Crossing ou <u>traverse de cours d'eau</u>
Location of Work Permit Area/En	nplacement			
Township, Municipality, Basemap No. or L Canton, municipalité, carte de base nº ou Water Crossings #22 & 23 as deta	parcelle, concession, emplacer	ment, subdivision ou N° du MTU	ou concess	sion minère
Autre p. ex. cours d'eau (decrire)	Crossings #22 & 23, as de	tailed on the enclosed Watero	ourse De	
Camp Location Emplacement du camp				No. or Workers on Site  Nbre de travailleurs sur le site
Private Land/Terres privées				
Private Lands of - Applicant/Appartenant a  Yes No Other (specify) Oui Non À d'autres (préciser qu				
Effective Date(s)/Dates	, ,			
Start Date/Date de début des travaux  Estimated as Aug	Finish Date/Date d	le fin des travaux stimated as December 2014	Ī	
Equipment to be Used/matériel q	ui sera utilisé		_	
Please specify/Préciser To Be Dete	ermined by the Contractor.			
Note: The issuance of this permit does not relie responsibility of acquiring any other agen approvals as may be required.  If an applicant requires a copy of this applica prior to submitting.  Personal Information on this form is colle	tion, he/she should retain copy	cher autorisa- tions qui pourr organismes, commission  Si le demandeur en a bese avant de la soumettre.  Les renseignements per	aient être ns, etc. oin, il doit d sonnels e	ère pas le détenteur d'obtenir les exigées par d'autres gouvernements, conserver un exemplaire de cette demande xigés dans les présentes sont recueillis
Section 13 of the Public Lands Act, R.S.O. 453/96 as amended and Ontario Regulatio information will be used for the purposes Questions about this information should loffice. MNR office addresses and phone neverse of this form.	on 975 as amended, and the of the Act and Regulations. be directed to the local MNR	règlement de l'Ontario 4: l'Ontario tel que modifié des règlements. Veuillez	53/96 tel q Ils seron adresser des burea	er les terres publiques, S.R.O. 1990 et du que modifié et du règlement 975 de t utilisés selon les termes de la Loi et toute question à ce sujet au bureau ux du MRN avec adresses et numéros d
I/We hereby agree to rely solely upon the ten work permit issued pursuant to this application the written work permit must be approved in	on. Any changes, amendments	s to ploitation émis pour la pré	sente dem	ent aux conditions écrites du permis d'ex- ande. Tout changement ou toute modifi- t être approuvé par écrit par le MNR.
I certify the information given in this application	on is true.	Je certifie que les renseign	nements de	onnés ici sont véridiques.
Signature of Applicant/Signé par	Position/Poste		Date	
Signature of contractor (if applicable) Signature de l'entrepreneur (s'il y a lieu)  To Be Determined	Position/Poste		Date	
Date Application Received in Office Date de r'éception de la demande				

Ministry of Natural Resources

Ministère des Richesses naturelles

# Road or Trail Construction/Water Crossings Construction de routes ou sentiers/traverses d'eau

Part 4 Partie 4

1 \	T1114-1.	showing:/Joindre		·1 · 4 ·
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L /	miciauc a sactu	SHOWINZ JOUNUIC	un ucssin	muiuuami .

1)	Include a sketch showing  - detailed location of re l'empl.acement dé - all water crossings toutes les traverses d	oad or trail (i.e. hov tailléde la route ou Please se	w close to wa du sentier (dee attached)	aterboo c. –à-d Water	. distance à u Crossing L	ocation Di	d'eau, etc.); rawing 10-212-WC1 Electrical Cabling & N	otes
2)	Purpose/But  - Access to private pro Accès aux propriétés  - Access for resource e Accès pour extraction  - Other (specify) Autres (préciser)	privées Oui extraction (e.g. min	ex. exploration	on mir	nière, exploita	ation miniè	Yere ou forestière) ☐ C	
3)	Type (cocher)	mmer Winter Hiver	Year I			il Road ite de trans	-	Other Autre
	escription					5) Leng	gth of Time Required/I	
	th/Longueur Travelled Road Largeur utile To Be Determined D	I During Detailed Des		mprise		X Lon	ng Term Short Term	
	ho will be responsible for					en?		
	ate Person, Company, Associat Nodin Kitagan 2 Lim	ited Partnership	association, en	treprise	e, etc.			
	ource Gravel/Fill/Source de							
	e indicate intended source, if an Gravel from within a	pproved Right-of-V	Vay, or from	Permit	ted Aggregat			
	ater Crossing/Traverse d'	<b>eau</b> (letters refer to	sample sket	tch on	reverse/les le	ttres corres	spondent à l'exemple de	croquis au verso)
	m Name/Nom du course d'eau	Please see atta	ached summa	ary tab	les			
	Name/Nom de la route					Type of Fi	ll to be Used at Crossing/T	'ype de remblai utilisé
	Conditions/Condition du site			T				
	l plain width (A)/ our de la plaine inondable	Water Width (B Largeur de l'eau			r Depths (C, D indeur de l'eau		Measured Flow Velocit Vitesse Measurée du courant	(ft/sec or m/sec) pi/s. ou m/s
Found	dation Soil Description/Descrip	tion du sous-sol					•	•
8 a)	Bridge/Pont N/A							
Propo	osed Bridge – Length (F) t de pont – Longueur du pont	Clearance (G) Dégagement	Clear Span ( Travée	(H)	Crib Height Hauteur du l		Crib Width (J) Largeur du berceau	Deck Width (K) Largeur du tablier
String	ger Type/Type de longeron							
String	ger Spacing/Espacement des lor	ngerons						
Deck	Details (L)/Détails du tablier							
Waar	Surface (M)/Surface							
wear	Surface (IVI)/Surface							
Curb	Details (N)/Détails de la chaus	sée						

#### 8 b) Culvert/Ponceau

Guide Rail Details (O)/Détails du rail de guidage

Culvert Dia	meter/Diamètre du	Culvert Length/Longueur du	Road Fill Height Above Creek Bottom/Hauteur du remblai de la route au
ponceau	Minimum 450mmØ	ponceau Based on Detailed Design	fond du cours d'eau Based on Detailed Design

Bow Lake Wind Farm Summary of Roads & Cable Crossings Prepared By: Tulloch Engineering

January 28, 2013

Water Body	Crossing	Crossin	a Typo	Location	NAD 83 UT	M Zone 16	Watercourse Characteristics	
Number	Number	Crossin	в туре	Location	Northing	Easting	Thermal	Flow
10-33	21	Culvert & Cable	New	Private P1	5233457	684120	Unknown	Intermittent
5-2	22	Culvert & Cable	New	2b	5229309	689024	Unknown	Intermittent
5-2	23	Culvert & Cable	New	2b	5229390	689128	Unknown	Intermittent

#### Notes

- 1. Water Body Number as identified in the Water Assessment and Water Body Report; Stantec
- 2. Crossing Number as identified on Water Crossing Locations Drawing, 10-212-WC1; Tulloch Engineering
- 3. Watercourse Description and Photographs Attached for Additional Information

