

January 29, 2018

Ms. Barcy F. McNeal, Secretary
Ohio Power Siting Board
Docketing Division
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3793

Re: Case No. 16-1871-EL-BGN, In the Matter of the Application of Icebreaker Windpower Inc. for a Certificate to Construct a Wind-Powered Electric Generation Facility in Cuyahoga County, Ohio.

Responses to Fourth Set of Interrogatories from Staff of the Ohio Power Siting Board

Dear Ms. McNeal:

Attached please find Icebreaker Windpower Inc.'s ("Applicant") responses to the Fourth Set of Interrogatories from the staff of the Ohio Power Siting Board ("OPSB Staff"), which were provided to the Applicant on January 9, 2018. The Applicant provided these responses to OPSB Staff on January 29, 2018.

We are available, at your convenience, to answer any questions you may have.

Respectfully submitted,

/s/ Christine M.T. Pirik

Christine M.T. Pirik (0029759)

Terrence O'Donnell (0074213)

William V. Vorys (0093479)

Dickinson Wright PLLC

150 East Gay Street, Suite 2400

Columbus, Ohio 43215

Phone: (614) 591-5461

Email: cpirik@dickinsonwright.com

todonnell@dickinsonwright.com

wvorys@dickinsonwright.com

Attorneys for Icebreaker Windpower Inc.

Enclosure

Cc: Stuart Siegfried
Grant Zeto

COLUMBUS 63172-1 83211v1

**BEFORE
THE OHIO POWER SITING BOARD**

In the Matter of the Application of Icebreaker)
Windpower Inc., for a Certificate to Construct)
a Wind-Powered Electric Generation Facility) Case No. 16-1871-EL-BGN
in Cuyahoga County, Ohio.)

**ICEBREAKER WINDPOWER INC.'S RESPONSES TO THE
FOURTH SET OF INTERROGATORIES
FROM THE STAFF OF THE OHIO POWER SITING BOARD**

On February 1, 2017, as supplemented, Icebreaker Windpower, Inc. (“Applicant” or “Icebreaker”) filed an application (“Application”) with the Ohio Power Siting Board (“OPSB”) proposing to construct a wind-powered electric generation facility in Lake Erie off the shore of Cleveland, in Cuyahoga County, Ohio (“Project”).

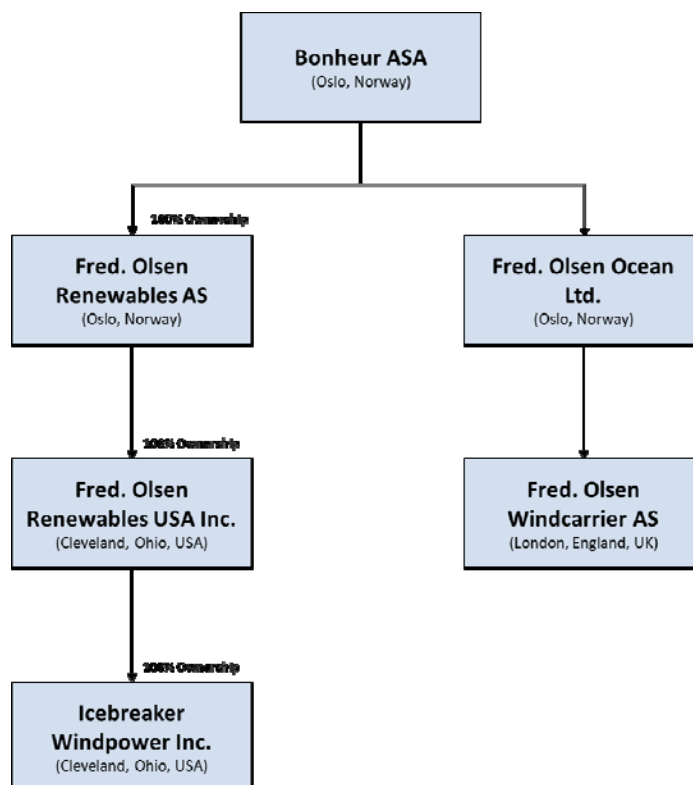
On January 9, 2018, the staff of the OPSB (“OPSB Staff”) provided the Applicant with OPSB Staff’s Fourth Set of Interrogatories. Now comes the Applicant providing the following responses to the Fourth Set of Interrogatories from the OPSB Staff.

1. **Does LEEDCo still exist? If so, does LEEDCo have a role with the Icebreaker Windpower project going forward? If so, please detail that role.**

Response: Lake Erie Energy Development Corporation (“LEEDCo”) does exist and will continue to exist beyond the Project. LEEDCo will not have a direct operational role with the Project.

