ATTACHMENT 6 LAND IMPACT ASSESMENT

ALTALINK

Land Impact Assessment for the Fidler 312S Interconnection NID and Pincher Creek to Chapel Rock SATR NID Amendment

Presented to the

Alberta Electric System Operator (AESO)

in Support of the AESO Need Identification Document

Date: September 21, 2012

EXECUTIVE SUMMARY

The intent of this Land Impact Assessment (LIA) is for the transmission facility owner (TFO), AltaLink Management Ltd. (AltaLink), to provide the Alberta Electric System Operator (AESO) with general land impact information in support of the Need Identification Documents (NID) being developed for the Fidler 312S Interconnection NID and Pincher Creek to Chapel Rock SATR NID Amendment (the Project). The Land Impact Assessment (LIA) process is based on consideration of the major aspects described in Alberta Utilities Commission (AUC) Rule 007, Section 6, NID 12 (i.e., agricultural impact, residential impact, environmental impact, electrical considerations, visual impact and special constraints), with the exception of cost, which is an aspect dealt with by the AESO. The LIA assesses and compares these aspects and considerations in order to determine coarse, high-level indicators of potential land impacts associated with potential technical solutions, based on information currently available.

Two technical alternatives have been identified by the AESO to address the need in this area.

Alternative 1 components:

- A new Fidler 240 / 138 kV substation
- A new Chapel Rock 500/ 240 kV substation
- A new double circuit 240 kV transmission line to connect 1071L and the Fidler substation
- Re-build / new 138 kV lines as required to interconnect local wind generation
- A new double circuit 240 kV transmission line to connect the Fidler substation and the Chapel Rock substation
- A new double circuit 500 kV transmission line to connect the Chapel Rock substation to the existing 1201L 500 kV transmission line.

Alternative 2 components:

- A new Fidler 240 / 138 kV substation
- A new Chapel Rock 500/ 240 kV substation
- Additional line terminations at the existing Castle Rock Ridge substation
- A new double circuit 240 kV transmission line to connect 1071L and the Fidler substation
- Re-build / new 138 kV lines as required to interconnect local wind generation
- A new double circuit 240 kV transmission line to connect the Castle Rock Ridge substation and the Chapel Rock substation
- A new double circuit 500 kV transmission line to connect the Chapel Rock substation to the existing 1201L 500 kV transmission line.

AltaLink used a primarily qualitative approach for assessing the high-level potential land impacts associated with the two alternatives. Where possible, some quantitative metrics are also used to contribute to the overall comparisons. The amount of prior siting work done on similar, previous projects in this area (Fidler to Chapel Rock and Fidler 312S interconnection projects) makes this LIA somewhat unique in the level of detailed information that can be drawn upon compared to typical LIAs that tend to occur before detailed siting has commenced. This previous work included consultation with many of the same potentially affected stakeholders that would be involved in this project. Access to this type of information is normally not available at the conceptual stage of a project. As well, the Route segments used for quantitative analysis on this project leveraged the routes developed under these previous projects. As with all LIAs, any routes or route segments are intended to be viewed and used as representative routes for the purposes of this high-level analysis. Any routes determined through the LIA are not intended to predetermine the location of any routes that may be determined through future siting work.

This LIA examines the potential land impacts associated with each proposed alternative. The conclusions presented in this assessment are based on the assumption that all new transmission line development and rebuilds will require new right-of-way (ROW), and that locating towers within road allowances will not be possible.

Both Alternatives are feasible from a Land Impact Assessment point of view. The potential overall impacts of the two alternatives are very similar. As with most routes, routing scenarios in either alternative may have the potential to minimize certain localized impacts during more detailed siting work associated with the later facility application stage. The main geographic factors that are influenced by the alternative chosen are the overall length and the location of the transmission line to Chapel Rock north or south of the Oldman Reservoir. The conclusions presented as part of this Land Impact Assessment do not provide an analysis of specific routes or sites, but are intended to summarize the potential impacts of future routing or siting that may occur within a broadly defined geographic area. The impacts associated with specific routes, and substation locations, are considered at the Facility Application stage.

ACRONYMS

AESO	Alberta Electric System Operator
AUC	Alberta Utilities Commission
CB	Citizen Band
EMF	Electromagnetic Field
ESA	Environmentally Significant Area
kV	Kilovolt
HRO	Historical Resources Overview
HRV	Historic Resource Value
LIA	Land Impact Assessment
NID	Need Identification Document
RDA	Restricted Development Area
RFI	Radio Frequency Interference
ROW	Right-of-Way
TFO	Transmission Facility Owner
TUC	Transportation/Utility Corridor

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1. INTRODUCTION

1.1 Background

The AESO is responsible for the safe, reliable, and economic planning and operation of the transmission system within the province of Alberta. As the TFO, AltaLink is responsible for siting, constructing, connecting, and operating new transmission facilities as assigned by the AESO within its operating area. Currently, AltaLink maintains and operates approximately 11,800 kilometres (km) of transmission line and 270 substations in Alberta.

The AESO has requested that AltaLink provide a Land Impact Assessment (LIA) for the proposed SATR Fidler NID amendment Project (the Project).