Bow Lake Wind Farm

**Watercourse Descriptions for Roads & Cable Crossings** 

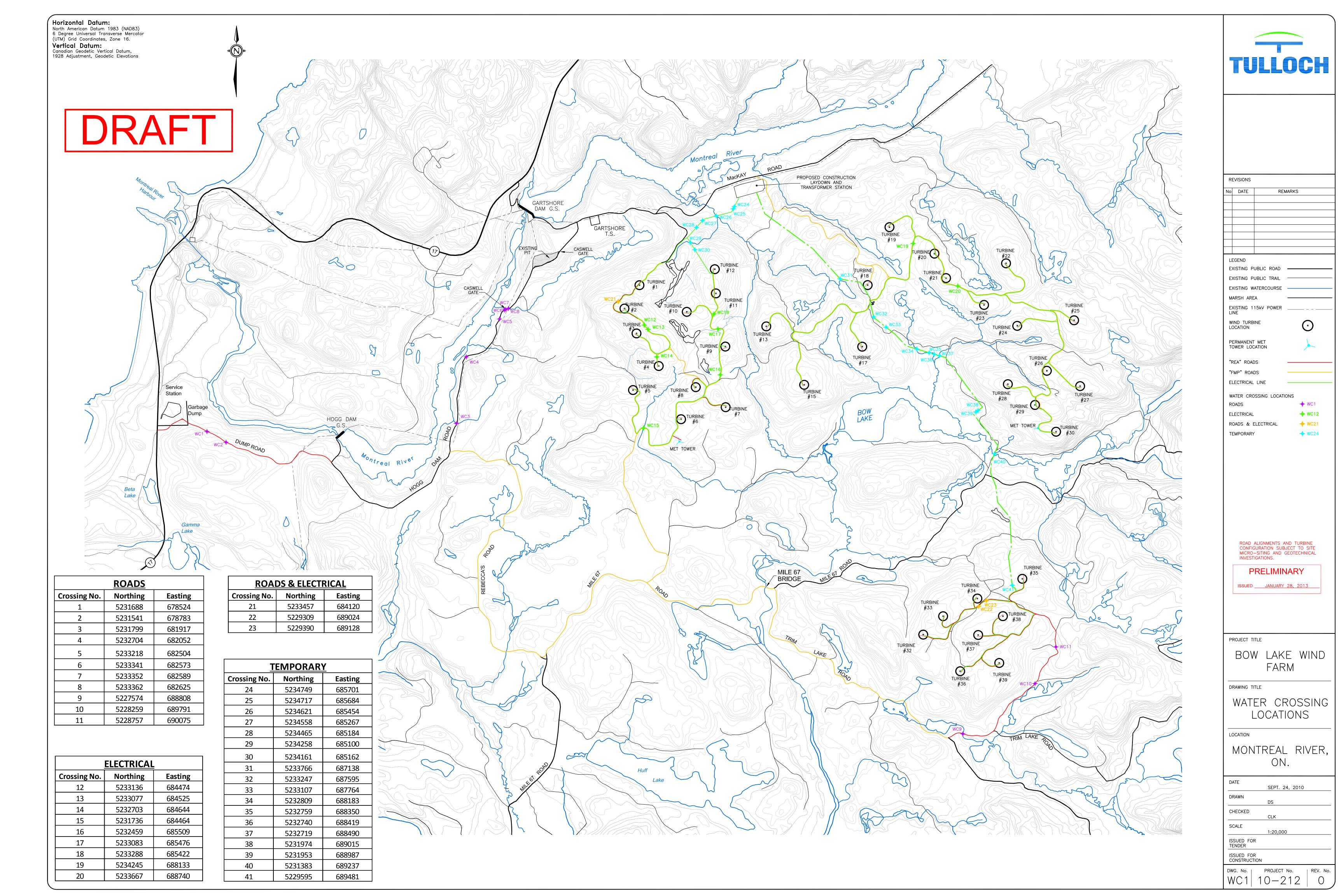
**Prepared By: Tulloch Engineering** 

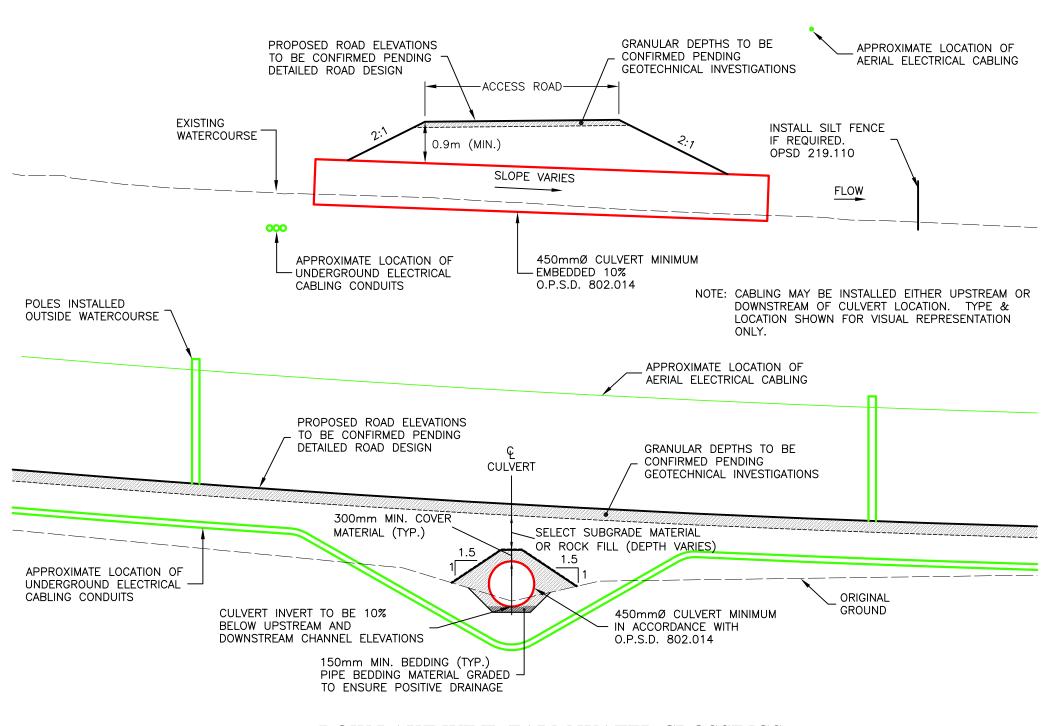
January 28, 2013

Crossing Number	Water Body Number	Watercourse Description	Photo
10-33	21	High gradient channel; riparian dominated by yellow birch, balsam fir, and maple. Bankfull width = 0.5 m Water depth = 10 cm (isolated areas) Substrate = Detritus, silt, sand, boulder, and gravel	
5-2	22	Dry at time of field investigations. Permanent shallow pond at the downstream end of the channel within 10m of existing road. Riparian vegetation dominated by mature deciduous forest. Bankfull= 1.4m. Substrate= gravel, detritus, muck, cobble, and boulder	
5-2	23	Dry at time of field investigations. Permanent shallow pond at the downstream end of the channel within 10m of existing road. Riparian vegetation dominated by mature deciduous forest. Bankfull= 1.4m. Substrate= gravel, detritus, muck, cobble, and boulder	

#### <u>Notes</u>

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BOW LAKE WIND FARM WATER CROSSINGS
FIGURE 3 - TYPICAL ROAD CROSSING c/w ELECTRICAL CABLING

# BOW LAKE WIND FARM WATER CROSSINGS TYPICAL ROAD CROSSING c/w ELECTRICAL CABLING

#### **GENERAL NOTES**

- 1. FINAL CROSSING LOCATION AND ALIGNMENT TO BE DETERMINED PENDING DETAILED DESIGN OF ROAD AND GEOTECHNICAL INVESTIGATIONS.
- 2. ALL WORK SHALL ADHERE TO THE MNR'S GUIDELINES FOR ACCESS ROADS AND WATER CROSSINGS.
  3. ALL WORK SHALL CONFORM TO THE ONTARIO
- PROVINCIAL STANDARD SPECIFICATIONS (OPSS) LATEST REVISION.
- 4. CONTRACTOR TO VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
- 5. THE CONSTRUCTOR IS TO ADHERE TO THE REQUIREMENTS OF ALL REGULATORY WORK PERMITS.

#### SEDIMENT CONTROL

- 1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED WHERE NECESSARY TO MINIMIZE ENVIRONMENTAL IMPACTS.
- 2. THE CONTRACTOR WILL BE IN CHARGE OF AND
- RESPONSIBLE FOR ALL ON—SITE WORK.

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- 1. INSTALL SEDIMENT CONTROL MEASURES.
- 2. EXCAVATE FOR CULVERT BEDDING. EXCAVATED MATERIAL SHALL BE STOCKPILED FOR REUSE AWAY FROM WATERCOURSE.
- 3. INSTALL, COMPACT AND SHAPE BEDDING MATERIAL TO RECEIVE CULVERT.
- 4. INSTALL CULVERT AND EMBEDMENT MATERIAL
- COMPLETE WITH COMPACTION.

  5. IF REQUIRED, INSTALL GEOTEXTILE PRIOR TO PLACING ROCK FILL.
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#### CONSTRUCTION SEQUENCING (FLOWING CONDITION)

SHOULD INSTALLATION OF THE CULVERT BE REQUIRED DURING FLOWING CONDITIONS, THE DRY CONDITION SEQUENCING WOULD APPLY WITH THE FOLLOWING MODIFICATIONS FOR SITE DEWATERING.

- 1A. EXCAVATE SMALL SUMP IMMEDIATELY UPSTREAM OF CROSSING LOCATION.
- 1B. INSTALL APPROPRIATELY SIZED PUMPS AND HOSES, DISCHARGING TO A SEDIMENT DEWATERING BAG.
- 1C. SEDIMENT DEWATERING BAG SHALL BE LOCATED PRIOR TO THE DOWNSTREAM SEDIMENT CONTROL MEASURES.

ONCE FLOW HAS BEEN DIVERTED TO CULVERT, REMOVE THE PUMPS AND DEWATERING BAG AND REHABILITATE THE UPSTREAM SUMP TO PRECONSTRUCTION CONDITIONS.

#### **CULVERT INSTALLATION**

- 1. CULVERT INSTALLATION WILL BE BY OPEN CUT.
- 2. BEDDING MATERIAL WILL BE GRANULAR A.
- 3. COVER AND EMBEDMENT MATERIAL WILL BE GRANULAR A, OR SAND WITH NO STONES LAGER THAN 25mm.
- 4. BACKFILL WILL BE SELECT SUBGRADE MATERIAL OR ROCK FILL.
- 5. CULVERT TO BE EMBEDDED 10% BELOW PROPOSED CHANNEL ELEVATIONS WITH INFILL COMPLETED BY NATURAL SEDIMENTATION.
- 6. PREFERRED INSTALLATION TO BE COMPLETED DURING DRY CONDITIONS. INSTALLATION DURING FLOWING CONDITION IS PERMISSIBLE WITH MODIFICATIONS TO THE CONSTRUCTION SEQUENCING, PENDING MNR APPROVAL.
- 7. CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH OSPD 802.014.
- 8. SEDIMENT CONTROL MEASURES TO BE MONITORED CONTINUOUSLY DURING CONSTRUCTION.

#### CABLING

- 1. UNDERGROUND CABLING IS PROPOSED TO BE INSTALLED BELOW GROUND, OUTSIDE OF THE PROPOSED CULVERT OCCUPATION.
- 2. UNDERGROUND CABLING WILL BE INSTALLED VIA THE DRY OPEN-CUT STREAM CROSSING OR ISOLATED OPEN-CUT STREAM CROSSING METHOD DEPENDING ON THE FLOW CONDITIONS AT TIME OF INSTALLATION.

  3. UNDERGROUND CABLING WILL BE INSTALLED
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  4. LOCATION OF CABLING MAY BE EITHER UPSTREAM OR DOWNSTREAM OF THE CULVERT.
- 5. POLES FOR AERIAL CABLING WILL BE OUTSIDE THE WATERCOURSE.



Name/Nom.

Ministry of Natural Resources

Mailing Address/Adresse postale

Ministère des Richesses naturelles

Nodin Kitagan Limited Partnership

# Application for Work Permit Demande de permis d'exploitaion

BluEarth Renewables Inc., 200, 4723 - 1st Street SW, Calgary, AB

Business Phone/Tél. (Bureau) (403) 668-1575 Part 1 Partie 1

Residence Phone/Tél. (Résidence)

Postal Code/Code postal T2G 4Y8

Applicant (eg. landowner, licencee, permittee, etc.) (Cannot be a subcontractor)

Demandeur (ex.: propriétaires fonciers, détenteurs de permis, etc.) (Ne doit pas être un sous-traitant)

