



Alberta Utilities Commission

In the Matter of the Need for the Queenstown Power Plant Connection

And in the matter of the *Electric Utilities Act*, S.A. 2003, c. E-5.1, the *Alberta Utilities Commission Act*, S.A. 2007, c. A-37.2, the *Hydro and Electric Energy Act*, R.S.A. 2000, c. H-16, the *Transmission Regulation*, AR 86/2007 and Alberta Utilities Commission Rule 007, all as amended

**Application of the Alberta Electric System Operator for
Approval of the
Queenstown Power Plant Connection Needs Identification
Document**

PART A - APPLICATION

1 Introduction

1.1 Application – Pursuant to Section 34(1)(c) of the *Electric Utilities Act* (Act), and in accordance with further provisions set out in legislation,¹ the Alberta Electric System Operator (AESO) applies to the Alberta Utilities Commission (Commission) for approval of the *Queenstown Power Plant Connection Needs Identification Document* (Application).

1.2 Application Overview – This Application describes the need for transmission development arising from BowArk Energy Ltd. (market participant) request for transmission system access service for its proposed 90 MW generation facility (Facility), to be located in the area northeast of the Town of Vulcan (AESO Planning Area 45, Strathmore/Blackie). The market participant's request to connect its Facility can be met by adding a new 138 kV transmission circuit between the market participant's proposed McGregor Lake 200S substation and the existing Queenstown 504S substation ("Proposed Transmission Development", as further described in Section 2.2). The requested in-service date for the Proposed Transmission Development is August 2016.²

Having followed the AESO Connection Process,³ the AESO has determined that the Proposed Transmission Development described herein provides a reasonable opportunity for the market participant to exchange electricity. The Proposed Transmission Development is aligned with the AESO's long-term transmission forecasts and plans in the Strathmore/Blackie area. The AESO, in accordance with its

¹ The Alberta Utilities Commission Act, S.A. 2007, c. A-37.2, the Hydro and Electric Energy Act, R.S.A. 2000, c. H-16, the Transmission Regulation, AR 86/2007 and Alberta Utilities Commission Rule 007, all as amended.

² The in-service date of the connection must be aligned with the completion of the approved Southern Alberta Transmission Reinforcement (SATR) 138 kV system modifications in the Strathmore/Blackie area (Approval No. U2014-138, Stage II, paragraph 8), as explained in Appendix A to this Application.

³ For information purposes, refer to note iv of Part C of this Application for more information on the AESO Connection Process.

Queenstown Power Plant Connection Needs Identification Document

responsibility to plan the transmission system, submits this Application to the Commission for approval.^{4,5}

1.3 AESO Directions to the TFO – During the AESO Connection Process, the AESO issued various directions to AltaLink Management Ltd. (AltaLink) as the legal owner of transmission facilities (TFO), including direction to assist the AESO in preparing this Application.⁶

⁴ For information purposes, some of the legislative provisions relating to the AESO's planning duties and duty to provide system access service are referenced in notes i and ii of Part C of this Application.

⁵ Note v of Part C of this Application describes the Application scope in more detail.

⁶ The directions are described in more detail in the following sections of this Application and in Part C, note vi.

2 Need Overview and Proposed Transmission Development

2.1 Duty to Provide Transmission System Access Service – The AESO, pursuant to its responsibilities under Section 29 of the Act, must provide system access service on the transmission system in a manner that gives all market participants a reasonable opportunity to exchange electric energy and ancillary services.

The market participant has requested connection of its Facility to the transmission system, thereby establishing the need for transmission development. Through the AESO Connection Process, the AESO, the TFO and the market participant have collaborated to determine the characteristics of the Proposed Transmission Development and assess the impacts of connecting the Facility and the Proposed Transmission Development to the transmission system. The AESO has issued directions to the TFO to prepare a Facility Proposal⁷ to meet the market participant's identified need.

2.2 Proposed Transmission Development – The Proposed Transmission Development includes the following main elements:

1. Add a new 138 kV transmission circuit including one associated 138 kV circuit breaker to terminate the new circuit at the existing Queenstown 504S substation; and
2. Modify, alter, add or remove equipment, including disconnect switches, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.⁸

⁷ Also referred to as facility application, or FA, under Commission Rule 007.

