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SHARP HILLS WIND FARM

Frequently Asked Questions

EDP Renewables (EDPR) operates over 40 wind farms in North America with over 5,200 megawatts (MW) of operating assets. We are an owner and operator of wind energy facilities and have experience in the development, construction and operation of over 2,000 turbines in Canada, the US and Mexico. Our landowners in other jurisdictions can serve as excellent resources to share their experiences. We are happy to connect community members near the Sharp Hills Wind Farm (also referred to as the "Project") with landowners in existing EDPR projects to answer any other questions.

FAQ 1: What are the wildlife impacts during construction and operation of the Sharp Hills Wind Farm?

EDPR takes the impacts to wildlife seriously at all stages of the Project lifecycle and works to minimize impacts in consultation with stakeholders, agencies (such as Alberta Environment and Parks [AEP]) and by applying our own robust internal standards (e.g. completion of a site characterization study at the outset of the development process, undertaking stick-nest surveys to identify avian habitats, etc.). There is a four-stage approach to understanding wildlife in the area and determining potential wildlife impacts: Planning, Wildlife Studies, Setback Implementation and Approvals.

1. Planning:

EDPR hired TetraTech (a qualified and independent environmental consulting firm) to prepare a Wildlife Study Plan in consultation with the assigned AEP Regional Wildlife Biologist. This plan was reviewed and agreed upon by AEP. The object of the Wildlife Study Plan was to characterize the distribution and regional habitat usage for wildlife and species of local concern to AEP including but not limited to Sharp-Tailed Grouse leks, migratory birds (including raptors, songbirds and waterfowl) and bats (migratory and resident).

2. Wildlife Studies:

Once the wildlife study plan was approved by AEP, TetraTech completed wildlife studies over a two-year period through to June of 2017. These included:

- Raptor nest surveys
- Sharp-Tailed Grouse lek surveys
- Bird migration surveys
- Bat acoustic surveys
- Breeding bird surveys
- Burrowing owl surveys

3. Setback Implementation:

Based on the results of the field studies, EDPR then applied the AEP setback guidelines from the proposed wind farm infrastructure to wildlife sensitive regions to ensure minimal interaction during

operation and construction. These setbacks are aligned with AEP's Wildlife Guideline for Alberta Wind Energy Projects (AEP 2011), the AEP Sensitive Species Inventory Guidelines (AEP 2013) and the Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat with Grassland and Parkland Natural Regions of Alberta (2011), including nests, leks, and some wetlands, and the associated restricted activity periods. These setbacks used in the Project were reviewed and signed off by AEP in the Phase 1 buildable area application in the form of a Wildlife Referral Report. The turbines and infrastructure have been sited in accordance with the setbacks established by AEP with few minor exceptions: one turbine is shown sited on native prairie and some collection lines and roads fall within the setbacks.

4. Approvals:

Based on the feedback by stakeholders and AEP, the proposed layout was prepared and has been sent to all stakeholders. Tetra Tech has also completed an Environmental Evaluation Report and sent this to AEP for more feedback. As part of the Environmental Evaluation Report, we have proposed potential mitigation techniques for the construction and operations period, as well as post-construction wildlife monitoring and adaptive management plans.

Environmental Impacts Expected:

Based on the Environmental Evaluation Report completed by Tetra Tech on the proposed Sharp Hills Wind Farm, we expect that the environmental impacts are not significant. A high-level summary of the environmental impacts and mitigating measures are shown in the table below. Note that "residual effect" refers to the effect of the Project after implementation of any mitigation measures, as set out below.