2. **Please provide a corporate chart or similar that shows the relationship between at least the following entities:**
- **Icebreaker Windpower Inc,**
 - **Fred. Olsen Renewables USA, Inc.,**
 - **Fred. Olsen Renewables and**
 - **Fred. Olsen Windcarrier.**

Response:



3. The application (p. 75) indicates that the Applicant is working with ODNR to time construction activities to avoid sensitive fish spawning periods. In addition, the application (p. 116) refers to avoiding fish spawning periods in early spring as a mitigation measure to minimize disturbance during construction. Please detail any commitments the Applicant has made regarding work during spawning periods.

Response: In addition to the commitments set forth in the Application, the Applicant has now completed two full seasons of fisheries and aquatic pre-construction monitoring surveys pursuant to the Lake Erie Monitoring Plan, which is Exhibit A to the June 8, 2017 Monitoring Protocols for Fisheries and Aquatic Resources Memorandum of Understanding (“Aquatic MOU”) entered into between the Applicant and the Ohio Department of Natural Resources (“ODNR”). Based on the information collected during the monitoring surveys, the proposed turbine sites are well away from any fish spawning reefs or preferred spawning habitats, except

lake trout, which had a near off-shore presence. See the *Aquatic Ecological Resources Study prepared by Limno Tech, January 2017*. In accordance with the Aquatic MOU, ODNR and the Applicant will further discuss the results of these surveys and develop a plan to avoid sensitive fish spawning periods in order to minimize any impact on near shore fish spawning. The Applicant has not made specific commitments regarding work during fish spawning periods at this time. The Applicant will continue to work closely with ODNR and the Ohio Environmental Protection Agency ("Ohio EPA") to determine what steps, if any, are determined to be necessary during construction of the Project to avoid, minimize, and mitigate any potential adverse impacts to fish during spawning.

- 4) **When installing the electric line (including the inter-array cables), the Applicant expects disturbed sediments to settle back in the lakebed with any depression filling with ambient sediments (p. 17 of application). During and/or after installation, would the Applicant perform any inspection along the electric line to confirm that reclamation is not required? If yes, please detail when that inspection would occur and how it would be performed.**

Response: Inspection along the electric line to determine and confirm sediment settlement will be performed prior to, during, and after installation of the electric line. Prior to cable laying, a bathymetric route survey, using a multibeam echosounder ("MBES") will be performed. The results of this MBES survey will serve as the basis for cable laying. During the cable lay process, video feeds will be available from either the jet trencher installation rig or a remotely operated vehicle ("ROV"). These will monitor the trenching, cable, lay, and post-lay burial process during all operations. After cable laying, a post-lay bathymetric survey (as-built survey) using MBES will be performed to map the as-laid position of the cables and the conditions of the surrounding lakebed. The final as-built survey will be conducted within 1 month of final cable installation.

- 5) **The application refers to four City of Cleveland water intake structures. Are there other municipal water intake structures within the central basin of Lake Erie, and if so, how far are they located from the proposed turbine locations and electric collection line route?**

Response: We have identified 19 water intake structures in the central basin of Lake Erie through a review of nautical charts. Please see the following table showing the distance of the water intake structures in the central basin to the proposed turbine locations and electric collection line route.

Water Intake	Closest Turbine to Intake	Distance Between Intake and Turbine (mi)	Distance Between Intake and Cable (mi)
Mentor Harbor	ICE1	23.97	19.98
Fairport Harbor	ICE1	30.12	26.09
Lake Co East	ICE1	32.93	28.87
Ashtabula	ICE1	55.37	50.98
Cleveland Baldwin	ICE1	4.45	1.87
Cleveland Nottingham	ICE1	9.59	5.69
Cleveland Crown	ICE1	6.94	6.94
Conneaut	ICE1	67.99	63.44
Cleveland Morgan	ICE1	4.09	2.26
Painesville City	ICE1	28.03	24.16
Lake Co West	ICE1	21.34	17.25
Marblehead	ICE6	46.93	46.94
Kelleys Island	ICE6	45.81	45.83
Sandusky City	ICE6	43.89	43.9
Vermillion	ICE6	31.26	31.27
Elyria	ICE6	23.51	23.51
Huron	ICE6	40.78	40.79
Lorain	ICE6	21.81	21.81
Avon Lake	ICE6	13.69	13.69

- 6) **Is the Applicant expecting to have a single decommissioning plan that will serve OPSB and submerged lands lease requirements?**

Response: Yes, there will be one decommissioning plan that satisfies both requirements.

- 7) **Page 22 of the application indicates that final design and detailed construction drawings are expected to be completed in December 2017. Please provide an update as to the status of these documents.**

Response: The final design and detailed construction drawings were not completed in December 2017. Substantial progress was made, but due to delays and uncertainties in the receipt of the permits/approvals, the work schedule was adjusted to push the completion of the final design and detailed drawings into the 4Q 2018. This updated schedule is based on receiving the permits/approvals by the end of the 2Q 2018. Further delays could extend the schedule even more.

