June 11, 2015

Wade Vienneau
Executive Director - Facilities
Alberta Utilities Commission
Fifth Avenue Place
4th Floor, 425 - 1 Street SW
Calgary, AB T2P 3L8

Dear Mr. Vienneau:

Re: Application of the Alberta Electric System Operator for Approval of the Boreal 193S Substation Connection Needs Identification Document

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Please find enclosed the Alberta Electric System Operator (AESO) application for approval of the Needs Identification Document (NID) for the proposed Boreal 193S Substation Connection pursuant to Section 34 of the *Electric Utilities Act.*

The AESO understands that AltaLink Management Ltd. will file the related facilities application shortly. The AESO requests that the Commission combine the NID and the facilities application and consider them together pursuant to Section 154 of the *Hydro and Electric Energy Act.*

Please do not hesitate to contact the below if you have questions or concerns regarding the foregoing:

Brenda Hill
Regulatory Coordinator
need.applications@aeso.ca
403-539-2950

Sincerely,

Warren Clendining
Manager, Regulatory

Alberta Utilities Commission

In the Matter of the Need for the Boreal 193S Substation 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 Boreal 193S Substation 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 *Boreal 193S Substation Connection Needs Identification Document* (Application).

1.2 Application Overview – Cenovus FCCL Ltd. (Cenovus), having obtained necessary approvals under Section 101(2) of the Act, has requested transmission system access service to connect its proposed Boreal 193S substation, with its associated 35 MW load, to the 240 kV transmission system in the Christina Lake subarea 61 (within the AESO Planning Area 25, Fort McMurray). Cenovus's request can be met by constructing a new 240 kV transmission line connecting the proposed Boreal 193S substation to the existing 240 kV transmission line 971L ("Proposed Transmission Development", as further described in Section 2.2). The requested in-service date for the Proposed Transmission Development is mid-2017.

This Application describes the need to respond to Cenovus's request for system access service. Having followed the AESO Connection Process,[2] the AESO has determined that the Proposed Transmission Development provides a reasonable opportunity for the market participant to exchange electricity. The Proposed Transmission Development is aligned with the AESO's long-term plan for the Fort McMurray area. The AESO, in accordance with its responsibility to respond to requests for system access service, submits this Application to the Commission for approval.[3,4]

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

[3] 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.

[4] Note v of Part C of this Application describes the Application scope in more detail.

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.[5]

[5] 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 (in this case Cenovus) a reasonable opportunity to exchange electric energy and ancillary services.

FortisAlberta Inc., as the legal owner of the distribution facilities (DFO) in the area and in executing its duties as defined under Section 105(1)(b) of the Act, has granted approval pursuant to Section 101(2) of the Act for Cenovus to enter into an arrangement directly with the AESO for the provision of system access service.

Cenovus has applied to the AESO to obtain transmission system access service to connect its proposed Boreal 193S substation to the transmission system.

Through the AESO Connection Process, the AESO, Cenovus and the TFO have collaborated to determine the characteristics of the Proposed Transmission Development and assess the impacts of connecting the Proposed Transmission Development to the transmission system. The AESO has issued directions to the TFO to prepare a Facility Proposal[6] to meet Cenovus's identified need.

2.2 Proposed Transmission Development – The Proposed Transmission Development includes the following major elements: [7]

1. Add one new 240 kV transmission circuit, with an approximate summer/winter rating of 560/740 MVA, to connect the proposed Boreal 193S substation to the existing 240 kV transmission line 971L using a T-tap configuration; and

[6] Also referred to as facility application, or FA, under Commission Rule 007.

[7] 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 240 kV circuit is currently estimated to have a length of approximately 12 kilometres. This is subject to change as routing and/or siting is finalized by the TFO.

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.

2.3 Proposed Transmission Development Cost Estimates – The AESO directed the TFO to prepare a cost estimate for the Proposed Transmission Development. The TFO estimated the in-service cost of the Proposed Transmission Development, described in Section 2.2, to be approximately $34 million ($2017).[8] In accordance with the ISO Tariff, the AESO has determined that there are no system-related costs associated with the Proposed Transmission Development.

2.4 Transmission Development Alternatives – In addition to the Proposed Transmission Development, three other transmission alternatives were identified and ruled out.

1. Radially connect the proposed Boreal 193S to the Black Spruce 154S switching substation – this alternative would add approximately 22 km of new 240 kV transmission line and would modify the Black Spruce 154S substation. This alternative was ruled out by Cenovus as it would require materially more transmission facilities at a higher cost as compared to the Proposed Transmission Development, and as it would conflict with future industrial developments and existing pipeline rights-of-way.
2. Radially connect the proposed Boreal 193S to the Leismer 72S substation – this alternative would add approximately 17 km of new 240 kV transmission line and would modify the Leismer 72S substation. This alternative was ruled out by Cenovus as difficulties with routing would require materially more transmission facilities at a higher cost as compared to the Proposed Transmission Development, and as this could impact the in-service date.

