

In the Matter of the Need for the Cascade Power Plant Project 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 Regulations made thereunder, and *Alberta Utilities Commission Rule 007*

Application of the Alberta Electric System Operator for Approval of the
Cascade Power Plant Project Connection
Needs Identification Document

Date: June 26, 2020

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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 *Cascade Power Plant Project Connection Needs Identification Document* (Application). This application is submitted in accordance with AUC Rule 007, Section 6.2.2, *ISO Abbreviated Needs Identification Document Application Information Requirements for System Access Service Requests by Generators*.

1.2 Application Overview – Cascade Power Project Limited Partnership (market participant), has requested system access service to connect its approved Cascade Power Plant Project (the Facility)² to the transmission system in the Edson area (AESO Planning Area 29, Hinton/Edson). The Facility consists of two phases, which each include the addition of a 450 MW combined cycle generating unit. The Facility also includes a substation, designated as the Whisky Jack 1047S substation. The market participant expects both phases of the Facility to be commercially operational in Q2 2023.

The market participant's request includes a new Rate STS, *Supply Transmission Service*, contract capacity of 900 MW and a new Rate DTS, *Demand Transmission Service*, contract capacity of 11.5 MW in the Edson area. The market participant's request can be met by adding three 240 kV circuits to connect the Facility to the existing Bickerdike 39S substation and modifying the Bickerdike 39S substation (the Proposed Transmission Development, as further described in Section 2.2). The scheduled in-service date for the Proposed Transmission Development is March 25, 2022.

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 Regulations made thereunder, and Alberta Utilities Commission Rule 007 (AUC Rule 007).

² The *Cascade Power Plant Project* was originally approved by the Commission on October 8, 2019 in Decision 24081-D01-2019 and Power Plant Approval 24081-D02-2019.

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This Application describes the need to respond to the market participant's request for system access service, and the AESO's determination of the manner in which to respond to the request. Having followed the AESO Connection Process,³ the AESO has determined that the Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electric energy and ancillary services. The Proposed Transmission Development is consistent with the AESO's long-term plans for the Central Planning Region, which includes the Edson area. The AESO submits this Application to the Commission for approval in accordance with the AESO's responsibility to respond to requests for system access service, and having determined that transmission development is required and is in the public interest.^{4,5}

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

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

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.

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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 AESO, in consultation with the market participant and the TFO, has determined that the Proposed Transmission Development is the preferred option to provide the market participant with a reasonable opportunity to exchange electric energy and ancillary services. In accordance with Section 34 of the Act, the AESO has determined that the Proposed Transmission Development will result in an expansion or enhancement of the transmission system thereby establishing the need for this Application. The market participant has made the appropriate applications to the AESO to obtain transmission system access service.

Through the AESO Connection Process, the AESO, in consultation with the market participant and the TFO, has determined the Proposed Transmission Development and has assessed the impacts that the Proposed Transmission Development and the associated generation would have on the Alberta interconnected electric system. The AESO has issued directions to the TFO to prepare a transmission facility proposal⁷ (Facility Proposal) that corresponds with this Application.

2.2 Proposed Transmission Development – The Proposed Transmission Development involves connecting the Facility to the transmission system, and consists of the following elements:

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

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1. Add three 240 kV circuits, approximately 1 kilometer each in length, with a minimum normal rating of 514 MVA for each circuit, to connect the Facility to the existing Bickerdike 39S substation;⁸
2. Modify the Bickerdike 39S substation, including adding four 240 kV circuit breakers; and
3. Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.⁹

2.3 Proposed Transmission Development Cost Estimate – The AESO directed the TFO to prepare cost estimates for the Proposed Transmission Development, described in Section 2.2. The TFO estimated the cost of the Proposed Transmission Development to be approximately \$16 million.¹⁰ In accordance with the ISO tariff, the AESO has determined that all costs associated with the Proposed Transmission Development will be classified as participant-related.

2.4 Transmission Development Alternative – In addition to the proposed Transmission Development, the AESO, in consultation with the market participant and TFO, examined one other transmission development alternative to respond to the market participant's request for system access service:

⁸ The three 240 kV circuits will connect to the market participant's Whisky Jack 1047S substation, which is part of the Facility. The TFO has estimated that the 240 kV circuits will have a length of approximately 1 kilometer each. This is subject to change as routing and/or siting is finalized by the TFO.

⁹ 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. Line numbering and substation names provided here are for ease of reference and are subject to change as engineering and design progresses. Market participant facilities that may subsequently be connected to the Proposed Transmission Development are the responsibility of the market participant and are not included in the Application.

¹⁰ The cost is in nominal dollars using a base year of 2022 with escalation considered. Further details of this cost estimate, which has an accuracy level of +20%/-10%, can be found in Appendix B.

