

## Adelaide Project Update – Sound Monitoring

In July 2011, the Adelaide Wind Power Project was awarded a 40 MW, 20-year-term Feed in Tariff (FIT) power purchase contract by the Ontario Power Authority. The Project consists of 18 wind turbines and includes a meteorological tower, an electrical collection system, and a substation.

As part of our ongoing commitment to being a good neighbour and community partner, we are providing some information about wind turbines and sound – as well as updates on sound monitoring and new software upgrades for the turbines.

### Turbines and Sound

Wind turbine sound comes from either a mechanical or aerodynamic source. Mechanical sound is typically produced from internal turbine components while aerodynamic sound is produced by the rotation of the turbine blades through the air. In addition to the sound generated by the turbines, environmental factors affect the noise that is heard at nearby locations. Changing environmental factors including temperature, wind direction, atmospheric pressure and ambient noise levels all play a significant role in whether wind turbine noise can be heard.

It has been noted that warm air near the ground causes turbine sound to curve upwards, away from the ground, which results in reduced sound levels, while warm air in a temperature inversion may cause the sound to curve down to the earth resulting in increased sound levels. Wind direction may also affect the sound levels, which are likely to be greater downwind of the turbine<sup>1</sup>.

### Sound Regulations

The allowable sound level limits for the Project are determined by the Project's [Renewable Energy Approval](#) (REA) (issued December 2013). The sound level limits when measured at a "Point of Reception" (e.g. a nearby residence), are listed in the table below:

Wind Speed (metres per second) at 10 metres height	4	5	6	7	8	9	10
Sound Level Limits (Decibels Adjusted)	40.0	40.0	40.0	43.0	45.0	49.0	51.0

<sup>1</sup> Wind Turbine Sound and Health Effects: An Expert Panel Review. Colby et al. December 2009.

### **Sound Monitoring**

Sound monitoring is done via acoustic audits performed by Independent Acoustical Consultants in accordance with the Project's REA. Acoustic audits were completed in 2015/2016 with data collected at three different Points of Reception. Additional sound audits were completed at two of the 18 wind turbines and the main power transformer to verify the noise emitted meets manufacturer specifications. A summary of the audits has been made available on the Project website.

### **Software Updates**

During times of surplus power generation on the Ontario electric grid system, the Independent Electrical System Operator (IESO) may issue a curtailment instruction to the facility to reduce or stop generating electricity. Some area residents have informed Suncor of audible noise which was related to times when the facility was under a curtailment instruction. Suncor has recently updated the turbine software which controls the operation of the turbines.

This software update adjusts the pitch of the blades and slows the rotation of the turbine rotor during a curtailment instruction from the IESO. The turbine blades will continue to rotate, but at a slower rate and the rotor direction is maintained into the wind so that the turbine can efficiently return to normal operation once a curtailment instruction is released. This reduction of the speed of rotation is intended to reduce sound from the turbine when the IESO has issued a curtailment instruction compared with the current software configuration.

### **Community Feedback**

We continue to welcome your feedback regarding the Project and acknowledge the concerns that have been raised to date from local community members regarding the sound from the turbines at certain times. We are confident that the turbine software updates discussed above will be successful at reducing sound emitted from the turbines and will ensure that the Project continues to operate in accordance with the Project's REA.

### **We want to hear from you!**

Your feedback is important to us. Should you have any further questions or concerns, please email us at [adelaide@suncor.com](mailto:adelaide@suncor.com) or phone 1-866-344-0178.