Pattern Development Lanfine Wind ULC

Lanfine Wind Power Project

January 27, 2020

Alberta Utilities Commission
Decision 22736-D01-2020
Pattern Development Lanfine Wind ULC
Lanfine Wind Power Project
Proceeding 22736
Applications 22736-A001 to 22736-A005

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1 Decision summary

1. In this decision, the Alberta Utilities Commission considers whether to approve applications from Pattern Development Lanfine Wind ULC requesting approval to construct and operate the power plant and substations, collectively designated as the Lanfine Wind Power Project (the project). After consideration of the record of the proceeding, for the reasons outlined in this decision, and subject to the specified conditions, the Commission finds that approval of the project is in the public interest having regard to the social, economic, and other effects of the project, including its effect on the environment.

2. Pattern's application to connect the project to the Alberta Interconnected Electric System will be considered in a separate interconnection application.

2 Introduction

2.1 Project description

3. Bowark Energy Ltd. filed an application with the Commission on June 15, 2017, for a Phase 1 buildable area for a wind power project.[1] On November 27, 2017, the application was put in abeyance while Bowark prepared a joint Phase 1 and Phase 2 application.[2] Bowark's buildable area wind power project was subsequently acquired by Pattern.

4. On January 11, 2019, Pattern submitted new applications for the project. The applications were subsequently amended to reflect a revised anticipated in-service date and to remove one turbine (T19). The project consists of 78 Vestas turbines, each rated at 3.6 megawatts (MW). Pattern proposed to construct the project in two phases; Lanfine North would consist of 41 turbines for a total generating capability of 147.6 MW while Lanfine South would consist of 37 turbines for a total generating capability of 133.2 MW. The total project size is 280.8 MW. Pattern also proposed two substations; Buffalo Bird 601S Substation, located on the southwest quarter of Section 19, Township 27, Range 4, west of the Fourth Meridian, for Lanfine North, and Nighthawk Substation, located on the northeast quarter of Section 8, Township 26, Range 3, west of the Fourth Meridian, for Lanfine South.

[1] In a Phase 1 buildable area application, an applicant identifies an area in which it proposes to construct a wind power plant and applies for approval of that area. In such an application, the applicant specifies the maximum thresholds for project components such as turbine size, and noise levels. The buildable area concept allows developers to have the flexibility to change the turbine type within a specific physical dimension; e.g., maximum turbine height, maximum rotor length, maximum number of turbines, maximum noise level, without requiring an amendment application. Bowark converted its buildable area application to the standard power plant application when it filed its combined Phase 1 and Phase 2 application.

[2] Exhibit 22736-X0044, Ruling on Abeyance - 2017-11-27.

2.2 Hearing process

5. The Commission provided notice of the applications in accordance with Rule 001: *Rules of Practice*. In response to the notice of application for the Phase 1 buildable area, the Commission received statements of intent to participate from 10 parties. The application was placed in abeyance prior to the issuance of a standing ruling. In response to the notice of applications for the combined Phase 1 and Phase 2 applications, the Commission received responses from parties who had previously submitted statements of intent to participate and from parties submitting for the first time. The Commission granted standing to Brad Kuich, Leslie Girletz, Ray and Wendy Girletz, Dennis Fischbuch, John Murray, Jaclyn Murray, Richard Fischbuch, Kathleen Butler, Leonard Parenteau, Tom Carroll, and Jerry Svatos.[3] A number of parties granted standing formed the Oyen Landowners Group. Jamie Ross appeared at the hearing and was granted standing along with Jared Ross based on the proximity of their residence to the project and the nature of the concerns they expressed in their statement of intent to participate filed in response to the notice of application for the Phase 1 buildable area. Ms. Ross and Mr. Murray joined the Oyen Landowners Group at the hearing.

6. A public hearing to consider the applications was held from December 10, 2019, to December 12, 2019, in Oyen, Alberta.

2.3 The Commission's consideration of the applications and structure of the decision

7. Relevant to the Commission's consideration of the applications are sections 11, 14, 15 and 19 of the *Hydro and Electric Energy Act*. In accordance with Section 17 of the *Alberta Utilities Commission Act*, the Commission must assess whether the project is in the public interest, having regard to its social, economic, environmental and other effects.

8. The Commission considers that the public interest will be largely met if an application complies with existing regulatory standards, and the project's public benefits outweigh its negative impacts.[4] The Commission must take into account the purposes of the *Hydro and Electric Energy Act* and the *Electric Utilities Act*[5] and cannot consider the need for the project or whether it is the subject of a renewable electricity support agreement under the *Renewable Electricity Act*. The Commission must also determine whether an applicant has met the requirements of Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations and Hydro Developments* and Rule 012: *Noise Control*. An applicant must also obtain all approvals required by other applicable provincial or federal legislation.

9. In Section 3 of this decision, the Commission considers arguments advanced by the parties concerning the noise-related aspects of the applications, more specifically: the applicable version of Rule 012; determination of ambient sound levels and representative conditions for measurement of ambient sound; ground absorption factor, terrain mapping and third-party facilities; project compliance; and post-construction comprehensive sound level (CSL) surveys. In Section 4, the Commission considers issues related to the environmental effects of the project, primarily on bats, native grasslands and wetlands. The need for additional environmental surveys is also addressed. Section 5 considers other concerns expressed by the interveners including the

[3] Exhibit 22736-X0113, AUC ruling on standing.

[4] EUB Decision 2001-111: EPCOR Generation Inc. and EPCOR Power Development Corporation 490-MW Coal-Fired Power Plant, Application 2001173, December 21, 2001, page 4.

[5] *Hydro and Electric Energy Act*, RSA 2000 c H-16, ss 2, 3; *Electric Utilities Act*, SA 2003, c E-5.1.

effect of the project on groundwater, property values, health and viewscapes. The Commission's conclusion, is summarized in Section 6 and its decision on the applications is detailed in Section 7.

3 Noise

3.1 Introduction and background

10. The Commission recently amended Rule 012: *Noise Control*; those amendments came into effect on August 1, 2019. One of the amendments found in the current version of Rule 012 is a new section (Section 2.6) that expressly addresses ambient sound levels (ASLs).

11. In this decision, the new version of Rule 012 is referred to as "the current version of Rule 012" whereas the version of Rule 012 that it replaced is referred to as "the previous version of Rule 012."

12. Under the previous and current versions of Rule 012, applicants have two options for establishing ASLs and permissible sound levels (PSLs) at receptors.

- If the assumed ASLs and PSLs provided in Table 1 of Rule 012 are representative of the project study area (at receptors), an applicant may use those assumed values.

- If the project area is located in a pristine area or an unusually noisy area and the assumed ASLs and PSLs provided in Table 1 of Rule 012 are not representative of the project study area (at receptors), an applicant may rely on measurements to determine the ASL. Where a measured ASL is used, a Class A2 adjustment (also called an ambient monitoring adjustment)[6] is established based on the measured ASL and then applied to the PSL determined in accordance with Table 1 of Rule 012 to produce an A2-adjusted PSL.

13. The primary noise-related issue raised in this proceeding was whether it was reasonable for Pattern to use an assumed nighttime ASL of 35 dBA (as provided in Table 1 of Rule 012) when calculating the nighttime PSL at various receptors in the project area.[7] Pattern submitted that the assumed nighttime ASL was representative of the project study area. The Oyen Landowners Group disagreed and argued that its measurements demonstrated that the nighttime ASL for certain receptors in the project area was lower than the assumed nighttime ASL and that the use of Table 1 of Rule 012 was therefore not appropriate for the project.

14. Pattern submitted two noise impact assessments (NIAs) prepared by RWDI AIR Inc. Pattern's original NIA was dated January 9, 2019 (the project NIA).[8] As a post-hearing undertaking, Pattern submitted an updated NIA dated December 19, 2019.[9] In the updated NIA,

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[6] A Class A2 adjustment is an adjustment to the permissible sound level for locations where the measured ambient sound level is not representative of the assumed ambient sound environment based on Table 1 of Rule 012.

[7] Rule 012 defines nighttime as from 10 p.m. to 7 a.m. and daytime as from 7 a.m. to 10 p.m.. Based on Table 1 of Rule 012, the daytime PSL is the nighttime PSL plus a daytime adjustment of 10 dB. Because the nighttime PSL is a more stringent limit for noise compliance than the daytime PSL, this decision is focused on noise compliance during the nighttime period.

[8] Exhibit 22736-X0069, Attachment 11 - Noise Impact Assessment.

[9] Exhibit 22736-X0197.01, Undertaking #2 - Updated NIA.

the results and conclusions of the project NIA remained valid but were supplemented by RWDI to: (i) reflect the removal of Turbine T19, which was a project amendment confirmed by Pattern during the hearing; and (ii) provide a comparison of predicted results for noise models using ground attenuation factors of 0.5 and 0.7 for all identified receptors as well as the three intervener residences addressed in the evidence of dBA Noise Consultants Ltd. Item (ii) was provided as part of RWDI's reply evidence and repeated in the updated NIA as supplementary information.

15. Pattern retained Teresa Drew from RWDI and Payam Ashtiani from Aercoustics Engineering Ltd. to provide evidence on the project's noise impact and noise-related issues. Ms. Drew was the primary author of both NIAs submitted by Pattern, prepared reply evidence[10] in response to issues raised by the Oyen Landowners Group and testified at the hearing. Mr. Ashtiani prepared evidence[11] in response to issues raised by the Oyen Landowners Group that focused specifically on representative ASLs and Class A2 adjustments. Mr. Ashtiani also testified at the hearing.

16. The Oyen Landowners Group retained Henk de Haan of dBA Noise to review the project NIA and related noise documents. Mr. de Haan authored a report summarizing his review of the project NIA and other noise-related evidence and analysing the ASL of the project area.[12] Mr. de Haan measured the ASLs at three intervener residences: Receptor A (Ray and Wyatt Girletz), Receptor B (Dennis Fischbuch), and Receptor C (Brad Kuich) and developed a noise model to assess project compliance based on measured ASLs. Mr. de Haan also testified at the hearing.

3.2 Applicable version of Rule 012

3.2.1 Views of Pattern and the Oyen Landowners Group

17. Pattern submitted that the project NIA complies with the previous version of Rule 012, which was in effect from July 4, 2017, to July 31, 2019. Pattern suggested that compliance with the previous version of Rule 012 is appropriate because the project NIA was completed and project applications were submitted before the current version of Rule 012 came into effect on August 1, 2019.[13] Pattern referred to a comment matrix issued by the Commission during a previous Rule 012 revision process in 2012,[14] which stated that applications submitted prior to the effective date of the new version of the rule would be subject to the previous version.[15]

18. In response, the Oyen Landowners Group submitted that Rule 012 applies to facilities, not NIAs, making the date that RWDI prepared its NIA and the date the project applications were filed, irrelevant.[16] The Oyen Landowners Group stated that as the project has neither been approved nor built, the current version of Rule 012 should apply.[17]

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[10] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873.
[11] Exhibit 22736-X0159, AERC001 - Lanfine Wind Payam Ashtiani Evidence (2019.12.02).
[12] Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019; Exhibit 22736-X0151, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.B V2 dated November 16, 2019.
[13] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 3.
[14] Comments on the draft Rule 012 – Noise Control, dated March 8, 2012. AUC website http://www.auc.ab.ca/regulatory_documents/Consultations/2012-03-06-Rule012-CommentMatrix1.pdf.
[15] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 3.
[16] Transcript, Volume 3, page 677, lines 3-8.
[17] Transcript, Volume 3, page 677, lines 23-24, and page 678, lines 4-5.

3.2.2 Commission findings

19. Many of the issues raised in this proceeding concerning the applicability and interpretation of the previous and current versions of Rule 012 were considered by the Commission in Decision 24401-D01-2019.[18] In that decision, the Commission offered a detailed review of the historical development of Rule 012, which will not be repeated here. Instead, a short summary is provided below.

20. The first version of Rule 012 came into force on March 24, 2009, and was largely modelled on the February 2007 version of the Alberta Energy Regulator's (AER) Directive 038: *Noise Control*, which remains in force today. Directive 038 states: "[b]ased on research conducted by the Environment Council of Alberta, the average rural ambient sound level in Alberta is about 35 dBA at night." Directive 038 effectively allows applicants to establish ASLs by using an assumed ASL from Table 1 of Directive 038 or, where that is not representative of the project area, by using an ASL based on measurement and establishing a Class A2 adjustment. Based on a plain and ordinary reading, the effect of Directive 038 is that the default ASL in rural Alberta for facilities regulated by the AER is 35 dBA and that adjustments to this ASL can be made only in limited circumstances.

21. Rule 012 has been amended six times since its introduction. As with Directive 038, every version of Rule 012 has allowed applicants to use an assumed ASL unless the project area is characterized as pristine or unusually noisy. More specifically, every iteration of Rule 012 included a Table 2: Class A Adjustments, which identifies the two situations where the use of an assumed ASL may not be representative of the project area: (a) pristine areas (as defined in each version of the rule), and (b) areas that have non-energy industrial activity that would impact the ASL.

22. Rule 012's definition of "pristine area" is similar to that in Directive 038 and has not materially changed since 2012:

> a natural area that might have a dwelling **but no industrial presence, including energy, agricultural, forestry, manufacturing, recreational or other industries that affect the noise environment**. [emphasis added][19]

23. Like the previous versions of Rule 012, the current version includes Table 2: Class A Adjustments, in which the circumstances for deviating from an assumed ASL are set out. However, the current version of Rule 012 included, for the first time, a new section (Section 2.6) devoted exclusively to ASLs.

24. In Decision 24401-D01-2019, the Commission expressed the view, with which this Commission panel agrees, that the addition of Section 2.6 has not materially changed the requirements for establishing ASLs, and subsequently PSLs in an NIA. Section 2.6 emphasizes, as did previous versions of Rule 012, that an important factor when determining whether to rely on an assumed ASL is whether the project is located in a pristine area, which is defined in Appendix 1 as a natural area with no industrial (including agricultural or energy) presence. Ambiguity resulting from an apparent inconsistency pertaining to the definition of pristine area

[18] Decision 24401-D01-2019: EDP Renewables SH Project GP Ltd. – Sharp Hills Wind Project Amendment, Proceeding 24401, Applications 24401-A001 and 24401-A002, December 20, 2019.

[19] Rule 012: *Noise Control*, PDF page 46.

that was created when Section 2.6 was added, was unintended[20] and should be remedied through further amendment to Section 2.6(2) of Rule 012 to simply refer to the definition of pristine area in Appendix 1.

25. Having regard to the foregoing, it is unnecessary to determine which version of Rule 012 applies in the circumstances of these applications as there are no substantive differences between the previous and current versions of the rule that are material to the Commission's determination of the fundamental noise issues raised in these applications; namely, the applicable ASLs (and resulting PSLs) for the receptors identified in the project NIA and compliance with Rule 012 at those receptors.

