



April 18, 2019
Project No: 180629

Nation Rise Wind Farm Ltd.
219 Dufferin Street, Unit 217C
Toronto, ON
M6K 3J1

**Re: Nation Rise Wind Farm
Renewable Energy Approval No. 0871-AV3TFM
Conditions L – Groundwater Monitoring Program - Updated**

Nation Rise Wind Farm Limited Partnership (the “Proponent”) is proposing to develop the Nation Rise Wind Farm (the “Project”) which is subject to Ontario Regulation (O. Reg.) 359/09 (Renewable Energy Approvals (REA) under Part V.0.1 of the Ontario Environmental Protection Act (EPA)), as amended. The Proponent was awarded a contract for this Project in March 2016 from the Independent Electricity System Operator (IESO) under the Large Renewable Procurement (LRP), and has received its Renewable Energy Approval (REA) No. 0871-AV3TFM from the Ontario Ministry of the Environment, Conservation and Parks (MECP, formerly the Ontario Ministry of Environment and Climate Change) on 4 May 2018. The Project is situated in the Municipality of North Stormont within the United Counties of Stormont, Dundas and Glengarry, and construction is anticipated to begin in early 2019. The Project will be owned and operated by Nation Rise Wind Farm Limited Partnership, a wholly-owned subsidiary of EDP Renewables Canada Ltd. (EDPR).

BluMetric Environmental Inc. (BluMetric™) has prepared the following Groundwater Monitoring Program (GMP) for the Project construction. The GMP provided herein serves to satisfy Condition L (Groundwater Monitoring) of the Project REA.

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DEFINITIONS

REA No. 0871-AV3TFM provides the following definitions of direct relevance to the GMP:

- *“Facility” means the renewable energy generation facility, including the Equipment, as described in this Approval and as further described in the Application, to the extent approved by this Approval;*
- *“Equipment” means the thirty three (33) wind turbine generators and one (1) transformer substation, identified in this Approval and as further described in the Application, to the extent approved by this Approval;*
- *“Qualified Expert” means a “Professional Engineer” or “Professional Geoscientist”;*

BACKGROUND

Construction of up to 33 wind turbines in North Stormont is planned for 2019. Construction activities will occur in rural areas where residences are mainly serviced by private well water supply. A pre-construction well survey as per Condition I (Well Water Sampling) of REA No 0871-AV3TFM was completed in the fall of 2018 and the summary report (BluMetric, January 30, 2019) has been submitted to the MECP. The survey included the sampling of 248 water supply wells located within 1 km of Project Equipment (i.e. wind turbines and transformer station), communication tower (none for the Project) and meteorological towers. The GMP, as specified under Condition L of the Project REA, is for measuring/monitoring groundwater pressure changes and groundwater quality changes in response to blasting activities and pile-driving activities during construction of the Project. The monitoring data will assist the Qualified Expert in assessing well water supply complaints, if any. The Proponent has indicated that no pile-driving activities or blasting activities will occur during the Project, as committed during the Environmental Review Tribunal Case no. 18-028. The GMP provided herein serves to provide a methodology/approach for implementing a GMP if/when this is required during the construction.

METHODOLOGY / APPROACH

The GMP will be implemented when blasting activities and/or pile-driving activities are to be undertaken during construction of the Project. The scheduling of these activities will need to be identified at least 2 weeks in advance to ensure that a monitoring program to the satisfaction of the Qualified Expert can be implemented before, during and after the completion of the activity.

GMP MONITORING LOCATIONS

The GMP will utilize groundwater monitoring information obtained from water wells located on leased properties (where consent for well access for well water level monitoring has been obtained). New groundwater monitoring wells will only be installed where no other suitable monitoring options are available to the satisfaction of the Qualified Expert for use in the GMP.

Leased Property Wells

A list of the leased property wells is provided as Table 1. The leased property well(s) are often located on the same land parcel as the Project Equipment to be constructed. In many cases, the leased property well is expected to be the nearest water supply well to construction. Also, the leased properties provide the highest probability that permission will be granted for well access for water level monitoring.

Water level measurements are to be obtained using a water level transducer with data logger (i.e. Solinst® Levellogger or equivalent) to be installed in the well. The data logger shall use a measurement frequency on the order of minutes to provide a complete and high-resolution record of water levels. Following completion of monitoring, the well cap must be restored and inspected to the satisfaction of the property owner.