⁸ Details and configuration of equipment required for the Proposed Transmission Development, including substation single-line diagrams, are more specifically described in the AESO's Functional Specification included in the TFO's Facility Proposal. Also, further details will be determined as detailed engineering progresses and the market participant's operating requirements are finalized. Routing and/or siting of transmission facilities do not form part of this Application and are addressed in the TFO's Facility Proposal. The new transmission circuit between the McGregor Lake 200S substation and the existing Queenstown 504S substation is currently estimated to have a length of approximately 100 metres. This is subject to change as routing and/or siting is finalized by the TFO. Market participant facilities that may

2.3 Proposed Transmission Development Cost Estimates – The AESO directed AltaLink to prepare a cost estimate for the Proposed Transmission Development. AltaLink estimated the in-service cost of the Proposed Transmission Development, described in Section 2.2, to be approximately \$5 million (\$2016).⁹ In accordance with the ISO tariff, the AESO has classified these costs as participant-related costs.

2.4 Transmission Development Alternatives – In addition to the Proposed Transmission Development, the following connection alternatives were identified:¹⁰

1. A double circuit, 240 kV connection – this alternative would add a 240 kV double circuit connection between the market participant’s proposed McGregor Lake 200S substation and either one of the existing 240 kV transmission lines 924L or 927L (Milo 356S – Langdon 102S) using an in-and-out connection configuration. This alternative was ruled out by the market participant as it would require materially more transmission facilities at a higher cost as compared to the Proposed Transmission Development.
2. A 138 kV T-tap connection – this alternative would add a 138 kV T-tap circuit to connect the market participant’s proposed McGregor Lake 200S substation to the existing 138 kV transmission line 876L, which is between Queenstown 504S and Gleichen 179S substations. This alternative was ruled out by the market participant as it could potentially be less reliable than the Proposed Transmission Development.

The Proposed Transmission Development was selected as the preferred option to reliably connect the Facility to the transmission system and forms the basis of the cost estimates and the Connection Assessment described herein.

subsequently be connected to the Proposed Transmission Development are the responsibility of the market participant and are not included in the Application.

⁹ Further details of this cost estimate can be found in Appendix B, with an approximate accuracy level of +20%/-10%.

¹⁰ Details of the connection alternatives are included in Appendix A.

2.5 Connection Assessment – Power flow, transient stability and short circuit analyses were conducted to assess the impact of connecting the market participant’s Facility via the Proposed Transmission Development to the transmission system.¹¹ System modifications in the Blackie area as part of the approved Southern Alberta Transmission System Reinforcement Needs Identification Document¹² were assumed to be in-service for the purpose of these studies in order to reliably connect the Facility to the transmission system.

Study results demonstrated acceptable system performance following connection of the Facility and Proposed Transmission Development. Consequently, the AESO has determined that connection of the Facility through the Proposed Transmission Development will not adversely impact the transmission system performance.¹³

2.6 Transmission Interdependencies – The Proposed Transmission Development is dependent on the completion of the approved system developments in the Blackie area.¹² Future AESO needs identification documents in the area will assume the Proposed Transmission Development will be in-service when the approved system developments in the Blackie area are in-service, unless new information indicates otherwise.

2.7 AESO Participant Involvement Program – The AESO directed AltaLink to assist the AESO in conducting a participant involvement program (PIP), in accordance with requirement NID14 and Appendix A2 of Commission Rule 007. Between June 2014 and February 2015, the TFO and the AESO used various methods to notify occupants, residents, landowners, government bodies, agencies and stakeholder groups (the

¹¹ The AESO’s *2012 Long-term Outlook* (LTO) was used as the basis for applicable load and generation forecasts in the connection assessment. The Proposed Transmission Development is located in the South region which is found in Section 6.3, Table 3 of the AESO’s *2012 LTO*. As part of its planning responsibilities, the AESO updates its corporate forecasts routinely to ensure they reflect the latest economic projections and other factors that may affect the forecasts. While the AESO has updated its regional forecasts since the connection studies were performed, the use of the current AESO forecasts (*2014 Long-term Outlook*) for the region would not materially alter the connection assessment results or affect its conclusions.

¹² Approval No. U2014-138, Stage II, paragraph 8.

¹³ The Connection Assessment is included as Appendix A.

Queenstown Power Plant Connection Needs Identification Document

stakeholders) of the need for the Proposed Transmission Development in the area where transmission facilities could be installed to address the identified need. The AESO also notified the public in the area where transmission facilities could be installed, of its intention to file this Application with the Alberta Utilities Commission. No concerns or objections have been raised regarding the need for the Proposed Transmission Development.¹⁴

2.8 Information Regarding Rule 007, Section 6.1 - NID13 – The AESO has been advised that the TFO’s Facility Proposal addresses the major aspects listed in Commission Rule 007, Section 6.1 – NID13.¹⁵ In consideration of that fact, and as the filing of the Application is combined with the TFO’s Facility Proposal, the AESO has not undertaken a separate assessment of the sort contemplated in Commission Rule 007, Section 6.1 – NID13.