3.3 Determination of applicable ambient sound levels

3.3.1 Views of Pattern and the Oyen Landowners Group

26. RWDI submitted that the use of Table 1 in Rule 012 to establish the ASL for noise receptors located within the project study area was appropriate, given that the project area is typical of rural Alberta with predominant agricultural and energy industry land use resulting in neither a pristine nor a noisy noise environment.[21] RWDI emphasized that the project area includes dwellings, active agriculture and active oil and gas facilities, and concluded that given the level of local development and absence of large industrial sound sources, the use of Table 1 from Rule 012 to establish PSLs and ASLs in the project NIA was reasonable and well founded.[22] Further, Ms. Drew suggested that for the above reasons, noise in the project area should not be treated differently than noise in other rural areas with similar land use.[23]

27. RWDI compared the Rule 012 requirements and definitions related to the determination of ASLs with those of Directive 038[24] and Alberta Energy and Utilities Board (EUB) Guide 038.[25] RWDI stated that consideration of ASLs has been required in NIAs in Alberta since the introduction of ambient adjustments in EUB Guide 038. RWDI submitted that the conditions defined in Table 2 of Rule 012 for conducting ASL measurements are consistent with EUB Guide 038 and Directive 038; in particular, all three documents indicate that ASLs may be measured in areas that are pristine or where there are non-energy industrial activities that would impact ASLs.[26] In addition, RWDI noted that the definition of "pristine" in Rule 012[27] is similar to the definition provided in Directive 038.[28, 29]

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[20] Table 2, which sets out the requirements for Class A2 adjustments, refers to Appendix 1 of Rule 012 (glossary) for the definition of "pristine area", whereas Section 2.6(2) describes a "pristine area" as "(i.e. nighttime ambient sound levels might be less than 35dBA)".

[21] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 3.

[22] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 4.

[23] Transcript, Volume 2, page 290, lines 4-8.

[24] Directive 038: *Noise Control*, Alberta Energy Regulator, issued on February 16, 2007.

[25] Guide 38: *Noise Control Directive User Guide*, Alberta Energy and Utilities Board, issued in November 1999.

[26] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 3.

[27] "Pristine area" in Appendix 1 of AUC Rule 012: "A natural area that might have a dwelling but no industrial presence, including energy, agricultural, forestry, manufacturing, recreational or other industries that affect the noise environment." (Rule 012, PDF page 46)

[28] "Pristine area" in Appendix 3 of AER Directive 038: "A pure, natural area that might have a dwelling but no industrial presence, including energy, agricultural, forestry, manufacturing, recreational, or other industries that already impact the noise environment." (Directive 038, PDF page 35)

[29] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 3.

28. Pattern argued that the PSL for all receptors in the project area was correctly established and "[t]he Class A2 ambient adjustment that Mr. de Haan recommends is not necessary, reasonable, or appropriate in the context of this project."[30]

29. The Oyen Landowners Group submitted that the AUC's recent revisions to Rule 012 should be interpreted to mean that "it is no longer good enough to follow the past practice of using the assumed ASL of 35 dBA automatically without question." Consequently, the use of an assumed ASL must be justified.[31]

30. In the Oyen Landowners Group's view, Mr. de Haan followed the requirements of assessing ASLs in Rule 012. First, Mr. de Haan conducted a desktop study to determine if it would be appropriate to use the assumed ASL of 35 dBA. Based on this desktop study, Mr. de Haan found that the project area is rural with mostly large field pasture, there are no major highways or frequent aircraft flyovers,[32] and there are a number of oil and gas related facilities but no other acoustically significant facilities.[33] He concluded that use of the assumed ASL would not be appropriate for the project area.[34] Therefore, Mr. de Haan measured ASLs at the three intervener residences for one day and one night (i.e., approximately 24 hours). The results of his survey showed nighttime ASLs between 25 and 29 dBA at the intervener residences, which are significantly less than the assumed ASL of 35 dBA.[35,36]

31. Based on the measurement results, Mr. de Haan argued that the project area is "pristine", because Section 2.6 of Rule 012 defines a "pristine area" as "an area where the ASL may be less than 35 dBA."[37] Consequently, Mr. de Haan submitted that a downward A2 adjustment was appropriate. He established A2 adjustments and A2-adjusted PSLs for the three intervener residences based on measured ASLs.[38] Mr. de Haan also applied downward A2 adjustments at the other receptors in the study area based on his assertion that these receptors have a similar acoustic environment to one of the intervener residences that was measured.[39]

32. The Oyen Landowners Group identified an inconsistency in the definition of "pristine" in Rule 012. It noted that the word "pristine" appears in Rule 012 three times: (i) Table 2 references "pristine" but refers to Appendix 1, the glossary of Rule 012, for its definition; (ii) Subsection 2.6(2) provides that "pristine" can be equated to "an area where ASLs may be less than 35 dBA"; and (iii) the definition of "pristine area" in the glossary is described as an area where there is no industrial presence, including energy, agricultural, forestry,

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30 Transcript, Volume 3, page 618, lines 9-16.
31 Transcript, Volume 3, page 674, lines 17-21.
32 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 16.
33 Exhibit 22736-X0151, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.B V2 dated November 16, 2019, PDF page 7.
34 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 17.
35 Exhibit 22736-X0151, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.B V2 dated November 16, 2019, PDF page 3.
36 Transcript, Volume 3, page 675, lines 13-24.
37 Transcript, Volume 3, page 591, lines 18-23.
38 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 20, Table 4.
39 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF pages 21 and 22, Table 5.

manufacturing, recreation or other industries that affect the noise environment.[40] The Oyen Landowners Group explained that the use of the term "pristine" in items (i) and (iii) is not new, however, its use in Subsection 2.6(2) is new and should "be taken to represent the Commission's current view of what 'pristine' means in the context of ASL surveys."[41]

3.3.2 Commission findings

33. In Decision 24401-D01-2019, the Commission described its approach when evidence is tendered suggesting that the Table 1 values in Rule 012 are not representative of the ambient sound environment in a project area as well as the Commission's intention in using assumed ASLs in rural areas:

> 56. It is evident from the express language of the previous and current versions of Rule 012 that an application for a Class A2 adjustment is available where there may be an issue as to whether Table 1 values are representative of the ambient sound environment in the project study area or, as here, evidence is tendered suggesting that Table 1 values are not representative. In such circumstances, the Commission must focus on whether the evidence supports that the Table 1 values are representative of the ambient sound environment at the subject receptors and if not, what ASL should be used in establishing the PSL at those receptors. And, while Rule 012 does not currently and has never expressly restricted the opportunity for measurements and the availability of a Class A2 adjustment to pristine and noisy circumstances, its intended purpose effectively limits any other circumstance to one where both the evidence of measured ASL and, most significantly, the reasons for the proposed Class A2 adjustment are compelling such that they outweigh the reasons for reliance on the assumed values.
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> ...
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> 59. The Commission's use of the assumed ASLs in Rule 012 for rural areas is intended to provide a reasonable, consistent and practical mechanism for predicting and assessing cumulative sound levels in NIAs, especially where, as is the case for wind developments, the project area can span many square kilometres. The use of assumed ASLs is also intended to promote comparability when assessing energy-related projects in similar environments and allow for consistency when assessing noise compliance at receptors within a common project area. Further, assumed ASLs promote consistent PSLs for energy applications filed at different times and prevent divergence between PSLs for oil and gas facilities regulated by the AER and utility facilities regulated by the AUC.
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> 60. The Commission emphasizes that the use of an assumed nighttime ASL of 35 dBA is not intended to describe ambient conditions at a particular receptor on a particular night; instead, this value is intended to describe typical or representative ambient conditions for receptors in rural areas where agricultural and/or oil and gas activity is also taking place. As such, Rule 012 (the current and previous version) makes it clear that Class A2 downward adjustments are appropriate when considering pristine areas without agricultural, industrial or oil and gas related operations and, as is more often the case, Class A2 upward adjustments are appropriate for unusually noisy areas such as locations near highways or rail lines.

[40] Transcript, Volume 3, page 680, lines 2-6; page 682, lines 24-25; and page 683, lines 1-9.
[41] Transcript, Volume 3, page 684, lines 15-20.

> 61. Although the Commission accepts that measurements may yield ASLs that are different than the average, it also recognizes that measured ASLs reflect the particular environmental conditions and nearby activities that are present at the time the measurements are collected. As stated by both parties, ASLs can be highly variable.
>
> 62. In rural areas where agricultural and/or oil and gas activities take place, the noise from those activities can be intermittent and unpredictable, making it difficult to obtain a representative ASL. It is for this reason that the use of an assumed ASL is generally considered reasonable in those areas. A proponent's obligation under Subsection 2.6(5) of Rule 012 to demonstrate the reasonableness of using an assumed ASL in those instances (rural areas where agricultural and/or oil and gas activities take place) can be satisfied by documenting the existence of such activities. And although it nonetheless remains open to interveners to challenge the use of the assumed ASL by providing evidence of compelling circumstances warranting a departure from the assumed values as well as measurement data in support of a Class A2 adjustment, obtaining representative ASL values via measurement in a non-pristine environment requires a comprehensive measurement program of sufficient duration to capture conditions that are typical of the acoustic environment at a given location.

34. This Commission panel agrees with the views expressed above and has considered whether the evidence in this proceeding supports that the Table 1 values are representative of the ambient sound environment at the project receptors or conversely, that a departure from the Table 1 assumed ASL values is warranted.

35. The Commission finds that, based on the presence of agricultural and oil and gas activities in the project area, it was reasonable for Pattern to rely on the assumed values of Table 1 of Rule 012 when preparing its NIA. This assumption was validated by the evidence of all parties who confirmed the existence of agricultural and oil and gas activities throughout the project area. The ambient monitoring results filed by the Oyen Landowners Group have not demonstrated to the satisfaction of the Commission, that the project area is pristine or otherwise contains features or characteristics that materially distinguish it from other parts of rural Alberta, where agricultural and oil and gas activities take place. For both these reasons, the Commission finds that a departure from the assumed values of Table 1 of Rule 012 is not warranted and that it was reasonable for Pattern to conclude that the assumed ASLs based on Table 1 of Rule 012 are representative of the project area.

3.4 Representative conditions for the measurement of ambient sound levels

3.4.1 Views of Pattern and the Oyen Landowners Group

36. Pattern argued that the Commission should not give consideration to Mr. de Haan's ASL survey and associated downward A2 adjustments; however, should the Commission decide to do so, it must also account for the quality and quantity of data used in Mr. de Haan's ASL survey.[42] In Pattern's view, Mr. de Haan's measurement data did not adequately establish representative conditions on the basis that (i) the anemometers used during the ASL survey were not properly calibrated, (ii) the duration of the measurements was too short to establish representative conditions for a downward Class A2 adjustment, and (iii) measurements collected at one receptor were improperly transferred to other receptors where measurements were not collected.

[42] Transcript, Volume 3, page 620, lines 14-20.

37. Pattern stated that the calibration of anemometers used in ASL surveys is particularly important, because data isolation depends on the comparison of measured wind speeds to the maximum wind speed set out in Rule 012 (3.5 metres per second (m/s)).[43] Mr. Ashtiani reviewed the calibration certificates provided for the anemometers Mr. de Haan used in his ASL survey and stated that the documents supplied by Mr. de Haan were certificates provided upon purchase of the equipment. Mr. Ashtiani noted that the anemometers seemed to have never been calibrated by a third-party laboratory.[44] Mr. Ashtiani concluded that the documentation provided by Mr. de Haan for the two anemometers did not provide sufficient certainty as to the validity of the ASL survey.[45]

38. Mr. Ashtiani submitted that the duration of measurements to quantify typical ASLs at a receptor should be sufficient to allow for an assessment of the temporal variation in ASLs. He opined that a measurement duration of 24 hours could not provide enough data to determine whether typical ambient conditions were captured. Mr. Ashtiani explained that ASLs in rural environments vary significantly due to the proximity of trees, type and make-up of foliage, temperature variations, prevalent wind conditions and traffic patterns.[46]

39. Mr. Ashtiani stated that the appropriate duration for measurements used to establish representative ASLs and Class A2 adjustments is dependant on whether there is a nearby noise source that is constant, reliable and predictable. He stated that short-term measurements will suffice in circumstances where there is a relatively constant dominant sound source in the vicinity of a receptor. Mr. Ashtiani submitted that, in the absence of industry or traffic noise, a minimum of two weeks of measurements is necessary to capture the typical variability in ASLs. Applying this reasoning to the project area, Mr. Ashtiani submitted that the ASLs measured by Mr. de Haan over a relatively short period of 24 hours or less could not fully represent the acoustic environment at the intervener residences.[47]

40. Mr. Ashtiani also submitted that "[t]he transferability of results from one receptor to another should be done with caution."[48] Mr. Ashtiani argued that before transferring measured ASLs from one receptor to another, one must first establish that the measured ASLs are reliable and representative of typical conditions at the measured receptor. He emphasized that where ASLs do not clearly show a trend or there is not enough information to identify typical ASLs, data transfers are not appropriate.[49]

41. The Oyen Landowners Group disagreed with Pattern's criticism of the reliability of Mr. de Haan's anemometers stating that it was "nothing more than speculation" and that "[t]here is no actual evidence that anything was wrong…"[50]

42. The Oyen Landowners Group submitted that a measurement duration of 24 hours is appropriate and supported by Rule 012.[51] Mr. de Haan indicated that, although Rule 012 does not specify an appropriate duration for ASL surveys, Rule 012 explicitly requires a minimum

[43] Transcript, Volume 3, page 621, lines 20-24.
[44] Exhibit 22736-X0159, AERC001 - Lanfine Wind Payam Ashtiani Evidence (2019.12.02), PDF page 7.
[45] Exhibit 22736-X0159, AERC001 - Lanfine Wind Payam Ashtiani Evidence (2019.12.02), PDF page 8.
[46] Exhibit 22736-X0159, AERC001 - Lanfine Wind Payam Ashtiani Evidence (2019.12.02), PDF page 9.
[47] Exhibit 22736-X0159, AERC001 - Lanfine Wind Payam Ashtiani Evidence (2019.12.02), PDF page 5.
[48] Exhibit 22736-X0159, AERC001 - Lanfine Wind Payam Ashtiani Evidence (2019.12.02), PDF page 9.
[49] Transcript, Volume 2, page 304, lines 13-20.
[50] Transcript, Volume 3, page 687, lines 5-10.
[51] Transcript, Volume 3, page 686, lines 9-11, and page 687, lines 1-3.

measurement duration of 24 hours for a comprehensive sound level (CSL) survey. In Mr. de Haan's opinion, the requirements for a CSL survey could be considered "the next best thing" when determining the appropriate duration for an ASL survey.[52] Based on this analysis, Mr. de Haan concluded that his survey met the requirements of Rule 012.[53]

43. The Oyen Landowners Group argued that Rule 012 expressly allows for measurement results from an ASL survey to be transferred from one receptor to another and submitted that Mr. de Haan's transfer of data in this regard was appropriate.[54] In his report, Mr. de Haan's justification for transferring A2-adjusted PSLs included similarities between the three intervener residences and other receptors with respect to proximity to nearby roads and nearby surroundings.[55]

3.4.2 Commission findings

44. For the reasons stated above, the Commission is satisfied that the use of assumed ASLs based on Table 1 of Rule 012 is appropriate for these applications. Accordingly, the ASL survey by the interveners and its results are not a basis upon which to evaluate project compliance and noise impact at the affected receptors. Nevertheless, the Commission recognizes that this proceeding is only the second occasion on which the Commission has considered a request for a downward A2 adjustment to ASLs in a rural area and the guidance offered in Decision 24401-D01-2019 was not available to these parties as it was issued subsequent to the hearing in this proceeding. For these reasons, the Commission has considered the ASL evidence offered by the Oyen Landowners Group and the three issues raised by Pattern concerning that evidence: measurement duration, data transferability and equipment calibration.

45. While Rule 012 speaks to a 24-hour measurement duration for CSL surveys, it does not provide specific requirements for the duration of ASL surveys to establish representative ASLs. In the case of CSL surveys, there is typically a predictable and known noise source being measured (e.g., post-construction measurements to demonstrate compliance for a new facility). In such circumstances, 24 hours of measurement data may be appropriate to record representative conditions. This is not the case for ASL surveys in support of a downward A2 adjustment in a typical rural area, where the aim is to characterize a variable and unpredictable sound environment. The Commission agrees with Mr. Ashtiani that in such circumstances, 24 hours of measurement data is inadequate to establish representative ASLs.

