

Alberta Utilities Commission

**In the Matter of the Need for Modifications to the Sunnybrook
and Livock Substations**

**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 Needs Identification Document for the
Sunnybrook and Livock Substation Modifications**

PART A - APPLICATION

1 Introduction

1.1 Application – Pursuant to section 34 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 *Sunnybrook and Livock Substation Modifications Needs Identification Document* (Application), as more specifically described herein.

1.2 Application Overview – This Application describes the need for substation modifications at the existing Sunnybrook 510S 500 kV substation (Sunnybrook Substation) and the existing Livock 939S 240 kV substation (Livock 240 kV Substation) to facilitate integration of the Fort McMurray West 500 kV Transmission Project (FMM West 500 kV Project), into the Alberta interconnected electric system (AIES) (collectively, the Sunnybrook and Livock Substation Modifications).

The FMM West 500 kV Project consists principally of two 500 kV line segments: (i) a segment between the Sunnybrook Substation and the future Livock 939S 500 kV switchyard (the Southern Line Segment); and (ii) a segment between the Livock 939S 500 kV Switchyard and the future Thickwood Hills substation. The facilities included in the FMM West 500 kV Project have been designated as “critical transmission infrastructure” (CTI) by the Government of Alberta.²

The Sunnybrook and Livock Substation Modifications are to existing transmission facilities and are to be performed by the legal owners of the impacted existing transmission facilities (TFOs). These modifications are described in greater detail in section 4.1 of this Application.

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 FMM West 500 kV Project is described in section 4(a) and (b) of the Schedule to the Act.

1.3 AESO Directions – In the process of identifying the need for the Sunnybrook and Livock Substation Modifications and preparing this Application, the AESO issued various directions to AltaLink Management Ltd. (AltaLink) and ATCO Electric Ltd. (ATCO), who are the TFOs in the applicable service areas. These directions included, pursuant to section 39 of the Act and section 14 of the *Transmission Regulation*, directions to assist the AESO in preparing this Application.³

³ The directions are described in more detail in the following sections of this Application and in Part C, note iv.

2 Need for the Sunnybrook and Livock Substation Modifications

The Sunnybrook and Livock Substation Modifications are needed to complete the integration, and thereby enable the reliable operation, of the FMM West 500 kV Project as part of the AIES. The modifications are minor in nature and are confined to existing facilities and property owned by ATCO or AltaLink. The modifications at the Sunnybrook Substation (owned by AltaLink) are needed to terminate the Southern Line Segment into the 500 kV Sunnybrook Substation. The modifications at the Livock 240 kV Substation (owned by ATCO) are needed to enable the provision of AC station service to the Livock 500 kV Switchyard. Related system modifications to existing telecommunication facilities, protections and controls are also needed to facilitate the safe and reliable operation of the FMM West 500 kV Project.

3 Process for Approval of the Sunnybrook and Livock Substation Modifications

The AESO is responsible for determining when an expansion or enhancement to the capability of the transmission system is needed and, subject to certain exceptions, for submitting a needs identification document (NID) to the Commission for approval of the identified need.⁴ At the time of preparing, after submitting, or following approval of a NID, the AESO may also direct the TFO for the applicable service area (i.e., the incumbent TFO) to submit, for Commission approval under the *Hydro and Electric Energy Act*, an application for the construction and operation of transmission facilities to meet the identified need.⁵

An exception to the foregoing standard approval process exists for transmission facilities such as those addressed by the FMM West 500 kV Project that have been designated as CTI.⁶ CTI consists of facilities that are specifically described in the Schedule to the Act⁷ and for which the AESO is not required to submit a NID for approval by the Commission, as the need for the CTI has already been approved by the Government of Alberta. Further, for certain CTI projects, including the FMM West 500 kV Project, the AESO must develop a competitive process to determine who is eligible to apply for the construction and operation of CTI (Competitive Process).⁸

In late 2014, pursuant to a competitive process approved by the Commission,⁹ Alberta PowerLine Limited Partnership (APL) was awarded a contract to apply for the construction and operation of the FMM West 500 kV Project. Notably, the scope of APL's contract necessarily excludes work or modifications that must be carried out to

⁴ Section 34 of the Act.

⁵ Section 35 of the Act.

⁶ Section 1(1)(f.1) of the Act.

⁷ *Ibid.*

⁸ Section 24.2(2) of the *Transmission Regulation*.

⁹ Commission Decision 2013-044: *Alberta Electric System Operator, Competitive Process Pursuant to Section 24.2(2) of the Transmission Regulation Part B: Final Determination*, issued February 14, 2013.

existing facilities that are owned by the incumbent TFOs in their respective service areas. Accordingly, the need for the Sunnybrook and Livock Modifications is being addressed by way of this Application.

Subject to the Commission's approval of this Application, the AESO intends to direct ATCO and AltaLink to apply to the Commission for approval to construct and operate the Sunnybrook and Livock Substation Modifications in their respective service areas. The AESO intends to direct AltaLink and ATCO to submit their respective facility proposals for the Sunnybrook and Livock Substation Modifications on or about the same time that APL will submit its facility proposal for the FMM West 500 kV Project. As such, the Commission will have the opportunity to combine and consider the facility proposals for the Sunnybrook and Livock Substation Modifications and the FMM West 500 kV Project in the same proceeding.

4 Sunnybrook and Livock Substation Modifications

This section describes the Sunnybrook and Livock Substation Modifications that are required to meet the need described in section 2 above. The AESO did not identify any alternatives to the Sunnybrook and Livock Substation Modifications to meet the need described in section 2 above.