- 8) **Page 57 of the application indicates that it is generally known that Lake Erie sediments may contain elevated levels of contaminants. The application further indicates that the Applicant has collected bottom sediment samples in the Project Area and "... is in the process of evaluating the information for construction planning purposes and in the context of Ohio EPA guidance and regulations." Please (A) confirm bottom sediment samples were taken from both the turbine locations and the electric collection line route, and (b) describe the results of the evaluation, if completed, as pertains to construction planning purposes, and (c) summarize any Ohio EPA guidance received on this topic. If the Ohio EPA guidance was in written form, please provide a copy of the correspondence.**

Response: (A) As documented in the March 10, 2017 Sediment Evaluation ("Sediment Evaluation"), which was filed as a supplement to the Application on March 13, 2017, 12 bottom sediment samples were taken along the electric collection route and at the turbine locations.

(B) As described in the Sediment Evaluation, it was determined that, overall, there is low potential for toxicity in the Project area, based on the low frequency of Probable Effects Concentration ("PEC") exceedance and the mean PEC-Quotient evaluation results. As a result, the construction plan did not require modification.

(C) The Applicant submitted the Section 401 Water Quality Application to the Ohio EPA in mid-October 2017. The Application was deemed complete on November 13, 2017. The

public notice appeared in *The Plain Dealer* on November 22, 2017. To date, no guidance on this topic has been received.

9) How (if at all) did the findings from the geotechnical investigation impact the selection of the mono bucket foundation design?

Response: Foundation design practice is founded on the measured physical characteristics of soil and the application of well-established engineering principles that follow state, national, and/or international codes. Icebreaker followed this methodology and used the soil data to determine the best possible foundation which is the Mono Bucket.

The Icebreaker team performed separate geotechnical and geophysical investigations to collect and analyze lakebed data. These data were used to develop a preliminary design for each offshore foundation type used in the industry (concrete gravity base, steel monopile, steel jacket, steel tripod, sheetpile circular cell, and suction caisson [Mono Bucket]). The Mono Bucket yielded the best engineering and economic solution, as well as the lowest environmental impact.

10) Page 80 of the application discusses the history of seismic activity in the project area. What design parameters, if any, did the Applicant incorporate to address seismic considerations?

Response: The seismic analysis was performed on the Icebreaker Wind turbine generator tower and foundation model to evaluate the structure when subjected to extreme event seismic accelerations. Modal (response spectrum/frequency domain) analysis was utilized to determine seismic loads and accelerations on the structure by evaluating the loading contribution from all relevant modes of vibration during an earthquake. The response spectrum for such seismic analysis were defined in accordance with the international codes, as well as the Ohio Building Code ("OBC"). There were two soil classes for the seven turbine locations, with three having Site Class D and four having Site Class E. Site Class E was adopted for general analysis.

The design parameters utilized included: the foundation tower, the wind turbine tower plus rotor and generator masses, seismic accelerations at multiple locations, maximum considered earthquake ("MCE") spectrum, material yield strength, density, Young's modulus and Poisson ratio, centers of gravity, inertia, permissible natural frequencies and permissible intervals, and damping ratios.

Respectfully submitted,

/s/ Christine M.T. Pirik
Christine M.T. Pirik
Terrence O'Donnell
William Vorys
DICKINSON WRIGHT PLLC
150 E. Gay St., 24th Floor
Columbus, Ohio 43215
Telephone: (614) 591-5461
cpirik@dickinsonwright.com
todonnell@dickinsonwright.com
wvorys@dickinsonwright.com

Attorneys for Applicant Icebreaker Windpower, Inc.

January 29, 2018

CERTIFICATE OF SERVICE

The Ohio Power Siting Board's e-filing system will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to this case. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the person below via electronic mail this 29th day of January, 2018.

/s/ Christine M.T. Pirik

Christine M.T. Pirik (0029759)

Counsel:

john.jones@ohioattorneygeneral.gov
thomas.lindgren@ohioattorneygeneral.gov
mleppla@theoec.org
tdougherty@theoec.org
jstock@beneschlaw.com
ocollier@beneschlaw.com
mjsettineri@vorys.com
glpetrucci@vorys.com
paul@ptblaw.com

Administrative Law Judges:

megan.addison@puco.ohio.gov
nicholas.walstra@puco.ohio.gov

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Summary: Response to Fourth Set of Interrogatories from Staff of the Ohio Power Siting Board
electronically filed by Christine M.T. Pirik on behalf of Icebreaker Windpower Inc.