Potential Impacts	**Mitigation Measures**
Soils: No anticipated residual effects to terrain and soils valued ecosystem components (e.g. soils with high cultivation capability, terrain susceptible to erosion).	Environmental protection measures (summarized in FAQ 7) to prevent loss of land capability during construction and following decommissioning and closure of the Project
Surface Water, Hydrology and Wetlands: No residual effects to watercourse crossings associated with the loss of bank stability along watercourses or drainages are expected. Any potential residual effects on drainage patterns, wetland land cover types and water quality are not significant.	Construction of watercourse crossings in accordance with AEP's Code of Practice for Watercourse Crossings.
Vegetation Species and Communities: All potential residual effects to native land cover types, and vegetation conditions are not significant	Reclamation of temporary workspace. Implementation of recommended mitigation measures (see FAQ 7 for a summary of the mitigation measures

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	contemplated in the Construction and Operation Plan for the Project).
Wildlife Species and Habitat: Assuming implementation of the recommended mitigation measures, all potential residual effects to passerines, near-passerines, raptors, waterfowl, waterbirds, sharp-tailed grouse, and bats are not significant.	Adherence to setbacks from wildlife habitat sites where feasible, implementation of a construction and operation mitigation plan, post-construction monitoring, and adaptive management.
Environmentally Sensitive Areas: Potential residual effects to environmentally sensitive areas are not significant	Reclamation of temporary workspace after construction to equivalent land use capability, relative to what existed prior to construction.
Air Quality: Any potential residual effects to air quality are not significant	None. Air quality impacts from construction vehicles and dust emissions will be isolated in time and space and are considered to be of a temporary nature.

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FAQ 2: Will there be impacts to public roads because of the delivery of components to the project?

EDPR has been in consultation with the Special Areas Board (SAB) over the past two years discussing potential transportation routes for the construction phase of the Project. We are sensitive to any impacts that delivery and construction vehicles may have to existing public road infrastructure including the temporary air quality impacts from dust during the construction and decommissioning period.

EDPR has committed to entering into a Road Users Agreement (RUA) with the SAB to ensure that the condition of public roads used in the construction of the Project will be left in the same or better condition than existed prior to construction. Some features of the RUA will likely include:

- Avoidance of certain stretches of road for delivery of components, such as large portions of Township Road 314 (the main road from Highway 41 to Sedalia) to reduce impact to this paved road
- Commitment to pre- and post-construction video surveys of public roads included in the transportation plan to document any damage done and to guide the requirements for reinstatement after construction
- Commitment to upgrade existing public roads used during the construction process to improve bearing capacity for component delivery. Such upgrades will be left in place for the benefit of all future users

FAQ 3: Is there expected to be increased traffic during construction and operation from the Sharp Hills Wind Farm?

We recognize that increased traffic will be a possible annoyance during the construction period. We will be working with the SAB to inform the community about the roads that will be in use for

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construction and component delivery. We will also try to avoid delivery times after 7pm and will take school bus routes into consideration in our transportation and logistics plan.

During the operations period, we expect traffic to Project infrastructure locations to include mainly pickup trucks and other standard road vehicles with the exception of the replacement of major components (which will occur only on an as-needed basis).

FAQ 4: Is there expected to be an impact to human health from the Sharp Hills Wind Farm?

A few concerns over impacts to human health have been raised as part of the consultation process for the Project. Specific issues include:

- Ice throw: EDPR will install modern turbines at the Sharp Hills site. With modern turbine technology, ice accumulation is a rare event because the turbines will have sensors to detect an imbalance in the rotor. Ice accumulation causes rotor imbalance, which, in turn, creates stress on the rotor assembly and gearbox. Such stress can diminish the design life of internal components. When the sensor detects imbalance (e.g. from ice accumulation), the detection system instructs the turbine to shut down until the imbalance is rectified. Shutting down the turbine during icing events prevents the potential for ice throw. In addition, the setbacks incorporated into the project design ensure a significant distance between turbine locations and residences, to provide additional assurance of minimal or no impact from ice throw.
- Noise: The Project will be designed according to Alberta Utilities Commission (AUC) Rule 012 (Noise Control), which is intended to “ensure noise from a facility, measured cumulatively with noise from other energy-related facilities, does not exceed the permissible sound level calculated in accordance with this rule.”