4.1 Sunnybrook and Livock Substation Modifications¹⁰

Sunnybrook substation

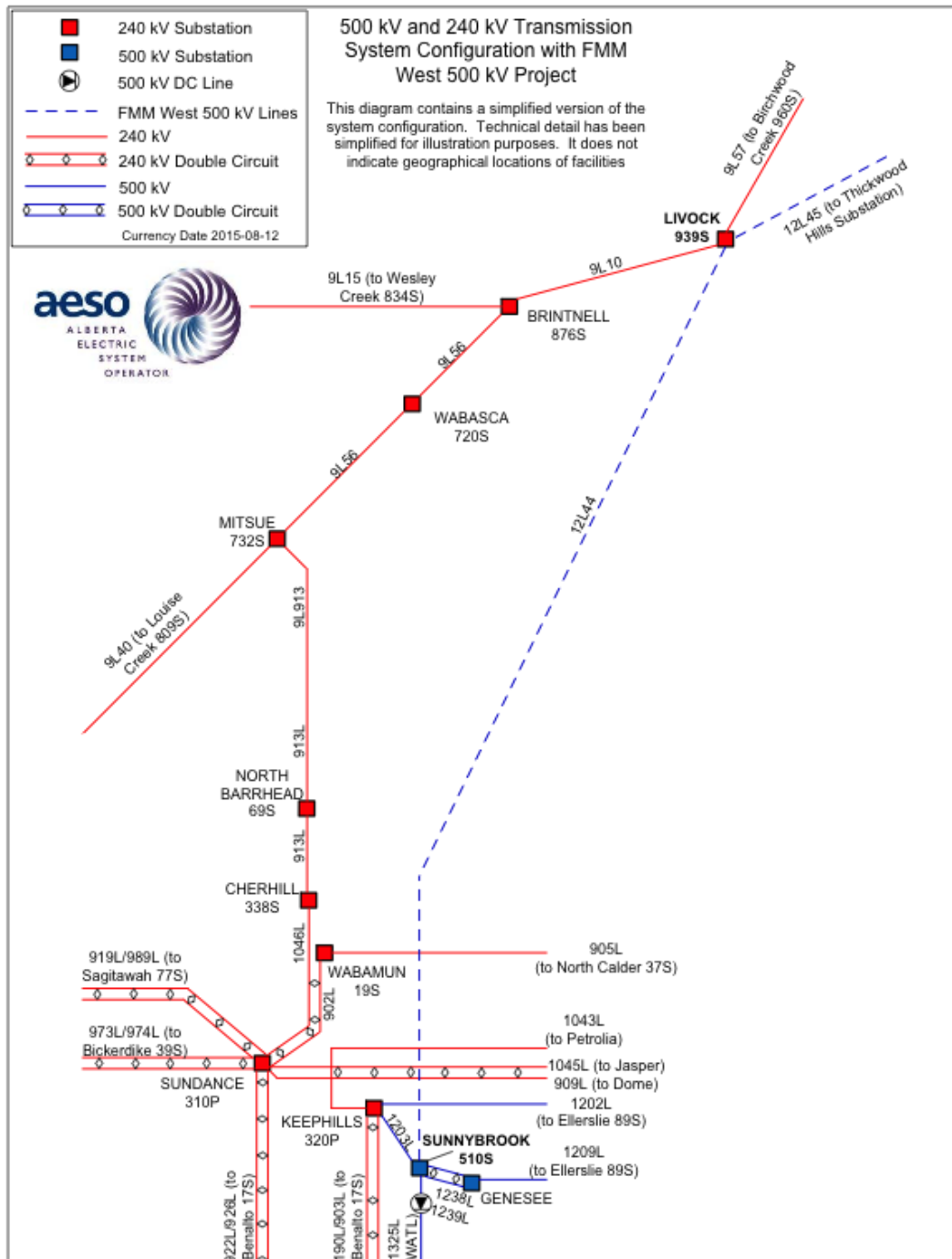
- a) Add a 500 kV circuit breaker, a 500 kV line shunt reactor and associated neutral reactor such that the Southern Line Segment can be reliably terminated at the Sunnybrook Substation.
- b) Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices at existing transmission facilities, as required, to integrate and reliably operate the FMM West 500 kV Project.

Livock 240 kV substation

- a) Modify the Livock 240 kV Substation as necessary to enable AC station service for the Livock 939S 500 kV Switchyard to be supplied from the Livock 240 kV Substation.
- b) Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices at existing transmission facilities, as required, to integrate and reliably operate the FMM West 500 kV Project.

¹⁰ Equipment ratings are approximated to the accuracy level required by the AESO for transmission planning purposes. Actual ratings of constructed facilities may vary. The AESO's functional specification will identify the components of the preferred development in greater detail, ensuring that the TFO applies for approval of facilities that are functionally consistent with the approved need for transmission development. Also, line numbering and substation names provided here are for ease of reference and are subject to change as engineering and design progresses.

The following system configuration diagram shows the Sunnybrook Substation and the Livock 240 kV Substation.



4.2 Timing of the Sunnybrook and Livock Substation Modifications

The AESO will direct the incumbent TFOs to coordinate the in-service date of the Sunnybrook and Livock Substation Modifications to facilitate the commissioning, testing and integration of the FMM West 500 kV Project. It is currently anticipated that commissioning of the FMM West 500 kV Project and the Sunnybrook and Livock Substation Modifications will begin around December 2018. The target in-service date of the FMM West 500 kV Project is June 2019.

Should the target in-service date for the FMM West 500 kV Project be changed, the AESO will adjust the in-service date for the Sunnybrook and Livock Substation Modifications accordingly.

4.3 Sunnybrook and Livock Substation Modifications Costs – The AESO directed the incumbent TFOs to prepare cost estimates for the Sunnybrook and Livock Substation Modifications as applicable in their respective service areas. AltaLink has estimated the capital cost of the transmission modifications at the Sunnybrook Substation to be in the order of \$40 million (+/-30%, \$2019). AltaLink's cost estimate assumes that its scope of work will be completed in 2019 commensurate with commissioning activities carried out by APL. Accordingly, AltaLink's cost estimates include escalation to 2019. ATCO has estimated the capital cost of the transmission modifications at the Livock 240 kV Substation to be in the order of \$3 million (+/-30%, \$2018).¹¹ ATCO's cost estimate assumes its scope of work will be materially complete in 2018 to enable commissioning of the FMM West 500 kV Project to begin by December 1, 2018, and includes escalation to that date. In accordance with the ISO tariff, the AESO has determined that these estimated costs are all system-related costs.