N. I /N. I			nsable sur place	) ( - ! - ! - ! )	Dedie Occident A. W. L. Co.	
Name/Nom	Business Phone/Tél. (E	Bureau)	Residence Phone/Tél. (F	kesidence)	Radio Contact Available/Rad	
Mailing Address/Adresse postale	TO BE DETERMINED	)	-		Postal Code/Code postal	
Type of Work Proposed - Ple	ase indicate and complete th	he appropriate	additional part(s)			
Type de travaux prévus - Pré			, , , , , , , , , , , , , , , , , , , ,			
		☐ Work Within	a Waterbody X Roads	or Trails or Wa	ater Crossing	
	Travaux sur des terres	ravaux subm			traverse de cours d'eau	
		submergée		•		
_ocation of Work Permit Arc	ea/Emplacement					
Township, Municipality, Basemap N	lo. or Lot and Concession, L					
Canton, municipalité, carte de base	•	•				
Water Crossings #24, 25, 26	5, 27, 28, 29 & 30 as deta	alled on the e	nclosed Summary of Ten	nporary Cros	ssings Table	
Other i.e. Waterbody (describe) Autre p. ex. cours d'eau (décrire)	Water Crossings #24, 25	5, 26, 27, 28, 2	29 & 30, as detailed on the	ne enclosed	Watercourse Description Ta	ble
Camp Location					No. or Workers on Site	
Emplacement du camp					Nbre de travailleurs sur le si	e
Private Land/Terres privées  Private Lands of - Applicant/Appart	onant au domandour					
☐ Yes ☒ No ☐ Other (specify) Oui Non À d'autres (préc						
Effective Date(s)/Dates	isei qui)					
Start Date/Date de début des travai	ux Finish Da	ate/Date de fin	des travaux	†		
Fetimated a	as August 2013	Ectim	ated as December 2014			
	•	ESUITIO	ated as December 2014			
Equipment to be Used/maté	•	EStille	ated as December 2014	<u> </u>		
Equipment to be Used/maté Please specify/Préciser To B Note:	riel qui sera utilisé e Determined by the Con	ntractor.	Remarque:			
Please specify/Préciser  To B  Note: he issuance of this permit does no esponsibility of acquiring any othe pprovals as may be required.	riel qui sera utilisé e Determined by the Con of relieve the applicant from r agency, board, governme	ntractor. m the ent, or other	Remarque: La délivrance de ce pern autorisa- tions qui pourr organismes, commission	aient être exi ns, etc.	pas le détenteur d'obtenir le gées par d'autres gouverner	ents,
Equipment to be Used/maté Please specify/Préciser To B	riel qui sera utilisé e Determined by the Con of relieve the applicant from r agency, board, governme	ntractor. m the ent, or other	Remarque: La délivrance de ce pern autorisa- tions qui pourr organismes, commission	aient être exi ns, etc.		ents,
Please specify/Préciser  To B  Note: The issuance of this permit does not esponsibility of acquiring any othe pprovals as may be required.  Tan applicant requires a copy of this a	riel qui sera utilisé e Determined by the Con of relieve the applicant from r agency, board, governme application, he/she should re s collected under the author R.S.O. 1990 and Ontario R gulation 975 as amended, a poses of the Act and Regu nould be directed to the loc	ntractor.  In the ent, or other etain copy  Ority of Regulation and the illations.  cal MNR	Remarque: La délivrance de ce pern autorisa- tions qui pourr organismes, commission Si le demandeur en a best avant de la soumettre. Les renseignements per en vertu de l'article 13 de règlement de l'Ontario 4 l'Ontario tel que modifié des règlements. Veuillez	saient être exins, etc.  soin, il doit cons  sonnels exige e la <i>Loi sur le</i> 53/96 tel que . Ils seront ut e adresser tou des bureaux o	gées par d'autres gouverner	ecueill 90 et d de Loi et
Please specify/Préciser  To B  Note: The issuance of this permit does not esponsibility of acquiring any other pprovals as may be required.  The an applicant requires a copy of this arrior to submitting.  Personal Information on this form is section 13 of the Public Lands Act, 53/96 as amended and Ontario Registromation will be used for the purposessions about this information siffice. MNR office addresses and plants.	riel qui sera utilisé e Determined by the Con ot relieve the applicant fron r agency, board, governme application, he/she should re as collected under the author R.S.O. 1990 and Ontario R gulation 975 as amended, a poses of the Act and Regu nould be directed to the loc none numbers are listed or the terms and conditions of t plication. Any changes, ame	ortractor.  In the ent, or other etain copy  Ority of Regulation and the ulations.  Cal MNR or the	Remarque: La délivrance de ce pern autorisa- tions qui pourr organismes, commission Si le demandeur en a best avant de la soumettre. Les renseignements per en vertu de l'article 13 de règlement de l'Ontario 4 l'Ontario tel que modifié des règlements. Veuillez local du MRN. Une liste de téléphone se trouve au vu J'accepte de me conforme ploitation émis pour la pré	saient être exins, etc.  oin, il doit cons  sonnels exigne la Loi sur le 53/96 tel que Ils seront ut adresser tou des bureaux of verso.  er strictement a	gées par d'autres gouverner server un exemplaire de cette és dans les présentes sont r es terres publiques, S.R.O. 15 modifié et du règlement 975 illisés selon les termes de la ute question à ce sujet au bu	demandecueill 90 et de Loi et de Loi et de méros
Please specify/Préciser  To B  Note: The issuance of this permit does not esponsibility of acquiring any other pprovals as may be required.  To an applicant requires a copy of this arior to submitting.  Tersonal Information on this form is section 13 of the Public Lands Act, 53/96 as amended and Ontario Registration will be used for the pur formation will be used for the pur fluestions about this information significe. MNR office addresses and pleasers of this form.  We hereby agree to rely solely upon work permit issued pursuant to this approved.	riel qui sera utilisé e Determined by the Con ot relieve the applicant from r agency, board, governme application, he/she should re application, he/she should re accollected under the author R.S.O. 1990 and Ontario R gulation 975 as amended, a poses of the Act and Regu nould be directed to the location of the terms and conditions of the plication. Any changes, ame wed in writing by MNR.	ortractor.  In the ent, or other etain copy  Ority of Regulation and the ulations.  Cal MNR or the	Remarque: La délivrance de ce pern autorisa- tions qui pourr organismes, commission Si le demandeur en a best avant de la soumettre. Les renseignements per en vertu de l'article 13 de règlement de l'Ontario 4 l'Ontario tel que modifié des règlements. Veuillez local du MRN. Une liste de téléphone se trouve au vu J'accepte de me conforme ploitation émis pour la pré	saient être exins, etc.  oin, il doit cons  sonnels exige e la Loi sur le 53/96 tel que . Ils seront ut e adresser tou des bureaux overso.  er strictement a sente demand bitation doit êti	gées par d'autres gouverner server un exemplaire de cette és dans les présentes sont res terres publiques, S.R.O. 15 modifié et du règlement 975 illisés selon les termes de la ute question à ce sujet au bu du MRN avec adresses et nu aux conditions écrites du perm de. Tout changement ou toute le approuvé par écrit par le MN	demand ecueilli 90 et c de Loi et eau néros s d'ex- nodifi-
Please specify/Préciser  To B  Note: The issuance of this permit does not esponsibility of acquiring any other pprovals as may be required.  To an applicant requires a copy of this arrior to submitting.  The resonal Information on this form is section 13 of the Public Lands Act, 53/96 as amended and Ontario Registration will be used for the purple strong about this information of the purple strong about this information so the purple strong and pleasers of this form.  We hereby agree to rely solely upon work permit issued pursuant to this apprendiction witten work permit must be approved.	riel qui sera utilisé e Determined by the Con ot relieve the applicant from r agency, board, governme application, he/she should re application, he/she should re accollected under the author R.S.O. 1990 and Ontario R gulation 975 as amended, a poses of the Act and Regu nould be directed to the location of the terms and conditions of the plication. Any changes, ame wed in writing by MNR.	ntractor.  In the ent, or other etain copy  ority of Regulation and the ulations. cal MNR In the written endments to	Remarque: La délivrance de ce pern autorisa- tions qui pourr organismes, commission Si le demandeur en a best avant de la soumettre. Les renseignements per en vertu de l'article 13 de règlement de l'Ontario 4 l'Ontario tel que modifié des règlements. Veuillez local du MRN. Une liste de téléphone se trouve au vu J'accepte de me conforme ploitation émis pour la précation audit permis d'explorer.	saient être exins, etc.  oin, il doit cons  sonnels exige e la Loi sur le 53/96 tel que . Ils seront ut e adresser tou des bureaux overso.  er strictement a sente demand bitation doit êti	gées par d'autres gouverner server un exemplaire de cette és dans les présentes sont res terres publiques, S.R.O. 15 modifié et du règlement 975 illisés selon les termes de la ute question à ce sujet au bu du MRN avec adresses et nu aux conditions écrites du perm de. Tout changement ou toute le approuvé par écrit par le MN	deman ecueill 90 et de Loi et eau néros s d'ex-
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Please specify/Préciser  To B  Note: he issuance of this permit does no esponsibility of acquiring any other pprovals as may be required.  an applicant requires a copy of this arior to submitting.  Personal Information on this form is ection 13 of the Public Lands Act, 53/96 as amended and Ontario Registrons about this information sliffice. MNR office addresses and playerse of this form.  We hereby agree to rely solely upon rork permit issued pursuant to this apie written work permit must be approcentify the information given in this approach is a process of the pursuant to this approach is approached by the information given in this approached by the process of the pursuant to this approached by the process of the pursuant to this approached by the process of the pursuant to this approached by the process of the pursuant to this approached by the process of the pursuant to this approached by the pursuant to the pursuant to this approached by the pursuant to the pursuant to this approached by the pursuant to th	riel qui sera utilisé e Determined by the Con of relieve the applicant from r agency, board, governme application, he/she should re application, he/she should re application 975 as amended, a poses of the Act and Regu application enumbers are listed or the terms and conditions of the plication. Any changes, ame and in writing by MNR. application is true.  Position/F e) Position/F lieu)	ontractor.  In the ent, or other etain copy  Ority of Regulation and the lations.  It is a lation with the written endments to	Remarque: La délivrance de ce pern autorisa- tions qui pourr organismes, commission Si le demandeur en a best avant de la soumettre. Les renseignements per en vertu de l'article 13 de règlement de l'Ontario 4 l'Ontario tel que modifié des règlements. Veuillez local du MRN. Une liste de téléphone se trouve au vu J'accepte de me conforme ploitation émis pour la précation audit permis d'explorer.	saient être exins, etc.  oin, il doit cons  sonnels exige e la Loi sur le 53/96 tel que . Ils seront ut adresser tou des bureaux e verso.  er strictement a sente demand oitation doit êti nements donn	gées par d'autres gouverner server un exemplaire de cette és dans les présentes sont res terres publiques, S.R.O. 15 modifié et du règlement 975 illisés selon les termes de la ute question à ce sujet au bu du MRN avec adresses et nu aux conditions écrites du perm de. Tout changement ou toute le approuvé par écrit par le MN	deman ecueill 90 et de _oi et eau néros s d'ex nodifi-