Rule 012 does not allow sound pressure levels from all energy related sources, measured in dBA (which is the decibel sound pressure level which approximates human hearing response at low intensities) to exceed 40 dBA at residences during nighttime summer conditions (see the chart below for noise comparisons). In addition, the SAB has further setback requirements such that the sound pressure level cannot exceed 40 dBA at the property line of a non-participant landowner or Crown lessee; this requirement is among the most stringent of any provincial Municipal District or county. EDPR have designed the Project to comply with both standards and will monitor the sound pressure levels on-site post-construction to ensure compliance.

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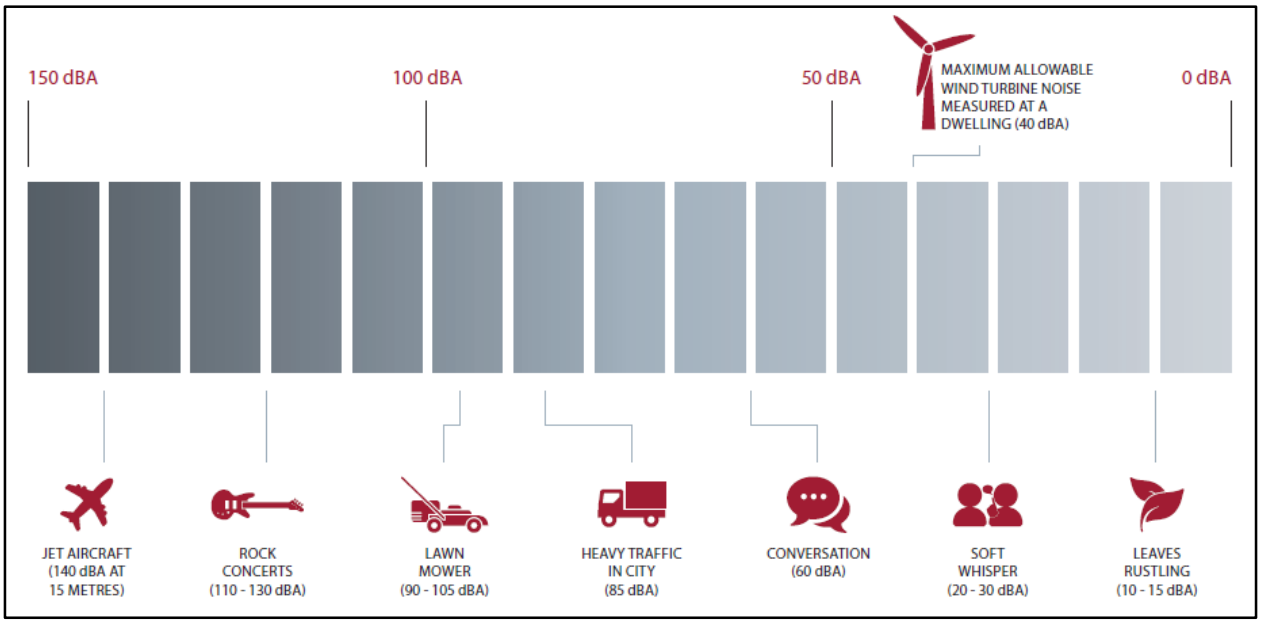

- Shadow flicker: EDPR is currently completing a full shadow-flicker study for the final proposed layout. This study will identify the maximum potential for shadow-flicker on residences. This analysis will be uploaded to our website once completed. Poster boards showing the results will also be available at the August 17th open house in Sedalia.
- Human Health Impacts: The Government of Canada in 2012 initiated a large-scale study in collaboration with Statistics Canada, called *Wind Turbine Noise and Health Study*. The study was completed in Ontario and PEI where there were homes in the vicinity of wind turbine installations. The study concluded that wind turbine noise was **not** observed to be related to human health impacts, as demonstrated by hair cortisol concentration (which is indicative of stress level), blood pressure, resting heart rate or measured sleep.

FAQ 5: Orphan fund – Are there sufficient funds to pay for decommissioning costs at the end of the usable life of the wind farm?