4.4 Participant Involvement Program – The AESO conducted a participant involvement program (PIP) in accordance with NID14 and Appendix A2 of Commission

¹¹ Further details of the cost estimates can be found in Appendix A, with an approximate accuracy level of $\pm 30\%$. Cost estimates with a more refined accuracy level will be provided with the TFOs' respective facility proposals.

Rule 007. As outlined in further detail in Appendix B to this Application, the AESO notified occupants, residents, landowners, government bodies, agencies and stakeholder groups of the need for transmission development in the area where transmission facilities could be installed to implement the Sunnybrook and Livock Substation Modifications. Additionally, the AESO notified the public, in the area where transmission facilities could be installed to address the identified need, of its intention to file this Application with the Commission for approval. To date, no concerns or objections have been raised regarding the need for the Sunnybrook and Livock Substation Modifications.¹²

4.5 Information Regarding Rule 007, Section 6.1 - NID13 – The AESO has been advised by AltaLink and ATCO that their related facility proposals will address the major aspects listed in Commission Rule 007, section 6.1 - NID13.¹³ AltaLink and ATCO have determined that the incremental impacts of the Sunnybrook and Livock Substation Modifications are expected to be minor in nature and limited to, or related to, modifications to existing infrastructure on the incumbent TFOs' existing property. In consideration of these facts, the AESO has not undertaken a separate assessment of the sort contemplated in Commission Rule 007, section 6.1 - NID13.

4.6 Transmission Interdependencies and Risks – The connection and integration of the FMM West 500 kV Project into the AIES depends on the Sunnybrook and Livock Substation Modifications. Accordingly, delays to the in-service dates of the Sunnybrook and Livock Substation Modifications could impact the integration of the FMM West 500 kV Project. The Sunnybrook and Livock Substation Modifications are also related to recently approved transmission developments in the Thickwood Hills area.¹⁴ The AESO does not intend to file any additional needs identification documents related to the

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

¹³ Please refer to the letters included as Appendix C of this Application. It is noted that the East Bay option referred to in AltaLink's letter has since been ruled-out as a termination option.

¹⁴ The *Thickwood Hills 240 kV Transmission Development Needs Identification Document* was originally approved by the Commission in Decision 3588-D01-2015 and Approval 3588-D02-2015, issued March 12, 2015.

integration of the FMM West 500 kV Project. The Sunnybrook and Livock Substation Modifications are consistent with the AESO's regional plans for the Northeast and Edmonton planning regions.

5 Relief requested

5.1 The AESO submits that its assessment of the need for the Sunnybrook and Livock Substation Modifications is technically complete and that the manner proposed to meet the identified need is consistent with AESO long-term forecasts, transmission system plans, and the need to plan the transmission system to provide efficient, reliable and non-discriminatory system access service and the timely implementation of required transmission system modifications. As a result of the AESO's consideration of these factors, the AESO submits that approval of this Application is in the public interest.

5.2 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 for the Sunnybrook and Livock Substation Modifications, comprised of the following:

Sunnybrook substation:

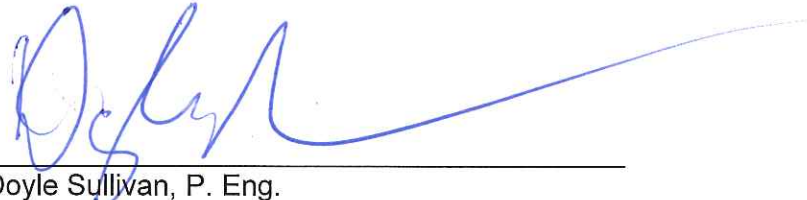
- a) Add a 500 kV circuit breaker, a 500 kV line shunt reactor and associated neutral reactor.
- b) Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices at existing transmission facilities, as required, to integrate and reliably operate the FMM West 500 kV Project;

Livock 240 kV substation:

- a) Modify the existing Livock 240 kV Substation as necessary to enable AC station service for the Livock 939S 500 kV Switchyard to be supplied from the Livock 240 kV Substation.
- b) Modify, alter, add or remove equipment, including switchgear, and any operational, protection, control and telecommunication devices at existing transmission facilities, as required, to integrate and reliably operate the FMM West 500 kV Project.

All of which is respectfully submitted this 13th day of August 2015.

Alberta Electric System Operator

A handwritten signature in blue ink, appearing to read 'Doyle Sullivan', is written over a horizontal line.

Doyle Sullivan, P. Eng.
Director, Regulatory Transmission

PART B – APPLICATION APPENDICES

The following appended documents support the Application (Part A). The appendices include work undertaken by the AESO, and the TFOs, under the AESO's direction, to support this Application.

APPENDIX A **AESO Capital Cost Estimates** – Appendix A contains detailed capital cost estimates referred to in this Application. These estimates were prepared by the incumbent TFOs at the direction of the AESO, and correspond to the scope of work for the Sunnybrook and Livock Substation Modifications. The accuracy level is estimated to be approximately $\pm 30\%$, which meets the requirements of Commission Rule 007, section 6.1 - NID11. In accordance with the ISO tariff, the AESO has determined that the estimated costs are all system-related costs.

APPENDIX B **AESO Participant Involvement Program (PIP)** – Appendix B provides a summary of the AESO's PIP activities conducted regarding the need for the transmission developments described in this Application. Copies of the relevant materials distributed during the PIP are attached for reference.

APPENDIX C **Information Regarding Rule 007, Section 6.1 - NID13** – Appendix C provides letters from the incumbent TFOs addressing the major aspects of Commission Rule 007, section 6.1 - NID13 in the incumbent TFOs' respective service areas. The letters were requested by the AESO to confirm (i) that the incremental impacts of the substation modifications are expected to be minor in nature, and limited to modifications to existing infrastructure on the incumbent TFOs' existing property; and (ii) that the incumbent TFOs' facility proposals would consider the factors contemplated in AUC Rule 007, section 6.1 - NID13.

PART C – REFERENCES

- i. **AESO Duties to Plan the Transmission System and Make Arrangements for Expansions and Enhancements to the Transmission System** – Certain aspects of AESO 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.¹⁵ 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”. 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 wishing to exchange electric energy and ancillary services a reasonable opportunity to do so”.
- iii. **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 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 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 such other processes or information from time to time, the inclusion of such 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 is not intended to constitute an application for approval of such facilities, and the responsibility for seeking such regulatory or other approval remains the responsibility of such market participants or other parties.