# Ministry of Ministère des Noturel Pichassas Road or Trail Construction/Water Crossings

Part 4

Resources naturell	( 'oneti	ruction d	e roı	ites ou se	entiers/t	raverses d'eau	Partie 4
1) Include a sketch showing - detailed location of	road or trail (i.e. ho étailléde la route ou Please se	w close to want du sentier (cee attached)	aterbod c. –à-d. Water	distance à un Crossing Le	ocation Dr	l'eau, etc.); awing 10-212-WC1 nsmission Line & Note	es
<ul> <li>Purpose/But         <ul> <li>Access to private pr Accès aux propriété</li> <li>Access for resource Accès pour extraction</li> <li>Other (specify) Autres (préciser)</li> </ul> </li> </ul>	és privées	ex. exploration	on min	ière, exploita	ation minièr	Yes re ou forestière) □ O	
3) Type (check box) Su Type (cocher) Éto	immer Winter ≦ ☐ Hiver	Year I  X Tout 1			l Road ite de transp	Trail port ☐ Piste [	Other Autre
4) Description					5) Leng	th of Time Required/L	Ourée
Length/Longueur Travelled Roa Largeur utile To Be Determined		Right-of-Way Largeur de l'er sign Stage			Long	g Term Short Term	
6) Who will be responsible for					en?		
Indicate Person, Company, Associa Nodin Kitagan Limi	ted Partnership	association, en	treprise	e, etc.			
7) Source Gravel/Fill/Source of							
	approved Right-of-V	Nay, or from	Permitt	ted Aggregat			
8) Water Crossing/Traverse d		o sample sket	ch on 1	reverse/les le	ttres corres	pondent à l'exemple de	croquis au verso)
Stream Name/Nom du course d'eau	Please see atta	ached summa	ary tabl	es			
Road Name/Nom de la route					Type of Fil	l to be Used at Crossing/T	ype de remblai utilisé
Site Conditions/Condition du site							
Flood plain width (A)/	Water Width (E	3)/	Water	Depths (C, D	, E)/	Measured Flow Velocit	y/
Largeur de la plaine inondable	Largeur de l'ea	u	Profo	ndeur de l'eau		Vitesse Measurée du courant	(ft/sec or m/sec) pi/s. ou m/s
Foundation Soil Description/Description	ption du sous-sol					•	•
8 a) Bridge/Pont N/A							
Proposed Bridge – Length (F) Projet de pont – Longueur du pont	Clearance (G) Dégagement	Clear Span ( Travée	(H)	Crib Height Hauteur du b		Crib Width (J) Largeur du berceau	Deck Width (K) Largeur du tablier
Stringer Type/Type de longeron		1					

8 a) Bridge/Pont N/A				
Proposed Bridge – Length (F)	Clearance (G)	Clear Span (H)	Crib Height (I)	Crib W
Projet de pont – Longueur du pont	Dégagement	Travée	Hauteur du berceau	Largeu
Stringer Type/Type de longeron		I	l	ı

Stringer Spacing/Espacement des longerons Deck Details (L)/Détails du tablier Wear Surface (M)/Surface

Guide Rail Details (O)/Détails du rail de guidage

Curb Details (N)/Détails de la chaussée

8 b) Culvert/Ponceau
----------------------

o b) Curverur on	ceau		
Culvert Diameter/D	iamètre du	Culvert Length/Longueur du	Road Fill Height Above Creek Bottom/Hauteur du remblai de la route au
ponceau Minim	num 450mmØ	ponceau Based on Detailed Design	fond du cours d'eau Based on Detailed Design



Ministry of Natural Resources Ministère des Richesses naturelles

# Application for Work Permit Demande de permis d'exploitaion

Part 1 Partie 1

Applicant (eg. landowner, licencee, permittee, etc.) (Cannot be a subcontractor)

**Demandeur** (ex. : propriétaires fonciers, détenteurs de permis, etc.) (Ne doit pas être un sous-traitant)

Name/Nom. Nodin Kitagan 2 Limite	d Partnership	Business	Phone/Tél. (Bureau) (403) 66		Residence Phone/Tél. (Résidence)
Mailing Address / Advances and Advances	Earth Renewables Inc., 200	), 4723 - 1s	,		Postal Code/Code postal T2G 4Y8
Site Contractor or Person in Cl	narge/Entrepreneur ou r	responsa	ble sur place	ı	
Name/Nom	Business Phone/Tél. (Bureau)		esidence Phone/Tél. (R	ésidence)	Radio Contact Available/Radio  Yes/Oui  No/Non
Mailing Address/Adresse postale	TO BE DETERMINED	•			Postal Code/Code postal
Type of Work Proposed - Please	indicate and complete the appro	opriate addit	ional part(s)		
	rk on Shorelands	k Within a W ux submerge mergées			Nater Crossing u traverse de cours d'eau
Township, Municipality, Basemap No. of Canton, municipalité, carte de base n° of Water Crossings #31, 32, 33, 34  Other i.e. Waterbody (describe)	or Lot and Concession, Location bu parcelle, concession, emplace 4, 35, 36, 37, 38, 39, 40 & 4	cement, sub 1, as detail	division ou N° du MTU o ed on the enclosed S	ou concession command	f Temporary Crossings Table
Autre p. ex. cours d'eau (décrire)  Camp Location	er Crossings #31, 32, 33, 34, 30	5, 30, 37, 30	, 39, 40 & 41, as detaile	ed on the en	No. or Workers on Site
Emplacement du camp					No. or workers on site  Nbre de travailleurs sur le site
Private Land/Terres privées					
Private Lands of - Applicant/Appartenar  Yes No Other (specify) Oui Non À d'autres (préciser					
Effective Date(s)/Dates	4/				
Start Date/Date de début des travaux Estimated as A	Finish Date/Date	e de fin des t	ravaux as December 2014	Ť	
Equipment to be Used/matériel	•	Estimateu	as December 2014	<u>T</u>	
Places aposify/Présisor					
To Be D	etermined by the Contractor	Г.			
Note: The issuance of this permit does not re responsibility of acquiring any other ag approvals as may be required.	ency, board, government, or o	La other au orç	torisa- tions qui pourra ganismes, commission	aient être e ıs, etc.	re pas le détenteur d'obtenir les xigées par d'autres gouvernements,
f an applicant requires a copy of this appli prior to submitting.	cation, he/she should retain cop		Si le demandeur en a besoin, il doit conserver un exemplaire de cette demandavant de la soumettre.		
Personal Information on this form is co Section 13 of the Public Lands Act, R.S 453/96 as amended and Ontario Regula nformation will be used for the purpose Questions about this information shoul office. MNR office addresses and phone reverse of this form.	.O. 1990 and Ontario Regulati tion 975 as amended, and the es of the Act and Regulations d be directed to the local MNF	ion en e rèç s. l'O R de loc	vertu de l'article 13 de glement de l'Ontario 45 ntario tel que modifié. s règlements. Veuillez	la <i>Loi sur</i> 53/96 tel qu Ils seront adresser te les bureau	igés dans les présentes sont recueillis les terres publiques, S.R.O. 1990 et du e modifié et du règlement 975 de utilisés selon les termes de la Loi et oute question à ce sujet au bureau x du MRN avec adresses et numéros d
/We hereby agree to rely solely upon the terms and conditions of the written work permit issued pursuant to this application. Any changes, amendments the written work permit must be approved in writing by MNR.			J'accepte de me conformer strictement aux conditions écrites du permis d'ex- ploitation émis pour la présente demande. Tout changement ou toute modifi- cation audit permis d'exploitation doit être approuvé par écrit par le MNR.		
certify the information given in this applic	ation is true.	Je	certifie que les renseign	iements doi	nnés ici sont véridiques.
Signature of Applicant/Signé par	Position/Poste			Date	
Signature of contractor (if applicable) Signature de l'entrepreneur (s'il y a lieu To Be Determined	Position/Poste			Date	
Date Application Received in Office Date de r'éception de la demande					

Ministry of Natural Resources

Ministère des Richesses naturelles

# Road or Trail Construction/Water Crossings Construction de routes ou sentiers/traverses d'eau

Part 4 Partie 4

Ontar	rio							
1) 2)	Include a sketch showing  - detailed location of a l'empl.acement de  - all water crossings toutes les traverses de  Purpose/But  - Access to private pre Accès aux propriété  - Access for resource Accès pour extraction  - Other (specify)	road or trail (i.e. ho étailléde la route or Please so d'eau. as well a Bridge (V operty Yes so privées Oui extraction (e.g. mi	ow close to w u du sentier ( ee attached s Figure 4 - VC#40) will  No i X Non ning, logging . ex. explorat	vaterbook (c. –à-d Water Temp be in a	distance à ur Crossing Lorary Cross accordance ral explorationière, exploit	ocation E ing for Tr with MNF on) ation mini	Drawing 10-212-WC1 ransmission Line & Note R's Portable Bridge Spe	ecifications.
	Autres (préciser)		ergy (vvirid i	aiiii) i	Developmen			
3)	Type (check box) Summer Winter Year Round Haul Road Trail Other Type (cocher) ☐ Été ☐ Hiver ☒ Tout l'année ☐ Route de transport ☐ Piste ☐ Autre							
	escription					5) Ler	ngth of Time Required/E	Ourée
Leng	th/Longueur Travelled Roa Largeur utile To Be Determined		Right-of-Way Largeur de l'e esign Stage		1		ong Term Short Term ong terme Cout terme	No. of Months/Years N <sup>bre</sup> de mois/années
	Vho will be responsible for					en?		
Indic	cate Person, Company, Associa Nodin Kitagan 2 Lin	tion, etc./Particulier,	association, e	ntrepris	e, etc.			
7) S	ource Gravel/Fill/Source d		<u> </u>					
	se indicate intended source, if a			as échéa	int			
	Gravel from within							
	Vater Crossing/Traverse d		to sample ske	etch on	reverse/les le	ettres corre	espondent à l'exemple de	croquis au verso)
Strea	nm Name/Nom du course d'eau	Please see att	tached summ	ary tab	les			
	l Name/Nom de la route					Type of I	Fill to be Used at Crossing/T	ype de remblai utilisé
Site (	Conditions/Condition du site							
Floor	d plain width (A)/	Water Width (	B)/	Wate	r Depths (C, D	). E)/	Measured Flow Velocit	v/
Larg	eur de la plaine inondable	Largeur de l'ea					Vitesse Measurée du courant	(ft/sec or m/sec) pi/s. ou m/s
Foun	dation Soil Description/Descri	ption du sous-sol						
8 a)	Bridge/Pont							
Prop	osed Bridge – Length (F) et de pont – Longueur du pont	Clearance (G) Dégagement	Clear Span Travée	(H)	Crib Height Hauteur du		Crib Width (J) Largeur du berceau	Deck Width (K) Largeur du tablier
Strin	ger Type/Type de longeron							
Strin	ger Spacing/Espacement des lo	ongerons						
Deck	Details (L)/Détails du tablier							
	Dimensions to be deter			with M	NR's Portable	e Bridge S	tandards and Specificatio	ns.
Wear	r Surface (M)/Surface							
Curb	Details (N)/Détails de la chau	ssée						
<u> </u>	D 1D ( 1 (0)/D(: 1 1	.1.11						
Guid	le Rail Details (O)/Détails du ra	iii de guidage						