EDPR is committed to fully decommissioning the site at the end of the operational phase.

EDPR has committed to a decommissioning fund with each Project landowner as part of the lease agreement. The decommissioning fund commences in the fifteenth year after the wind farm is commissioned and provides funds or credit in escrow until the Project meets the end of its usable life. This fund is an obligation on EDPR to every landowner who will have infrastructure on their property. The obligation persists with the leaseholder (EDPR) and any successor, in the unlikely event that EDPR were to pass ownership to another party (which is not anticipated at this time).

In addition to the escrow fund, the decommissioning costs are typically covered by the salvage value of the equipment (turbines, cable, electrical infrastructure) installed on-site. For example, the steel which comprises the towers on-site will hold significant value which is likely to cover a significant portion of the overall decommissioning costs.

FAQ 6: What happens to the construction waste?

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Another issue that was raised was construction waste. The concern is that EDPR may leave construction waste within the road right-of-way or on private property.

EDPR utilizes a waste management plan for any wind farm construction. During the construction phase, the contractor will need to meet the specific contractual requirements of the waste management plan. EDPR will ensure that all Project – related waste will be disposed of in accordance with all legal requirements. EDPR will be responsible for cleanup of construction waste within road right of ways and on private property.

In addition, EDPR has a covenant in every lease to leave the leased lands in a tidy condition post-construction. Further, lands that are not under lease cannot be disturbed. Any impacts to the road right-of-way will be governed by the RUA, and it is expected that the SAB will include a provision to remove any residual construction waste post-construction.

FAQ 7 Erosion and sediment control – what will the impact be to project lands because of disturbance from construction?

As part of the Environmental Evaluation to support the Phase 2 AUC application, EDPR has submitted a Construction and Operation Plan to AEP which addresses commitments during the construction and operational phases of the Project to control and minimize erosion and sediment deposit. When approved, EDPR will be bound by the Construction and Operation Plan, which will be enforced by the AUC through the AUC approval. These mitigating measures include:

- Minimization of, and alternative approaches to, topsoil/subsoil stripping/salvage and isolation
- Erosion and sediment control measures (e.g., minimization of handling, application of water or tackifiers, utilization of geotextiles, deployment of silt fencing)
- Rig mats or low-ground pressure vehicles in areas of moderate to high risk for compaction and rutting where minimum disturbance construction techniques will be applied (i.e., no-strip) or where increased bearing capacity is required for crane supports during tower erection
- Timing amendments to avoid high risk erosion (i.e., windy or wet weather), compaction, and rutting conditions
- Isolation of soils stripped from areas infested with weeds
- Revegetation requirements including but not limited to timing of seeding, seed mix selection, use of cover crops or other treatments that may be required
- Reduction of the extent of stripping and grading to only the areas required to ensure safe equipment access and operation
- Retention of salvaged topsoil within equivalent soil map units, to the greatest extent feasible
- Deployment of silt fencing for disturbed areas within 30m of waterbodies
- Apply water or single-application tackifier at active construction sites to limit dust during dry periods
- Ensure all temporary grading of slopes, landscape contours, watercourses and drainages are restored to preconstruction conditions.
- Decompact subsoils where necessary prior to replacement of salvaged topsoils.
- Replace salvaged topsoil and subsoils from which they were stripped, in layers matching surrounding soils.
- Revegetate temporary workspace and other areas outside of gravelled pad sites and access roads following construction according to landowner specification(s) or equivalent to adjacent conditions.
- Except where risk of erosion and degradation of bank stability may occur, allow all temporary disturbances to waterbodies to revegetate naturally (i.e., without reseeding).

- Monitor reclamation progress for at least one year following completion of soil replacement.

FAQ 8: What wind turbine setbacks are you using?