¹⁵ 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.

- iv. **Directions to the TFO** – The AESO has directed the TFOs, pursuant to section 39 of the Act and section 14 of the *Transmission Regulation*, to assist in the preparation of the AESO's Application and, under section 39 of the Act, to prepare a proposal to provide services to address the need for the Sunnybrook and Livock Substation Modifications.
- v. **Capital Cost Estimates** – Capital cost estimates provided in the Application are used by the AESO for the sole purpose of comparing and considering transmission development alternatives. Where only a single transmission development alternative has been studied, capital cost estimates are provided for context. Project costs will be determined by the TFOs as part of their facility proposals. The AESO's responsibilities with respect to project cost reporting are described in the *Transmission Regulation*, including section 25, and ISO Rule 9.1.

APPENDIX A CAPITAL COST ESTIMATES

Project Name & No.	Sunnybrook & Livock Interconnection with P1655				TRANSMISSION PROJECT ESTIMATE SUMMARY - WEST OPTION
Prepared by:	AltaLink				
AACE Class: (future use)	N/A	Estimate Basis	NID		
High Range	30%	Low Range	-30%		
Date of Estimate:	May 22, 2015	Base Year Used	2015		
	SYSTEM	CUSTOMER	TOTAL		ASSUMPTIONS
TRANSMISSION LINE					
Material	\$ 43,523	\$ 0	\$ 43,523		
Labour	\$ 208,000	\$ -	\$ 208,000		
Supply & Install	\$ -	\$ -	\$ -		
TOTAL TRANSMISSION LINE	\$ 251,523	\$ 0	\$ 251,523		
SUBSTATION					
Material	\$ 12,020,714	\$ -	\$ 12,020,714		
Labour	\$ 8,113,574	\$ -	\$ 8,113,574		
Supply & Install	\$ -	\$ -	\$ -		
TOTAL SUBSTATION	\$ 20,134,288	\$ -	\$ 20,134,288		
TELECOMMUNICATION					
Material	\$ 300,000	\$ -	\$ 300,000		
Labour	\$ 200,000	\$ -	\$ 200,000		
Supply & Install	\$ -	\$ -	\$ -		
TOTAL TELECOMMUNCATIONS	\$ 500,000	\$ -	\$ 500,000		
OWNERS					
Pre-PPS cost			\$ -		
Proposal to Provide Service	\$ 400,000	\$ -	\$ 400,000		
Facility Applications	\$ 400,000	\$ -	\$ 400,000		
Regulatory & Compliance	\$ -	\$ -	\$ -		
Land Rights - Easements	\$ -	\$ -	\$ -		
Land - Damage Claims	\$ -	\$ -	\$ -		
Land - Acquisitions	\$ -	\$ -	\$ -		
Other	\$ -	\$ -	\$ -		
TOTAL OWNERS COST	\$ 800,000	\$ -	\$ 800,000		
DISTRIBUTED					
Procurement Management	\$ 422,680	\$ -	\$ 422,680		
Project Management	\$ 3,138,425	\$ -	\$ 3,138,425		
Construction Management	\$ 1,629,381	\$ -	\$ 1,629,381		
Contingency	\$ 4,031,445	\$ 0	\$ 4,031,445		
Escalation	\$ 2,754,083	\$ -	\$ 2,754,083		
TOTAL DISTRIBUTED	\$ 11,976,014	\$ 0	\$ 11,976,014		
SALVAGE					
Transmission Line Labour			\$ -		
Substation Labour	\$ -		\$ -		
Telecom Labour	\$ -		\$ -		
Land Remediation and Reclamation	\$ -		\$ -		
			\$ -		
			\$ -		
TOTAL SALVAGE	\$ -	\$ -	\$ -		
OTHER COSTS					
AFUDC	\$ 2,019,709		\$ 2,019,709		
E&S/Overhead	\$ 1,854,465		\$ 1,854,465		
TOTAL OTHER	\$ 3,874,174	\$ -	\$ 3,874,174		
TOTAL PROJECT	\$ 37,535,998	\$ 0	\$ 37,535,998		

Assumptions and Risks - WEST OPTION

In Service Date: June 1, 2019
Completion of this work for commencing of commissioning activities Dec. 1, 2018

AltaLink participation in a Facility Application AUC Hearing is not included
Reactor pricing based on manufacturer OOM discussion
All new facilities will be wired into the existing AC control building
No new station service or access roads are required
Outages are available as required
No RAS or other system modifications/studies are included

Escalation:
Base costs on 2015 \$, escalated to 2019 with the exception of Reactor costs up to PO issuance
E&S:
Applied at a rate of 6% for the project
AFUDC:
Applied at a rate of 6% for the project