2.9 Approval is in the Public Interest – Having regard to the following:

- the transmission planning duties of the AESO as described in Sections 29, 33 and 34 of the Act;
- the market participant’s System Access Service Request;
- the Connection Assessment;
- information obtained from the AESO PIP Activities; and
- the AESO’s long-term transmission system plans;

it is the conclusion of the AESO that the Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electricity. In consideration of these factors, the AESO submits that approval of the Application is in the public interest.

¹⁴ Further information regarding the AESO’s PIP for this Application is included in Appendix C.

¹⁵ Confirmation letter from AltaLink is included as Appendix D to this Application.

3 Request to Combine this Application with the Facility Proposal for Consideration in a Single Process

3.1 Pursuant to Subsection 35(1) of the Act, the AESO has directed the TFO to prepare a Facility Proposal to meet the need identified. The AESO understands that the TFO's Facility Proposal will be filed shortly.¹⁶ The AESO requests, and expects that the TFO will request, that this Application be combined with the Facility Proposal for consideration by the Commission in a single process. This request is consistent with Section 15.4 of the *Hydro and Electric Energy Act* and Section 6 of Commission Rule 007.

3.2 While it is believed that this Application and the Facility Proposal will be materially consistent, the AESO respectfully requests that in its consideration of both, the Commission be mindful of the fact that the documents have been prepared separately and for different purposes. The purpose of this Application is to obtain approval of the need for the identified transmission system developments and provide a preliminary description of the manner proposed to meet that need. In contrast, the Facility Proposal will contain more detailed engineering and designs for the Proposed Transmission Development and seek approval for the construction and operation of specific facilities.

¹⁶ The AESO understands that AltaLink intends to file a Facility Proposal relating to this Application to be titled *BowArk Queenstown Power Plant Connection*.

4 Relief Requested

4.1 The AESO submits that its assessment of the need to meet the market participant's request for transmission system access service is technically complete and that approval of the need for the Proposed Transmission Development is in the public interest.

4.2 For the reasons set out herein, and pursuant to Section 34 of the Act, the AESO requests that the Commission approve this Application, including issuing an approval of the need to connect the Proposed Transmission Development, as follows:

- A. Add a new 138 kV circuit between the market participant's proposed McGregor Lake 200S substation and the existing Queenstown 504S substation; and
- B. Modify, alter, add or remove equipment, including disconnect switches, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.

All of which is respectfully submitted this 27th day of February 2015.

Alberta Electric System Operator



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PART B – APPLICATION APPENDICES

The following appended documents support the Application (Part A).

APPENDIX A **Connection Assessment** – Appendix A contains the *Connection Engineering Study Report for AUC Application BowArk Energy Queenstown Power Plant* that assesses the transmission system performance prior to and following the connection of the Facility and the Proposed Transmission Development. As part of the AESO Connection Process, the market participant engaged a consultant to conduct the connection assessment (Study). The AESO defined the Study scope, and provided the system models and Study assumptions. The AESO also reviewed this report and its conclusions, and finds the Study acceptable for the purposes of assessing the impacts of the Facility connection and the Proposed Transmission Development on the transmission system.

APPENDIX B **TFO Capital Cost Estimates** – Appendix B contains detailed cost estimates corresponding to the Proposed Transmission Development. These estimates have been prepared by the TFO at the direction of the AESO. These estimates are prepared to an approximate accuracy level of +20%/-10%, which exceeds the accuracy required by Commission Rule 007, NID11.

APPENDIX C **AESO PIP** – Appendix C contains a summary of the PIP activities conducted regarding the need for the Proposed Transmission Development. Copies of the relevant materials distributed during the PIP are attached for reference.

APPENDIX D **Information Regarding Rule 007, Section 6.1 - NID13** – Appendix D contains a letter provided by the TFO confirming that the seven major aspects of Commission Rule 007, NID13 will be addressed within the TFO's Facility Proposal.