8 b)	Cul	lvert/P	onceau
------	-----	---------	--------

Culvert Diameter/Diamètre du	Culvert Length/Longueur du	Road Fill Height Above Creek Bottom/Hauteur du remblai de la route au
ponceau Minimum 450m	nØ ponceau Based on Detailed Design	fond du cours d'eau Based on Detailed Design

Bow Lake Wind Farm Summary of Temporary Crossings Prepared By: Tulloch Engineering

January 28, 2013

Water Body	Crossing	Cuasin	a Tura	Location	NAD 83 UT	M Zone 16	Watercourse Characteristics	
Number	Number	Crossin	g Type Location –		Northing	Easting	Thermal	Flow
7-15	24	Culvert	New	T-Line 1	5234749	685701	Cold	Permanent
7-16	25	Culvert	New	T-Line 1	5234717	685684	Cold	Permanent
10-25	26	Culvert	New	T-Line 1	5234621	685454	Cold	Permanent
10-28	27	Culvert	New	T-Line 1	5234558	685267	Cold	Permanent
10-27	28	Culvert	New	T-Line 1	5234465	685184	Unknown	Permanent
10-13	29	Culvert	New	T-Line 1	5234258	685100	Unknown	Permanent
10-16	30	Culvert	New	T-Line 1	5234161	685162	Unknown	Permanent
1-10	31	Culvert	New	T-Line 2a	5233766	687138	Unknown	Intermittent
1-9	32	Culvert	New	T-Line 2b	5233247	687595	Unknown	Intermittent
1-7	33	Culvert	New	T-Line 2b	5233107	687764	Unknown	Intermittent
1-8	34	Culvert	New	T-Line 2b	5232809	688183	Cold	Permanent
1-8	35	Culvert	New	T-Line 2b	5232759	688350	Cold	Permanent
1-8	36	Culvert	New	T-Line 2b	5232740	688419	Cold	Permanent
0-9	37	Culvert	New	T-Line 2b	5232719	688490	Cold	Permanent
0-4	38	Culvert	New	T-Line 2b	5231974	689015	Cold	Intermittent
0-4	39	Culvert	New	T-Line 2b	5231953	688987	Cold	Intermittent
0-10	40	Bridge	New	T-Line 2b	5231383	689237	Warm	Permanent
5-3	41	Culvert	New	T-Line 2b	5229595	689481	Unknown	Intermittent

### <u>Notes</u>

- 1. Water Body Number as identified in the Water Assessment and Water Body Report; Stantec
- 2. Crossing Number as identified on Water Crossing Locations Drawing, 10-212-WC1; Tulloch Engineering
- 3. Watercourse Description and Photographs Attached for Additional Information

Bow Lake Wind Farm
Watercourse Descriptions for Temporary Crossings
Prepared By: Tulloch Engineering

January 28, 2013

Crossing Number	Water Body Number	Watercourse Description	Photo
7-15	24	Flow originating from upstream seep. Channel dominated by riffle morphology with sections of sub-surface flow. Riparian vegetation consisting of mature mixed forest. Bankfull width= 4m, wetted width =0.3m, water depth = 5cm. Substrate= sand, silt and detritus.	
7-16	25	Flow originating from upstream seep. Channel dominated by riffle morphology with sections of sub-surface flow. Riparian vegetation consisting of mature mixed forest. Bankfull width= 3m, wetted width =1.2m, water depth = 5cm. Substrate= sand, silt and detritus.	
10-25	26	Flow dominated by riffle and run morphology. Undercut banks observed during field investigations. Riparian area dominated by mountain maple, yellow birch, and sugar maple. Bankfull width = 4.5m, wetted width= 2.5 m. Substrate= cobble, gravel, sand, and boulder.	
10-28	27	Seep originating from side of steep slope. Generally unchannelized and disappears underground before crossing McKay Rd.	
10-27	28	Dominant run morphology. Riparian areas dominated by sugar maple and yellow birch. Bankfull width= 2m, wetted width = 0.7m, water depth = 8cm.	

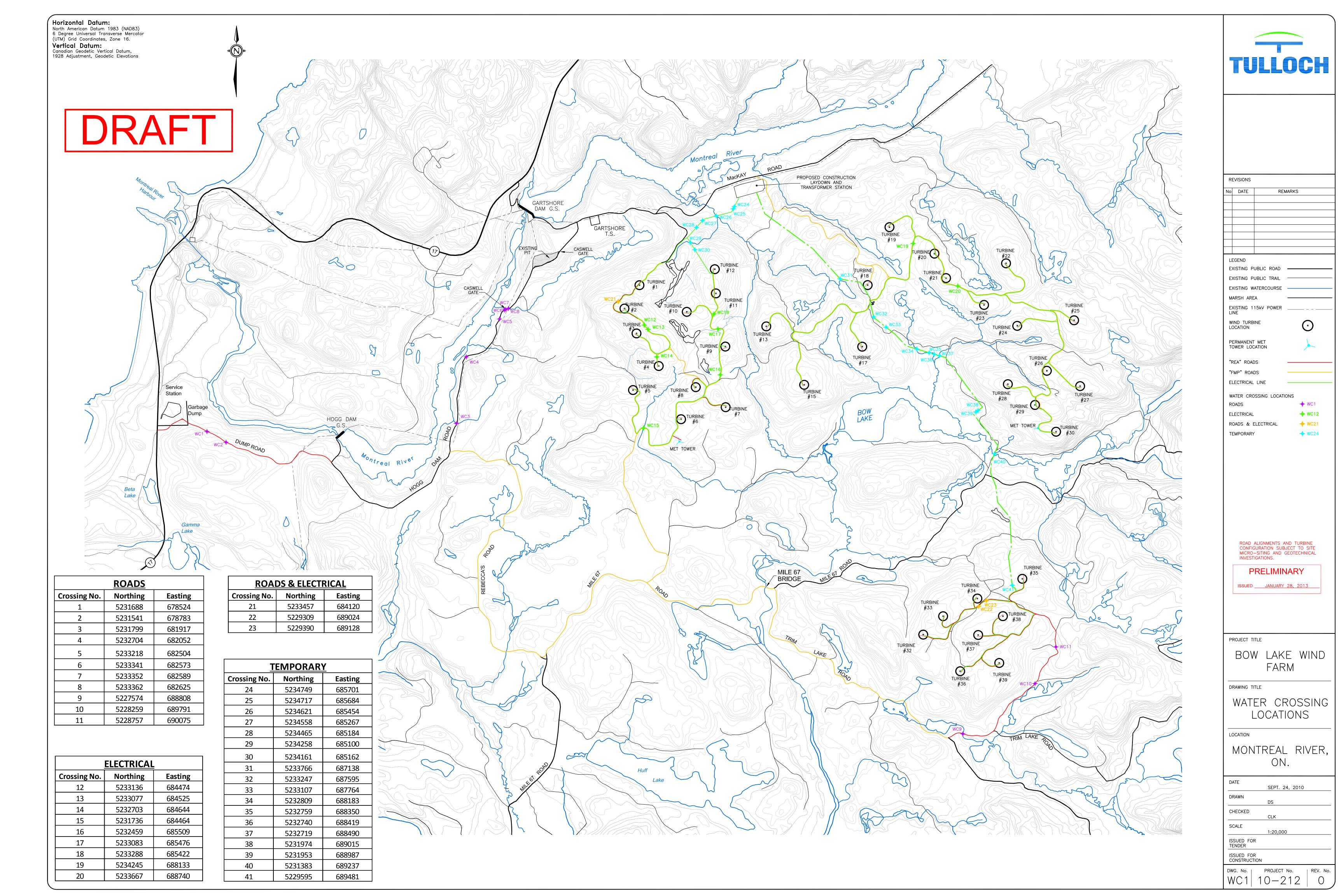
Crossing Number	Water Body Number	Watercourse Description	Photo
10-13	29	Dominant pool morphology. Riparian area dominated by sugar maple and ferns. Several locations with undercut banks.  Bankfull width = 3m, wetted width = 0.6m, water depth = 4 cm. Substrate= cobble, gravel, sand, boulder, and detritus.	
10-16	30	Dominant run morphology. Riparian area dominated by maple and ferns. Low gradient area with jewelweed and grasses adjacent to, and on edge of poorly defined channel. Bankfull width= 1.5m, wetted width= 0.7m, substrate- silt and detritus.	
1-10	31	Shallow channel with small pools; Riparian vegetation dominated by immature sugar maple and eastern white cedar.  Bankfull width = 0.6 m  Substrate = Clay, boulder, silt and muck	
1-9	32	High gradient. Channel dominated by pool morphology. Riparian vegetation dominated by fern and sugar maple. Bankfull width = 1m, wetted width= 0.5m, water depth= 4cm. Substrate= boulder, cobble, gravel and detritus.	
1-7	33	High gradient, upstream of reach of 1-8. Surface water confined to a series of isolated pools at the time of field investigations. Riparian vegetation was dominated by fern and sugar maple. Bankfull width = 0.7m, wetted width = 0.5m, water depth = 2cm. Substrate = cobble, boulder, sand and detritus.	