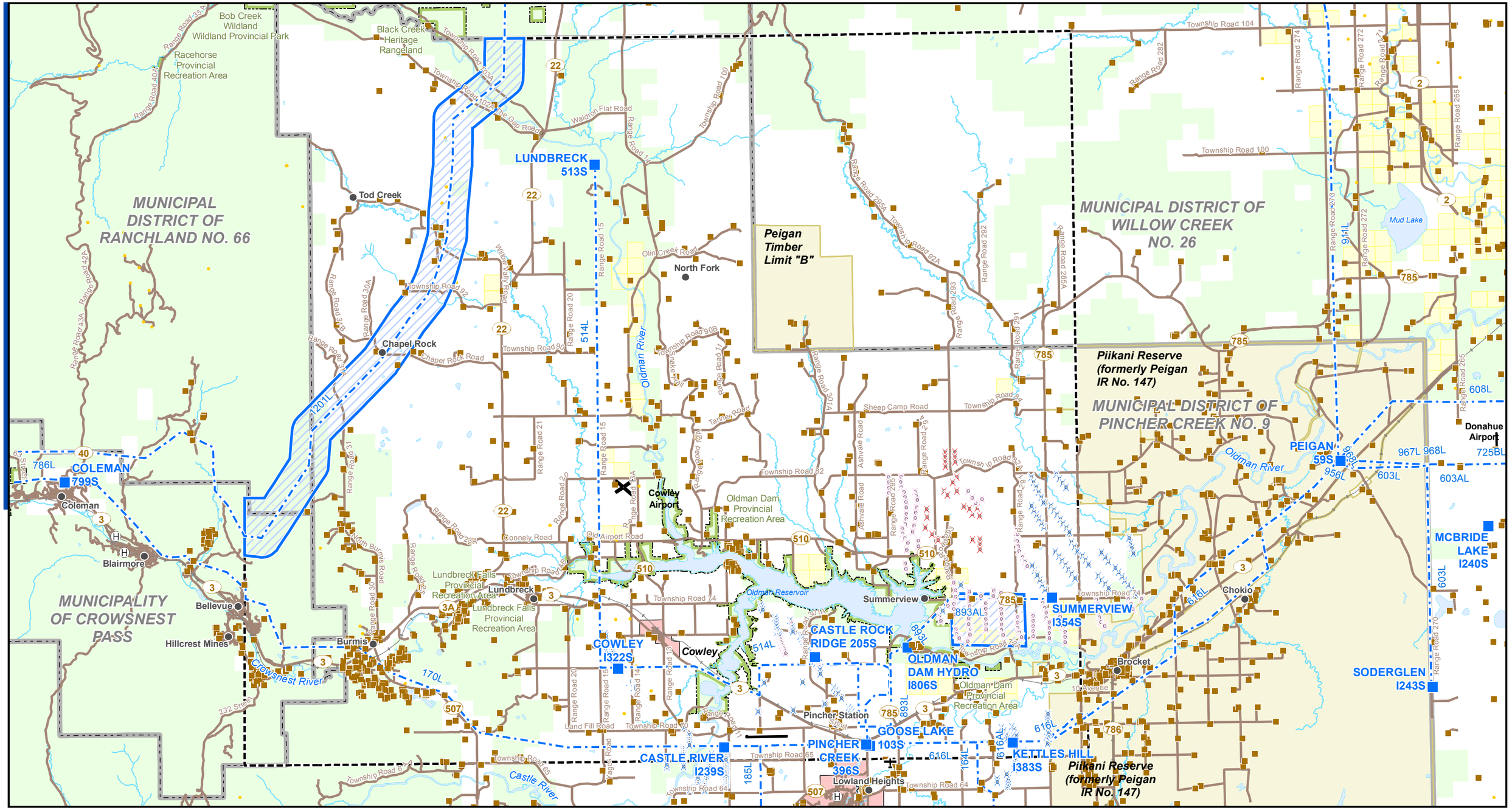
This LIA discusses the potential land impacts of the two proposed Alternatives for the Project, all of which occur within the AltaLink service territory.

Both alternatives would interconnect wind generated power from the Pincher Creek area with the existing 500 kV transmission line 1201L. Both alternatives include a 500 / 240 kV substation to make this interconnection. The alternatives differ in their connection point in the Pincher Creek area. Alternative 1 would terminate at the Fidler 312S substation and Alternative 2 would terminate at the Castle Rock Ridge 205S substation.

1.2 Study Area

The Study Area is located in southern Alberta and covers an area generally from Pincher Creek as far north as Maycroft and from the Porcupine Hills to the Livingstone Range.The Study Area falls mainly in the MD of Pincher Creek but also overlaps into the MD of Crowsnest Pass, and the MD of Ranchland.

See Figure 1 below.



LEGEND

- Existing Substation
- Existing Transmission Line
- Potential Substation Target Area
- Study Area
- Air Strip
- Helicopter Pad
- Hamlet or Locality
- Residence
- Wellsite

Wind Turbine

- Approved
- Existing
- Proposed
- Railway
- Road
- River or Stream
- Airport
- Environmentally Significant Area
- First Nations Reserve
- Irrigated Parcel
- Municipal or County Boundary
- Other Protected Area
- Urban Area
- Water Body

NO.:
DRAWN: BL - ST
FILE NO.: 123510888-001
REVISION: 0.00.00
AL FOLDER: Fidler Area Transmission Project
DATE: 2012-06-12

N

0 5 10 15 Kilometres
0 3 6 9 Miles

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

Irrigated parcel data provided by Alberta Agriculture and Rural Development, Irrigation and Farm Water Division and other sources.

LAND IMPACT ASSESSMENT

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Figure 1

POTENTIAL
FIDLER 312S INTERCONNECTION AND PINCHER CREEK TO CHAPEL ROCK

Study Area Map

Two technical alternatives have been identified by the AESO to address the need in this area.

These alternatives are summarized in Table 1 below.

Table 1: Summary of Project Alternative Components

Description	Components	Approx. Length of Line (km)[1]	Alt.1	Alt.2
New / Expanded Substations				
Chapel Rock 491S	• 500/240 kV new substation with 2-500 kV Line bays, • 2-500/240 kV 1200 MVA transformers and 2-240 kV line bays	n/a	√	√
Fidler 312 S	• 240/138 kV new substation The number of 240 kV line bays depends on the alternative. • One or Two 240 /138 kV 400 MVA transformers and Two or Four-138 kV breakers	n/a	√	√
Castle Rock Ridge 205S	• 240 kV switching station the addition of two 240 kV line bays depends on the alternative.	n/a		√
New 500 kV Transmission Lines				
New 500kV transmission line – from 1201L to Chapel Rock	• 500 kV kV D/C transmission line with 4x1590 conductor on lattice towers from 1201L to Chapel Rock 491S	0.5-2	√	√
New 240 kV Transmission Lines				
New 240 kV transmission line – Castle Rock Ridge to	• 240 kV D/C transmission line with 2x1033 conductor on steel lattice towers from Castle Rock Ridge 205S to	34-40		√

Description	Components	Approx. Length of Line (km)[1]	Alt.1	Alt.2
Chapel Rock	Chapel Rock 491S			
New 240 kV transmission line – Fidler to Chapel Rock	• 240 kV D/C transmission line with 2x1033 conductor on steel lattice towers from Fidler 312S to Chapel Rock 491S	39-48	√	
New 240 kV transmission line – Tap Point on 1071L to Fidler 312S	• One 240 kV D/C transmission line with 2x1033 conductor on steel lattice towers from Fidler 312S to tap in point on 1071L	5-9	√	√
New 138 kV Transmission Lines				
New 138 kV transmission line – Wind Farm interconnections	• The amount of 138 kV transmission line depends on the location of the Fidler Substation and the future wind Farm collector substations.	N/A	√	√

1.3 Scope of the LIA

The LIA compares the potential land impacts of the proposed project alternatives. The comparison is primarily based on estimated total line lengths and proposed substation search areas of the transmission development as well as the characteristics and sensitivity of the landscape being crossed. The only difference between these two alternatives is the double circuit transmission line components associated with the two different substation to be used as the eastern termination point.