Project Name & No.	Livock Interconnection		P1655	TRANSMISSION PROJECT ESTIMATE SUMMARY
Prepared by:	ATCO Electric Transmission			
AACE Class: (future use)	N/A	Estimate Basis	NID	
High Range	30%	Low Range	-30%	
Date of Estimate:	July 7, 2015	Base Year Used	2015	
	SYSTEM	CUSTOMER	TOTAL	ASSUMPTIONS
TRANSMISSION LINE				
Material	\$ -	\$ -	\$ -	
Labour	\$ -	\$ -	\$ -	
TOTAL TRANSMISSION LINE	\$ -	\$ -	\$ -	
SUBSTATION				
Material	\$ 263,119	\$ -	\$ 263,119	Apparatus prices were based on the 2014 existing Bulk Purchase Order
Labour	\$ 1,113,190	\$ -	\$ 1,113,190	
Supply & Install				
TOTAL SUBSTATION	\$ 1,376,309	\$ -	\$ 1,376,309	
TELECOMMUNICATION				
Material	\$ -	\$ -	\$ -	
Labour	\$ 157,000	\$ -	\$ 157,000	
Supply & Install				
TOTAL TELECOMMUNICATIONS	\$ 157,000	\$ -	\$ 157,000	
OWNERS				
Pre-PPS Cost	\$ 50,000	\$ -	\$ 50,000	In service date: 1 Dec 2018
Proposal to Provide Service	\$ 61,697	\$ -	\$ 61,697	
Facility Applications	\$ 61,500	\$ -	\$ 61,500	Estimate does not include support services of Land Agents or Landowner Consultation Liason's as no site or substation expansion is required; assumes new noise impact study may be required to ensure compliance with AUC Rule 012
Regulatory & Compliance	\$ -	\$ -	\$ -	
Land Rights - Easements	\$ -	\$ -	\$ -	
Land - Damage Claims	\$ -	\$ -	\$ -	
Land - Acquisitions	\$ -	\$ -	\$ -	No expansion of the Livock 939S substation is required for the addition of the 25 kV breaker or control building
Other	\$ -	\$ -	\$ -	
TOTAL OWNERS COST	\$ 173,197	\$ -	\$ 173,197	
DISTRIBUTED				
Procurement Management	\$ 65,105	\$ -	\$ 65,105	
Project Management	\$ 180,480	\$ -	\$ 180,480	
Construction Management	\$ 73,211	\$ -	\$ 73,211	
Contingency	\$ 221,209	\$ -	\$ 221,209	
Escalation	\$ 149,032	\$ -	\$ 149,032	
TOTAL DISTRIBUTED	\$ 689,037	\$ -	\$ 689,037	
SALVAGE				
Transmission Line Labour	\$ -	\$ -	\$ -	
Substation Labour	\$ 6,600	\$ -	\$ 6,600	Dismantle work for 3 panels
Land Remediation and Reclamation	\$ -	\$ -	\$ -	
TOTAL SALVAGE	\$ 6,600	\$ -	\$ 6,600	
OTHER COSTS				
AFUDC	\$ -	\$ -	\$ -	AFUDC is not included in the above estimate based on the assumption that the AUC will approve that the regulatory treatment under AUC Decision 2013-358 continue past 2014
E&S/Overhead	\$ 237,812	\$ -	\$ 237,812	
TOTAL OTHER	\$ 237,812	\$ -	\$ 237,812	
TOTAL PROJECT	\$ 2,639,956	\$ -	\$ 2,639,956	

General Assumptions

Considerations for telecommunication paths between AESO, APL, Alta Link and ATCO have been assumed within this estimate based on information provided in the Functional Specification provided by the AESO
Control building expansion not required
Access road exists
Additional four pannels for redundant RTU and replacement of existing RTU to be compatible for redundancy.
The current GE RTU at Livock is at the end of the product life cycle and ATCO Electric has not developed a redundancy configuration for the GE RTU. The GE RTU platform has been replaced by the Cooper RTU as a standard platform by AET and ATCO Electric is currently developing a redundant configuration and setup of the Cooper RTU. As such, the original RTU is being replaced and a marshalling rack is being installed to provide redundant I/O connections from the marshalling rack to the RTU.
Materials for redundant RTU and for replacement of existing RTU to be compatible for redundancy
This includes commissioning work and electrician support for commissioning work. This category has been adjusted with RTU materials being correctly allocated to the Control Building – Structures category
This includes the use of a hot line crew to install the 25 kV breaker to avoid an outage, as well as structural yard work. Safety requirements for an on-site medic are included due to the remote location and not being able to utilize Laracina emergency services for work at the Livock site.
Two 219mm diameter screw piles with 7m embedment will be sufficient for the 25 kV breaker foundations
Forecasted cash flow 4% compounded annually

APPENDIX B AESO PARTICIPANT INVOLVEMENT PROGRAM (PIP)

Sunnybrook and Livock Substation Modifications

Needs Identification Document

1.0 Participant Involvement Program

From May 2015 to August 2015, the AESO conducted a Participant Involvement Program (PIP) to assist in preparing its *Sunnybrook and Livock Substation Modifications Needs Identification Document* (NID) in accordance with NID14 and Appendix A2 of Alberta Utilities Commission (Commission) Rule 007.

1.1 Stakeholder Notification

Prior to submitting the NID to the Commission for approval, the AESO provided written notification to stakeholders in the area where it reasonably determined that facilities could be installed to implement the Sunnybrook and Livock Substation Modifications. Stakeholders included occupants, landowners or residents identified within the notification area, as well as other interested parties including government bodies, agencies, First Nations, and market participants (collectively, Stakeholders). Specifically, the following Stakeholders were notified by the AESO:

- Counties and Municipal Districts:
 - o Municipal District of Opportunity No. 17
 - o Leduc County
- Companies:
 - o ATCO Gas and Pipelines Ltd.
 - o Capital Power GP Holdings Inc.
 - o EPCOR Distribution & Transmission Inc.
 - o TransAlta Corporation
 - o Alberta-Pacific Forest Products Incorporated
 - o ATCO Electric Ltd.
 - o Husky Oil Operations Limited
 - o Laricina Energy Ltd.
 - o Osum Oil Sands Corp.
 - o Perpetual Energy Operating Corp.
 - o Talisman Energy Inc.
 - o Telus Communications Inc.
- Two individual trappers located in the notification area
- First Nations:
 - o Big Stone Cree Nation
 - o Fort McMurray #468 First Nation
 - o Chipewyan Prairie Dene First Nation

The AESO did not identify any other Stakeholders outside of the notification area that may have an interest in the NID.

The AESO used a variety of methods to notify Stakeholders of the need for the Sunnybrook and Livock Substation Modifications. The AESO drafted a Stakeholder notification letter that described the need for minor modifications at the existing Sunnybrook 510S and Livock 939S substations. This letter was mailed to each of the Stakeholders listed above during the week of May 11, 2015. On May 14, 2015, a copy of this document was posted to the AESO website at <http://www.aeso.ca/transmission/32026.html> and a notice was published in the AESO Stakeholder Newsletter. Copies of the Stakeholder notification letter and AESO Stakeholder Newsletter notice have been included as Attachments 1 and 2, respectively.