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Connection to the existing Bikerdike 39S substation with two 240 kV circuits – This alternative involves the addition of two 240 kV circuits, approximately 1 kilometer each in length, to connect the Facility to the Bikerdike 39S substation. This alternative also involves modifying the Bickerdike 39S substation including the addition of three 240 kV circuit breakers. This alternative was ruled out due to technical performance issues during certain Category C conditions.

The Proposed Transmission Development was selected as the preferred transmission alternative and forms the basis for the cost estimates and the connection assessment described herein.

2.5 Connection Assessment – Power flow, transient stability, and short-circuit studies were conducted to assess the impact that the Proposed Transmission Development and the associated generation would have on the transmission system. Power flow and short-circuit studies were conducted prior to and following connection of the Proposed Transmission Development, and transient stability studies were performed following connection of the Proposed Transmission Development.¹¹

The pre-connection assessment identified a system performance issue. Under certain Category B conditions, a thermal criteria violation was observed. The pre-connection system performance issues can be managed using real-time operational practices.

The post-connection assessment identified several system performance issues. Thermal criteria violations were observed under the Category A condition and under certain Category B conditions.

The probability of Category A thermal criteria violations materializing is highly dependent upon the production profile of the Facility, which will be merit order driven in the competitive energy market. The connection assessment uses credible worst case conditions to assess the impact of the Facility connection on the Alberta interconnected

¹¹ The connection assessment is included as Appendix A.

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electric system. These credible worst case load and generation forecast conditions will have a low probability of occurring.

Should Category A thermal criteria violations materialize, the AESO will use operational procedures or other mitigation measures, to reduce the thermal criteria violations to acceptable levels, which may include the application of Section 302.1 of the ISO rules, *Real Time Transmission Constraint Management* (TCM Rule). If the AESO determines in the future that congestion is reasonably anticipated to arise, the AESO will make an application to the Commission to obtain approval for an exception under Section 15(2) of the *Transmission Regulation* and include the AESO's mitigation plan within the application. The AESO will notify market participants if and when the AESO determines that it is necessary to apply to the Commission for approval of such an exception.

Under Category B conditions, the following mitigation measures can be used, alone or in combination, to mitigate the post-connection system performance issues:

- new remedial action scheme (RAS) for 890L;
- new RAS for 202L;
- new RAS for 740L;
- new RAS for 720L;
- new RAS for Bickerdike 39S substation transformer T1 or T2; and
- real-time operational practices.

2.6 Transmission Dependencies – The Proposed Transmission Development is dependent on restoration of the thermal ratings for the 138 kV transmission line 720L and the 144 kV transmission line 7L199. The TFO, in discussion with the Market Participant, has committed to restoring the 720L thermal rating prior to the in-service date of the Proposed Transmission Development. The 7L199 restoration is part of a planned ATCO Electric Ltd. (ATCO) capital maintenance program. ATCO has advised that the 7L199 restoration will be completed prior to the in-service date of the Proposed Transmission Development. The restoration of both the 138 kV transmission line 720L

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and the 144 kV transmission line 7L199 are outside the scope of the Proposed Transmission Development.

2.7 AESO Participant Involvement Program – The AESO directed the TFO to assist the AESO in conducting the AESO’s participant involvement program (PIP). Between December 2019 and May 2020, the TFO and the AESO used various methods to notify stakeholders about the need for development and the AESO’s preferred option to respond to the system access service request. This included a notification to market participants that may be affected by the Proposed Transmission Development. The AESO has responded to the questions and concerns raised by one of the notified market participants. No other questions or concerns have been raised by the other notified market participants.

Apart from the inquiry above, there are no outstanding concerns or objections regarding the need for the Proposed Transmission Development or the AESO’s preferred option to respond to the system access service request. In May 2020, the AESO notified stakeholders of its intention to file this Application with the Commission.¹²

2.8 Environmental and Land Use Effects – The AESO has been advised that the TFO’s Facility Proposal addresses the environmental and land use effects requirements of AUC Rule 007, Section 6.2.2, NID23(3).¹³ In consideration of this 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 kind contemplated in AUC Rule 007, Section 6.2.2, NID23(3).

2.9 Confirmation Date – In the event that the Proposed Transmission Development is not in service by March 25, 2022, which is the scheduled in-service date, the AESO will inform the Commission in writing if the need to expand or enhance the transmission system described in this Application continues, and if the technical solution described in

¹² Further information regarding the AESO’s PIP for this Application is included in Appendix C.

¹³ Please refer to the letter included as Appendix D of this Application.

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this Application continues to be the AESO's preferred technical solution. In addition, in the event that the AESO believes that the in-service date will not be met, and such delay will have a material impact on this Application, the AESO will advise the Commission of the same.