46. More specifically, given that the measured receptors in Mr. de Haan's survey have no nearby constant dominant sound sources but instead have potential high variation of ASLs, the Commission considers that Mr. de Haan's ASL survey was of insufficient duration to capture representative conditions at those receptors. As such, the Commission does not accept that the ASLs measured by Mr. de Haan over a particular 24-hour period were representative of the acoustic environment for the intervener residences.

47. With respect to data transferability, Rule 012 allows measurement data collected at one receptor to be used to establish ASLs at other receptors in a similar acoustic environment. The Commission accepts that the three intervener residences measured by Mr. de Haan and other

[52] Transcript, Volume 3, page 561, lines 23-25.
[53] Transcript, Volume 3, page 563, lines 15-19.
[54] Transcript, Volume 3, page 676, lines 3-9.
[55] Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF pages 21 and 22, Table 5.

receptors that were not measured may have similar acoustic environments, and that it may have been appropriate to use measurement data collected at measured receptors to establish the nighttime ASL for unmeasured receptors. However, because the ASLs established at the intervener residences are based on an inadequate measurement duration, the Commission does not accept that the ASLs measured at the intervener residences should be considered representative of the ASL at other receptors.

48. Pattern argued that Mr. de Haan's measurements were not reliable as his measurement equipment was not properly calibrated. The issue of anemometer calibration does not impact the Commission's decision in this proceeding. Nevertheless and while Rule 012 does not explicitly state that properly calibrated anemometers must be used for ASL surveys, the Commission considers that equipment calibration is good engineering practice. Further, it considers that the onus to properly maintain and calibrate anemometers is on practitioners conducting measurements and calibration certificates may be of value in verifying the validity of measurement data.

3.5 Other noise issues

3.5.1 Views of Pattern and the Oyen Landowners Group

Identification of third-party facilities

49. The project NIA stated that RWDI used the following publicly available databases to identify facilities that may contribute to cumulative sound levels at receptors: (i) AER ST37 – Alberta well listing; (ii) AER ST102 – Alberta facility list; and (iii) National Pollutant Release Inventory Reporting Facilities.[56]

50. RWDI explained that to identify the specific facilities that were modelled in the project NIA, it identified facility sites within five kilometres (km) of the study area, filtered the data to focus on sites that were listed as operational and identified noise generating facilities based on the type of operation listed in the database.[57] More specifically, the review focused on facility types that could have potential cumulative impacts at receptors such as pumping wells, compressor stations, proration batteries and gas plants.[58]

51. RWDI also contacted compressor station and gas plant operators to discuss the operation status of these facilities. In total, RWDI included five third-party facilities in the noise model (one compressor station, one gas plant, two pumping wells and one disposal well). RWDI used measurements of similar facilities and equipment from the RWDI internal library to establish sound power levels for these third-party facilities.[59]

52. Mr. de Haan acknowledged that RWDI used AER ST37 and AER ST102 databases to identify third-party facilities; however, he criticized RWDI's decision to only include currently pumping wells and exclude wells with other license codes, such as licensed, re-entered, issued or re-certified.[60]

[56] Exhibit 22736-X0069, Attachment 11 - Noise Impact Assessment, PDF page 14.
[57] Exhibit 22736-X0086, Pattern Development Lanfine IR2 Response, PDF page 17.
[58] Exhibit 22736-X0129, Lanfine Intervener IR1 Response 07OCT2019, PDF page 17.
[59] Exhibit 22736-X0069, Attachment 11 - Noise Impact Assessment, PDF pages 15 and 16.
[60] Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 26.

53. Mr. de Haan conducted a study on the terminology for the various status codes used in the AER databases and provided his opinion as to whether or not they should be included in the NIA. In addition to the five facilities identified by RWDI, Mr. de Haan stated that the following types of facilities should be included: any wells with well status "abandoned" and license status "re-entered", any wells with well status "undefined", any wells with well status "suspended" and license status "issued" or "amended", any wells with well status "drilled and cased", batteries with license status "issued" and pipeline installations (regulator stations and meter stations) with license status "operating".[61] Mr. de Haan argued that these types of facilities have the potential to start or restart operations and thus influence future noise levels at receptors. Based on his analysis, Mr. de Haan submitted that a total of 69 facilities (54 wells, four compressor stations, four batteries, one injection/disposal facility and six pipeline installations) should be included when predicting cumulative sound levels at receptors in the project area.

54. RWDI disagreed with Mr. de Haan's submission that abandoned, suspended and undefined wells should be included in the project NIA. RWDI stated that the bulk of the facilities identified in Mr. de Haan's analysis (i.e., all five re-entered wells, 31 of 33 suspended wells, and all 11 drilled and cased wells) were connected to abandoned or discontinued pipelines, and that satellite imagery of the remaining two suspended wells showed no mechanical equipment present on-site. RWDI submitted that applications to the AER would be required to restart any wells connected to abandoned or discontinued pipelines, and that these future AER applications would have to account for the project, should it be approved, when assessing cumulative noise levels at receptors.[62] As such, it would not be appropriate to include these facilities in the project NIA.

55. RWDI studied the operation status of the four compressor stations, four well batteries, one injection well and six pipeline installations that Mr. de Haan stated should be included in the project NIA. RWDI contacted the operators of the compressor stations and confirmed that there are no plans to restart any of these facilities. RWDI found that the well batteries directly correspond to suspended and abandoned wells and that the injection well has already been included in the project NIA. RWDI stated that the components of the pipeline installations did not contain noise emitting sources, or were part of a discontinued pipeline. As a result, RWDI argued that it was appropriate to omit these facilities from the project NIA[63] and that all active oil and gas facilities that should be considered noise sources were properly considered in the noise model for the project.[64]

Maximum sound power levels for the project turbine

56. The project turbine design includes two types of blade edges: a standard or non-serrated blade and a serrated trailing blade. RWDI submitted that the project turbines with standard blades would reach a maximum sound power level of 108.2 dBA at a hub height wind speed of 12 m/s, while the project turbines with serrated blades would have a maximum sound power level of 105.5 dBA at a hub height wind speed of 12 m/s.[65] RWDI further explained that the use

[61] Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF pages 27 to 39.
[62] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF pages 6 to 7.
[63] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF pages 7 to 8.
[64] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 8.
[65] Exhibit 22736-X0069, Attachment 11 - Noise Impact Assessment, PDF page 17, and PDF page 19, Table 7.

of the sound power levels at the hub height wind speed of 12 m/s is representative of the maximum operating conditions for normal ASL conditions.[66]

57. Mr. de Haan disagreed with RWDI's use of a sound power level for a hub height wind speed of 12 m/s to model the project wind turbines. He submitted that it may be more appropriate to use the sound power level for a hub height wind speed of 20 m/s, which corresponds to the maximum wind speed at which the turbines may operate.[67]

58. In response to Mr. de Haan's maximum sound power level criticisms, RWDI provided a comparison of predicted results obtained using sound power levels corresponding to hub height wind speeds of 12 m/s and 20 m/s. This comparison showed that predicted sound levels at receptors for wind speeds of 20 m/s were the same or 0.1 dB less than predicted sound levels at receptors for wind speeds of 12 m/s.[68] RWDI concluded that the sound power level of the project turbine at a hub height wind speed of 12 m/s is representative of the planned maximum operating conditions. RWDI further explained that while some variation in the sound power level spectra occurs across different hub height wind speeds, these differences are not material to the results of the project NIA.[69]

59. Mr. de Haan also expressed concern with uncertainty in the sound power level for the project turbine. He questioned the accuracy of measurements presented in the Vestas manufacturer data and noted that the sound power levels were based on measurements collected in 2013 and 2014 for a different type of turbine. Mr. de Haan also noted that the sound power levels presented in the Vestas data are considered best estimates and are not guaranteed for any project.[70] In the absence of current measurement data and a signed guarantee (including spectral data) for the project turbines, Mr. de Haan submitted that uncertainty should be considered when modelling noise levels at receptors.[71]

60. RWDI stated that the acoustic specifications provided by Vestas are expected to represent an upper 95 per cent confidence limit for turbine performance. RWDI submitted that while not specifically guaranteed in the Vestas data, a confidence level of 95 per cent means that the inclusion of additional uncertainty is not required in noise modelling.[72] During the hearing, Pattern referenced conversations it has had with Vestas and expressed its confidence in the acoustic specifications provided by the turbine manufacturer.[73]

Ground attenuation factor

61. Both RWDI and Mr. de Haan used international standard ISO 9613-2 in their noise models. ISO 9613-2 sets out a methodology to determine the attenuation of sound as it propagates outdoors and accounts for factors such as ground effect, temperature, humidity and

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66 Exhibit 22736-X0086, Pattern Development Lanfine IR2 Response, PDF pages 21 and 22.
67 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 23.
68 Exhibit 22736-X0129, Lanfine Intervener IR1 Response 07OCT2019, PDF pages 23 and 24, Table 5.
69 Exhibit 22736-X0129, Lanfine Intervener IR1 Response 07OCT2019, PDF page 23.
70 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF pages 23 to 24.
71 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 24.
72 Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 14.
73 Transcript, Volume 2, page 317, line 19 to page 318, line 6.

wind conditions. ISO 9613-2 accounts for ground attenuation through using a ground factor ranging from 0 to 1. The ISO 9613-2 standard sets out three types of ground surface: (i) hard ground, which includes paving, water, ice, concrete and all other ground surfaces having a low porosity. For hard ground, the ground factor is defined to be zero in the ISO 9613-2; (ii) porous ground, which includes ground covered by grass, trees or other vegetation, and all other ground surfaces suitable for the growth of vegetation, such as farming land. For porous ground, the ground factor is defined to be one in the ISO 9613-2; and (iii) mixed ground. If the surface consists of both hard and porous ground, then ground factor takes on values ranging from 0 to 1, the value being the fraction of the region that is porous.[74]

62. RWDI used a general ground attenuation factor of 0.7 in the project NIA. This overall ground attenuation factor was applied to the entire modelling domain.[75] RWDI stated that reflective surfaces make up 6.3 per cent of the project area (5.3 per cent water bodies and 1.0 per cent hard surfaces). It submitted that a ground attenuation factor of 0.7 is therefore an appropriate and conservative representation, since it accounts for a higher percentage of reflective surfaces (i.e., 30 per cent) than is actually found in the project area.[76]

63. Mr. de Haan submitted that RWDI was overly optimistic in its use of an overall ground attenuation factor of 0.7 for the project NIA and failed to model water bodies separately with an appropriately reflective ground factor.[77] Mr. de Haan recommended that an overall ground attenuation factor of 0.5 be used for the project study area and that a mapped ground attenuation factor of 0.0 be used for individual water bodies.[78]

64. In its reply evidence, RWDI provided a comparison of modelling results obtained using a ground attenuation factor of 0.5 and a ground attenuation factor of 0.7.[79] RWDI stated that additional conservatism from the ground attenuation factor of 0.5 would result in the requirement to change one turbine (T41) from a standard blade to a serrated blade to ensure compliance with Rule 012.[80] However, RWDI cautioned that use of overly conservative models could artificially limit future development by overestimating cumulative sound levels at receptors.[81]

65. RWDI submitted that it is more appropriate for the Commission to rely on the results from the noise model using a ground attenuation factor of 0.7 when making a decision regarding project compliance with Rule 012. RWDI explained that it provided results using a ground attenuation factor of 0.5 for information purposes, primarily in response to the interveners' concerns with the degree of modelling conservatism.[82]

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74 International Standards Organization (ISO), ISO 9613-2, Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation, Geneva, 1996, Section 7.3, Ground effect (A_{gr}).

75 Exhibit 22736-X0069, Attachment 11 - Noise Impact Assessment, PDF page 9, Table 1.

76 Exhibit 22736-X0129, Lanfine Intervener IR1 Response 07OCT2019, PDF page 6.

77 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 47.

78 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 46.

79 Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF pages 8-10.

80 Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF pages 8; and Exhibit 22736-X0197.01, Undertaking #2 - Updated NIA, PDF page 22.

81 Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF pages 10 and 11.

82 Transcript, Volume 2, page 309, line 22 to page 310, line 7.

66. Regarding the use of mapped ground attenuation factors in computer noise models, RWDI stated that the commercial noise models used for predictive analysis are "ray-tracing" models, meaning that the mapped areas only come into play if there are open water bodies on a direct line between the source and receptor. With elevated sound sources such as wind turbines, the ground attenuation effect is dominated by the area in the immediate vicinity of homes. As such, RWDI disagreed with Mr. de Haan's assertion that there would be a significant difference when using mapped ground factors for water bodies.[83]

3.5.2 Commission findings

Identification of third-party facilities

67. The Commission considers that RWDI's use of publicly accessible databases to identify third-party energy-related facilities was reasonable, and that a five-kilometre search radius is sufficient to satisfy Rule 012 requirements.

68. The Commission also finds that RWDI's approach to filtering third-party energy-related facilities was reasonable and consistent with Rule 012. In particular, RWDI's decision to include in its NIAs only those wells identified as "pumping" in the AER ST37 database was reasonable, considering the uncertainty surrounding if and when other types of wells would be operating as noise emitting sources. The Commission considers that it would be overly conservative to assume that wells identified with status codes such as "abandoned" or "undefined" are noise emitting sources or may become noise emitting sources in the future. The Commission accepts this as a reasonable approach for identifying valid operating third-party energy-related facilities.

69. The Commission further observes that RWDI conducted a thorough study of the wells, batteries and pipeline installations that were identified in Mr. de Haan's analysis and contacted the owners or operators of the compressor stations identified in Mr. de Haan's report to confirm and clarify their operation status. RWDI found that most of the third-party facilities included in Mr. de Haan's model were not operational or had no noise generating equipment, and that all facilities with operational noise sources had already been included in RWDI's model. Overall, the Commission finds that RWDI made sufficient effort to confirm the status of third-party energy-related facilities and accepts its conclusion that the project NIA reasonably considered third-party facilities that have potential to influence sound levels at affected receptors.

Maximum sound power levels

70. The evidence supports that the project wind turbines reach a maximum sound power level of 108.2 dBA (standard blade unit) or 105.5 dBA serrated blade unit) at a hub height wind speed of 12 m/s and maintain this maximum sound power level for hub height wind speeds up to 20 m/s. The Commission notes that RWDI used the sound power level of the project turbine at a hub height wind speed of 12 m/s because it is representative of the maximum operating conditions for normal ASL conditions. To address a concern from the Oyen Landowners Group about maximum sound power levels of the project turbine, RWDI compared receptor noise predictions for hub height wind speeds of 12 m/s and 20 m/s. This comparison demonstrates that the noise contribution from the project turbines is higher for a hub height wind speed of 12 m/s. On this basis, the Commission finds that the sound power levels for hub height wind speeds of 12 m/s can be considered "the planned maximum operating conditions" for the project wind

[83] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 11.

turbine, in accordance with Rule 012 requirements. Accordingly, RWDI's use of a sound power level for a hub height wind speed of 12 m/s to model the project wind turbines was appropriate.

71. With respect to the interveners' concerns about the accuracy of measurements presented in the Vestas turbine manufacturer data, the Commission considers that RWDI made reasonable efforts to understand and address uncertainties associated with the turbine acoustic specifications provided by Vestas. In the absence of evidence to the contrary, the Commission accepts Pattern's expressed confidence that the acoustic specifications provided by Vestas are conservative and finds that it is unnecessary to include an additional uncertainty factor in the noise modelling for the project.