1.2 Public Notification

The AESO's Public Notification of NID Filing was published in the following newspapers on July 15 and 16, 2015, respectively:

- Edmonton Examiner (Sunnybrook substation)
- Wabasca Fever (Livock substation)

Proofs of the Public Notification of NID Filing advertisement have been included as Attachment 3.

On July 14, 2015, the AESO published the Public Notification of NID Filing to the AESO website at <http://www.aeso.ca/transmission/32026.html> and a notice was published in the AESO Stakeholder Newsletter on July 16, 2015. Copies of the Public Notification of NID Filing website posting and the AESO Stakeholder Newsletter NID filing notice have been included as Attachments 4 and 5, respectively.

To ensure that Stakeholders have the opportunity to learn more about the Sunnybrook and Livock Substation Modifications NID and provide feedback, the AESO also provides Stakeholders with a dedicated, toll-free telephone line (1-888-866-2959) and a dedicated email address (stakeholder.relations@aeso.ca).

1.3 Concerns and Objections Raised

The AESO has not received any indication of concern or objections from any party about the need for the Sunnybrook and Livock Substation Modifications.

1.4 List of Attachments

- Attachment 1 – Stakeholder Notification Letter
- Attachment 2 – AESO Stakeholder Newsletter Notice
- Attachment 3 – Public Notification of NID Filing (Newspaper Advertisement)
- Attachment 4 – Public Notification of NID Filing (AESO Website Posting)
- Attachment 5 – AESO Stakeholder Newsletter NID Filing Notice

Attachment 1 – Stakeholder Notification Letter

May 8, 2015

Dear Stakeholder:

Re: Information about the Need for Transmission Development at the Existing Livock 939S and Sunnybrook 510S Substations

The purpose of this letter is to inform you that the Alberta Electric System Operator (AESO) plans to file an application for the approval of minor modifications to the existing Livock 939S and Sunnybrook 510S substations. The modifications are needed to integrate a new 500 kilovolt (kV) transmission line between Fort McMurray and Edmonton into the transmission system. This new transmission line is called the Fort McMurray West 500 kV Transmission Project.

We are seeking Alberta Utilities Commission (AUC) approval of the need for these modifications, and plan to file our application, called a Needs Identification Document, later this summer. ATCO Electric will carry out the work required at the Livock substation; AltaLink will carry out the work required at the Sunnybrook substation. Prior to carrying out this work, both ATCO Electric and AltaLink will be required to apply for AUC approval of the specific modifications that they propose to make. ATCO Electric and AltaLink will be consulting directly with impacted stakeholders to develop their respective applications.

The AESO is responsible for the safe, reliable and economic operation of Alberta's transmission system. The AESO's planning responsibility includes determining the need for transmission system development and the manner in which that need is addressed.

If you have any questions or would like to discuss this information further, please contact me by email at matt.gray@aeso.ca or by phone at 403-539-2507.

Yours truly,

(original signed by)

Matt Gray
Account Manager – Supervisor

Attachment 2 – AESO Stakeholder Newsletter Notice

Fort McMurray West 500 kV Interconnections

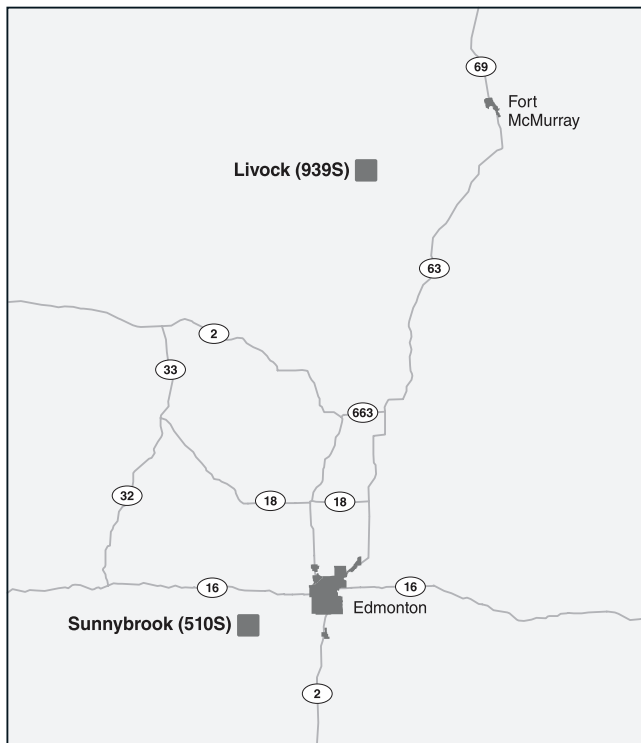
The AESO plans to file an application for the approval of minor modifications to the existing Livock 939S and Sunnybrook 510S substations to integrate the Fort McMurray West 500 kV Transmission Project into the transmission system. For more information, please [click here](#) or visit the AESO website at www.aeso.ca and follow the path Transmission> Needs Identification Documents > Fort McMurray West 500 kV Interconnections.

Attachment 3 – Public Notification of NID Filing (Newspaper Advertisement)

AESO Public Notification of NID Filing Addressing the Need for Modifications to the Existing Livock 939S and Sunnybrook 510S Transmission Substations

The Alberta Electric System Operator (AESO) advises you that it intends to file a Needs Identification Document (NID) for modifications to the existing Livock 939S and Sunnybrook 510S substations with the Alberta Utilities Commission (AUC) on or after July 31, 2015.

The minor modifications to the existing substations are needed to integrate a new 500 kilovolt (kV) transmission line between Fort McMurray and Edmonton into the transmission system. This new transmission line is called the Fort McMurray West 500 kV Transmission Project.



The map above shows the approximate locations of the two existing transmission substations where the modifications are needed. ATCO Electric Ltd. (ATCO) will carry out the work required at the Livock substation; AltaLink Management Ltd. (AltaLink) will carry out the work required at the Sunnybrook substation. Prior to carrying out this work, both ATCO and AltaLink will be required to apply for AUC approval of the specific modifications that they propose to make. ATCO and AltaLink will be consulting directly with impacted stakeholders to develop their respective applications.