Crossing Number	Water Body Number	Watercourse Description	Photo
1-8	34	Flow dominated by pool morphology. Riparian vegetation dominated by jewelweed, yellow birch, sugar maple and fern. Bankfull width= 1m, wetted width = 0.5m, water depth =7 cm. Substrate= gravel, detritus, boulder and cobble.	
1-8	35	Flow dominated by pool morphology. Riparian vegetation dominated by jewelweed, yellow birch, sugar maple and fern. Bankfull width= 1m, wetted width = 0.5m, water depth =7 cm. Substrate= gravel, detritus, boulder and cobble.	
1-8	36	Flow dominated by pool morphology. Riparian vegetation dominated by jewelweed, yellow birch, sugar maple and fern. Bankfull width= 1m, wetted width = 0.5m, water depth =7 cm. Substrate= gravel, detritus, boulder and cobble.	
0-9	37	Stream with riffle, run and pool sequences; minor undercutting of banks; riparian dominated by yellow birch, sugar maple, fern.  Bankfull width = 3.0 m  Wetted width = 2.0 m  Water depth = 10 cm  Substrate = Boulder, cobble, gravel and sand.	
0-4	38	Low water at the time of field investigations restricted to pools and flats. Riparian vegetation dominated by sugar maple, balsam fir and fern. Bankfull width = 1.5m, wetted width = 0.7m, water depth = 5cm. Substrate= sand, boulder, cobble, detritus and gravel.	

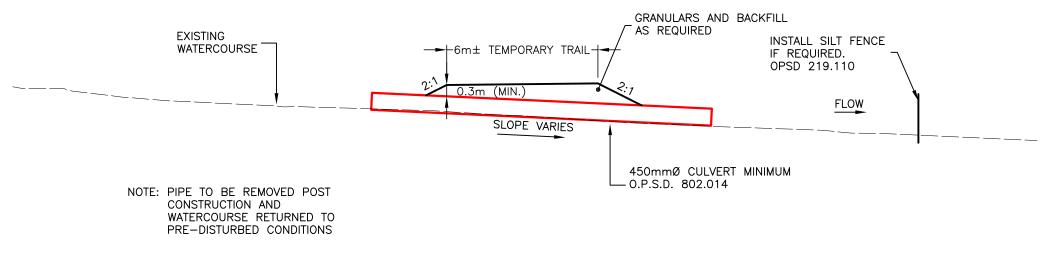
Crossing Number	Water Body Number	Watercourse Description	Photo
0-4	39	Low water at the time of field investigations restricted to pools and flats. Riparian vegetation dominated by sugar maple, balsam fir and fern. Bankfull width = 1.5m, wetted width = 0.7m, water depth = 5cm. Substrate= sand, boulder, cobble, detritus and gravel.	
0-10	40	Lake and wetland. Bankfull width = 30 m, wetted width = 25m, water depth = >1.2m. Substrate= gravel, sand, detritus and muck.	
5-3	41	Dominant flat morphology. Riparian vegetation dominated by maple and fern. Bankfull width = 1.3m, wetted width= 0.5m, water depth = 4cm, substrate= gravel, detritus, muck, cobble and boulder.	

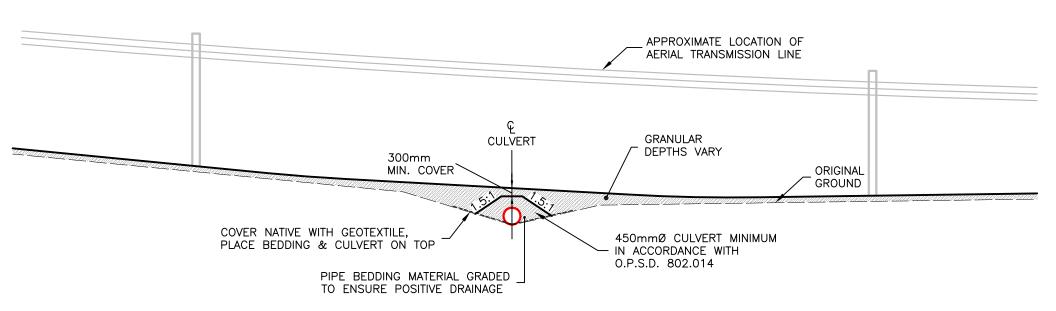
#### <u>Notes</u>

- 1. Water Body Number as identified in the Water Assessment and Water Body Report; Stantec
- 2. Crossing Number as identified on Water Crossing Locations Drawing, 10-212-WC1; Tulloch Engineering









# BOW LAKE WIND FARM WATER CROSSINGS FIGURE 4 - TEMPORARY CROSSING for TRANSMISSION LINE

# BOW LAKE WIND FARM WATER CROSSINGS TEMPORARY CROSSING for TRANSMISSION LINE

#### **GENERAL NOTES**

- 1. FINAL CROSSING LOCATION AND ALIGNMENT TO BE DETERMINED PENDING ROUTING OF ACCESS TRAIL.
- 2. ALL WORK SHALL ADHERE TO THE MNR'S GUIDELINES
- FOR ACCESS ROADS AND WATER CROSSINGS.

  3. ALL WORK SHALL CONFORM TO THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (OPSS) LATEST REVISION.
- 4. CONTRACTOR TO VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
- 5. THE CONSTRUCTOR IS TO ADHERE TO THE REQUIREMENTS OF ALL REGULATORY WORK PERMITS.

#### SEDIMENT CONTROL

- 1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED WHERE NECESSARY TO MINIMIZE ENVIRONMENTAL IMPACTS.
- 2. THE CONTRACTOR WILL BE IN CHARGE OF AND
- RESPONSIBLE FOR ALL ON-SITE WORK.

  3. THE SITE SUPERVISOR WILL HOLD A MEETING OF ALL EQUIPMENT OPERATORS WORKING AT THE SITE TO MAKE THEM AWARE OF MINISTRY CONCERNS AND MEASURES TO CONTROL SEDIMENT. EXISTING
  VEGETATION IS TO BE PROTECTED TO THE MAXIMUM EXTENT POSSIBLE.
- 4. TO THE MAXIMUM EXTENT POSSIBLE, NO SEDIMENTS SHALL ENTER THE WATER DURING ANY ASPECT OF THE WORK. SHORT TERM INTRODUCTION OF SEDIMENTS SHALL BE KEPT TO THE LOWEST PRACTICAL LEVEL AND THERE SHOULD BE NO LONG TERM SOURCES OF SEDIMENT FROM THE COMPLETED PROJECT.
- 5. ANY EQUIPMENT WORKING NEAR THE WATER MUST BE FREE FROM ANY LEAKS OF OIL, GREASE OR OTHER CONTAMINANTS. THE EQUIPMENT SHALL BE CLEANED OF ALL CONTAMINATES PRIOR TO BEING BROUGHT ON
- 6. CONSTRUCTION OPERATIONS WILL BE UNDER THE DIRECTION OF THE SITE SUPERVISOR FOR THE CONTRACTOR AND INSPECTOR BY THE SITE INSPECTOR FOR THE OWNER. ANY PROBLEMS OR CONCERNS WILL BE RESOLVED ON SITE WITH THE ENGINEER.

#### **TEMPORARY CROSSINGS**

- 1. GEOTEXTILE SHALL BE LAID OVER WATERCOURSE AND SURROUNDING HABITAT AREA PRIOR TO PLACEMENT
- OF GRANULARS AND CULVERTS.
  2. ALL MATERIALS SHALL BE REMOVED POST CONSTRUCTION INCLUDING GEOTEXTILE TO RETURN SITE TO PRE-CONSTRUCTION CONDITIONS.

#### CONSTRUCTION SEQUENCING (DRY CONDITION)

- 1. INSTALL SEDIMENT CONTROL MEASURES.
- 2. EXCAVATE FOR CULVERT BEDDING. EXCAVATED MATERIAL SHALL BE STOCKPILED FOR REUSE AWAY FROM WATERCOURSE.
- 3. INSTALL, COMPACT AND SHAPE BEDDING MATERIAL TO RECEIVE CULVERT.
- 4. INSTALL CULVERT AND EMBEDMENT MATERIAL COMPLETE WITH COMPACTION.
- 5. IF REQUIRED, INSTALL GEOTEXTILE PRIOR TO PLACING ROCK FILL.
- 6. COMPLETE PLACEMENT OF FILL MATERIAL TO SUBGRADE ELEVATION.
- 7. EXCAVATE CHANNEL REALIGNMENT, IF NECESSARY TO MATCH EXISTING CHANNEL DIMENSIONS.
- 8. RELOCATE ABANDONED CHANNEL SUBSTRATE TO REALIGNED CHANNEL. IF NECESSARY.

#### CONSTRUCTION SEQUENCING (FLOWING CONDITION)

SHOULD INSTALLATION OF THE CULVERT BE REQUIRED DURING FLOWING CONDITIONS, THE DRY CONDITION SEQUENCING WOULD APPLY WITH THE FOLLOWING MODIFICATIONS FOR SITE DEWATERING.

- 1A. EXCAVATE SMALL SUMP IMMEDIATELY UPSTREAM OF CROSSING LOCATION.
- 1B. INSTALL APPROPRIATELY SIZED PUMPS AND HOSES, DISCHARGING TO A SEDIMENT DEWATERING BAG.
- 1C. SEDIMENT DEWATERING BAG SHALL BE LOCATED PRIOR TO THE DOWNSTREAM SEDIMENT CONTROL MEASURES.

ONCE FLOW HAS BEEN DIVERTED TO CULVERT, REMOVE THE PUMPS AND DEWATERING BAG AND REHABILITATE THE UPSTREAM SUMP TO PRECONSTRUCTION CONDITIONS.

#### **CULVERT INSTALLATION**

- 1. CULVERT INSTALLATION WILL BE BY OPEN CUT.
- BEDDING MATERIAL WILL BE GRANULAR A.
   COVER AND EMBEDMENT MATERIAL WILL BE GRANULAR A, OR SAND WITH NO STONES LAGER THAN 25mm.
- 4. BACKFILL WILL BE SELECT SUBGRADE MATERIAL OR ROCK FILL.
- 5. PREFERRED INSTALLATION TO BE COMPLETED DURING DRY CONDITIONS. INSTALLATION DURING FLOWING CONDITION IS PERMISSIBLE WITH MODIFICATIONS TO THE CONSTRUCTION SEQUENCING, PENDING MNR APPROVAL.
- 6. CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH OSPD 802.014.
- 7. SEDIMENT CONTROL MEASURES TO BE MONITORED CONTINUOUSLY DURING CONSTRUCTION.



# Appendix C Fire Prevention and Preparedness Plan



# **Bow Lake Wind Farm**

# Fire Prevention and Preparedness Plan

30 January, 2013

#### Prepared By:

Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership

200, 4723 -1 Street SW

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## 1 Introduction

## 1.1 Project Description

Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership, through its General Partners Shongwish Nodin Kitagan GP Corp. and Shongwish Nodin Kitagan 2 GP Corp. (the "Proponent") are proposing to develop Phase 1 and Phase 2 of the Bow Lake Wind Farm on Provincial Crown Land within the unorganized Townships of Smilsky and Peever, in the District of Algoma, Ontario (the "Project"). The Project is located approximately 80 km north of Sault Ste. Marie and roughly six kilometers east of Montreal River Harbour. The Project has three Feed-in Tariff Contracts with the Ontario Power Authority for the sale of electricity generated by the Project.