Ground attenuation factor

72. RWDI's evidence states that reflective surfaces make up 6.3 per cent of the project area. The Commission accepts this evidence and RWDI's opinion that the use of one overall ground attenuation factor in the noise model for this specific project area is therefore appropriate.

73. The Commission also finds that an overall ground attenuation factor of 0.7 is acceptable to characterize ground attenuation in the project area, based on RWDI's evidence that reflective surfaces make up a relatively small percentage of the project area (i.e., 6.3 per cent); or, stated another way, a ground attenuation factor of 0.7 accounts for a higher percentage of reflective surfaces (i.e., 30 per cent) than is actually found in the project area. On that basis the Commission agrees with Pattern that a ground attenuation factor of 0.7 is an appropriate and conservative representation. Accordingly, for this project, the Commission accepts the predicted results based on the noise model that uses a ground factor of 0.7.

3.6 Rule 012 compliance

3.6.1 Views of Pattern and the Oyen Landowners Group

74. RWDI submitted that the project will comply with the PSL set out in Table 1 of Rule 012. Where a ground attenuation factor of 0.7 is used in the modelling, 26 of the 78 turbines must be modelled with serrated blades to achieve compliance with the PSL. Where a ground attenuation factor of 0.5 is used in the modelling, 27 of the 78 turbines must be modelled with serrated blades to achieve compliance with the PSL (i.e., Turbine T41 must be altered to include serrated blades when the project is modelled using a ground attenuation factor of 0.5).[84]

75. With respect to the appropriate blade type for Turbine T41, RWDI stated that "if there's a desire to have greater conservatism in the model, meaning the project takes more of the noise room that's available in the area from a design standpoint, … then T41 should change."[85] Pattern added that it is prepared to, in advance, be overly cautious and switch Turbine T41 to a serrated edge.[86] Pattern confirmed that regardless of which ground attenuation factor (0.5 or 0.7) is more appropriate, switching Turbine T41 to a serrated blade unit would both ensure compliance and give the project a greater margin of compliance.[87]

[84] Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF pages 8.
[85] Transcript, Volume 2, page 311, lines 6-11.
[86] Transcript, Volume 2, page 311, lines 22-24.
[87] Transcript, Volume 2, page 312, lines 4-14.

76. The project NIA included all 32 occupied dwellings within 1.5 km of the project as noise receptors.[88] The three intervener residences are located more than 1.5 km from the project, and accordingly, were not included in the project NIA. In its reply evidence, RWDI predicted cumulative sound levels at the three intervener residences. RWDI used Table 1 of Rule 012 to establish the ASLs and PSLs for the intervener residences. For each of these three receptors, RWDI determined that the nighttime ASL is 35 dBA and the applicable nighttime PSL is 40 dBA. RWDI concluded that whether a ground attenuation factor of 0.5 or 0.7 is used, the predicted cumulative sound levels at the three intervener residences are compliant with a nighttime PSL of 40 dBA.[89]

77. The noise model developed by Mr. de Haan included all 79 turbines from the project NIA, including Turbine T19.[90] Mr. de Haan used an overall ground attenuation factor of 0.5 for the project study area and a local mapped ground factor of 0.0 for individual water bodies.[91] Mr. de Haan predicted cumulative sound levels at receptors as the sum of measured ASLs, the noise contribution from the project and the noise contribution from the 69 third-party facilities that he identified. Mr. de Haan then assessed compliance with Rule 012 by comparing predicted cumulative sound levels to A2-adjusted PSLs.

78. Mr. de Haan predicted that cumulative sound levels would exceed the A2-adjusted PSLs at three receptors during the daytime period and 26 receptors during the nighttime period.[92] Based on Mr. de Haan's prediction results, cumulative sound levels at the three intervener residences would be compliant with the A2-adjusted PSLs during the daytime period. However, Mr. de Haan predicted that cumulative sound levels would be non-compliant with the A2-adjstued PSL at one intervener residence (Receptor A) during the nighttime period.[93]

3.6.2 Commission findings

79. In the preceding paragraphs the Commission found, among other things, that: the use of assumed ASLs based on Table 1 of Rule 012 is appropriate for these applications; RWDI conducted a reasonable study to identify third-party energy-related facilities that have potential to influence cumulative sound levels at the noise receptors; and, that the parameter settings and model inputs (including sound power levels for third-party facilities and project turbines as well as a ground attenuation factor of 0.7) are acceptable. On the basis of the foregoing, the Commission finds that the project NIA meets the technical requirements of Rule 012.

80. In light of the Commission's finding that the use of assumed ASLs based on Table 1 of Rule 012 is appropriate for these applications, the Commission accepts RWDI's evidence that the appropriate nighttime PSL is 43 dBA for noise receptors R11 through R14, which represent a Hutterite Colony with elevated population density, and the appropriate nighttime PSL is 40 dBA for all other receptors, including the intervener residences. The project NIA predicts compliance

88 Exhibit 22736-X0069, Attachment 11 - Noise Impact Assessment, PDF page 10, Table 2.
89 Exhibit 22736-X0158, 20191202_LWPP_Reply_Evidence_RWDI_1700873, PDF page 10, Table 3.
90 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 11, Figure 1.
91 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 49, Table 11.
92 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF page 53.
93 Exhibit 22736-X0150, OLG-PATTERN-2019NOV18-001 - dBA Noise Consultants Ltd. Report H.19.506.A.V2 dated November 16, 2019, PDF pages 50-53, Table 12.

with Rule 012 PSLs at all receptors. Based on the results of the project NIA, and with adherence to the following condition, the Commission finds that cumulative sound levels at all affected noise receptors will likely comply with the PSLs set out in Rule 012.

81. The Commission notes that most project turbines were modelled with standard blades but RWDI determined that it was necessary to model some turbines (T3, T4, T13, T20, T29, T30, T31, T33, T40, T42, T43, T44, T45, T46, T47, T49, T50, T51, T53, T54, T55, T56, T57, T58, T59 and T64), with serrated blades to reduce sound power levels and achieve compliance with Rule 012. Although not required to achieve compliance based on a modelled ground attenuation factor of 0.7, Pattern indicated that it is also prepared to proactively implement serrated blades on Turbine T41 to address the small margin of compliance predicted for receptor R27.

82. The Commission finds that the blade type used for the project turbines is a crucial factor for the project to achieve noise compliance at receptors. Therefore, the following conditions are placed on the project approval:

- Pattern shall install serrated blades on the following turbines: T3, T4, T13, T20, T29, T30, T31, T33, T40, T41, T42, T43, T44, T45, T46, T47, T49, T50, T51, T53, T54, T55, T56, T57, T58, T59 and T64.

- On the date the project commences operations, Pattern shall file a letter with the Commission confirming the blade types installed on the individual project turbines.

3.7 Post-construction comprehensive sound level surveys

3.7.1 Views of Pattern and the Oyen Landowners Group

83. At the hearing, RWDI confirmed that a post-construction CSL survey would be an appropriate method to verify Rule 012 compliance, in the event that the Commission approves the application.[94] RWDI recommended three receptors for the post-construction CSL survey: R18, R27 and R29.

84. Ms. Drew explained that these receptors were chosen because they are typically downwind of project turbines during the summer months, which would make it feasible to collect adequate valid data under the summertime conditions required by Rule 012.[95] Ms. Drew also noted that selection of these receptors could ensure that receptors close to both standard and serrated blade turbines would be monitored.[96] The closest turbines to R18 and R29 (i.e., turbines T67 and T26, respectively) will use standard blades while the closest turbine to R27 (i.e Turbine T41) will use serrated blades.[97] As previously noted, Pattern confirmed it would pre-emptively switch Turbine T41 to a serrated blade unit to ensure noise compliance at R27 regardless of the Commission's determination of the proper ground attenuation factor for the project area.[98] Ms. Drew stated that selection of receptors R18, R27, and R29 for the

94 Transcript, Volume 2, page 329, lines 2-7.

95 One of the requirements for post-construction comprehensive sound level surveys is "downwind conditions from the wind turbines with dominant noise contribution towards the dwelling(s)". (Rule 012, PDF page 30)

96 Transcript, Volume 2, page 329, line 19 to page 330, line 5.

97 Exhibit 22736-X0197.01, Undertaking #2 - Updated NIA, PDF page 11, Table 2.

98 Transcript, Volume 2, page 312, lines 4-14.

post-construction CSL survey would allow compliance to be confirmed for both types of turbines used in the project (i.e., those with standard and serrated blades).

85. RWDI submitted that the three intervener residences would not be suitable for a post-construction CSL survey to confirm project compliance with Rule 012. Ms. Drew explained that because of prevailing summertime wind conditions, it would be difficult to collect measurements under appropriate downwind conditions at these intervener residences.[99] Ms. Drew also stated that it would be difficult to verify the noise contribution from project turbines at the intervener residences because these receptors are located farther than 1.5 km from project turbines. Ms. Drew opined that receptors located closer to project turbines would provide "a better potential verification of the noise modelling."[100]

86. Mr. de Haan stated that the post-construction CSL survey is the method typically favoured by the Commission for verifying compliance with PSLs. Although he did not object to a CSL survey for the project,[101] Mr. de Haan stated that a CSL survey at receptors was not his preferred method of testing compliance with Rule 012. Mr. de Haan noted that post-construction CSL surveys for wind turbines can be very challenging and costly because of the difficulties associated with collecting representative measurements.[102]

87. Mr. de Haan had no principal objection to selecting some receptors for a post-construction CSL survey and stated that it should be the responsibility of Pattern to select suitable locations for CSL monitoring. Mr. de Haan stated that he had no particular concern with RWDI's selection of receptors.[103]

88. Mr. de Haan also stated that if the Commission orders a post-construction CSL survey for the project, it would be important to compare the measured results to appropriate PSLs for the receptors.[104] The Oyen Landowners Group submitted that if the project is approved, an ASL survey should be conducted to confirm or refute Mr. de Haan's measured ASLs and associated A2-adjusted PSLs. In the event Mr. de Haan's findings are confirmed, the Oyen Landowners Group stated that "the project should not proceed without further direction from the Commission regarding the appropriate PSL."[105]

3.7.2 Commission findings

89. Although the project NIA predicts compliance with Rule 012 PSLs at all receptors, given the concerns raised by the Oyen Landowners Group and the fact that the predicted sound levels are close to the nighttime PSL at a number of receptors, the Commission requires Pattern to complete a post-construction CSL survey to verify compliance with Rule 012 once the project commences operation.

[99] Transcript, Volume 2, page 329, lines 11-15.
[100] Transcript, Volume 2, page 329, lines 16-18.
[101] Transcript, Volume 3, page 568, line 25 to page 569, line 8.
[102] Transcript, Volume 3, page 569, lines 9-20.
[103] Transcript, Volume 3, page 570, lines 10-20.
[104] Transcript, Volume 3, page 568, line 25 to page 569, line 8.
[105] Transcript, Volume 3, page 693, lines 5-11.

90. RWDI recommended that the post-construction CSL survey use receptors R18, R27 and R29 as monitoring locations. Mr. de Haan did not offer any recommendations as to the appropriate monitoring locations for a CSL survey.

91. In selecting monitoring locations for the post-construction CSL survey, the Commission must consider a number of criteria, including the commitments made by the proponent, project layout, predicted project contribution to cumulative sound levels, predicted cumulative sound levels and margin of compliance, degree of conservatism in the model, technical feasibility and concerns brought forward by local residents.

92. The Commission has focused on the receptors with the smallest margins of compliance[106] when selecting potential monitoring locations for a post-construction CSL survey for the project. The Commission observes that according to the project NIA, the project's predicted cumulative sound levels are closest to the nighttime PSL at receptors R27, R29 and R30, and the predicted margins of compliance at these three receptors are 0.0, 1.0 and 0.7 dB, respectively based on the noise model with a ground attenuation factor of 0.7.

93. The Commission finds that Receptor R27 is an appropriate monitoring location for the CSL survey, because the predicted nighttime cumulative sound level at R27 is equal to the nighttime PSL (i.e., the margin of compliance is predicted to be zero) and the noise contribution from the project is predicted to be large (38.3 dBA).

94. The Commission finds that predicted cumulative sound levels are close to the nighttime PSL at both receptors R29 and R30, but receptor R30 is a more appropriate monitoring location. Although R29 and R30 are located in close proximity to one another (separation distance less than 120 metres), the noise contribution from the project is predicted to be slightly higher at R30 than at R29 (i.e., 37.3 dBA vs. 36.8 dBA).

95. The Commission finds that Receptor R18 is not an ideal location for the CSL survey. The predicted cumulative sound level at R18 is 38.9 dBA (i.e., compliance margin is 1.1 dB) and the noise contribution from the project is 36.6 dBA. If a post-construction CSL survey demonstrates compliance at a dwelling with a small predicted margin of compliance (e.g., R27 and R30), then it is reasonable to assume that measured noise levels at a dwelling with a lower predicted cumulative sound level (e.g., R18) would also be compliant.

96. In summary, the Commission finds that receptors R27 and R30 are appropriate monitoring locations for a post-construction CSL survey to demonstrate the project's noise compliance with the PSLs.

97. The Oyen Landowners Group recommended a pre-construction ASL survey to confirm or refute Mr. de Haan's measurement results. The Commission finds that it is unnecessary to conduct a pre-construction ASL survey because the project area is not pristine or materially different from typical areas of rural Alberta where agricultural and/or oil and gas activity is also taking place. Accordingly, use of an assumed nighttime ASL of 35 dBA is appropriate to characterize the project area. A more detailed discussion of this topic is presented in the previous subsections.

[106] Margin of compliance is PSL minus cumulative sound level.

98. Based on the foregoing, approval of the project is subject to the following condition to verify and confirm that the project complies with the requirements of Rule 012:

- Pattern shall conduct a post-construction comprehensive sound level survey, including an evaluation of low frequency noise, at receptors R27 and R30. The post-construction comprehensive sound level survey must be conducted under representative conditions and in accordance with Rule 012: *Noise Control*. Pattern shall file all studies and reports relating to the post-construction comprehensive sound level survey with the Commission within one year of connecting the power plant to the Alberta Interconnected Electric System.

4 Environmental issues

4.1 Introduction

99. Pattern retained Hemmera Envirochem Inc. to prepare Phase 1 and Phase 2 environmental evaluation reports for the project (the EE Reports). Michael Peckford testified at the hearing on behalf of Hemmera. Pattern also filed Alberta Environment and Parks (AEP) Wildlife Management renewable energy referral reports which were conducted as the project evolved, including a June 19, 2017 report for the project's initial Phase 1 buildable area application, and amended reports, dated August 1, 2018, and December 14, 2018, for the Phase 2 buildable area project layout. The referral report dated December 14, 2018, is the most current version (the Referral Report). AEP concluded that the project posed an overall moderate risk to wildlife and wildlife habitat as proposed, based on project siting, wildlife assessment data, and the commitments made by Pattern to mitigate and monitor wildlife impacts.

100. The Oyen Landowners Group retained Cliff Wallis, a professional biologist with Cottonwood Consultants Ltd., to prepare evidence and testify at the hearing with respect to environmental matters. Mr. Wallis filed a report detailing the project's environmental impacts and potential mitigation measures. The Oyen Landowners Group also retained Michael Anissimoff of Species Inc. to prepare evidence and provide testimony on the project's potential effects on local bat species. Mr. Anissimoff filed a report outlining the potential impacts of the project on bats and proposed a number of operational mitigation measures. Members of the Oyen Landowners Group also testified at the hearing about their environmental concerns with the project.