The AESO presented the need for these modifications to stakeholders, including residents, occupants and landowners, from May to July 2015. The AESO has considered feedback gathered from stakeholders, and technical and cost considerations, and will apply to the AUC for approval of the need for this transmission development. Once filed, the NID will be posted on the AESO website at <http://www.aeso.ca/transmission/32026.html>.

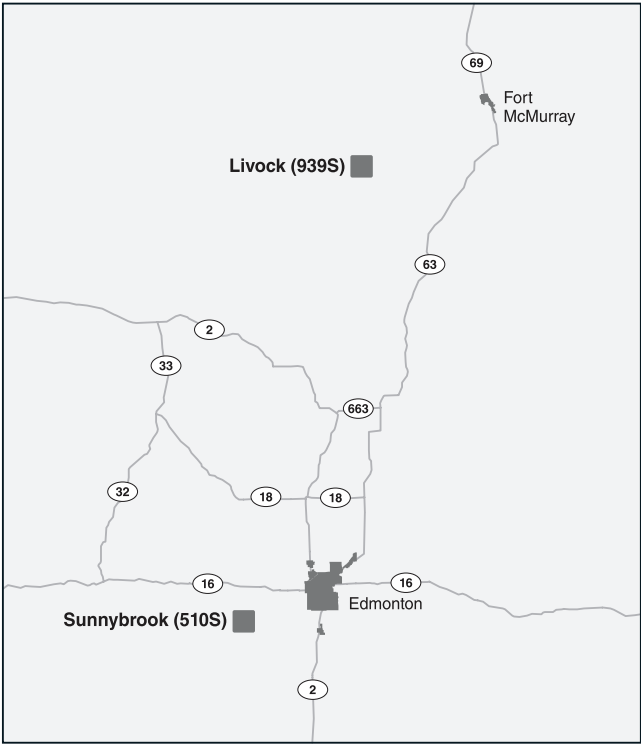
Please visit our website, www.aeso.ca for more information, or contact the AESO at 1-888-866-2959 or stakeholder.relations@aeso.ca



AESO Public Notification of NID Filing Addressing the Need for Modifications to the Existing Livock 939S and Sunnybrook 510S Transmission Substations

The Alberta Electric System Operator (AESO) advises you that it intends to file a Needs Identification Document (NID) for modifications to the existing Livock 939S and Sunnybrook 510S substations with the Alberta Utilities Commission (AUC) on or after July 31, 2015.

The minor modifications to the existing substations are needed to integrate a new 500 kilovolt (kV) transmission line between Fort McMurray and Edmonton into the transmission system. This new transmission line is called the Fort McMurray West 500 kV Transmission Project.



The map above shows the approximate locations of the two existing transmission substations where the modifications are needed. ATCO Electric Ltd. (ATCO) will carry out the work required at the Livock substation; AltaLink Management Ltd. (AltaLink) will carry out the work required at the Sunnybrook substation. Prior to carrying out this work, both ATCO and AltaLink will be required to apply for AUC approval of the specific modifications that they propose to make. ATCO and AltaLink will be consulting directly with impacted stakeholders to develop their respective applications.

The AESO presented the need for these modifications to stakeholders, including residents, occupants and landowners, from May to July 2015. The AESO has considered feedback gathered from stakeholders, and technical and cost considerations, and will apply to the AUC for approval of the need for this transmission development. Once filed, the NID will be posted on the AESO website at <http://www.aeso.ca/transmission/32026.html>.

Please visit our website, www.aeso.ca for more information, or contact the AESO at 1-888-866-2959 or stakeholder.relations@aeso.ca

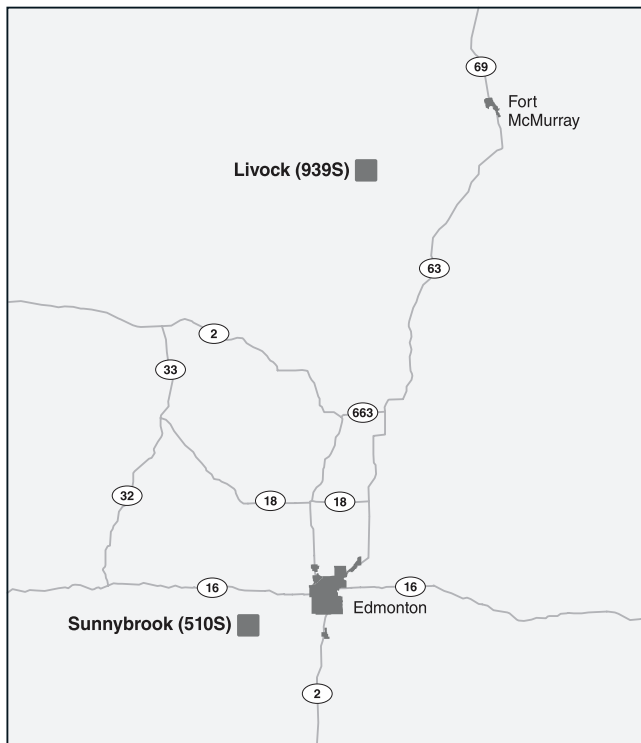


**Attachment 4 – Public Notification of NID Filing (AESO
Website Posting)**

AESO Public Notification of NID Filing Addressing the Need for Modifications to the Existing Livock 939S and Sunnybrook 510S Transmission Substations

The Alberta Electric System Operator (AESO) advises you that it intends to file a Needs Identification Document (NID) for modifications to the existing Livock 939S and Sunnybrook 510S substations with the Alberta Utilities Commission (AUC) on or after July 31, 2015.

The minor modifications to the existing substations are needed to integrate a new 500 kilovolt (kV) transmission line between Fort McMurray and Edmonton into the transmission system. This new transmission line is called the Fort McMurray West 500 kV Transmission Project.



The map above shows the approximate locations of the two existing transmission substations where the modifications are needed. ATCO Electric Ltd. (ATCO) will carry out the work required at the Livock substation; AltaLink Management Ltd. (AltaLink) will carry out the work required at the Sunnybrook substation. Prior to carrying out this work, both ATCO and AltaLink will be required to apply for AUC approval of the specific modifications that they propose to make. ATCO and AltaLink will be consulting directly with impacted stakeholders to develop their respective applications.