1.3.1 Description of Each Component:

1.3.1.1 New Chapel Rock 491S 500/240 kV Substation

The development of the Chapel Rock 491S substation is required to accommodate the connection of the Fidler 312S or Castle Rock Ridge 205S substation to the existing 500 kV transmission line 1201L.

A combination of 500kV and 240 kV transmission line is required to complete the interconnection. A substation location adjacent to the existing 1201L line minimizes the amount of 500 kV transmission line required. The substation search area is displayed on Figure 1.

The LIA does not include metrics for the Chapel Rock substation. The Chapel Rock substation is a common component for both alternatives, making the consideration of impacts posed by the substation moot for the LIA. The previously identified sites for the substations were referenced for the basis of this LIA. However, it is understood that the potential substation sites could all move along transmission line routes to be located in more optimal locations based on consultation, environmental and technical considerations, cost, and availability of land and other factors. As ultimately the substation would be located along the final line routes, the area used to generate the metrics associated with the routes also encompass the substation sites. The additional incremental impact from the actual substation footprint will have little effect on the overall impacts in the context of the entire development.

1.3.1.2 New Fidler 312S 240 / 138 kV Substation

The development of the Fidler 312S substation is required to accommodate the interconnection of the wind farms north east of the Oldman Dam. The ultimate size and major equipment needed at the Fidler substation will depend on the alternative selected. The substation search area is displayed in Figure 1 above.

The LIA does not include metrics for the Fidler substation. The Fidler substation is a common component for both alternatives, making the consideration of impacts posed by the substation

moot for the LIA. The previously identified sites for the substation sites were referenced for the basis of this LIA. However, it is understood that the substations could all move along transmission line routes to be located in more optimal locations based on consultation, environmental and technical considerations, cost, and availability of land and other factors. As ultimately the substation would be located along the final line routes, the area used to generate the metrics associated with the routes also encompass the substation sites. The additional incremental impact from the actual substation footprint will have little effect on the overall impacts in the context of the entire development.

1.3.1.3 Castle Rock Ridge 205S Substation

The Castle Rock Ridge 205S substation interconnects the local windfarms south of the Oldman Reservoir. The substation may need to be expanded depending on the alternative selected.

The LIA does not include metrics for the Castle Rock Ridge substation expansion. The additional incremental impact from the actual expanded substation footprint will have little effect on the overall impacts in the context of the entire development.

1.3.1.4 New Double Circuit 500 kV Transmission Line

A transmission line is required to connect the 1201L 500 kV transmission line to the Chapel Rock 491S substation. The proposed structure type is assumed to be a steel lattice tower and the conductor is assumed to be 4 x 1590 kcml to match the existing conductors on 1201L.

The LIA does not include metrics for the 500 kV transmission line and the additional incremental impact will have little effect on the overall impacts in the context of the entire development. The line is required for either alternative. The lines will be relatively short (500m to 2 km) in comparison to the associated 240 kV transmission line. The location of the lines will primarily be driven by the selection of the of the Chapel Rock substation in conjunction with the associated 240 kV lines.

1.3.1.5 New Double Circuit 240 kV Transmission Line from Castle Rock Ridge205 S to Chapel Rock 491S

The transmission line required to connect the Castle Rock Ridge 205S substation in the case of Alternative 2 to the Chapel Rock Ridge 491S substation is a double-circuit, 240 kV transmission line. The proposed structure type is assumed to be a steel lattice tower and the conductor is assumed to be 2x1033 kcml.

1.3.1.6 New Double Circuit 240 kV Transmission Line from Fidler312 S to Chapel Rock 491S

The transmission line required to connect the Fidler 312S substation in the case of Alternative 1 to the Chapel Rock Ridge 491S substation is a double-circuit, 240 kV transmission line. The proposed structure type is assumed to be a steel lattice tower and the conductor is assumed to be 2x1033 kcml.

1.3.1.7 New Double Circuit 240 kV Transmission Line from 1071L to Fidler312 S

The transmission line required to connect the existing 1071L 240 kV transmission line to the Fidler 312S substation is a double-circuit, 240 kV transmission line. The proposed structure type is assumed to be a steel lattice tower and the conductor is assumed to be 2x1033 kcml.

The line is required for either alternative. The impact of this line will not have any bearing on the assessment of the overall impacts in the context of the entire development.

1.3.1.8 New 138 kV Transmission Lines

The 138 kV transmission lines required to connect the wind farms to the Fidler 312S substation will depend on the eventual location of the Fidler substation. In general, 138 kV transmission lines are not considered in the LIA because the related impacts are low-level and common – i.e., they typically fit in road allowances, have relatively little associated land impact, therefore the additional incremental impact will have little effect on the overall impacts in the context of the entire development.

2. LAND IMPACT ASSESSMENT PROCESS

2.1 LIA Methodology

The LIA process allows the AESO to consider the potential land impacts associated with the Project developments. The assessment process is driven by the major aspects of AUC Rule 007, Section 6, NID12. Agricultural impact, residential impact, environmental impact, electrical considerations, visual impact and special constraints are examined. Cost is an aspect addressed by the AESO. Associated with each major aspect are several specific considerations, as per AUC Rule 007, which are detailed in section 2.2. However, these considerations in many cases (e.g., noise and TV interference, visual impact of tree removal, etc.) cannot be assessed in detail until the Facility Application stage, when more detailed route and structure location and detailed design are finalized by the TFO. The LIA focuses on the conceptual aspects and considerations that can be described using information currently available.