4.2 Expert qualifications and procedural fairness

4.2.1 Views of Pattern and the Oyen Landowners Group

101. Pattern submitted that each of its expert witnesses are highly qualified in their respective areas of expertise and provided evidence that is fair, impartial and non-partisan. It stated that each of its experts have experience in Alberta, hold designations or memberships in their respective professional organizations and are well versed in the Commission's rules and related provincial legislation and policies governing wind power development.[107] Pattern argued that conversely, while Mr. Anissimoff has experience with bat research and the regulatory approval process for wind power projects in Ontario as it relates to bats, he is not familiar with the relevant AUC requirements nor the interplay between AEP and the AUC as it relates to post-construction bat monitoring and mitigation measures. Pattern further stated that

[107] Transcript, Volume 3, page 613, line 18 to page 614, line 6.

Mr. Anissimoff has not completed post-secondary course work related to bats, is not a registered professional biologist in Alberta and has no experience working on projects in Alberta.[108] As a result, Mr. Anissimoff's evidence should be afforded less weight than Mr. Peckford's.

102. Pattern also raised a concern that information included in Mr. Wallis's opening statement was not directly responsive to issues raised in cross-examination. Further, Pattern stated that Mr. Wallis quoted from a number of reports that were available at the time he prepared his evidence but which were not cited in his pre-filed evidence despite pertaining to substantially the same issues raised in his pre-filed evidence. Pattern submitted that Mr. Wallis's use of these reports constituted an inappropriate attempt to buttress his original report.

103. In response to Pattern's submissions on Mr. Anissimoff's qualifications, the Oyen Landowners Group submitted that both Mr. Anissimoff and Mr. Peckford have similar qualifications with a difference being that Mr. Anissimoff is based in Ontario while Mr. Peckford is based in Alberta. The Oyen Landowners Group argued that being based in Ontario does not make Mr. Anissimoff any less qualified given that he was not put forward as an expert on Alberta's regulatory system, rather he was put forward as a bat expert.[109] The Oyen Landowners Group noted that Mr. Ashtiani is also from Ontario.

104. The Oyen Landowners Group submitted that Mr. Peckford lacked the independence and objectivity of an expert witness and took on the role of advocate for his wind developer client, Pattern. It argued that Mr. Peckford's employer, Hemmera, is an Ausenco company that aims to assist wind developers with obtaining project approvals as evidenced by its website materials and membership in CanWEA. In contrast, the Oyen Landowner's Group submitted that Mr. Anissimoff's work in Ontario was aimed at expediting the wind-development process and this is evidence of his independence and objectivity.[110]

105. The Oyen Landowners Group submitted that the concerns identified by Pattern in argument with respect to Mr. Wallis's opening statement ought to have been raised at the time Mr. Wallis presented his opening statement. To raise these concerns during argument is improper.[111]

106. Pattern agreed with the Oyen Landowners Group that being from Ontario does not make an expert less qualified but emphasized that both Mr. Peckford and Mr. Ashtiani have extensive experience working on projects in Alberta.

107. Regarding the Oyen Landowners Group's challenge of Mr. Peckford's impartiality, Pattern submitted that this argument should be dismissed. Pattern stated that Mr. Peckford gave the attestation required by AUC Rule 001 to give opinion evidence that is fair, objective and non-partisan. Pattern noted that Mr. Peckford is bound by the Alberta Society of Professional Biologists' code of ethics and that Hemmera did not share CanWEA's values. Pattern referred to Commission Decision 22665-D01-2018,[112] where the Commission refers to the Supreme Court of Canada in the White Burgess case contemplating such an oath and states that once the expert

[108] Transcript, Volume 3, page 614, line 7 to page 615, line 18.
[109] Transcript, Volume 3, page 660, line 13 to page 661, line 12.
[110] Transcript, Volume 3, page 662, lines 1-14.
[111] Transcript, Volume 3, page 647, lines 14-18.
[112] Decision 22665-D01-2018: EDP Renewables SH Project GP Ltd. – Sharp Hills Wind Project, Proceeding 22665, Applications 22665-A001 to 22665-A004, September 21, 2018.

attests or testifies an oath to this effect, the burden is on the party opposing the admission of the evidence to show that there is a realistic concern that the expert's evidence should not be received because the expert is unable and/or unwilling to comply with that duty. Pattern submitted that Mr. Peckford presented thoughtful and balanced opinions throughout the course of the hearing, that there should be no question as to the independence and objectivity of the opinions he presented and his evidence should be ascribed full weight.

4.2.2 Commission findings

108. Each of the parties urged the Commission to afford lesser weight to the evidence of the opposing environmental consultant. The Commission is not satisfied that sufficient reason has been offered to do so in the case of Mr. Anissimoff, or Mr. Peckford. In the case of Mr. Anissimoff, his lack of a professional biologist designation in Alberta and formal course work concerning bats is offset by his years of experience with bat research in Ontario. The Commission is likewise not persuaded that any lack of experience with or understanding for the interplay between the Commission and AEP concerning bat monitoring and mitigation measures should reasonably undermine Mr. Anissimoff's evidence concerning the project's potential effect on bats, the methodology by which to assess those effects or the mitigation measures by which to address them.

109. In the case of Mr. Peckford, in light of his attestation under Rule 001 to give opinion evidence that is fair, objective and non-partisan, the burden is on the party opposing the admission of the evidence to show that there is a realistic concern that the expert's evidence should not be received because the expert is unable and/or unwilling to comply with that duty. The Commission is not satisfied that the Oyen Landowners Group has discharged this onus.

110. Concerning the issues raised in relation to Mr. Wallis's opening statement, the Commission reminds parties of the Commission's expectation that: opening statements should be brief and confined to pre-filed evidence and matters adduced through cross-examination; and, objections to the content of an opening statement filed or read into the record should be raised at the time, not in argument.

4.3 Impacts on environmentally significant areas, wetlands and native grasslands

4.3.1 Views of Pattern and the Oyen Landowners Group

111. With respect to the general siting of the project, Pattern submitted that the majority of the construction disturbance and operational footprint for the project will occur on previously disturbed lands which largely consist of cultivated land and tame pasture. Pattern stated that 3.9 hectares of the total construction footprint will impact native pasture and 1.89 hectares of native wetland habitat will be disturbed during construction. Avoiding fragmentation of native pasture was considered during project design by placing project infrastructure on the edge of native pasture and within road allowances where possible.[113] Pattern stated that no turbines are sited on native pasture and therefore the potential impact in this regard would be minimal.[114]

112. Pattern submitted that the locations of environmentally significant areas (ESAs) were considered in the siting of project infrastructure. Pattern noted that 12.03 hectares and 6.44 hectares of operational footprint will overlap ESAs identified in "Sweetgrass (1997) and

[113] Exhibit 22736-X0056.01, Attachment 7 AEP Consultation, PDF page 23.
[114] Transcript, Volume 1, pages 71-73.

Fiera (2014)" respectively, and that those portions of the project overlapping ESAs are sited entirely on previously disturbed lands.[115] Pattern noted that ESAs are intended to inform land use planning rather than restrict development and explained that it used the ESA data as intended, as part of the project's pre-construction siting and planning stages. Pattern further noted that AEP does not have recommended setbacks for native grasslands or ESAs in any guidance documents relating to the development of wind projects and stated that no concerns relating to setbacks were identified during project consultation.[116]

113. Pattern stated that there would be a total of 5.2 hectares of disturbance to native grassland as a result of the project and avoidance of these areas was considered in early planning stages. As a result of the presence of native grassland found in the initial project area in 2016, sections of the western portion of the project area were removed.[117] In addition to avoiding native grasslands where feasible, rare plant surveys were completed in native grassland, wetland, and riparian areas where project infrastructure was proposed. The rare plant surveys identified no rare ecological communities and an occurrence of one plant species listed provincially as vulnerable.[118]

114. According to Pattern, project infrastructure has primarily been sited to avoid wetlands; however, the project would be sited within AEP's 100-metre minimum setback for 118 wetlands. Pattern submitted that impacts to these wetland buffers will be temporary and are largely associated with the installation of underground collector lines. A total of 41 wetlands will incur temporary but direct disturbances and six wetlands will have direct and permanent disturbance. Pattern stated that all permanent disturbances to wetlands would be the result of upgrades to municipal roads or development of road allowances.[119]

115. Mr. Peckford stated that wetland classes that include semi-permanent and permanent wetlands are of higher use to wildlife and that the majority of the wetlands within the project area are of a lower class which would provide limited value to wildlife.[120] Pattern's Construction and Operation Mitigation Plan outlines the mitigation measures to limit disturbance to wetlands during construction and operation which it has committed to implementing for the project.[121] AEP noted in the Referral Report that the mitigation measures outlined by Pattern with respect to wetlands align with the intent of the *Wildlife Directive for Alberta Wind Energy Projects (2011 and 2017).*[122]

116. Pattern stated that conservation, reclamation and decommissioning activities would be implemented in alignment with AEP's *Conservation and Reclamation Directive for Renewable Energy Operations*. Mr. Peckford submitted that this would include completion of a pre-disturbance site assessment prior to the start of construction.[123]

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115 Exhibit 22736-X0067, Attachment 10, Environmental Evaluation Part 1 of 2, PDF pages 58-59; Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF page 8.
116 Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF page 8.
117 Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF page 10.
118 Exhibit 22736-X0067, Attachment 10, Environmental Evaluation Part 1 of 2, PDF page 98.
119 Exhibit 22736-X0056.01, Attachment 7 AEP Consultation, PDF page 24.
120 Transcript, Volume 1, pages 78-79.
121 Exhibit 22376-X0199, Undertaking #9 – Updated COMP and PCMMP.
122 Exhibit 22736-X0056.01, Attachment 7 AEP Consultation, PDF page 24.
123 Transcript, Volume 2, pages 361-362.

117. Mr. Wallis raised concerns with the proximity of the project in relation to ESAs classified at regional and local significance levels in the landscape in and around the project area. He explained that ESAs include landscape types important for wildlife and as a result, native grasslands, waterfowl, marsh birds, shorebirds, species of concern and numerous wetlands would be potentially affected by the project. In project areas within and adjacent to ESAs, Mr. Wallis submitted that additional field data should be collected to assess the potential interaction of project components with these landscape types.[124]

118. Mr. Wallis testified that a significant amount of the project infrastructure was not assessed for wetland and grassland habitats during field surveys. Mr. Wallis noted that the lack of specific survey data in proximity to project infrastructure was of concern due to the prominence of wetlands on the landscape and their importance for biodiversity and species of concern. Due to the hummocky landscape in the project area, Mr. Wallis submitted that the 800 metre radius used in the surveys conducted by Hemmera could not have led to adequate survey coverage.[125]

119. Regarding wetlands in particular, in Mr. Wallis's view the project does not fully comply with the Alberta Wetland Policy.[126] Mr. Wallis submitted that additional field surveys for wetlands and ephemeral water bodies should be undertaken in areas where AEP setback buffers have been encroached upon and should focus on amphibians and migratory bird use.[127] Given the prominence of wetlands in the project area, Mr. Wallis concluded that the lack of specific survey data and the relaxations and lack of adherence to setback buffers for wetland habitats is of concern.[128]

4.3.2 Commission findings

120. The Commission has considered the evidence on the record of this proceeding in assessing the environmental effects of the project, including the evidence of the environmental consultants, various commitments made by Pattern, the mitigation and monitoring plans established in consultation with AEP, and the project's adherence to applicable regulatory standards, directives and guidelines, including AEP's post-construction wildlife requirements set out in the *Wildlife Directive for Alberta Wind Energy Projects (2011 and 2017)* and in the Referral Report.

121. As the majority of the construction disturbance and operational footprint for the project will occur on previously disturbed lands that largely consist of cultivated land and tame pasture, and considering that no turbines are sited on native pasture, the Commission finds that Pattern has acted reasonably in the general siting of the project and in a manner that will reduce the potential for adverse effects on wildlife and wildlife habitat.

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[124] Exhibit 22736-X0136, Tab 1 – Cottonwood Consultants Ltd. Report re Proposed Bowark Energy Ltd., PDF page 2.
[125] Exhibit 22736-X0193, OLG Opening Statement of Cliff Wallis, PDF page 2.
[126] Exhibit 22736-X0136, Tab 1 – Cottonwood Consultants Ltd. Report re Proposed Bowark Energy Ltd., PDF page 26.
[127] Transcript, Volume 2, pages 482-483.
[128] Exhibit 22736-X0136, Tab 1 – Cottonwood Consultants Ltd. Report re Proposed Bowark Energy Ltd., PDF page 45.

122. Concerning ESAs, the Commission takes into account their presence amongst other factors in assessing a project's potential environmental effects. While the Commission acknowledges the concerns identified by Mr. Wallis with the project's siting in relation to ESAs, the Commission considers that the location of ESAs is less useful in determining environmental effects than other information, such as targeted field surveys that identify the presence and quality of native vegetation and wildlife habitat. The Commission is mindful that ESAs are intended to be used as a planning tool and are not, in and of themselves, intended to restrict development.

123. Significantly, while there is some overlap of the project footprint with identified ESAs and there will be some disturbance of native grassland as a result of the project, the Commission observes that those portions of the project overlapping ESAs are sited on already disturbed land and that AEP does not have recommended setbacks for native grasslands or ESAs in any guidance documents relating to the development of wind projects. Also, AEP expressed no concerns relating to proposed setbacks during project consultation. Further, rare plant surveys were completed in native grassland, wetland and riparian areas where project infrastructure was proposed. Theses rare plant surveys identified no rare ecological communities and an occurrence of only one plant species listed provincially as vulnerable.

124. With respect to wetlands, the Referral Report indicates that the encroachment of some of the project's infrastructure on AEP's minimum wetland setbacks was acceptable to AEP, given the project's proposed mitigation and overall low risk of residual effects on wetlands. The Commission notes that permanent effects on wetlands are limited to 0.01 per cent of all wetlands in the project area which is in alignment with the Alberta Wetland Policy, which recommends avoidance as the first approach to reducing impacts on wetlands followed by mitigation. The Commission has taken AEP's perspective into account as part of its overall consideration of whether the proposed setbacks from wetlands in the project area are reasonable, along with other evidence submitted in respect of the project's effects on wetlands and the mitigation measures proposed by Pattern.

125. Overall, the Commission is satisfied that Pattern's approach to siting, specifically, the siting of a large portion of project infrastructure on cultivated lands and tame pasture, significantly mitigates the project's potential effects on ESAs, native grasslands and wetlands. With diligent application of Pattern's proposed mitigations, the potential residual adverse effects on ESAs, native grasslands and wetlands from construction and operation of the project can be reasonably mitigated.