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

3. Radially connect the proposed Boreal 193S to the Kettle River 2049S substation – this alternative would add approximately 21 km of new 240 kV transmission line and would modify the Kettle River 2049S substation. This alternative was ruled out by Cenovus as it would require materially more transmission facilities at a higher cost as compared to the Proposed Transmission Development.

The Proposed Transmission Development, selected since it has materially less transmission facilities and therefore a lower cost and since routing would be easier, forms the basis of the cost estimates and the Connection Assessment described herein.[9]

2.5 Connection Assessment – Power flow, voltage stability and short circuit analyses were conducted to assess the impact that the Proposed Transmission Development and its associated load would have on the transmission system.[10] Power flow analysis was conducted prior to and following connection of the Proposed Transmission Development for 2015 summer peak (SP) and 2015 winter peak (WP). Voltage stability analysis was conducted prior to and following connection of the Proposed Transmission Development for 2015 WP. Short circuit analyses were conducted prior to and following the Proposed Transmission Development for 2017 WP, 2020 WP, and 2025 WP.

Load and generation assumptions used in the analyses align with the AESO *2012 Long-term Outlook Update* (2012LTOU) corporate forecast. While the AESO has since updated its corporate forecast in the *2014 Long-term Outlook*, the updated forecast would not materially alter the connection assessment results or conclusions.

A number of overloads were identified in the pre-connection scenarios. All of these overloads however, were on behind the fence (BTF) facilities and none of these overloads were worsened following the Proposed Transmission Development and its associated load.

[9] Details of the connection alternatives are included in Appendix A.

[10] The Connection Assessment is included as Appendix A.

No voltage violations were identified prior to or following connection of the Proposed Transmission Development.

These analyses indicate that the Proposed Transmission Development will not adversely impact transmission system performance.

2.6 Transmission Interdependencies – The Proposed Transmission Development is dependent upon energization of the Christina Lake Area Transmission Development.[11] Future AESO needs identification documents in the Fort McMurray area will assume the Proposed Transmission Development will be in-service for the date specified, unless new information indicates otherwise.

2.7 AESO Participant Involvement Program – The AESO directed the TFO to assist the AESO in conducting a participant involvement program (PIP), in accordance with requirement NID14 and Appendix A2 of Commission Rule 007. Between July 2014 and May 2015, the TFO and the AESO used various methods to notify occupants, residents, landowners, government bodies, agencies and stakeholder groups (the 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 notified the public in the area where transmission facilities could be installed, of its intention to file this Application with the Commission. No concerns or objections have been raised regarding the need for the Proposed Transmission Development.[12]

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.[13] 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.

[11] The Christina Lake Area Transmission Development NID was approved by the AUC in Decision 2012-112 and Approval U2012-195.

[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.

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 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 this Application is in the public interest.

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.[14] 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 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 to respond to the Cenovus's request for system access service 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.

[14] The AESO understands that AltaLink intends to file a Facility Proposal relating to this Application to be titled *Boreal 193S Substation 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.

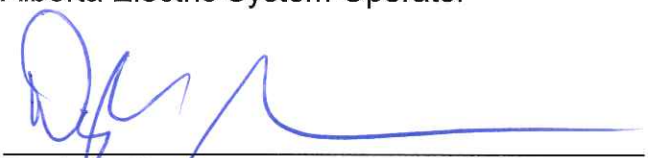
4.2 For the reasons set out herein, and pursuant to Section 34 of the Act, the AESO requests that the Commission approve this Application, including issuing an approval of the need to connect the Proposed Transmission Development, as follows:

A. Add one new 240 kV transmission circuit to connect the proposed Boreal 193S substation to the existing 240 kV transmission line 971L using a T-tap configuration; 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 11th day of June, 2015.

Alberta Electric System Operator



Doyle Sullivan, P. Eng.
Director, Regulatory

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 – Project 1404 – Cenovus Narrows Lake Substation Connection Project* that assesses the transmission system performance prior to and following the connection of the Proposed Transmission Development. As part of the AESO Connection Process, Cenovus 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 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, 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 needto 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 **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)

Standards.[15] 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).

[15] 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.[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 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, 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.[17]

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[18]

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

[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.

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

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

access service, as more fully described in 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**.**

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 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. **Duties of owner of electric distribution systems –** The duties of DFOs to make decisions about building, upgrading and improving their electric distribution systems are described in Section 105(1)(b) of the Act. The DFO, being responsible for electric distribution system planning, determines its need for transmission system access service based on its own distribution planning guidelines and criteria. While the DFO's plans are considered during the AESO Connection Process, the AESO, in executing its duties to plan the transmission system, does not oversee electric distribution planning or the development of specific DFO planning criteria. The AESO does, however, seek to ensure that DFO load growth forecasts used in the Connection Process are consistent with AESO load growth forecasts as described in Part A of this Application.

viii. **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.