Information obtained through the Route Determination process on the Fidler to Chapel Rock and Fidler 312S Interconnection projects provided data that could be used to represent potential routes for this assessment. Typically, LIA's consider impacts in a qualitative manner. The availability of data derived from siting work on the previous projects provides the opportunity to compare the alternatives in a quantitative manner. As stated previously any routes or route segments are intended to be viewed and used as representative routes for the purposes of this high-level analysis. Any routes determined through the LIA are not intended to predetermine the location of any routes that may be determined through future siting work.

The impacts used for comparison consist of:

- Overall Length
- Agricultural Impact (ranges of expected distances intersecting Native Vegetation, Crop Land and Tame Pasture as well as dominant land suitability classes
- Residential Impact (i.e., ranges of expected numbers of residences with 800m and 150m);
- Environmental Impact (ranges of expected intersections with surface water, sensitive wetlands, parks & protected areas and Environmentally Significant Areas (ESAs))

See table 3 for the details of these metrics.

Route options that were used have differing and offsetting impacts. For example, routes with low residential impact may have higher environmental impacts. Table 3 indicates the range for individual impacts. There is no route that comprises neither all of the lowest range nor all of the highest range.

A more detailed summary of the Data Sources, is included in Section 4 below.

A description of each major aspect of AUC Rule 007 and associated considerations is presented in Section 2.2. An assessment of the proposed alternatives is provided in Section 2.3.

2.2 Major Aspects of AUC Rule 007

This section provides a description of the concerns related to the major aspects identified in AUC Rule 007, and how these are used to provide land impact information and guide the overall land impact assessment of the Project. The major aspects identified in AUC Rule 007, with the exception of cost, were considered.

Each aspect in AUC Rule 007 contains a list of potential impacts which are discussed in the following sections. While the majority of these impacts are dealt with by the TFO during the more detailed Facility Application stage, a summary has been provided below for each of the specific concerns and how they may relate to the Project.

2.2.1 Agricultural Impact

Agricultural impact refers to the potential effects on farming activities carried out on rural lands which include raising livestock, cultivation of crops, and other commercial operations.

2.2.1.1 Specific Agricultural Concerns

AltaLink has considered the specific agricultural considerations outlined in AUC Rule 007 and how they relate to the Project:

a) Loss of crops: This includes short-term loss caused by construction; longer-term losses possible from soil erosion, rutting, drainage, disturbance, and soil mixing; and permanent loss of crop under or adjacent to the structure base

Short-term crop loss during construction can be reduced or avoided with appropriate mitigation and construction practices. Such short-term losses can be compensated through damage payments to landowners. Permanent loss of crop under or adjacent to the structure base can be mitigated through working with specific landowners during the Facility Application consultation and potentially compensated for. Potential impacts can be further reduced through landowner input on structure placement.

Any use of existing linear disturbances could also reduce potential impacts to agricultural activities. In addition, the majority of a ROW on private land can still be used by the landowner for agricultural activities if desired.

b) Short-term disruption of farming and livestock grazing resulting from construction

These potential impacts are mitigated through appropriate construction practices and working with specific landowners to reduce or avoid any disruption.

c) Reduced efficiency of field operations

This potential impact is mitigated by working with landowners and determining structure placement that reduces or avoids impact.

d) Restrictions on use of aircraft and high-pressure irrigation systems

The presence of a transmission line can potentially impact use of aircraft, which primarily involves concerns related to agricultural operations, such as crop spraying. While this practice is not common in all areas of Alberta, it can be somewhat mitigated through coordination with landowners or compensation. The impact on the operation of irrigation equipment can usually be reduced or avoided through consultation and coordination with affected landowners around the placement of proposed structures and centre-lines. Any unavoidable impacts (e.g., changes to irrigation systems) are considered when determining compensation payments for mitigations or impacts.

e) Risk of collision with structure; damage to equipment, lost time, liability for damage to structure and secondary liabilities

A landowner will not be held liable if they cause accidental damage to transmission structures. However, landowners will be held liable where they intentionally cause damage to a structure. If the transmission line is taken out of service by damage, it is typically restored to service within 24 to 48 hours, so any disruption to farming activities due to repairs of the line will be short in duration.

f) Reduction in yield adjacent to structures due to overlapping farming operations and added soil compaction

Permanent loss of crops and reduced yield adjacent to the structure on private land is mitigated through working with specific stakeholders during the Facility Application consultation. The total area adjacent to structures where the overlapping farming operations occur is relatively small and is addressed and compensated for through annual structure payments. Potential impacts are further reduced by landowner input to structure placements.

g) Added cost and inconvenience of weed control under structures

The added cost and inconvenience of weed control is compensated as part of the annual structure payments to landowners.

h) Impact of height restrictions on equipment during field operations

Transmission lines are designed to meet the electrical code for ground clearance. On agricultural land the transmission lines will be sufficiently elevated to allow farm equipment with a maximum height of 6.1 m (20 feet) to pass safely under the line. The minimum clearance required by the utility code in Alberta would allow for clearance of farm equipment up to 4.3 m (14 feet).

i) Psychological impact of line

This is a subjective impact involving factors such as visual impact, electromagnetic fields (EMF), land values, and other issues. Provision of unbiased information around EMF research from national and international health and scientific agencies is available to the public, and may help to address the concerns, as well as a robust Participant Involvement Program (PIP) during the Facility Application stage.

j) Loss of shelter belts

Impacts to shelter belts can be mitigated by working with landowners to apply routing offsets relative to legal boundaries such as quarter-section lines along which valued shelter belts may exist. In some cases only trimming may be required. Compensation for re-establishment of a shelter belt is also a possibility. All of these are site specific and determined in consultation with the potentially affected landowner at the Facility Application stage.

k) Shared use with other utilities and transmission lines

Utilizing or paralleling existing linear disturbances is a common consideration when determining potential routing during the more detailed Facility Application stage. This aligns with common landscape planning principles and practices, as illustrated in the Alberta Environment's *Guide for Transmission Lines*[2], and Alberta's *Transmission Regulation*[3]. There is limited potential to parallel transmission lines within the Study Area of this Project.

l) Interference with citizen band radios

This is becoming less of an issue as Citizen Band (CB) radios are being replaced with newer technologies. However, CB radios operate at frequencies close to that of AM radios, neither of which are designed to be immune to transmission line interference. The interference produced by power lines diminishes with distance from the power lines, making interference highly localized. All facilities will comply with federal guidelines related to radio interference.