126. The Commission notes that, pursuant to the *Conservation and Reclamation Regulation*, the project is subject to the reclamation obligations set out in Section 137 of the *Environmental Protection and Enhancement Act* and that Pattern must obtain a reclamation certificate at the project's end of life. The reclamation process is managed by AEP pursuant to the *Conservation and Reclamation Directive for Renewable Energy Operations*, which provides more detailed information on conservation and reclamation planning and reclamation certificate requirements for renewable energy operators in Alberta. The Commission notes that Pattern has committed to meet the requirements of the *Conservation and Reclamation Directive for Renewable Energy Operations.*

4.4 Impacts on bats

4.4.1 Views of Pattern and the Oyen Landowners Group

127. Pattern submitted that it conducted its 2016 and 2017 bat acoustic surveys in accordance with AEP protocols and considered the requirements outlined in the *Wildlife Directive for Alberta Wind Energy Projects* (2011) during project siting.[129] Pattern stated that no raised topography or topographic features such as river corridors or large coulees were found in the project area which would concentrate migrating bats. During the Phase 1 bat acoustic surveys and Phase 2 fall bat surveys, an average of 17.0 and 7.61 migratory bat passes per detector night were recorded respectively.[130]

128. In the Referral Report, the risk of fatality to bats was found to be high as a result of very high numbers of bat passes per detector night observed for the project, including very high rates of migratory bat passes per detector night.[131] AEP suggested that while both spring and fall bat acoustic surveys detected very high migratory bat activity, the number of bat passes per detector night may have been inflated as a result of a local population of non-migratory big brown bats and the difficulty associated with distinguishing their calls. AEP stated that the majority of bat activity was found in proximity to two detectors which are adjacent to foraging and roosting habitat. As a result, AEP recommended removing Turbine T19 or immediately initiating operational mitigations for Turbine T19 at the commencement of operation.[132]

129. Pattern removed Turbine T19 from the project layout in accordance with the recommendations provided by AEP.[133] In response, AEP stated that while the removal of the turbine is a desirable action and will likely reduce bat mortality during the operation phase of the project, the risk to bats, particularly migratory bats, remains high as informed by the AEP Wildlife Management policy *(Bat Mitigation Framework for Wind Power Development).*[134]

130. Pattern stated that the *Bat Mitigation Framework for Wind Power Development* recommends that the potential risk to bats be assessed for the project through the collection of acoustic bat data reported in terms of migratory bat passes per detector night.[135] Pattern submitted that its survey protocols followed a conservative approach to address any uncertainty associated with the classification of bat species. It further submitted that undertaking additional acoustic surveys would not change AEP's high risk assessment to bats.[136]

131. Pattern submitted that emergence and radio telemetry surveys are not required by the *Wildlife Directive for Alberta Wind Energy Projects (2011 and 2017)* and would not inform the AEP risk ranking which is based on acoustic data collection.[137] With respect to interannual variation, Pattern argued that AEP does not require studies over multiple years for pre-construction surveys.[138] In Pattern's view, conducting additional types of surveys would offer

[129] Exhibit 22736-X0067, Attachment 10, Environmental Evaluation Part 1 of 2, PDF page 106.
[130] Exhibit 22736-X0067, Attachment 10, Environmental Evaluation Part 1 of 2, PDF page 261.
[131] Exhibit 22736-X0056.01, Attachment 7 AEP Consultation, PDF page 19.
[132] Exhibit 22736-X0056.01, Attachment 7 AEP Consultation, PDF page 27.
[133] Exhibit 22736-X0163, CALGARY-#31446879-v2-Pattern_Lanfine_Reply_Evidence 02DEC2019, PDF page 7.
[134] Exhibit 22736-X0200, Attachment 1 - AEP Correspondence Regarding T19 Removal.
[135] Transcript, Volume 1, pages 123-124.
[136] Transcript, Volume 3, page 625, lines 19-23.
[137] Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, pdf page 4.
[138] Transcript, Volume 1, page 123, line 19 to page 124, line 2.

insufficient incremental value relative to cost and investing in post-construction curtailment items or post-construction monitoring would be of more value.[139]

132. Pattern noted that the Phase 2 fall 2016 acoustic bat data collected for the project used a two-second trigger window setting on its detectors whereas the *Bat Mitigation Framework for Wind Power Development* specifies a five-second trigger window to determine bat passes.[140] As a result, Pattern converted the data using an algorithm to enable comparability between the Phase 1 and Phase 2 data. The conversion resulted in the mean bat passes reported in Phase 2 being lower than in Phase 1. Pattern submitted that the bat surveys undertaken were consistent with the *Bat Mitigation Framework for Wind Power Development* and AEP guidance, and no concerns were expressed by AEP relative to the application of an algorithm to correct trigger windows.[141] It further noted that applying a consistent survey method allows AEP to conduct its risk assessment in a uniform manner across proposed wind developments to determine project risk rankings for bats.[142]

133. During the hearing, Pattern stated that in addition to following AEP guidelines, it is willing to go "above and beyond" those standard environmental mitigation measures recommended by AEP. For example, Pattern stated that the turbine model proposed for the project is compatible with a smart curtailment system[143] and committed to the use of such a system for the project.[144] The smart curtailment system would be activated in the event AEP determines such mitigation is warranted.[145] Pattern also committed to implementing blade feathering below the operational turbine cut-in speed (i.e., 3 m/s) during the fall bat migration season at the commencement of project operation to reduce the potential for bat mortalities. In Pattern's view, additional mitigation such as blade feathering and software upgrades to allow for smart curtailment and post-construction monitoring are more cost-effective tools for mitigating bat fatalities than other additional surveys such as radio telemetry surveys.[146]

134. In the event AEP determines that bird or bat mortality is high based on the results of first year post-construction monitoring, Pattern stated that it will discuss the implementation of the following further mitigation measures with AEP to address mortality concerns:

- Modified cut-in speeds.
- Temporary curtailment of specific turbines identified as high risk during a defined season or time period.
- Other technological advances as research into fatality prevention and reduction evolves (e.g., deterrents).[147]

[139] Transcript, Volume 2, page 377, lines 9-17.
[140] Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF page 5.
[141] Transcript, Volume 3, page 626, lines 3-8.
[142] Transcript, Volume 1, pages 162-163.
[143] A system that considers not only local wind speeds, but also extra information, such as weather variables, to curtail turbine operations to minimize potential impact on target species. (Transcript, Volume 2, pages 364-365)
[144] Transcript, Volume 2, page 378, line 19 to page 379, line 11.
[145] Transcript, Volume 3, page 627, lines 22-25.
[146] Transcript, Volume 1, pages 175-176.
[147] Exhibit 22736-X0199, Undertaking #9 – Updated COMP and PCMMP, PDF page 56.

135. Pattern submitted that it would consider using deterrents such as acoustics, electromagnetic radiation or lighting, dependent on the effectiveness and cost of the technology. As per Standard 100.4.12 of the *Wildlife Directive for Alberta Wind Energy Projects (2017)*, Pattern committed to assessing the effectiveness of such mitigation measures through an operational mitigation study in conjunction with two additional years of post-construction monitoring, if required by AEP. In the event that an additional two years of post-construction monitoring is required, the results of the operational mitigation study would be included in the annual post-construction monitoring report.[148]

136. Mr. Anissimoff stated that AEP's *Bat Mitigation Framework for Wind Power Development* classifies anything greater than two migratory bat passes per detector night as high risk. Considering the high levels of migratory bat activity within and near the project, he submitted that Pattern should consider not building certain wind turbines and develop a comprehensive operational mitigation strategy.[149]

137. With regard to the EE Reports, Mr. Anissimoff noted that there was minimal information provided specific to significant wildlife habitat as it pertains to bats. Although not required by the *Wildlife Directive for Alberta Wind Energy Projects (2011 and 2017)*, he stated that emergence surveys, radio telemetry surveys and considerations for interannual variation would have provided additional information on habitat usage over time, which would have been beneficial in determining operational mitigation strategies in advance of project operation.[150] Mr. Anissimoff stated that Pattern should consider two full years of acoustic data to account for interannual variations in bat behaviour and consider recording in full-spectrum to allow for more accurate species identification.[151]

138. With respect to the acoustic bat surveys conducted by Pattern, Mr. Anissimoff noted that while bat activity was monitored in both spring (2016 and 2017) and fall (2016), only data collected between August 1st and September 10th was used in determining the relative risk to migratory bats. He stated that the mean passes reported for Phase 2 were significantly lower than reported in Phase 1 for the same date range.[152] He recommended additional surveys such as emergence counts, radar studies and capture and tagging be completed to determine whether the project area is a major migratory route for bats.[153]

139. In response to Pattern's use of an algorithm to adjust project data, Mr. Anissimoff argued that there is nothing wrong with using a two-second trigger window so there was limited value in making the data congruent with AEP's *Bat Mitigation Framework for Wind Power Development*.[154] He further questioned why Pattern had not initially set the recorders to a

[148] Exhibit 22736-X0199, Undertaking #9 – Updated COMP and PCMMP, PDF page 57.
[149] Exhibit 22736-X0134, Tab 2 - Species Inc. Report re Independent Witness- Potential Impacts Pattern Proposed Lanfine WPP, PDF pages 19-20.
[150] Exhibit 22736-X0134, Tab 2 - Species Inc. Report re Independent Witness- Potential Impacts Pattern Proposed Lanfine WPP, PDF pages 10-11.
[151] Exhibit 22736-X0134, Tab 2 - Species Inc. Report re Independent Witness- Potential Impacts Pattern Proposed Lanfine WPP, PDF page 20.
[152] Exhibit 22736-X0134, Tab 2 - Species Inc. Report re Independent Witness- Potential Impacts Pattern Proposed Lanfine WPP, PDF pages 14-15.
[153] Transcript, Volume 2, pages 469-472.
[154] Transcript, Volume 2, pages 461-462.

five-second trigger window if it is common practice recommended by AEP and questioned the validity of the algorithm.[155]

140. While Mr. Anissimoff stated that there is nothing inherently wrong with using a two-second trigger window, he submitted that it could be problematic as it may be difficult to determine whether the same bat is being recorded multiple times when passing through a project area.[156] He submitted that if Pattern recorded its data in full-spectrum rather than zero-crossing it would have improved the accuracy of identifying bat species and determining if a bat had been recorded multiple times.[157]

141. In his report, Mr. Anissimoff outlined specific mitigation techniques for reducing bat mortality including feathering turbine blades, managing cut-in speeds, acoustic deterrents such as ultrasonic acoustic devices, weather considerations and smart curtailment.[158] He submitted that implementing smart curtailment as discussed by Pattern would help to reduce bat fatalities.[159] Mr. Anissimoff also agreed that the use of smart curtailment would have a significant positive effect on the project.[160]

142. Mr. Anissimoff submitted that by strictly conducting post-construction monitoring, Pattern is implementing a wait and see approach to demonstrate whether the project will result in wildlife mortality in excess of acceptable levels. He stated that a comprehensive operational mitigation strategy should be identified based on the results of the pre-construction data.[161] Mr. Anissimoff argued that while Pattern is following industry standard approaches, based on the high levels of migratory bat activity in the project area, such approaches are inadequate.[162]

143. In response to the removal of Turbine T19, Mr. Anissimoff argued that the acoustic bat surveys detected very high bat levels across the entire project area, not limited to one isolated turbine. He submitted that there is a large volume of water bodies and wetlands within the project area which could provide foraging habitat for both migratory and non-migratory bats and therefore, removing one turbine will not alleviate the high risk to bats in the project area.[163]

144. The Oyen Landowners Group requested that the Commission require a second season of fall bat acoustical and radar surveys to determine if the project is located in a bat migration corridor and that if it is determined that the project is located in a bat migration corridor, the project should not proceed without further Commission direction. The Oyen Landowners Group further requested that Pattern be required to submit a detailed smart curtailment mitigation plan to the Commission and AEP for review and approval prior to the commencement of project operation. The Oyen Landowners Group also requested that during project operation, all

[155] Exhibit 22736-X0192, M. Anissimoff Lanfine Wind Power Project - Potential Impacts to Local Bat Species Presentation (PDF version), PDF pages 7-8; Transcript, Volume 2, page 467.
[156] Transcript, Volume 2, page 466, lines 1-6.
[157] Transcript, Volume 2, pages 464-466.
[158] Exhibit 22736-X0134, Tab 2 - Species Inc. Report re Independent Witness- Potential Impacts Pattern Proposed Lanfine WPP, PDF pages 15-16.
[159] Transcript, Volume 3, pages 575-578.
[160] Transcript, Volume 3, page 575, lines 12-19.
[161] Exhibit 22736-X0134, Tab 2 - Species Inc. Report re Independent Witness- Potential Impacts Pattern Proposed Lanfine WPP, PDF page 18.
[162] Exhibit 22736-X0134, Tab 2 - Species Inc. Report re Independent Witness- Potential Impacts Pattern Proposed Lanfine WPP, PDF page 4.
[163] Transcript, Volume 3, pages 572-574.

mortalities be reported annually with high mortality rates reported immediately and that all reporting be made public.[164]

145. Additionally, in Mr. Anissimoff's view, the wind power industry in general and Pattern, in the instance of this application, can and should be doing more to proactively address declining bat populations particularly in light of the spread of White Nose Syndrome across Canada.[165]

4.4.2 Commission findings

146. Issues were raised in this proceeding concerning the high risk of bat mortality noted in the Referral Report, the sufficiency of the bat surveys undertaken by Pattern and the proposed mitigation measures.

147. The acoustic bat surveys undertaken for the project were consistent with the *Bat Mitigation Framework for Wind Power Development* and AEP guidance, and no concerns were expressed by AEP relative to the application of an algorithm to correct trigger windows. On these points the evidence of Pattern and Mr. Anissimoff was generally aligned. Likewise, Pattern and Mr. Anissimoff both offered evidence that Pattern's approach and methodology (with the exception of its application of an algorithm to data collected with a two-second trigger) as well as its proposed mitigation measures relative to bats, were generally consistent with industry practice and the requirements, directives and recommendations of AEP. Considering all of the above, the Commission finds that the acoustic bat surveys conducted for the project were reasonable.

148. In making the above finding, the Commission acknowledges that the environmental consultants for each of the parties offered opposing views as to the utility of additional bat surveys. However, the Commission is not satisfied on the evidence that additional surveys including emergence, radar and radio telemetry surveys are reasonably required. The Commission agrees with Pattern that additional surveys' are unlikely to alter either the AEP's or the Commission's assessment of the project's risk to bats or the need for mitigation measures as that risk is already rated "high". And, while the Commission accepts that further studies could provide information that might be beneficial in determining operational mitigation strategies in advance of project operation, there was insufficient evidence of the cost of such further studies relative to their incremental benefits to allow the Commission to make a reasoned determination in that regard. Further, as already noted, the environmental consultants agreed that emergence surveys, radio telemetry surveys and considerations for interannual variation are not required by the *Wildlife Directive for Alberta Wind Energy Projects* and they were not recommended by AEP. Finally, the Commission notes that Pattern committed to conducting an additional two years of bat fatality surveys to assess the effectiveness of its mitigation measures if AEP recommends further post-construction monitoring and mitigation to address high bat fatality levels during the initial three-year monitoring period.

149. Concerning mitigation measures, Mr. Anissimoff opined that Pattern should consider not building certain wind turbines and develop a comprehensive operational mitigation strategy. In his report, Mr. Anissimoff recommended specific mitigation techniques for reducing bat mortality including feathering turbine blades, managing cut-in speeds, acoustic deterrents such as ultrasonic acoustic devices, weather considerations and smart curtailment. During the hearing, Pattern confirmed its removal from the project layout of Turbine T19, which was identified in

[164] Transcript, Volume 3, pages 693-694.
[165] Transcript, Volume 3, page 594, line 4 to page 596, line 17.

the Referral Report as being adjacent to foraging and roosting habitat. AEP anticipated that the removal of Turbine T19 would reduce the potential for bat mortality during the operation phase of the project. Pattern also offered evidence on its previously proposed mitigation measures as well as additional commitments it is prepared to make to address the project's risk to bats (summarized in paragraphs 134 and 135), many of which were also recommended by Mr. Anissimoff.

150. The Commission finds that Pattern's proposed mitigation measures relative to bats are generally consistent with industry practice and the requirements of the *Wildlife Directive for Alberta Wind Energy Projects* and *Bat Mitigation Framework for Wind Power Development*, and the recommendations of AEP based on the content of AEP's reports and the testimony of Mr. Peckford and Mr. Anissimoff. However, even with the removal of Turbine T19, AEP nevertheless concluded that the risk of fatality to bats remains high as a result of the very high number of bat passes per detector night observed in the acoustic surveys conducted for the project, including very high rates of migratory bat passes per detector night.