The AESO presented the need for these modifications to stakeholders, including residents, occupants and landowners, from May to July 2015. The AESO has considered feedback gathered from stakeholders, and technical and cost considerations, and will apply to the AUC for approval of the need for this transmission development. Once filed, the NID will be posted on the AESO website at <http://www.aeso.ca/transmission/32026.html>.

Please visit our website, www.aeso.ca for more information, or contact the AESO at 1-888-866-2959 or stakeholder.relations@aeso.ca



Attachment 5 – AESO Stakeholder Newsletter NID Filing Notice

Sunnybrook and Livock Substation Modifications – Update to the Notification of NID Filing

*Please note that this NID application was referred to as *Fort McMurray West 500 kV Interconnections* in the previous issue of the AESO's stakeholder newsletter (July 14). This NID application will now be called *Sunnybrook and Livock Substation Modifications NID application*.

The AESO advises you of its intention to file a Needs Identification Document (NID) with the Alberta Utilities Commission (AUC) to address the need for minor modifications to the existing Livock 939S and Sunnybrook 510S transmission substations.

The AESO will be filing the *Sunnybrook and Livock Substation Modifications NID application* on or after July 31, 2015, requesting that the AUC approve this NID.

The AESO has posted the public notification for its NID filing on its website. Please [click here](#) to view the document or visit the AESO website at www.aeso.ca and follow the path Transmission > Needs Identification Documents > Sunnybrook and Livock Substation Modifications to see all the relevant documents, including the application once it is filed with the AUC.

**APPENDIX C INFORMATION REGARDING RULE 007,
SECTION 6.1 – NID13**

May 27, 2015

Alberta Electric System Operator
Suite 2500
330 – 5th Avenue SW
Calgary, Alberta, T2P 0L4

Attention: Brian Belway, Project Manager

Dear Mr. Belway,

RE: Sunnybrook Interconnection with Fort McMurray West 500 kV Transmission Project

Please accept this letter as confirmation that:

- (i) the incremental impacts of the Project are expected to be limited to, or related to, modifications to existing infrastructure on AltaLink's existing property, and
- (ii) AUC Rule 007 NID 13 aspects are being addressed in the Project Facility Application

AltaLink's Facility Application (FA) will include the proposed installation of new substation equipment and a 500 kV slack span to facilitate the termination of the Alberta PowerLine Limited Partnership (APL) 500 kV transmission line (1214L) at Sunnybrook 510S Substation. The Project Functional Specification¹ indicates the termination will occur in either the "West Bay" or "East Bay". The incremental impacts of both the West Bay Option and East Bay Option are summarized below:

1. West Bay Option

- Substation fence expansion of approximately 60m x 120m
- The expansion will occur within AltaLink's existing lease
- Minimal site work is required as much of the organic soil has already been removed for the construction of the Sunnybrook 510S Substation, and
- A Noise Impact Assessment is required prior to the installation of new substation equipment.

2. East Bay Option

- Substation fence expansion of approximately 30m x 70m
- 138 kV (430L) will need to be re-routed around the expanded fence area
- Existing drainage will need to be adjusted around the expanded fence area
- Additional leased area from the adjacent industrial landowner is required
- Further earth works required, and
- A Noise Impact Assessment is required prior to the installation of new substation equipment.

The 7 major aspects of AUC Rule 007 NID 13 will be addressed throughout AltaLink's FA where applicable, and each major aspect is specifically addressed in the sections of the Facility Application outlined below:

1. Agricultural Impact

Is addressed in the FA in Section 4 (AltaLink's Route Determination Process), Section 3 (Project Details), and Section 12 (Electrical Considerations).

¹ Sunnybrook and Livock Interconnection with Fort McMurray West 500 kV Transmission Facilities Functional Specification, Alberta Electric System Operator, Project 1655, Final R1 March 24, 2015.

2. Residential Impact

Is addressed in the FA in Section 3 (Project Details), Section 4 (AltaLink's Route Determination Process), Section 12 (Electrical Considerations) and Section 9 (Visual Impact).

3. Environmental Impact

Is addressed in the FA in Sections 4 (AltaLink's Route Determination Process) and 10 (Environmental Evaluation).

4. Cost

Is addressed in the FA in Section 14 (Economic Assessment).

5. Electrical Considerations

Is addressed in the FA in Section 3 (Project Details).

6. Visual Impact

Is addressed in the FA in Section 9 (Visual Impact).

7. Special Constraints

Is addressed in the FA in Section 12 (Electrical Considerations).

This Project is not located within the plan boundaries of an approved regional land use plan.

If you have any questions or require clarification regarding the information contained herein, please contact me by telephone at (403) 387-8255, or by email to carla.gorman@altalink.ca

Sincerely,



Carla Gorman
Right-of-Way Planner
AltaLink Management Ltd.



June 8, 2015

Brian Belway
Alberta Electric System Operator
2500, 330 – 5th Avenue SW
Calgary, AB T2P 0L4

Dear Brian Belway:

**RE: Confirmation of AUC Rule 007, NID 13 Content in Facility Application
Livock Interconnection with Fort McMurray West 500 kV Transmission Facilities
AESO Project File No. 1655**

ATCO Electric Ltd. will address seven aspects of AUC Rule 007, NID 13 in the Facility Application for the above-referenced project, where applicable:

1. Agricultural Impact
2. Residential Impact
3. Environmental Impact
4. Cost
5. Electrical Considerations
6. Visual Impacts
7. Special Constraints

It is expected that the incremental impacts of the Project will be limited to the modifications to the existing infrastructure on ATCO Electric's existing property.

In addition, the Facility Application will address the specific requirements of the *Lower Athabasca Regional Plan* (LARP) as described in AUC Rule 007. These requirements include the project's compliance with land-use planning; air, ground water, and surface water quality management frameworks; and identification of any potential impacts on conservation or provincial recreation areas.

Sincerely,

ATCO Electric Ltd.

A handwritten signature in blue ink, appearing to read "nicole hupka", written over a light blue horizontal line.

Nicole Hupka, P.Ag
Right-of-Way Project Planner
Tel: 780-733-2734
Email: nicole.hupka@atcoelectric.com