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[2] Environmental Protection Guidelines for Transmission Lines (Fact Sheet R&R/11-03).

[3] *Transmission Regulation* (A.R. 86/2007)

2.2.2 Residential Impact

The potential for reducing residential impact is an important consideration in the development of routing for transmission lines. The residences identified during the Fidler to Chapel Rock and Fidler 312S Interconnection projects along with the proximity of urban areas is used as a general indication of the potential residential impact associated with the proposed alternatives during the LIA stage.

2.2.2.1 Specific Residential Concerns

AltaLink has considered the concerns outlined in AUC Rule 007 which are listed below and are associated with residential impacts.

a) Decrease of property values

This is a site-specific impact which is dependent on a variety of factors and can vary with individual stakeholders. This impact is generally considered during the Facility Application stage when more specific routing is developed and additional information is obtained.

b) Loss of developable lands and constraints on development

Development tends to happen more often in proximity to existing developed (urban) areas (i.e., residential density is a measure of potential impact). Therefore, reducing routing in areas close to existing high density residential areas may result in potential impacts to areas with the highest development potential.

c) Relocation or removal of residences

It is not possible to assess the specific impact at this preliminary stage, as specific routes are not determined until the Facility Application stage, although known areas of denser residential development are typically avoided during the LIA stage.

e) Noise and TV interference

TV reception problems related to high-voltage transmission lines are unlikely. If interference does occur, it can often be resolved by relocating the TV or changing the antenna. The transmission lines are designed to meet allowable audible noise and TV interference. Where individual landowners are concerned, measurements will be taken before and after construction so signal interference beyond allowable levels can be identified and mitigated. These types of concerns tend to be associated with residences and related to routing which occurs as part of the Facility Application stage.

f) Windbreak and other vegetation removal

This is an issue where the removal or trimming of trees or other vegetation may be required when establishing a new ROW. It is also important to note that the overall impact is considered in making compensation payments for structures and land rights. This is site-specific and determined in consultation with the potentially affected landowner at the more detailed Facility Application stage.

g) Conflict with recreational use of land holdings

Assuming areas such as ESAs, parks, protected areas, river valleys and lakes are used for recreational purposes, there is a potential for conflict with recreational land use if routes are within close proximity to these features. Any potential recreation areas that are identified will be investigated in more detail at the Facility Application stage.

h) Public versus private land

With the exception of certain areas (parks, protected areas), the use of public land is generally viewed by landowners as a preferable development to using private lands. While there are large pieces of public land the majority of the Study Area is private land.

2.2.3 Environmental Impact

Existing environmental information was used to provide a general indication of potential environmental issues and relative impacts having the potential to occur within the Study Area. These impacts will be further considered during the Facility Application stage, where siting of the facilities and additional information typically becomes available.

2.2.3.1 Specific Environmental Concerns

Major surface water bodies, important bird areas, wetlands, parks, protected areas, ESAs, and native vegetation were considered as potential indicators of environmental impact as part of the LIA. AltaLink has considered the potential environmental impacts that are outlined in AUC Rule 007, as well as the additional criteria of "Impact to Waterfowl and Other Birds". It is expected that effects on these features can be further avoided or reduced at the Facility Application stage where additional assessment work will occur and more detailed information will become available.

a) Increased public accessibility to wildlife areas

This is typically an issue for treed or forested areas where there is currently little access. Much of the Study Area has been cleared for agricultural purposes and is already accessible. There is potential to increase access to treed or forested areas, however it is expected that small shrubs or trees can be spanned by the proposed alternatives and would not increase public access through transmission line right-of-ways.

Access along the ROW on private land or crown land is managed in consultation with the landowner through Alberta Sustainable Resource Development to determine the appropriate access mitigation; one method of controlling access may involve using locked gates. This consideration will be further discussed at the Facility Application stage when routing is developed and the potential to alter access is better known.

b) Alteration of natural areas and interference with outdoor educational opportunities

The location of protected or designated areas within the Study Area can be determined using existing data sources and identified as a factor for consideration. Further consideration of potential impacts will be discussed at the Facility Application stage when routing is developed and potential impacts can be more accurately addressed.

***c)* Use of Restricted Development Area**

Restricted Development Areas are more generally known as Transportation Utility Corridors (TUC). There are no Transportation Utility Corridors within the Study Area.

d) Effect on erosion

There is potential to cause erosion when topsoil is disturbed, which can have related effects if surface water is present. AltaLink will attempt to avoid areas that pose potential erosion problems. If they cannot be avoided, then the intent is to work with associated regulatory agencies and landowners to develop appropriate mitigations and construction practices to reduce potential impacts.

e) Unique ecological areas

The identification of areas of potential ecological value, such as wetlands and ESAs, can be used to determine if unique ecological areas occur in the Study Area. This consideration may be further discussed at the Facility Application stage when routing is developed and the potential to impact areas of potential ecological value is better known.

f) Impact to Waterfowl and Other Birds

AltaLink recognizes the potential for birds to collide with transmission lines and has developed a standard for installing bird markers on new transmission lines. AltaLink has identified that the overhead shield wire poses the greatest threat to larger bodied migratory waterfowl. AltaLink will assess new transmission lines for potential impacts to birds and installs line markers according to the following criteria:

- Lines with an overhead shield wire spanning open water wetlands and lakes;

- Transmission lines with an overhead shield wire in proximity to wetlands designated as high value (eg. Ducks Unlimited, RAMSAR, Birdlife International, top birding sites etc);
- Lines with an overhead shield wire spanning rivers and river valleys;
- Lines with an overhead shield wire that are located within high public use areas and are adjacent to open water wetlands or reservoirs; and
- Other areas as designated by AltaLink's Environmental Group.

2.2.4 Cost

The information and findings in an LIA do not consider cost, as they are not related to land impacts.

2.2.5 Electrical Considerations

Electrical considerations play an important role when assessing potential impacts associated with the proposed alternatives. While the technical considerations, such as transfer capability, system flexibility, system reliability and losses are considered by the AESO separately, some land impacts related to electrical considerations can be identified. Technical requirements and the other electrical considerations associated with the alternatives can affect the presence or level of impacts on the land.