151. Pattern acknowledged the high level of bat activity in the project area and the identified risk of migratory bat fatalities from the operation of the project and repeatedly expressed its willingness to go "above and beyond" the standard mitigation measures, including those outlined by AEP in the Referral Report to address the risk to bats. Among others, Pattern committed to the implementation of blade feathering as well as the use of smart curtailment for the project in the event AEP determines that smart curtailment is warranted.

152. Given the very high level of bat activity in the project area and the corresponding high risk of bat mortality from operation of the project, the Commission is satisfied that measures beyond those reflected in the AEP Referral Report are warranted and the Commission imposes the following as conditions of approval:

- On commencement of operation, Pattern shall implement blade feathering below the operational turbine cut-in speed (i.e., 3 m/s) during the fall bat migration season.

- Pattern shall install turbine software that would allow for smart curtailment.

- Pattern shall provide a detailed smart curtailment mitigation plan to the Commission and Alberta Environment and Parks for review and approval prior to the commencement of operations and shall implement any smart curtailment required by Alberta Environment and Parks.

153. Pattern shall also implement additional mitigation measures, in consultation with AEP, if the results of the post-construction bat carcass monitoring program indicate that the estimated corrected rate of bat fatalities for the project exceeds the current threshold for the project required by AEP. Additionally, Pattern shall implement mitigation measures if the results of post-construction bat carcass monitoring indicate bat fatalities in the vicinity of any individual turbine or cluster of turbines that are unacceptable to AEP. Such additional mitigation measures may include:

- Increasing the turbine cut-in wind speed.

- Stopping blades from idling during low wind speeds not conducive to electricity generation.

- Temporarily shutting down the turbines during certain periods of the year, weather conditions, and/or time of day during which migratory bats are more active or vulnerable to turbine-related mortalities.

- Monitoring advancements made in turbine bat mitigation throughout the life of the project and, in consultation with Alberta Environment and Parks, implementing any other mitigation methods/technologies as they become commercially available and/or their effectiveness is substantiated over time (e.g., acoustic or electromagnetic deterrents).

154. Rule 033: *Post-approval Monitoring Requirements for Wind and Solar Power Plants* came into force on July 1, 2019, and applies to all wind projects approved after September 1, 2019. Accordingly, Pattern must comply with the requirements of Rule 033. Subsection 3(3) of Rule 033 requires approval holders to submit to AEP and the AUC annual post-construction monitoring survey reports. Consequently, the Commission also imposes the following as a condition of approval:

- Pattern shall submit an annual post-construction monitoring survey report to Alberta Environment and Parks and the Commission within 13 months of the project becoming operational, and on or before the same date every subsequent year for which Alberta Environment and Parks requires surveys, pursuant to Subsection 3(3) of Rule 033: *Post-approval Monitoring Requirements for Wind and Solar Power Plants*.

4.5 Other environmental issues (additional surveys)

4.5.1 Views of Pattern and the Oyen Landowners Group

155. The initial surveys conducted in 2016 and 2017 included sharp-tailed grouse lek surveys, spring and fall bird migration surveys, raptor migration and stick nest surveys, breeding bird surveys, burrowing owl surveys and spring and fall bat activity acoustic surveys.[166] Pattern conducted additional surveys for sharp-tailed grouse, burrowing owls and sensitive amphibians in 2018.[167] Pattern stated that the wildlife survey data, types, methods and extent of coverage was in accordance with the 2011 *Wildlife Guidelines for Alberta Wind Energy Projects* and based on feedback received from AEP during project-specific consultation.[168]

156. Surveys for sensitive amphibians were conducted in accordance with the *Sensitive Species Inventory Guidelines* at all seasonal, semi-permanent and permanent wetlands within 100 metres of project infrastructure.[169] Two wetlands with sensitive amphibian observations (W57 and W9) were identified in areas where project infrastructure would be sited within the 100-metre setback. Pattern committed to conducting construction activities within the setback buffers of these wetlands outside the tiger salamander breeding activity period and outside the dispersal period for young-of-year. AEP noted in the Referral Report that these mitigation measures would be sufficient to reduce the impacts to sensitive amphibians at these wetlands.[170]

[166] Exhibit 22736-X0067, Attachment 10, Environmental Evaluation Part 1 of 2, PDF page 152.
[167] Exhibit 22736-X0068, Attachment 10, Environmental Evaluation Part 2 of 2; Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF pages 15-16.
[168] Exhibit 22736-X0067, Attachment 10, Environmental Evaluation Part 1 of 2, PDF page 159.
[169] Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF page 9.
[170] Exhibit 22736-X0056.01, Attachment 7 AEP Consultation, PDF page 25.

157. The Referral Report concluded that the project poses an overall moderate risk to breeding and migrating birds which includes species that may be at risk of collision with turbines. Hemmera identified 12 wildlife features during baseline field studies which will have project infrastructure within their respective setbacks.[171] Pattern stated that a detailed rationale for infringements on wildlife setbacks was submitted to AEP in the EE Reports or through consultation discussions. It submitted that AEP assessed this information, determined that the rationale and proposed mitigation satisfied the intent of the applicable wildlife policy, and communicated its position in the Referral Report.[172]

158. Pattern completed a Post-Construction Monitoring and Mitigation Plan (PCMMP) for the project in consultation with AEP to assess the impact of operation on birds and bats. The PCMMP included conducting a minimum of three years of post-construction bird and bat fatality surveys and an investigation and consultation with AEP regarding the need for operational mitigation if the number of carcasses found, or if the estimated corrected fatalities that result, exceed certain thresholds.[173]

159. With respect to sharp-tailed grouse, the PCMMP stated that all sharp-tailed grouse leks identified during pre-construction surveys would be revisited and assessed during post-construction surveys.[174] If AEP and Pattern determine that the project is having a significant effect on leks, then additional compensatory and/or mitigation measures would be considered.[175] Mr. Peckford stated that AEP requires sharp-tailed grouse surveys to be completed every two years until the project is commissioned which he submitted will provide updated assessments of potential risk to these features through the pre-construction phase of the project.[176]

160. Pattern stated that the PCMMP includes an assessment of both potential direct and indirect effects of the project on sharp-tailed grouse.[177] As specified in the *Wildlife Directive for Alberta Wind Energy Projects (2017)*, Pattern submitted that direct effects of the project would be assessed through the completion of three years of standardized mortality monitoring. Indirect impacts from the project would also be assessed through the completion of three years of sharp-tailed grouse surveys using the pre-construction survey methodologies.[178]

161. Pattern submitted that additional sharp-tailed grouse studies with a focus on chick survival would be unnecessary and should not be imposed as a condition of project approval.[179] Pattern stated that the proposed monitoring plan for the project will allow for a "before-and-after comparison" which will determine the impact attributable to the project.[180]

162. Given that the collision risk to nocturnal migrating passerines is low and that a positive relationship between pre-construction radar surveys and post-construction mortality has not been

[171] Exhibit 22736-X0056.01, Attachment 7 AEP Consultation, PDF page 19.
[172] Transcript, Volume 3, pages 629-630.
[173] Exhibit 22736-X0199, Undertaking #9 – Updated COMP and PCMMP.
[174] Exhibit 22736-X0199, Undertaking #9 – Updated COMP and PCMMP, PDF page 45.
[175] Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF page 14.
[176] Transcript, Volume 1, page 97, lines 12-20.
[177] Transcript, Volume 3, page 631, lines 16-18.
[178] Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF pages 14.
[179] Transcript, Volume 3, page 632, lines 2-7.
[180] Exhibit 22376-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF page 15.

established, Pattern submitted that pre-construction nocturnal migrant bird studies and radar studies should not be completed as they would not be informative for the project.[181]

163. Mr. Wallis discussed a number of specific concerns with the project's potential effects on wildlife including sharp-tailed grouse, species at risk and cumulative effects. Mr. Wallis submitted that conditions for limiting operations of turbines (i.e., altering cut-in speeds, turbine shut down at night during migration periods, and any mitigation deemed necessary by AEP) should be a condition of approval.[182]

164. Mr. Wallis submitted that the project area is used by breeding, staging and migrating waterfowl, marsh birds and shorebirds. He argued that the field surveys completed for the project were insufficient to fully determine use by breeding and migrating waterfowl, marsh birds and shorebirds in proximity to project infrastructure. Specifically, he stated:

> Additional field data should be collected on grassland bird, shorebird, waterfowl and marsh bird use within the project area to determine their potential interaction with project components, especially in areas within and adjacent to areas mapped as Environmentally Significant Areas. Alterations in siting and operation of the project should be required in conditions for approval should significant interactions or impingements on required setbacks be found.[183]

165. With respect to sharp-tailed grouse, Mr. Wallis recommended that additional follow-up research be undertaken in areas of the project important to lekking sharp-tailed grouse if ongoing grouse studies related to wind developments demonstrate further concern.[184] Mr. Wallis testified that he agreed with the initial monitoring completed by Hemmera for the project area and stated that additional studies would only be warranted if issues are identified.[185]

166. Mr. Wallis submitted that consideration should be given to nocturnal migrant bird studies and radar studies as they would provide important insight into passerine and waterfowl use in the project area.[186] Mr. Wallis further stated that radar studies can be beneficial in determining how migration occurs and establishing peak migratory periods in the project area. With the height of turbines having the potential to extend into migratory bird flight paths, this would be important during project operation.[187]

4.5.2 Commission findings

167. Based on the Commission's review of the record including the EE Reports, Pattern's reply evidence and responses to information requests, hearing testimony and the Referral Report, the Commission finds that while the pre-construction wildlife surveys conducted for the project

[181] Exhibit 22736-X0157, 191202_PatternLanfine_ReplyEvidence_v1.0_FINAL_Hemmera, PDF pages 16-17; Transcript, Volume 3, page 632, lines 16-22.
[182] Exhibit 22736-X0136, Tab 1 - Cottonwood Consultants Ltd. Report re Proposed Bowark Energy Ltd., PDF page 45.
[183] Exhibit 22736-X0136, Tab 1 - Cottonwood Consultants Ltd. Report re Proposed Bowark Energy Ltd., PDF page 3.
[184] Exhibit 22736-X0136, Tab 1 - Cottonwood Consultants Ltd. Report re Proposed Bowark Energy Ltd., PDF page 33.
[185] Transcript, Volume 2, page 493, lines 3-7.
[186] Exhibit 22736-X0136, Tab 1 - Cottonwood Consultants Ltd. Report re Proposed Bowark Energy Ltd., PDF page 36.
[187] Exhibit 22736-X0194, OLG Cliff Wallis Reply Evidence and Cross Rebuttal Dated December 10, 2019, PDF page 5.

did not cover every part of the project area, the survey approach adopted was reasonable. The Commission notes in particular that AEP found the wildlife surveys conducted for the project to be adequate and in alignment with the intent of the *Wildlife Directive for Alberta Wind Energy Projects (2011)*. The Oyen Landowners Group has not satisfied the Commission that additional nocturnal migrant bird studies or radar studies are required. The Commission expects Pattern to abide by its commitment to engage in ongoing discussions with AEP and to complete further pre-construction wildlife surveys as required or recommended by AEP and the Commission.

168. Considering the evidence presented by both Pattern and the Oyen Landowners Group, and AEP's post-construction wildlife requirements set out in the 2011 and 2017 *Wildlife Directive for Alberta Wind Energy Projects* and in the Referral Report, the Commission imposes the following as condition of approval:

- Pattern shall abide by all of the commitments and recommendations included in its final version of the Construction and Operation Mitigation Plan developed for the project. Pattern shall implement all mitigation measures identified in the Construction and Operation Mitigation Plan and monitor the effectiveness of its mitigation measures. If mitigation measures are unsuccessful, Pattern, in consultation with Alberta Environment and Parks, must develop and implement additional mitigation to minimize adverse effects on the environment.

169. The Commission acknowledges that Pattern has committed to continue to consult and co-ordinate with AEP throughout the project's construction phase on appropriate pre-construction environmental assessments, its post-construction monitoring plan, and adaptive management strategies.

170. With diligent application of Pattern's proposed mitigations, and adherence to the conditions of approval imposed by this decision, the Commission is satisfied that the potential adverse effects of the project on wildlife and bats in particular, can be reasonably mitigated.

5 Other identified concerns

171. The Oyen Landowners Group identified other concerns with the project. It raised concerns with regard to improper consultation, the disruption of the rural environment, damage to underground springs, visual effects, decreased property value and health effects.

5.1 Views of the Oyen Landowners Group

172. Ms. Ross expressed dissatisfaction with the consultation process for the project. She stated that she was not contacted by BowArk during the initial participant involvement program (PIP) in March of 2017 and did not learn about the project until fall 2018. She stated that the applicant believed her property to be part of another stakeholder's land and abandoned. She expressed concern with the applicant's consultation efforts noting that several oilfield companies were able to locate her property for consultation and she believed her property was on the Special Areas map. Ms. Ross stated that shortly after she was notified about the project, she received a letter from Pattern in addition to in-person consultation within the two weeks that followed. She stated that from that time forward, she received the same project mailouts as other interveners. Given the absence of timely consultation, Ms. Ross was concerned that her property

had not been tested for noise or shadow flicker effect despite the application process having been ongoing for a year and a half.[188]

173. Members of the Oyen Landowners Group stated that the project area is known for its quietness. Mr. Ray Girletz stated that one of the reasons he selected his land was due to the secluded and quiet nature of the area.[189] Ms. Ross stated that she and her family live in a very quiet place.[190] Mr. Dennis Fischbuch stated that on some mornings and evenings he can hear his neighbours talking in their yard a mile away.[191] Ms. Leslie Girletz stated that the quiet and peaceful environment is a huge part of her family's life and on calm days you can hear the tower in Oyen ring.[192] Many of these landowners expressed concern about the noise from the turbines and its effect on the quality of the acoustic environment where they live.

174. Mr. John Murray stated that his biggest concern with the project is contamination of underground springs and potential effects on groundwater level from the project construction. Mr. Murray runs a cow-calf operation which primarily relies on underground springs to fill the dugouts of his cattle pasture land. He stated that without the underground springs, he would incur the significant expense of hauling water for the cows.[193] Mr. Murray noted that Pattern offered to perform pre- and post-construction testing on his well to alleviate his contamination related concerns. Mr. Dennis Fischbuch and Mr. Girletz also expressed concern that the groundwater may be adversely affected by the project.

175. Mr. Dennis Fischbuch stated that the potential for adverse health effects and the visual impact associated with wind turbines will cause the value of his land to decrease and any study concluding otherwise cannot be taken seriously. In his view, Pattern should provide landowners with a property value guarantee and in the absence of one, any argument that properties will not be devalued is unreliable. Ms. Leslie Girletz stated that Pattern's response to her concern regarding property value loss due to the project was that there is no proof. In Ms. Ross' view, the proponent should be held accountable for any property value loss experienced by interveners as a result of the project.

176. The Oyen Landowners Group also expressed concerns that the project would impact the aesthetics of the area. Mr. Dennis Fischbuch and Mr. Kuich stated that the turbines would tower over the landscape and forever change the area aesthetic from a serene rural countryside to that of an industrial park. Ms. Leslie Girletz stated that based on the photo simulation provided by the applicant, she would be forced to look at "around 35 constantly spinning mills."[194]

177. Mr. Dennis Fischbuch expressed concerns with respect to turbine lighting and the effects of flashing aircraft warning lights. He stated that they would ruin the night sky and have an annoying strobe-like effect. In response to questioning by Commission counsel, Mr. Dennis Fischbuch stated that a radar aircraft warning light system would likely alleviate his concerns related to turbine lighting.