The AESO has been advised that the TFO's Facility Proposal addresses the requirements of AUC Rule 007, Section 6.2.2, NID25(2).¹⁴ In consideration of this fact, and as the filing of this Application is combined with the TFO's Facility Proposal, the AESO has not undertaken an implementation schedule of the sort contemplated in AUC Rule 007, Section 6.2.2, NID25(2).

2.10 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 request for system access service and the AESO's assessment thereof;
- the AESO's connection assessment;
- the TFO's cost estimate for the Proposed Transmission Development;
- the TFO's confirmation that it has addressed AUC Rule 007, Section 6.2.2, NID23(3);
- information obtained from 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 electric energy and ancillary services. In consideration of these factors, the AESO submits that approval of this Application is in the public interest.

¹⁴ *Ibid*

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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 corresponding to this Application. The AESO understands that the TFO's Facility Proposal will be filed shortly.¹⁵ The AESO requests, and expects 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 *Hydro and Electric Energy Act* and Section 6 of AUC 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 each, 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 to respond to the market participant's request for system access service and provide a preliminary description of the manner proposed to meet that need, having regard for the AESO's determination that the Proposed Transmission Development is required to provide the market participant with a reasonable opportunity to exchange electric energy and ancillary services. 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.

¹⁵ The AESO understands that the TFO intends to file a Facility Proposal relating to this Application to be titled *Cascade Combined Cycle Connection*.

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4 Relief Requested

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

4.2 In the event that the Proposed Transmission Development is not in service by March 25, 2022, which is the scheduled in-service date, the AESO will inform the Commission in writing if the need to expand or enhance the transmission system described in this Application continues, and if the technical solution described in this Application continues to be the AESO's preferred technical solution.

4.3 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 respond to the market participant's request for system access service, and to connect the Facility to the transmission system, by means of the following transmission development:

- A. Add three 240 kV circuits to connect the Facility to the existing Bickerdike 39S substation;
- B. Modify the Bickerdike 39S substation, including adding four 240 kV circuit breakers; and
- C. Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices required to undertake the work as planned and ensure proper integration with the transmission system.

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All of which is respectfully submitted this 26th day of June, 2020.

Alberta Electric System Operator

“Electronically Submitted by”

Robert Davidson, P.Eng.
Director, Customer Grid Access

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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 AESO *Engineering Connection Assessment – Cascade Power Plant Project Connection* that assesses the transmission system performance prior to and following the connection of the Proposed Transmission Development.

APPENDIX B **TFO Capital Cost Estimate** – Appendix B contains a detailed cost estimate corresponding to the Proposed Transmission Development. This estimate has been prepared by the TFO. The cost estimate has an accuracy level which meets the accuracy required by AUC Rule 007, NID24.

APPENDIX C **AESO PIP** – Appendix C contains a summary of the PIP activities conducted, in accordance with requirements of NID27 and Appendix A2 of AUC Rule 007, regarding the need to respond to the market participant’s request for system access service. Copies of the relevant materials distributed during the PIP are attached for reference.

APPENDIX D **TFO Information Regarding AUC Rule 007, Section 6.2.2, NID23(3) and NID25(2)** – Appendix D contains a letter provided by the TFO confirming that the requirements of AUC Rule 007, NID23(3) and NID25(2) will be addressed within the TFO’s Facility Proposal.

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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.¹⁶ 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 system access service, and the AESO has determined that the request requires or may require the expansion or enhancement of the capability of the transmission system, 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, 11, and 15 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 [Cascade Power Project Limited Partnership in this case] wishing to exchange electric energy and ancillary services a reasonable opportunity to do so.”
- iii. **AESO Transmission Planning Criteria** – In accordance with the Act, 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 on the AESO website.

In addition, the AESO’s *Transmission Planning Criteria – Basis and Assumptions* is included in Appendix A.
- iv. **AESO Connection Process** – For information purposes, the AESO Connection Process, which changes from time to time, is generally described on the AESO website.
- v. **Application for Approval of the Need to Respond to a Request for System Access Service** – This Application is directed solely to the question of the need to respond to a request for system access service, as more fully described in the Act and the *Transmission Regulation*,

¹⁶ 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.

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and the AESO's determination of the manner in which to respond to the request. 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.

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 territories 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 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. The TFO has also been directed by the AESO under Section 39 of the Act to prepare a service proposal to address the need for the Proposed Transmission Development.
- vii. **Capital Cost Estimates** – The provision of capital costs estimates in the Application is for the purposes of relative comparison and context only. The requirements applicable to cost estimates that are used for transmission system planning purposes are set out in Section 25 of the *Transmission Regulation*, AUC Rule 007, and Section 504.5 of the ISO rules, *Service Proposals and Cost Estimating*.