2.2.5.1 Specific Electrical Considerations

AltaLink has considered the specific electrical considerations outlined in AUC Rule 007 and how they relate to the Project:

a) Ease of connections to future load areas

This relates to the electrical capacity, location of the facilities, and the type of technology used (e.g., rebuild or replace). This specific impact does not have any direct land impact and will be considered by the AESO separately.

b) Reliability and reparability of the line

The reliability and reparability of a line as it relates to the specific technology being considered does not have any impact from a land perspective. However, wet soil conditions can present difficulties for future maintenance and repair activities. The identification of wet areas can be determined during the more detailed Facility Application processes that will occur in the future.

c) Access for construction and maintenance of the line

Wet soil conditions can present difficulties in accessing transmission lines for future maintenance and repair. Existing soil classification data can be used to provide a general indication of the presence of wet soils. Paralleling major roads or existing transmission lines can also reduce some of the potential access impacts associated with new facilities. The Project occurs in an area with intermittent access.

2.2.6 Visual Impact

Visual impacts depend on individual stakeholder values. These impacts will continue to be assessed as the Project moves forward and additional information becomes available. However visual impacts are an important consideration in this area, for example, the study area includes a municipally protected viewscape.

Visual impacts are closely related to residential impacts as they are typically influenced by similar factors. However, additional impacts will be experienced by other groups, such as recreational users (e.g., hikers, fishermen, hunters, etc.), and users of recreational installations. The area highways are heavily used by tourists and recreationalists. There are some general assumptions that can be made for all overhead transmission lines:

- The closer the line is to a residence, the more likely a visual impact will be perceived;
- The higher the residential density, the more likely a visual impact will be perceived;
- Paralleling similar, existing transmission facilities poses a lower visual impact than a greenfield route where there is no existing line;
- Close proximity to parks, natural areas and other recreational areas can be viewed as creating a higher degree of visual impact than in other areas; and
- The removal of mature-treed areas increases the potential level of visual impact by removing what is generally considered an aesthetically pleasing feature on the landscape and potential visual screening of the transmission line.

2.2.6.1 Specific Visual Concerns

AltaLink has considered the specific visual considerations in AUC Rule 007 and how they relate to the Project:

a) Visual impact of tree removal as seen from roads and recreational installations

Many stakeholders view the removal of trees as a visual impact. The Study Area consists of primarily cleared land used for agriculture. In the areas where tree clearing would be required visibility from roads and recreational areas would be limited. As a result, this is not viewed as a significant consideration for the LIA. However, potential impacts on shelter belts will be considered during the TFO route evaluations leading to the Facility Application.

b) Visual impact on dispersed recreational users such as hikers, fishermen, hunters, scenic viewers, and cross-country skiers

Areas commonly used by recreational users can be identified using existing data sources. This has been considered in the LIA and will be further considered during route selection. There are lakes, parks, protected areas, and ESAs within the Study Area.

c) Visual impact of structures and lines as seen from residences, farms, roads, and recreational installations

The type of residences and landowners can provide an indication of potential visual impact. The type of structure being proposed can also impact the potential level of visual impact.

2.2.7 Special Constraints

Special constraints are issues or factors unique to the specific Study Area being assessed. Using existing sources of available data, there are special constraints that have been identified in the Study Area and incorporated into the assessment of the alternatives.

2.2.7.1 Specific Special Constraints

AltaLink has considered specific impacts in AUC Rule 007 that can be associated with special constraints (item (a) below), as well as identified additional special constraints that may relate to the Project.

a) Electrical interference with radio transmitting stations, and other telecommunication equipment

There is the potential for transmission facilities to impact radio and other telecommunication equipment, as several telecommunications facilities, are found within the Study Area. The intent is to work with affected facility owners to ensure appropriate routing and mitigation methods are employed to reduce or avoid any potential impact. Following the construction of the proposed facilities, radio frequency interference (RFI) measurements will be taken to ensure that federal guidelines are not exceeded. Interference problems caused by the new facilities will be mitigated by AltaLink.

b) Major River Crossings

Major river crossings can present potential constraints related to technical design, environmental implications, timing restrictions and associated cost implications. Several potential impacts on major river crossings can be avoided by crossing overhead and complying with setbacks to the normal high-water marks for the crossing structures. Riparian vegetation can be selectively removed to reduce impacts. An accurate assessment of major river crossings will occur at the Facility Application stage, at which time site-specific routing occurs. The Old Man River, Castle River and Crowsnest River are potential major river crossings associated with the Project.

c) Proximity to Historical Resources

Historical resources are specific sites that have been identified within the province that hold particular archaeological significance. The province maintains a registry of known locations and, depending on the significance of a particular site, there will be constraints placed on nearby planned development or disturbance. Historical resources are present in the Study Area, and this aspect will be further addressed at the Facility Application stage when detailed routing is known.

d) Oil and gas

Active well sites and pipeline facilities do occur within the Study Area. These facilities pose a challenge to routing, but can typically be dealt with by working with oil and gas facility owner to identify potential mitigation options during the Facility Application Stage.

e) Airstrips, Airports and Helicopter Pads

Aviation activity associated with airstrips, airports and helicopter pads often results in constraints to development within their vicinity. There are known air strips within the Study Area. Interaction with these airstrips can be mitigated through route selection at the Facility Application Stage.

2.3 Assessment of Alternatives

This section assesses the two proposed development alternatives relative to the aspects of Rule 007. The two alternatives are comprised of the same components with the exception of the Chapel Rock 240 kV interconnection and the associated routeing.

The double circuit 240kV in Alternative 1, commencing from the Fidler 312S substation to the Chapel Rock 491S substation assumes route options would all be on the north side of the Oldman Reservoir. A route south of the Oldman Reservoir would result in identical routing as considered in Alternative 2 only with an additional double circuit lines crossing the Oldman River. The additional cost and impact associated with the double circuit line would not be considered given the potential for Alternative 2.

The double circuit 240kV in Alternative 2, commencing from the Castle Rock Ridge substation to the Chapel Rock 491S substation assumes route options would all be on the south side of the Oldman Reservoir. Similar to the statement above, a route to go east and then to the north of the Oldman Reservoir would not be considered given the potential for Alternative 1.