EDPR can confirm that turbines and infrastructure are subject to setbacks imposed by three jurisdictions: federal, provincial including the AUC and AEP, and municipal (through the SAB). These setbacks are typically focused on appropriate distances to important features. As mentioned above, for noise considerations, the AUC requires turbines to be set back such that the cumulative sound pressure level at receptors is no greater than the assigned Permissible Sound Level, which for our Project is 40 dBA at night for most homes. In addition, the SAB requires that setbacks are the greater of 550m or the distance required to ensure a sound pressure level of no greater than 40 dBA at the property line of non-participants unless setbacks are waived by the landowner.

FAQ 9: Will there be an impact on my property value?

A study completed by the Municipal Property Assessment Corporation (MPAC) in Ontario found that there is no impact from proximity to wind turbines on property sale prices. Concerns of this nature have been raised for wind farms. Two of the most recent wind farm applications in Alberta that went to a hearing before the AUC considered this potential impact. The AUC concluded as follows:

- Grizzly Bear Creek Wind Project (E.On Climate & Renewables Canada Ltd.): "The Commission was not presented with sufficient evidence in this proceeding to suggest that the project will result in an adverse impact on property values of parcels adjacent to the project."[1]
- Bull Creek Wind Project (BluEarth Renewables Inc.): "The Commission has not been presented with sufficient cogent evidence in this proceeding to suggest that the project will result in an adverse impact on property values of parcels adjacent to the project and finds that any limitations on subdivision potential is too speculative."[2]

FAQ 10: What will the wind farm look like?

We are currently developing viewscape representations of what the wind farm will likely look like from high-traffic locations. We will upload them to our website (sharphillswindfarm.com) once they are ready. We can mail you a copy of them if you do not have internet access, if requested. We will also have poster boards with the visualizations available at our August 17th open house in Sedalia.

FAQ 11: Will our climate be affected by the wind farms?

We understand that farmers are concerned over any impact to climate given the sensitivity of farming practices to weather patterns. However, we operate over 2,000 turbines in North America and have not observed such a "microclimate" effect. Accordingly, we do not expect that there will be any impact on the local climate at Sharp Hills. If you are interested in further information, we

[1] Paragraph 310, E.On Grizzly AUC Decision 3329 D-01-2016
[2] Paragraph 533, BluEarth Bull Creek AUC Decision 2014-040 (Errata)

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can put you in touch with some of our wind farm neighbors in other jurisdictions to see what their experience has been.

FAQ 12: Is there any impact to farming practices because of the wind farm operations?

In our experience across 40+ projects in North America, wind farm operations and farming practices co-exist very well. Farmers can cultivate close to the base of the turbine and pad transformer, and grazing lands have remained in use in the same manner as before construction. Crop spraying can also continue. A communications protocol will be used between people or companies that are crop spraying and the wind farm operations team to promote safe operations for all parties.

FAQ 13: How have you considered air strips in your project layout?

The Sharp Hills Wind Farm is subject to all federal and provincial laws including the *Aeronautics Act*. The Transport Canada regulations, as identified in TP1247E standard, indicates that a certified aerodrome requires setbacks as per Transport Canada TP312, Obstacle Limitation Surface for Code 1 (now referred to as Aircraft Group Number AGN 1) non-instrument runway, with visual flight rules. This standard imposes a surface starting from each end of the runway with a ten percent transitional surface, and a 2,500m take-off/ approach surface at five percent slope. Although the airstrips within the Project area are not designated as “certified aerodromes”, to be on the safe side, these takeoff and landing approach surfaces were voluntarily incorporated into the setbacks used for the Project’s turbine layout for non-certified aerodromes of non-participant landowners.

FAQ 14: How can I get in touch with EDPR if I have further concerns?

The Project will maintain a portal for community members to comment or voice concerns throughout the development, construction, operation and decommissioning processes. A dedicated toll-free number and email have been set up to receive any comments or concerns:

Toll-free: 1-844-624-0330

Email: canada.ab@edpr.com

All queries will go through EDPR’s communication management system to ensure that all outstanding issues are directed to the appropriate personnel and are addressed in due course.

Kind regards,

Ryan O’Connor
Project Manager, EDP Renewables Canada Ltd.