As part of the Project's design, construction, and operational activities, and understanding the Project falls within the territory of the Batchewana First Nation of Ojibways ("BFN"), the Project has engaged directly with the BFN. As a result of these efforts, the BFN:

- Has entered the Project as partner;
- Has entered into various business and relationship agreements with the Project to guide Project activities; and
- Has issued a Development and Power Generation Permit, which provides the BFN's approval to construct, operate, repower, and decommission the Project.

The English name of the Project is the *Bow Lake Wind Farm*, however, the BFN know and refer to the Project as *Chinodin Chigumi Nodin Kitagan*.

As proposed, the Project will include 36 wind turbines for a total maximum installed nameplate capacity of up to 58.32 MW. In addition, the operation of the Project will require 34.5 kV above and below ground electrical collector and communication lines, pad-mounted transformers, crane pads, two permanent meteorological towers, access roads, operations and maintenance building, welfare buildings, a transformer station, construction compounds and laydown areas, and other ancillary facilities. The Project will connect to the provincial power grid via existing 115 kV transmission lines located adjacent to the Project's transformer station.

The requirements for this *Fire Prevention and Preparedness Plan* ("FPPP") are defined in Section 7.11 of the Ministry Natural Resources' ("MNR") *Approval and Permitting Document for Renewable Energy Projects* (September, 2009) ("APRD"). The *Modifying Industrial Operations Protocol*, 2008 (the "Protocol") has also been used to guide the preparation of this report. The FPPP identifies potential fire risks throughout the Project's lifecycle and provides protection and mitigation measures to address these potential risks. The FPPP forms one of the component pieces of the APRD and REA application.

#### 1.2 Guidance Documents

#### 1.2.1 Approval and Permitting Requirements Document

Any renewable energy project proposed on Crown Land, or land within a fire region, must follow the MNR's APRD for forest fire prevention and preparedness. Under the APRD, fire risks are to be addressed through all phases of a project, including land clearing and disposal of debris, providing information on:

- fire hazard assessment (e.g., identification of fuel sources at the project location);
- risk assessment of ignition;
- ignition prevention measures, and if necessary, mitigation of potential for ignitions when operational;
- fire preparedness plan, including a suppression plan and an emergency plan; and
- fire protection of the facility from wildfire threats.

**Section 2** covers the first three requirements above; **Sections 3** and 4 address the last two requirements above.

#### 1.2.2 Modifying Industrial Operations Protocol

The Protocol provides direction to forest managers and industrial operators for the prevention and suppression of wildfires in forested areas where operations take place during the fire season, normally April 1– October 31.

The main goals of the protocol are twofold: (i) ensure that industrial operations are conducted in a manner that best prevents wildfires from starting; and (ii) ensure that industrial operators are adequately trained and have appropriate equipment available so as to safely control and extinguish fires resulting from their operations.

### 1.2.3 Burn Plan & Permit

The development of a burn plan and the acquisition of a burn permit are required by the MNR for any activities involving burning at the Project site. As Project activities are not presently envisioned to involve burning for the disposal of debris, neither a burn plan or burn permit are required for the Project. However, should this need change, a burn plan will be filed with and permit sought from the MNR.

# 2 FIRE HAZARD ASSESSMENT

#### 2.1 Construction Phase

## 2.1.1 Land Clearing

**Overview** 

Development of the Project requires land clearing at the following work areas: WTG sites, transformer station, collector lines, the operation and maintenance building, and concrete batch plants, among other ancillary facilities.

#### Risk of Ignition

Of the anticipated Project activities, tree clearing presents the greatest risk for fire when conducted during the fire season, normally April 1– October 31. However, the Project area is predominantly deciduous forest, and according to the Protocol, "Deciduous dominated mixed woods (<25% conifer)" are considered to be a "Low Hazard" fuel group. As the areas requiring clearing are relatively small compared to forest harvest operations, the fuel group is considered "Low Hazard" and clearing contractors will have experience with fire prevention measures, the risk of ignition is expected to be small.

#### Mitigation and Ignition Prevention Measures

Land clearing will be performed in accordance with the Protocol. Specifically, during clearing activities in the fire season, the fire prevention and preparedness requirements specified in the Annual Work Schedule of the Sustainable Forest License holder will be met, including the following general prevention measures:

- Open fires for cooking are not permitted. Fires are permitted in wood stoves approved under the Forest Fire Prevention Act.
- No smoking is permitted in a forested area while walking, working or operating skidders. Smoking materials will be thoroughly extinguished on mineral soil or bare rock. On all other vehicles, smoking is permitted provided the equipment has a suitable ashtray and is not an open cab or canopy.
- All power saws must have approved mufflers and each operator will have a serviceable fire extinguisher rated for ABC type fires with a minimum 225 grams of dry chemical. Hot power saws will be set down on stumps, bare rocks or mineral soil away from refueling sites. Power saws will not be started within 3 metres of a refueling site. Power saws must be allowed to cool before refueling.
- No welding is to be done within three metres of a forested area or flammable material unless the article or machine is situated on or over mineral soil. If this is impossible, welding blankets must be used under the area being welded. Welding blankets are also to be used whenever there is a chance of any hot embers falling onto or into any combustible material. No welding will be conducted within 7.6 metres of a fuelling area. A serviceable 6A80BC fire extinguisher will be readily available.
- Heavy equipment will be equipped with a serviceable 6A80BC fire extinguisher. Haul trucks, buses, vans, ½ tons, ¾ tons and 1 ton trucks will have serviceable 5 lb. A.B.C. extinguishers.
- Any equipment engaged in site preparation shall have a 20-gallon canopy tank or a pack pump full of water that is readily available and serviceable at a minimum. Site preparation operations will also have readily available communications equipment in place to report a fire.
- All mechanical equipment must be equipped with a proper spark arrestor and be kept free of accumulations of flammable debris.
- Supervisory staff must be familiar with operating fire suppression equipment.
- When required, fire equipment caches will be located no more than 20 minutes (round trip) from the operation.

#### 2.1.2 Operation of Heavy Machinery

#### Overview

General construction activities at the Project site will involve the operation of heavy machinery and large vehicles. Gasoline and diesel will be the primary fuels used on-site.

#### Risk of Ignition

The presence of gasoline and diesel in any setting poses some risk of ignition. However, all such fuels will be handled with care according to the provisions in the *Environmental Effects Monitoring Plan*. Therefore, the risk of ignition is expected to be low. More specifically, fuel storage and refuelling activities will be undertaken on gravel-covered road and work surfaces, which, according to the Protocol, classifies the activities as Low Risk.

#### Mitigation and Ignition Prevention Measures

On-site storage of fuel will be necessary for certain construction equipment and will be securely stored as per provincial and federal codes and guidelines for the storage of fuel, oil, and lubricants. As mentioned fuel storage and refueling will be undertaken on gravel-covered road and work surfaces. Additional measures are set out in the *Environmental Effects Monitoring Plan* contained in the *Design and Operations Report*.

## 2.1.3 Disposal of Debris and Waste

#### Overview

General construction and tree removal activities taking place during construction are expected to generate waste in the form of trees, brush, wood, rough lumber including pallets and other wood packaging materials, bark, wood chips or bark chips, and firewood of local tree species. Lumber will be hauled and delivered in accordance with the terms of the Forest Resource License obtained for the Project. All non-toxic and non-hazardous waste will be disposed of at the Montreal River Waste Facility, the nearest waste facility within the District of Algoma. With the exception of slash and chipped tree and brush materials from clearing activities, all waste will be removed off-site for disposal and no slash will be burned on-site.

#### Risk of Ignition

As no burning will occur on-site, the risk of ignition as a result of generated waste and debris is minimal.

#### Mitigation and Ignition Prevention Measures

Waste and debris will be removed off-site for disposal, thus negating the need for any burning activities on-site.

#### 2.1.4 Increased Activity in the Area

#### Overview

Increased activity in the Project area will occur upon the arrival of construction personnel. If unmitigated, such activity increases the risk of human caused fires.

#### Risk of Ignition

Construction personnel will be experienced in working on sites where best practices for safety are in place. Necessary precautions will be taken where risk of fire or other hazards present a concern. Therefore, the risk of fire as a result of human activity in the area is expected to be low.

#### Mitigation and Ignition Prevention Measures

Construction personnel will be made aware of preventative measures to reduce risk of fire and will behave in a manner that is in accordance to the *Forest Fire Prevention Act*. The safety management plan for the site will include site-specific fire prevention and response measures as required by the Protocol and industry practice. The on-site safety manager will be responsible for ensuring that the prevention measures are adhered to, and that equipment required for prompt response to fires is readily accessible. Prevention signage and increased security and site monitoring will be implemented on-site during periods of high fire hazard. The Emergency Plan presented in the Project's *Design and Operations Report* includes the MNR Forest Fire Reporting Number 310-3473 (310-FIRE).

## 2.2 Operations and Maintenance Phase

The following sections discuss the potential for ignition risk and specific mitigation measures associated with the operations phase of the Project. In addition to these specific mitigations, the operation of the Project will result in increased monitoring of fire conditions and an anticipated increased speed of reporting of any fires that may develop as a result of the ongoing daytime presence of operations staff at the Project location. Forest fire reporting protocols and fire response responsibilities will be part of the Project's site Environment, Health and Safety Plan. The Project operations staff will have constant secure communications to facilitate notification of the appropriate fire authorities. The presence of well maintained and well constructed access roads will also facilitate access for firefighting crews in the event that a forest fire does occur.

#### 2.2.1 Increased Public Access

#### Overview

Improved access to the Project area from new roads and road upgrades may result in an increased risk of human caused forest fires. Poorly maintained ATVs and similar vehicles using trails along dried grasses in overhead transmission line or road corridors may present a further risk of ignition.

#### Risk of Ignition

The forested area in the vicinity of the Project is already accessible to the public as a result of number of existing roads. Additional access roads constructed for the Project will also be publically accessible, with the exception of limited stretches of roads gated to prevent access for safety or environmental reasons.