The possible location of the Chapel Rock substation is affected by the Alternative that is chosen. Under Alternative 1, Chapel Rock could potentially be located as far north as Maycroft. With the Fidler substation being located on the north side of the Oldman River, routes could go along the west side of the Porcupine Hills and terminate at Maycroft without crossing the Oldman River. Under Alternative 2, the Maycroft site would not be considered as it would require a longer line routing past other feasible substation options and require an additional crossing of the Oldman River.

As discussed below the overall consideration of the land impact of the two alternatives is the comparison of the two components:

1. The Fidler to Chapel Rock interconnection.
2. The Castle Rock Ridge to Chapel Rock interconnection.

2.4 Comparison of Components

This section assesses the two components relative to the aspects of Rule 007. The two components are similar in that they would both involve facilities in the same general area. The areas where routes could be developed are overlapping in the western portion of the study area, but have unique characteristics due to the location of the eastern termination point either north or south of the Oldman reservoir at either the Fidler 312S substation or Castle Rock Ridge 205S substation.

The overall consideration of the potential land impact of the two components is the combination of:

1. Consideration of the main features in the area.
2. Consideration of the representative metrics provided.

The main features that are common to both components are:

- The Oldman Reservoir
- Highway 22 (The Cowboy Trail)
- The Burmis Valley
- The Cowley Airport (Glider Strip)
- Windfarms
- Recreational Properties and acreages
- Farms, ranches
- Large tracts of intact native prairie
- A protected viewscape (The DU Ranch)

It can be assumed that the eventual routes considered will have some level of impact on these features.

2.4.1 Fidler to Chapel

The main features that are specific to only the Fidler to Chapel Rock routing are:

- The Porcupine Hills
- The Oldman River

A main consideration of the Porcupine Hills is that the area is not classified as an Environmentally Significant Area (ESA) in the current ASRD data set. However this area is known to contain species of management concern, and large tracts of native vegetation.

The Oldman River requires a longer river crossing than either of the potential Castle River or Crowsnest River Crossings.

Route options for the Fidler to Chapel Rock component of Alternative 1 can have very differing impacts. Many of these impacts are tradeoffs of each other. For example, routes that stay closer to the reservoir may have a larger residential and agricultural impact as compared to routes that go through or along the Porcupine Hills which may have lower residential and agricultural impacts but higher environmental impacts.

Generally the area north of the reservoir:

- Is typically less dense residentially and does not include urban type developments like Cowley, Lundbreck and along Highway 3.
- Has avoided more development and more of the vegetation has been kept in a native state versus cultivated cropland and tame pasture.
- Is primarily either native vegetation, or cultivated cropland with smaller amount of tame pasture. In this area the trade off of avoiding the native vegetation is higher agricultural impact.

Parts of this area do have concentrations of residential development, agricultural operations, wind turbines and major roads.

2.4.2 Castle Rock Ridge to Chapel Rock

The main features that are specific to only the Fidler to Chapel Rock routing are:

- The Village of Cowley
- The Hamlet of Lundbreck
- The Hamlet of Burmis
- Highway 3 (Crowsnest Highway)
- The Castle River
- The Crowsnest River

As with Alternative 1, Route options for the Castle Rock Ridge to Chapel Rock component of Alternative 2 can have very differing impacts depending on the route option that is built. These impacts are also tradeoffs of each other. Residential impacts could be higher where routes are located near major highways such as Highway 3. Where routes are located away from residential development, there can be steep terrain and environmentally sensitive features such as sensitive vegetation or wildlife habitat.

Generally the area south of the reservoir:

- Is typically more dense residentially and may include routes near the urban type developments like Cowley, Lundbreck and along Highway 3.
- Is evenly split between cultivated cropland, and tame pasture versus native vegetation.
- Has more existing linear disturbances – in the same areas as the higher residential densities.

For information purposes the area considered for a double circuit line to interconnect with Fider 312 requires a single crossing of the Oldman River. The features in the area include:

- The Oldman River
- The Oldman Reservoir
- The Oldman Dam Provincial Recreation Area

- Highways 3 & 785
- Windfarms
- Recreational Properties and acreages
- Farms, ranches
- Tracts of intact native prairie
- Gravel Extraction

Many of these impacts are tradeoffs of each other. For example, routes that stay closer to the reservoir may have a larger recreational and residential impacts as compared to routes that go further east which may have more agricultural impacts and environmental impacts.

2.5 Comparative Metrics Summary

The following table summarizes the results of the metrics analysis used for this LIA. Routes used for the analysis were developed in the Fidler to Chapel Rock and Fider 312S Interconnection projects and are strictly being used as representative options.

Table 2: Comparative Metrics

Major Aspects and Considerations		Fidler to Chapel Rock	Castle Rock Ridge to Chapel Rock	Fidler 312S One Double Circuit
Total R-O-W Length (km)5		39-48	34-40	5-9
Agriculture				
Grassland Vegetation Inventory Crossed (km) 1	Native Vegetation	24-41	17-24	1-3
	Crop Land	2-14	7-15	1-2
	Tame Pasture	3-7	5-8	2
Dominant Land Suitability Class Distribution - Distance Crossed (km)1	Class 2	0	0	0
	Class 3	10-22	12-18	0
	Class 4	13-17	11-17	5-9
	Class 5 & 6	7-18	1-16	0
Irrigated Parcels Crossed (km)		0-1	0	0-4
Residential				
Residences within 150 m of centre line (#) 2		0-1	0-12	0-1
Residences within 800 m from R-O-W edge (#)		14-50	21-333	10-32
Environmental				
Surface Water in or within 800m of R-O-W edge (ha)		0-101	119-186	33-98
Sensitive Wetland Areas in or within 800m of R-O-W edge (ha)		0	0	0
Parks and Protected Areas Crossed (km)		0-2	1-2	0-2
Environmentally Significant Areas Crossed (km)		2-7	1-13	2-3
Other Considerations				
Historical Resource Values (HRV) within R-O-W edge (#) 3	HRV 1	0	0	0
	HRV 2-3	0-1	0-1	0
	HRV 4-5	39-48	26-39	4-9
Paralleling Existing Linear Disturbance within 130 m of centre line (km)		0-12	7-21	1-3
Major River Crossings		0-1	2	1

Line length tends to be a main driver in the overall impacts of a transmission line and the line lengths considered from the Fidler substation tended to be on average slightly longer.