APPENDIX E **AESO Transmission Planning Criteria – Basis and Assumptions** – The AESO has recently revised the *Transmission Reliability Criteria, Part II Transmission System Planning Criteria*, Version 0, dated March 11, 2005 primarily to remove criteria that are now included in the Transmission Planning (TPL)

Queenstown Power Plant Connection Needs Identification Document

Standards.¹⁷ Appendix E contains the *Transmission Planning Criteria – Basis and Assumptions*, Version 1, which includes the applicable thermal and voltage limits in support of the TPL standards. Planning studies that are included in this Application meet all the performance requirements of the specified TPL standards (TPL-001-AB-0, TPL-002-AB-0, and specified contingencies associated with TPL-003-AB-0).

¹⁷ TPL Standards are included in the current Alberta Reliability Standards.

PART C – REFERENCES

- i. **AESO Planning Duties and Responsibilities** – Certain aspects of the AESO’s duties and responsibilities with respect to planning the transmission system are described in the Act. For example, Section 17, Subsections (g), (h), (i), and (j), describe the general planning duties of the AESO.¹⁸ Section 33 of the Act states that the AESO “must forecast the needs of Alberta and develop plans for the transmission system to provide efficient, reliable, and non-discriminatory system access service and the timely implementation of required transmission system expansions and enhancements.” Where, as in this case, the market participant (refer to note ii below) is requesting transmission system access service, the AESO must prepare and submit for Commission approval, as per Section 34(1)(c), a needs identification document that describes the need to respond to requests for system access service, including the assessments undertaken by the AESO regarding the manner proposed to address that need. Other aspects of the AESO’s transmission planning duties and responsibilities are set out in Sections 8, 10, and 11 of the *Transmission Regulation*.
- ii. **Duty to Provide Transmission System Access** – Section 29 of the Act states that the AESO “must provide system access service on the transmission system in a manner that gives all market participants wishing to exchange electric energy and ancillary services a reasonable opportunity to do so.”
- iii. **AESO Planning Criteria** – The AESO is required to plan a transmission system that satisfies applicable reliability standards. Transmission Planning (TPL) standards are included in the Alberta Reliability Standards, and are generally described at: <http://www.aeso.ca/rulesprocedures/17006.html>.¹⁹

In addition, the AESO’s *Transmission Planning Criteria – Basis and Assumptions* is included in Appendix E.
- iv. **AESO Connection Process** – For information purposes, the AESO Connection Process, which changes from time to time, is generally described at: <http://www.aeso.ca/connect>.²⁰
- v. **Application for Approval of the Need for Expansion or Enhancement of the Capability of the Transmission System** – This Application is directed solely to the question of the need for expansion or enhancement of the capability of the transmission system as more fully described in

¹⁸ The legislation and regulations refer to the Independent System Operator or ISO. "AESO" and "Alberta Electric System Operator" are the registered trade names of the Independent System Operator.

¹⁹ This link is provided for ease of reference and does not form part of this Application.

²⁰ This link is provided for ease of reference and does not form part of this Application.

Queenstown Power Plant Connection Needs Identification Document

the Act and the *Transmission Regulation*. This Application does not seek approval of those aspects of transmission development that are managed and executed separately from the needs identification document approval process. Other aspects of the AESO's responsibilities regarding transmission development are managed under the appropriate processes, including the ISO Rules, Alberta Reliability Standards and the ISO Tariff, which are also subject to specific regulatory approvals. While the Application or its supporting appendices may refer to other processes or information from time to time, the inclusion of this information is for context and reference only.

Furthermore, this Application is directed solely to the question of the need for expansion or enhancement of the capability of the transmission system. Any reference within the Application to market participants or other parties and/or the facilities they may own and operate or may wish to own and operate, does not constitute an application for approval of such facilities. The responsibility for seeking such regulatory or other approval remains the responsibility of the market participants or other parties.

- vi. **Directions to the TFO** – Pursuant to Subsection 35(1) of the Act, the AESO has directed the TFO, in whose service territory the need is located, to prepare a Facility Proposal to meet the need identified. The Facility Proposal is also submitted to the Commission for approval. The TFO has also been directed by the AESO under Section 39 of the Act to prepare a proposal to provide services to address the need for the Proposed Transmission Development. The AESO has also directed the TFO, pursuant to Section 39 of the Act and Section 14 of the *Transmission Regulation*, to assist in the preparation of the AESO's Application.
- vii. **Capital Cost Estimates** – The provision of capital costs estimates in the Application is for the purposes of relative comparison and context only. The AESO's responsibilities in respect of project cost reporting are described in the *Transmission Regulation*, including Section 25, and ISO Rule 9.1.