The access roads constructed for the project will have a gravel surface, reducing the potential for ignition of vegetation from vehicle travel on these access roads. It is expected that the risk of ignition, due to the incremental increase in human traffic and activity, will be low.

#### Mitigation and Ignition Prevention Measures

Additional access roads constructed for the purpose of the Project will be generally publically accessible. However, the ongoing operation of the Project will require constant daytime presence of Project staff which is anticipated to improve the ability to identify, report and respond to any fires that may develop. Further, the road surfaces that are anticipated to be travelled by the public within the Project location are gravelled, reducing the potential for fire ignition associated with vehicle travel.

#### 2.2.2 Electrical Generation

#### Overview

The Project may increase the risk of forest fires due to fires occurring at project infrastructure. Fires at WTGs or the associated electrical infrastructure can be caused by lightning strike, mechanical breakdown or failure in electrical installations.

#### Risk of Ignition

WTGs are regularly struck by lightning due to their size and material. As such, it is standard practice to design WTGs with lightning protection measures (i.e. grounding systems) to minimize the potential for equipment damage and fire ignition. As a result fires ordinarily do not occur due to grounding systems that are specifically designed to handle the voltages and currents associated with lightning strikes. A similar system is integrated into the design and construction of the WTGs proposed for the Project, and is discussed in greater detail below. In the event of the grounding system breaking down or otherwise not functioning as intended, there is a risk that the blades could ignite, with combustible material falling to the ground. By maintaining a cleared area around the base of each WTG, the risk that such a fire would then spread to the surrounding forest is minimized.

Although very rare, and as is the case for any equipment with moving parts, mechanical breakdown creates a potential fire risk for WTGs. Examples of mechanical breakdowns that could result in fires occurring include failure of cooling fans or pumps, failures of oil pumps, or failures of gears or bearings within gearboxes or generators, however these types of significant failures are detectable by the WTG monitoring system sensors located in the nacelle and the electronics system and the WTG would automatically shut down. Only in the event that the WTG's monitoring system failed to detect the malfunction, heat generated from friction could either not be adequately dissipated or could exceed the capacity of the cooling systems. The resulting buildup of heat could ignite combustible materials (of which there are very few) within the nacelle.

The majority of materials within the nacelle are not combustible, consisting of largely steel. Only lubricants, some electronics and cable insulators would be susceptible to combustion in such an event. Fires occurring within the nacelle ordinarily burn out within the nacelle although a small risk exists that combustible material could fall to the ground below. In either instance, the WTG monitoring system will have notified the operations staff of an problem with the WTG in question, and operations staff would implement the Project's fire notification and response procedures.

Improper electrical installations can pose a fire risk, however, like mechanical failures, they are rare. Improper tightening of contacts, resulting in high contact resistance and heat generation is one of the more common causes of fires due to electrical failure. This type of failure can occur within WTGs or within the associated electrical infrastructure. Protocols, pre-operations testing and commissioning, and training for WTG installers are very robust and these types of failures within WTGs are very rare today. The installation of electrical equipment such as transformers, switchgear and metering is similarly guided by stringent codes and protocols, and failures within equipment of that nature is similarly rare in modern installations. Nevertheless, for each of the components of the Project discussed above, a risk exists that improper installation or electrical contact failure could result in a fire.

For fires within the nacelle, the risks of the fire spreading are identical to those discussed above for mechanical failure. For electrical fires along the collector system route, or within the transformer station, the operationally cleared area is considered to be a "Very Low Hazard" fuel group by the Protocol. The risk of fire spreading to the surrounding forest is therefore also considered to be minimal for these areas.

#### Mitigation and Ignition Prevention Measures

Lighting protection is a passive system that is integrated into the design of each WTG. The role of the lighting protection (grounding) system is to safely transfer the electrical energy from a lighting strike to the earth while protecting personnel and not damaging the WTG. The lightning protection system also interconnects with the WTG grounding system to allow for the normal operation of the electrical equipment within the WTG. To achieve the required lightning protection, a system of blade receptors, connections and conductors create pathway of low electrical resistance for the energy delivered by a lightning strike.

#### A WTG lightning protection system generally includes:

- Blade receptors and grounding conductors (either cable or metal braiding) within each blade to provide a path for the electrical energy in the event of a lightning strike to one of the blades;
- Grounding conductors are installed at various locations within the nacelle;
- Grounding conductors connecting the blade and nacelle are routed down the WTG tower to carry the electricity safely from the nacelle and blades to the foundation grounding system;
- Foundation grounding system (including multiple grounding rods and conductors) is installed in the earth immediately surrounding the WTG foundation and may be connected to the metal foundation reinforcement structure, delivering the energy from the lightning strike to the earth. All WTGs in the park are also interconnected with a grounding conductor to further lower the electrical resistance to earth.

Beyond protections inherent in the WTGs themselves, the Project area is predominantly deciduous forest, and according to the Protocol, "Deciduous dominated mixed woods (<25% conifer)" are considered to be a "Low Hazard" fuel group. Furthermore, operational areas will remain cleared for the lifetime of the Project. These include an area beneath each WTG approximately 100 m in diameter, a 40 m radius around the transformer station, and a 15 m to 20 m corridor around collector lines. In these operationally cleared areas, trees will be removed regularly, but live grasses and shrubs will remain. All slash from operationally cleared areas will be removed. According to the Protocol, sites of this nature are considered to be "Very Low Hazard" fuel groups.

#### 2.2.3 Disposal of Debris and Waste

#### Overview

During the operation phase of the Project certain areas will be maintained clear. These areas include a 100 m diameter area around the base of each WTG, a 15 m to 20 m corridor around collector lines and roads, and a 40 m radius around the transformer station. Clearing will be undertaken regularly enough such that large trees do not establish. Slash will be removed off-site for disposal and no slash will be burned on-site.

#### Risk of Ignition

As no burning will occur on-site, the risk of ignition as a result of generated waste and debris is minimal. Slash will not be left within the operationally cleared corridors, and will therefore not increase the risk of forest fire. Areas dominated by slash are considered to be a "Very High Hazard" fuel group, whereas areas dominated by live grasses, as operationally cleared areas will be after clearing, are considered to be a "Very Low Hazard" fuel group.

#### Mitigation and Ignition Prevention Measures

Waste and debris will be removed off-site for disposal, thus negating the need for any burning activities on-site and maintaining the areas as a "Very Low Risk" fuel group.

## 2.3 Decommissioning Phase

# 2.3.1 Operation of Heavy Trucks and Machinery

#### Overview

General decommissioning activities at the Project will involve the operation of heavy machinery and large vehicles. Gasoline and diesel will be the primary fuels used on-site.

#### Risk of Ignition

The presence of gasoline and diesel in any setting poses some risk of ignition. However, the fuels are expected to be present in relatively small quantities and all such fuels will be handled with care according to the prescriptions in the *Environmental Effects Monitoring Plan*, therefore the risk of ignition is expected to be low. Specifically, fuel storage and refuelling activities will be undertaken on gravel-covered road and work surfaces, which according to the Protocol classifies the activities as Low Risk.

#### Mitigation and Ignition Prevention Measures

On-site storage of fuel will be necessary for certain decommissioning equipment and will be securely stored as per provincial and federal codes and guidelines for the storage of fuel, oil, and lubricants. As mentioned fuel storage and refueling will be undertaken on gravel-covered road and work surfaces. Additional measures are set out in the *Environmental Effects Monitoring Plan* contained in the *Design and Operations Report*.

#### 2.3.2 Disposal of Debris and Waste

#### **Overview**

General activities taking place during decommissioning are expected to generate waste in the form of used WTG components, such as the turbine nacelle and equipment contained therein, turbine blades, tower structures, pieces of foundations, collector lines and poles, operations and maintenance building and transformer station building materials, transformers and electrical equipment, and packaging and miscellaneous construction waste.

As practicable, these components will be reconditioned, reused, or recycled. All non-toxic and non-hazardous waste will be disposed of at the Montreal River Waste Disposal Facility, the nearest waste facility within the District of Algoma, or at a similar type of facility in existence at the time of decommissioning. All waste will be removed off-site for disposal and no slash will be burned.

#### Risk of Ignition

As no burning will occur on-site, the risk of ignition as a result of generated waste and debris is minimal.

#### Mitigation and Ignition Prevention Measures

Waste and debris will be removed off-site for disposal, thus negating the need for any burning activities on-site.

# 3 FIRE PREPAREDNESS PLAN

# 3.1 Preparedness

Further to the fire hazard mitigation measures that will be implemented throughout the Project lifecycle, all contractors and on-site personnel will also be made aware of responsibilities to report forest fires as required by the *Forest Fires Prevention Act* as well as standard procedures to be followed in the event of a forest fire.

Fire suppression equipment will be kept on-site at all times and in visible locations as outlined by the *Forest Fires Prevention Act* and the Protocol as appropriate.

In the event that a forest fire is detected, it will immediately be reported to MNR Fire Reporting Number: 310-3473 (310-FIRE). An emergency response plan is contained in the Project's *Design and Operations Report*.

#### 3.2 Site Evacuation

All site personnel will be aware of fire preparedness protocols per the *Forest Fires Prevention Act* and will be aware of procedures for site evacuation in the event of a fire.

Regular briefings of construction personnel, regarding emergency evacuation procedures, will be carried out. Operations and decommissioning personnel will also be briefed and reminded from time-to-time as to the emergency evacuation procedures.

In the event of a fire, site personnel will immediately notify the MNR Fire Reporting Centre by calling 310-FIRE (3473) and will evacuate the site in a safe manner. Communication between on-site staff will occur by means of two-way radios to ensure all staff are able to evacuate the site immediately.

# 4 WILDFIRE PROTECTION

Wildfire protection will be achieved by the Project through implementation of the methods described herein. Additionally, a buffer will also be maintained around each WTG which will be kept cleared of vegetative re-growth to reduce the risk of the Project being impacted by wildfires.

# 5 QUALIFICATIONS AND LIMITATIONS

Nodin Kitagan Limited Partnership and Nodin Kitagan 2 Limited Partnership have prepared this report in accordance with the applicable REA requirements and technical guidance documents issued by the MNR and MOE. The information and analysis contained herein is for the sole benefit of the Bow Lake Wind Farm and save for regulatory review purposes may not be relied upon by any other person.

The contents of this report are based upon our understanding of guidelines and regulations which we believe to be current at this time.

While we have referred to and made use of reports and specifications prepared by others, we assume no liability for the accuracy of the information contained within those reports and specifications.