Further to the above, the Fall 2018 pre-construction well survey included both laboratory water quality analysis and field measurements for Temperature, pH, Conductivity, and Turbidity. Raw water quality for the leased property well will be monitored before, during and after the construction activity for the same list of field measurement parameters to assess for any changes in water quality that may be potentially attributable to the construction activity.

New Monitoring Well Installation

New monitoring wells (minimum 50 mm ID PVC construction) will be installed only where no other suitable monitoring locations are available to the satisfaction of the Qualified Expert for use in the GMP. The number of wells, well locations and well depths are to be determined by the Qualified Expert based on local geological/hydrogeological conditions, the nature of the construction activity, the availability of site access agreements, and property access for drilling equipment. Monitoring wells must be installed by an MECP-licensed well contractor and meet the minimum construction requirements of Ontario Regulation 903, as amended for monitoring wells. The new monitoring wells are to be purged/pumped until a near turbidity-free state is obtained to ensure representative sampling for groundwater quality.

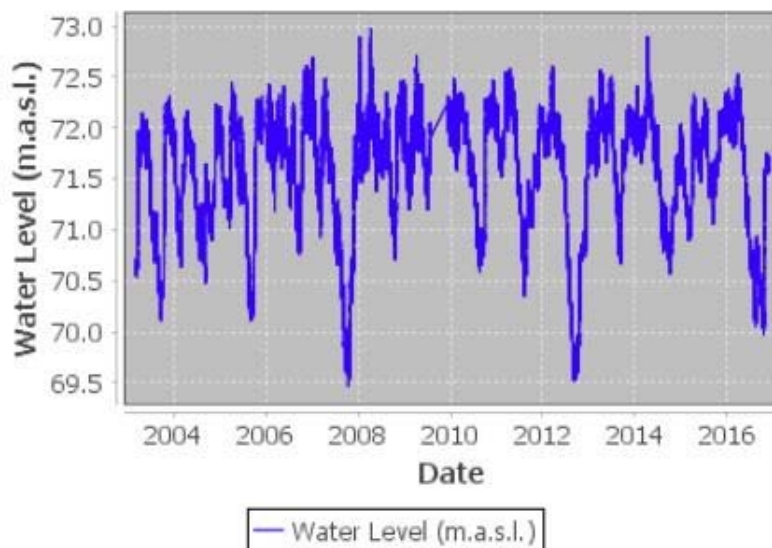
Water level measurements are to be obtained using a water level transducer with data logger (i.e. Solinst® Levellogger or equivalent) to be installed in the well. The data logger shall use a measurement frequency on the order of minutes to provide a complete and high-resolution record of water levels.

Field measurements for Temperature, pH, Conductivity, and Turbidity for groundwater collected from the monitoring well will be used to assess for any changes in water quality potentially due to the construction activity.

Provincial Groundwater Monitoring Network

The GMP will utilize the Provincial Groundwater Monitoring Network (PGMN) well located in Berwick (W0000268-1, completed to 25.9 m depth in limestone bedrock). This well is used by South Nation Conservation Authority (SNCA) for continuous water level monitoring and annual groundwater sampling (Contact: Michael Melaney, Hydrogeologist). Water level data reviewed for the well location (concurrent with construction activities) will be used as reference data for assessing seasonal influences on regional bedrock groundwater levels. As indicated in the hydrograph reproduced below, water levels at this bedrock well location have fluctuated by up to 3.5 m in the 2004 to 2016 water level monitoring period.

Water Level (W0000268-1)



WATER WELL MONITORING PRIOR TO CONSTRUCTION ACTIVITY

Water well monitoring (both water level and water quality) for the locations designated by the Qualified Expert must be initiated prior to the blasting and/or pile-driving activity, if any, to ensure baseline conditions are adequately characterized. The GMP must be initiated a minimum of 24 hours before commencement of the activity to ensure adequate baseline data for comparison.

WATER WELL MONITORING DURING CONSTRUCTION

The purpose of the water well monitoring during the blasting and/or pile-driving activity, if any, is to monitor for any potential adverse impacts to well water quantity and quality. As a minimum, continuous data logger water level measurement and daily field water quality measurements for Temperature, pH, Conductivity, and Turbidity are to be conducted during blasting and/or pile-driving activity for the locations designated by the Qualified Expert. More frequent water quality monitoring may be specified by the Qualified Expert depending on the nature/duration/location of the blasting and/or pile-driving activity.