188 Transcript, Volume 2, page 418, line 23 to page 420, line 12.
189 Transcript, Volume 2, page 405, line 19 to page 406, line 4.
190 Transcript, Volume 2, page 413, line 25 to page 414, line 3.
191 Transcript, Volume 2, page 414, lines 16-19.
192 Transcript, Volume 2, page 414, lines 23-25.
193 Transcript, Volume 2, page 396, lines 6-9.
194 Transcript, Volume 2, page 410, lines 21-23.

178. A number of the members of the Oyen Landowners Group emphasized the importance of the serenity and visual aesthetics of their home environments to their mental and physical wellbeing and urged the Commission to consider these potential adverse effects as seriously as the project's potential adverse effects on the environment.

5.2 Views of Pattern

179. BowArk submitted a PIP summary for the project prior to its purchase by Pattern in 2017. BowArk stated that it designed its PIP to ensure all potentially directly and adversely affected persons understood the nature of the project, that they could identify areas of concern and had the opportunity to engage in meaningful dialogue and discussion with the goal of eliminating or mitigating to an acceptable degree the affected parties' concerns about the project. BowArk stated that it initiated the PIP in accordance with Rule 007, in March 2017.

180. BowArk identified stakeholders within 2,000 metres of the project and mailed out project-specific information packages to these stakeholders. Newspaper advertisements for the open house were printed in the Oyen Echo, the Consort Enterprise and The Coffee Break Oyen Newsletter throughout the first half of March 2017, and an open house was held at the Oyen and District Senior's Rec Centre on March 21, 2017. Members of the BowArk project team engaged stakeholders within 800 metres for in-person consultation.

181. Pattern continued the PIP for the project once it acquired the project from Bowark by continuing to conduct periodic land title searches, mailing out project update information packages and consulting with stakeholders.

182. Pattern acknowledged that it made an error with respect to the late identification of Jamie and Jared Ross' residence.[195] Pattern stated that it identified the error in a quality assurance exercise and immediately took steps to engage in one-on-one consultation with the Ross family which included a telephone conversation and an in-person meeting to discuss the project and their concerns. In response to the consultation, Pattern stated that it moved the location of Turbine T63 approximately 430 metres away from the Ross residence.[196] Pattern stated that the Ross family indicated their preference for the turbine relocation compared to its previous siting. Further, Pattern notified the Ross family that no turbine would cause shadow flicker on their property.

183. Pattern expressed its commitment and willingness to undertake pre- and post-construction groundwater assessments for the wells located on the property of Mr. Dennis Fischbuch, Mr. Wyatt Girletz and Mr. Murray. Pattern stated it does not anticipate using pile driving or rock blasting activities at the project site; accordingly, the risk of any damage to existing wells is extremely low.[197] Nevertheless, it committed to compensate landowners for the reasonable cost of drilling a new well and replacing or repairing existing well pumps or any other subsurface well casings or piping as reasonably required as a result of the project.

[195] Transcript, Volume 3, page 636, line 7 to page 639, line 4.
[196] Exhibit 22736-X0059.01 - Attachment 4 - Appendices G to I - Part 2 of 6, PDF page 16.
[197] Exhibit 22736-X0198, Undertakings #3-4, 6-8, PDF page 4.

184. Pattern acknowledged the concerns expressed by members of the Oyen Landowners Group with respect to the potential effect of the project on property values but submitted that there is no link between the two.[198]

185. Pattern also acknowledged that there will be a change to the visual landscape once the project is constructed. Pattern stated that it provided visual simulations to Mr. Dennis Fischbuch, Mr. Wyatt Girletz, Ms. Ross and Mr. Murray, and where practicable, adjusted the project layout to respond to landowner concerns and lessen the visual effects at specific residences. For example, Pattern stated that it removed turbines T7 and T18 in response to concerns raised by Leslie and Wyatt Girletz and moved Turbine T63 further away from the residence of the Ross family.

186. Pattern stated that it submitted an application to Transport Canada for a lighting plan but was informed that Transport Canada would not assign a lighting plan until 90 days prior to construction. Pattern emphasized that it is Transport Canada that determines the lighting plan for the project. Pattern acknowledged the availability of light shielding and turbine lighting technology that strobes in coordination with airplane radar but noted that the latter is very early technology and has only recently been approved for testing in both the United States and Canada. Nevertheless, Pattern committed to the exploration and implementation of technical options that would help mitigate light pollution and make any ensuing requests to Transport Canada.[199]

5.3 Commission findings

187. The Commission finds that the PIP for the project was developed and conducted in accordance with the regulatory requirements of Rule 007. While Pattern missed the Ross' residence during initial consultation activities, it appears that Pattern rectified this omission as soon as it was identified. The Commission finds that this error was appropriately corrected and did not prejudice the Ross' ability to understand the project, voice concerns or participate in the Commission's hearing process.

188. More generally, the Commission is satisfied that through the PIP, stakeholders were provided with the opportunity to understand the project, voice their concerns and have those concerns addressed where feasible, thereby satisfying the purpose of consultation and Rule 007 requirements.

189. The Commission is also satisfied that Pattern is aware of and has acknowledged the potential effect of the project on water wells and groundwater in the area and has taken appropriate actions to evaluate and address these concerns. In particular, the Commission notes that Pattern has offered to conduct pre- and post-construction assessments of the water wells at the Fischbuch (Dennis), the Girletz and the Murray properties and has offered compensation, if necessary, as a mitigation measure. The Commission expects Pattern to follow through on these commitments. If there are adverse effects on groundwater wells due to construction or operation, the Commission expects Pattern to work with affected landowners to implement appropriate mitigation on a case-by-case basis.

190. The Commission acknowledges the concerns expressed by members of the Oyen Landowners Group concerning the effect the project may have on property values.

[198] Transcript, Volume 3, page 690, line 22 to page 691, line 1.
[199] Transcript, Volume 2, page 420, line 20 to page 421, line 4.

However, the Commission continues to hold the view, expressed in previous decisions, that specialized expertise and evidence is required for the Commission to conclude that a given project will have an adverse effect on land and property values.[200] Such evidence must be specific to a particular project rather than general in nature. No property value evidence specific to this project was submitted, nor was any expert available for cross-examination on the topic of the effect of the project on property values of residences in the area. The Commission was therefore not presented with sufficient evidence to support a finding that the project will result in a reduction in property values for parcels adjacent to the project.

191. The Commission also acknowledges the concerns expressed by members of the Oyen Landowner Group about the visual effects of the project. When considering the visual effects of a proposed project, the Commission takes into account that the assessment of visual effects is inherently subjective in nature. Nonetheless, the Commission accepts that the introduction of large, animated objects into a rural landscape would significantly affect the viewscape of the project area. Although the Commission is not satisfied that the visual effect of the project is prohibitive in and of itself, it is one of the factors the Commission has considered in making its overall public interest determination for the project.

192. With respect to visual impacts resulting from the aircraft safety lights associated with the project the Commission notes that the requirements for such lighting, including installation, location, and flashing duration, are at the direction of Transport Canada and therefore largely outside of Pattern's control. In order to minimize the visual impacts caused by lighting to the greatest extent possible, Pattern has committed to implementing the minimum aircraft safety lighting requirements to reduce impacts to surrounding stakeholders. Pattern has also committed to explore technical options that would help mitigate light pollution, including a light shielding system to minimize light pollution on the ground, and make any ensuing requests to Transport Canada. Although the Commission expects that Pattern will continue to evaluate the use of this and other technologies for the project and implement them where reasonably feasible, decisions about which turbines are lighted and to what extent, rests with Transport Canada.

193. The Commission also acknowledges the testimony of members of the Oyen Landowners Group concerning the importance of the serenity and visual aesthetics of their home environments to their mental and physical wellbeing. The sincerity of these witnesses and the genuine nature of the concerns expressed are accepted without question. However, specialized expertise and evidence is required for the Commission to conclude that a project will have an adverse effect on human health. No such evidence was presented in this proceeding and accordingly, the Commission is unable to make any finding related to this potential impact.

6 Conclusion

194. For the reasons outlined in this decision and subject to the conditions below, the Commission finds that Pattern has satisfied the requirements of Rule 007 and Rule 012, the negative effects of the project, which include social impacts, visual impacts, noise impacts and impacts to the environment, can be mitigated to an acceptable degree and that in accordance with Section 17 of the *Alberta Utilities Commission Act*, approval of the project is in the public

[200] Decision 2011-436, AltaLink Management Ltd. and EPCOR Distribution & Transmission Inc., Heartland Transmission Project, Application 1606609, Proceeding 457, November 1, 2011, page 16.

interest having regard to its social, economic, and other effects, including its effect on the environment.

195. The Commission's approval of this project is subject to the following conditions:

- Pattern shall install serrated blades on the following turbines: T3, T4, T13, T20, T29, T30, T31, T33, T40, T41, T42, T43, T44, T45, T46, T47, T49, T50, T51, T53, T54, T55, T56, T57, T58, T59 and T64.

- On the date the project commences operations, Pattern shall file a letter with the Commission confirming the blade types installed on the individual project turbines.

- Pattern shall conduct a post-construction comprehensive sound level survey, including an evaluation of low frequency noise, at receptors R27 and R30. The post-construction comprehensive sound level survey must be conducted under representative conditions and in accordance with Rule 012: *Noise Control*. Pattern shall file all studies and reports relating to the post-construction comprehensive sound level survey with the Commission within one year of connecting the power plant to the Alberta Interconnected Electric System.

- On commencement of operation, Pattern shall implement blade feathering below the operational turbine cut-in speed (i.e., 3 m/s) during the fall bat migration season.

- Pattern shall install turbine software that would allow for smart curtailment.

- Pattern shall provide a detailed smart curtailment mitigation plan to the Commission and Alberta Environment and Parks for review and approval prior to the commencement of operations and shall implement any smart curtailment required by Alberta Environment and Parks.

- Pattern shall submit an annual post-construction monitoring survey report to Alberta Environment and Parks and the Commission within 13 months of the project becoming operational, and on or before the same date every subsequent year for which Alberta Environment and Parks requires surveys, pursuant to Subsection 3(3) of Rule 033: *Post-approval Monitoring Requirements for Wind and Solar Power Plants*.

- Pattern shall abide by all of the commitments and recommendations included in its final version of the Construction and Operation Mitigation Plan developed for the project. Pattern shall implement all mitigation measures identified in the Construction and Operation Mitigation Plan and monitor the effectiveness of its mitigation measures. If mitigation measures are unsuccessful, Pattern, in consultation with Alberta Environment and Parks, must develop and implement additional mitigation to minimize adverse effects on the environment.

7 Decision

196. Pursuant to sections 11 and 19 of the *Hydro and Electric Energy Act*, the Commission approves applications 22736-A001 and 22736-A002 and grants Pattern Development Lanfine Wind ULC the approval set out in Appendix 1 – Power Plant Approval 22736-D02-2020 – January 27, 2020.

197. Pursuant to sections 14, 15 and 19 of the *Hydro and Electric Energy Act*, the Commission approves Application 22736-A003 and grants Pattern Development Lanfine Wind ULC the approval set out in Appendix 2 – Substation Permit and Licence 22736-D03-2020 – January 27, 2020, to construct and operate the Buffalo Bird 601S Substation.

198. Pursuant to sections 14, 15 and 19 of the *Hydro and Electric Energy Act*, the Commission approves Application 22736-A004 and grants Pattern Development Lanfine Wind ULC the approval set out in Appendix 3 – Substation Permit and Licence 22736-D04-2020 – January 27, 2020, to construct and operate the Nighthawk Substation.

199. The appendices will be distributed separately.

Dated on January 27, 2020.

Alberta Utilities Commission

(original signed by)

Carolyn Hutniak
Panel Chair

(original signed by)

Tracee Collins
Commission Member

(original signed by)

Joanne Phillips
Commission Member

Appendix A – Proceeding participants

Name of organization (abbreviation) Company name of counsel or representative
Bowark Energy Ltd. (Bowark) Pat Bowes Keith Knudsen
Pattern Development Lanfine Wind ULC (Pattern) Adam Renz Terri-Lee Oleniuk
Oyen Landowners Group Gavin Fitch Dennis Fischbuch Ray and Wendy Girletz Wyatt and Leslie Girletz Brad Kuich Jamie and Jared Ross John and Jaclyn Murray
Richard Fischbuch
Gordon Wood
Daryl Wood
Kyna Fischbuch
Kathleen Butler
Leonard Parenteau
Tom Carroll
Jerry Svatos

Alberta Utilities Commission Commission panel Carolyn Hutniak, Panel Chair Tracee Collins, Commission Member Joanne Phillips, Commission Member Commission staff Rob Watson (Commission counsel) Nicholas Sawkiw (Commission counsel) Victor Choy Joan Yu Heidi Ritchie Kyle Surgenor

Appendix B – Oral hearing – registered appearances

Name of organization (abbreviation) Name of counsel or representative	Witnesses
Pattern Development Lanfine Wind ULC Terri-Lee Oleniuk Nicole Bakker	Adam Renz Pat Bowes Keith Knudsen Payam Ashtiani Teresa Drew Mike Peckford
Oyen Landowners Group Gavin Fitch Marco Baldasaro	Dennis Fischbuch Ray Girletz Wendy Girletz Wyatt Girletz Leslie Girletz Brad Kuich Jamie Ross John Murray Henk de Haan Cliff Wallis Michael Anissimoff

Appendix C – Summary of Commission directions with required deliverables

This section is intended to provide a summary of those conditions which require follow-up with the Commission; it is not intended to summarize all of the conditions imposed on the applicant. This section is provided for the convenience of readers. In the event of any difference between the directions in this section and those in the main body of the decision, the wording in the main body of the decision shall prevail.

1. Pattern shall install serrated blades on the following turbines: T3, T4, T13, T20, T29, T30, T31, T33, T40, T41, T42, T43, T44, T45, T46, T47, T49, T50, T51, T53, T54, T55, T56, T57, T58, T59 and T64.…… paragraph 82
2. On the date the project commences operations, Pattern shall file a letter with the Commission confirming the blade types installed on the individual project turbines.…… paragraph 82
3. Pattern shall conduct a post-construction comprehensive sound level survey, including an evaluation of low frequency noise, at receptors R27 and R30. The post-construction comprehensive sound level survey must be conducted under representative conditions and in accordance with Rule 012: *Noise Control*. Pattern shall file all studies and reports relating to the post-construction comprehensive sound level survey with the Commission within one year of connecting the power plant to the Alberta Interconnected Electric System.……..paragraph 96
4. On commencement of operation, Pattern shall implement blade feathering below the operational turbine cut-in speed (i.e., 3 m/s) during the fall bat migration season……. ……paragraph 152
5. Pattern shall install turbine software that would allow for smart curtailment.…… ……paragraph 152
6. Pattern shall provide a detailed smart curtailment mitigation plan to the Commission and Alberta Environment and Parks for review and approval prior to the commencement of operations and shall implement any smart curtailment required by Alberta Environment and Parks…….. ..... ……paragraph 152
7. Pattern shall submit an annual post-construction monitoring survey report to Alberta Environment and Parks and the Commission within 13 months of the project becoming operational, and on or before the same date every subsequent year for which Alberta Environment and Parks requires surveys, pursuant to Subsection 3(3) of Rule 033: *Post-approval Monitoring Requirements for Wind and Solar Power Plants*…… ..... ……paragraph 154
8. Pattern shall abide by all of the commitments and recommendations included in its final version of the Construction and Operation Mitigation Plan developed for the project. Pattern shall implement all mitigation measures identified in the Construction and Operation Mitigation Plan and monitor the effectiveness of its mitigation measures. If mitigation measures are unsuccessful, Pattern, in consultation with Alberta Environment and Parks, must develop and implement additional mitigation to minimize adverse effects on the environment..…… .. paragraph 168