Where evidence of adverse impacts are identified by the Qualified Expert during the construction activity, the Proponent is to be notified immediately and the construction activity is to be terminated until such time that measures have been implemented to ensure the protection of the quantity and quality of any potentially affected well water supply.

WATER WELL MONITORING AFTER CONSTRUCTION

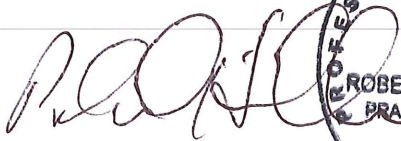
The purpose of the water well monitoring after the blasting and/or pile-driving activity, if any, is to confirm that conditions of the wells remain consistent with the baseline assessment or have returned to baseline conditions. Continuous data logger water level measurement and field water quality measurements for Temperature, pH, Conductivity, and Turbidity is to be conducted on a daily basis as a minimum, until observed conditions that are consistent with baseline conditions are determined by the Qualified Expert.

GROUNDWATER MONITORING PROGRAM REPORT

Following the completion of all post-construction monitoring activities, a summary report will be prepared documenting the well water monitoring/sampling activities carried out under the GMP. The compiled water level monitoring data and field measurement data will be provided as appendices to the summary report. The information will include, but not be limited to: static (i.e. groundwater pressure) water level measurements and continuous data logger water level measurement taken for specified locations; field water quality measurements for specified locations; and a description of any observed/documentated conditions on well water quantity. The GMP report must be stamped and signed by a Professional Engineer or Professional Geoscientist.

Regards,

BluMetric Environmental Inc.



Robert Hillier, P.Geol.
Senior Hydrogeologist



Encl: Table 1 – Summary of Leased Property Wells

TABLE 1: SUMMARY OF WELLS ON LEASED PROPERTIES

Parcel Ident. Number	Closest Turbine	Sampled for Fall 2018	Well Construction	Fall 2018 Water Level (m TOC)	Water/Level and Sample Date
601000055	1	Y	Dug	5.81	10/2/2018
601000059	2	Y	Dug	NA	10/2/2018
601000087	4	Y	Dug	NA	10/1/2018
601000112	6	Y	Drilled	NA	10/4/2018
601000119	4	Y	Drilled	NA	10/1/2018
601000125	4	Y	Drilled	NA	10/1/2018
601000161	6	Y	Drilled	7.36	10/4/2018
601000186	7	Y	Drilled	NA	10/2/2018
601000187	7	Y	Drilled	NA	10/1/2018
601010059	10	N	NA	NA	NA
601010062	11	Y	Drilled	NA	10/1/2018
601010069	12	Y	Dug	2.46	10/1/2018
601010070	12	Y	Drilled	NA	10/1/2018
601010086	16	Y	Drilled	NA	10/2/2018
601010089	12	N	NA	NA	NA
601020053	54	Y	Drilled	NA	10/3/2018
601020097	54	Y	Drilled	NA	10/3/2018
601030074	52	Y	NA	NA	10/4/2018
601040059	48	Y	Drilled	7.38	10/5/2018
601040143	56	Y	Drilled (2 Wells)	NA	10/1/2018
601040158	57	Y	Drilled	NA	10/3/2018
601050072	35	Y	NA	NA	10/2/2018
601050074	35	Y	Drilled	NA	10/1/2018
601050077	38	N	NA	NA	NA
601050078	38	Y	Drilled	NA	10/1/2018
601050097	54	N	NA	NA	NA
601050102	32	N	NA	NA	NA
601050109	35	N	NA	NA	NA
601050111	41	Y	Drilled	NA	10/2/2018
601050145	47	Y	Drilled	NA	10/5/2018
601060261	25	Y	Drilled	NA	10/2/2018
601060263	25	Y	Drilled	NA	10/2/2018
601060367	27	N	NA	NA	NA
601060376	20	Y	Drilled, 1 Unknowr	NA	10/5/2018
601060492	21	Y	Drilled (2 Wells)	NA	10/1/2018
601070143	9	N	NA	NA	NA
601080177	27	Y	Drilled	2.38	11/13/2018
601080188	29	Y	Drilled (2 Wells)	NA	10/2/2018

NA - Not Available