Consider the following:

Line Length

- The longest routes considered from Castle Rock Ridge is approximately the same length as the shortest routes considered from Fidler.

Agriculture

1. The metrics provided suggest that the amount of cultivation in each area is similar with more potential to avoid cultivation north of the reservoir. Avoiding the cultivation generally results in crossing more native prairie.
2. Land classification suggests (Class 3 vs Class 3, Class 4 vs Class 4, and Class 5&6 combined vs Class 5&6 combined) that there is very little difference between the amount of more productive or less productive soils in either area.
3. Impacts to irrigation are minimal

Overall impact to agriculture is very similar - and will generally be tied to overall line length.

Residential

1. There is generally a higher density of residences south of the Oldman reservoir – the heaviest concentrations are in Cowley, Lundbreck, and along Highway 3 into Burmis.

Route options with comparable residential impacts exist both north and south of the reservoir.

Most often potential impacts to residences is associated with the potential to parallel the existing road and highway infrastructure. For example following Highway 3 would result in higher residential impact due to the higher concentration of residences adjacent to it.

Routes with lower residential impacts would tend to be located in steeper terrain or native vegetation.

Environment

1. Surface Water metrics are primarily driven by the proximity of potential routes to the Oldman Reservoir.
2. No sensitive wetlands identified at this time.
3. Similar Parks and protected areas.
4. Environmentally Significant Areas only reflect the data set managed by ASRD and does not necessarily reflect the areas with known occurrences of species of management concern, native vegetation or other wildlife habitat considerations (specifically this does not include any of the areas commonly known as the Porcupine Hills).
5. Native Vegetation is also an environmental consideration - the routes considered from Castle Rock Ridge with the most impact to native vegetation has roughly the same impact as the routes considered from Fidler with the least impact to native vegetation.
6. Major River Crossings is also an environmental consideration. Routes with no river crossings require routing along or through the Porcupine Hills. The river crossings associated with the Castle River and Crowsnest River (from Castle Rock Ridge) are physically smaller than the crossing of the Oldman River (from Fidler).

Overall Environmental considerations exist both north and south of the reservoir and most often tend to be a tradeoff for lower residential and agricultural impacts. The metrics do not necessarily capture the habitat value that is associated with the native vegetation. While there could be comparable routes from a native vegetation perspective a suite of routes north of the reservoir would likely have more.

Other Considerations

Historical Resource Values (HRV) - the routes considered from Castle Rock Ridge with the most potential impact to HRV 4&5 has roughly the same impact as the routes considered from Fidler with the least potential to impact to HRV 4&5. An HRV 4 notation designates land that contains historical resources that may require avoidance. An HRV 5 notation designates land that is believed to contain historical resources. The exact location of these occurrences can not be determined until more detailed routing the field work has been conducted.

Overall considering the area north and south of the Oldman reservoir both alternatives include similar overall impact with similar tradeoffs between potential impacts.

3. CONCLUSION

The conclusions presented in this assessment are based on the assumption that all new transmission line development and rebuilds will require new right-of-way, and that locating towers within road allowances will not be possible.

Overall, both Alternatives are feasible from a Land Impact Assessment point of view. The potential overall impacts of the two components are similar. Individual routes have the potential to be comparable both north and south of the reservoir, with the potential to minimize certain localized impacts during more detailed siting work.

However a suite of routes north of the reservoir would likely include longer routes as well as routes with more native vegetation and agriculture. A suite of routes south of the reservoir would include shorter routes with more residences.

No factors have been identified in this LIA that preclude the development of either of the component. Both traverse a similar landscape, and with comparable line lengths that can be expected to have similar land impacts.

The specific determination of individual comparable routes and the associated impacts is completed during the Facility Application development and contemplates additional considerations such as cost. Generally speaking this stage will consider the elimination of longer routes with comparable impacts.

4. INFORMATION SOURCES

Table 3: Data Sources

Major Aspects & Considerations	Data Sources / Assumptions
Agricultural Impacts	
Grassland Vegetation Inventory Crossed (km)	Derived from Alberta Sustainable Resource Development (ASRD) Alberta Sustainable Resource Development (ASRD). 2009. Grassland Vegetation Inventory (GVI). ArcGIS shapefiles provided by Oriano Castelli. Resource Information Unit Prairies Area, SRD, Lethbridge, AB. Available at: http://www.srd.alberta.ca/MapsFormsPublications/Maps/ResourceDataProductCatalogue/ForestVegetationInventories.aspx
Dominant Land Suitability Class Distribution - Distance Crossed (km)	"The land capability classes were provided by Agriculture Canada in an ArcGIS database file that linked to the soil polygons within the Agricultural Region of Alberta Soil Inventory Database (AGRASID). The rating system is based on a methodology for deriving suitability ratings for spring seeded small grains (e.g., oats, wheat, barley) and the interpretation of AGRASID soil landscape and climate files **Source**: 1. T. Brierly. 2008. Land Suitability Rating System Classes For the Agricultural Region of Alberta. Agriculture and Agri-Food Canada. Data accessed September 2, 2008. 2. Alberta Soil Information Centre (ASIC). 2001. AGRASID 3.0: Agricultural Region of Alberta Soil Inventory Database (Version 3.0). (ed.) J.A. Brierley, T.C. Martin, and D.J. Spiess. Agriculture and Agri-Food Canada, Research Branch; Alberta Agriculture, Food and Rural Development, Conservation and Development Branch. 3. Agronomic Interpretations Working Group. 1995. Land Suitability Rating System For Agricultural Crops: 1. Spring Seeded Small Grains. Edited by W.W. Pettapiece. Tech. Bull. 1995-6E. Centre for Land and Biological Resources Research, Agriculture and Agri-Food Canada, Ottawa. 4. Alberta Agriculture and Food. 2007. Land Suitability Rating System Classes For the Agricultural Region of Alberta. September 2007. 2 pp."

Irrigated Parcels Crossed (km)	This dataset shows irrigated parcels as defined by Alberta Agriculture within Alberta's irrigation districts. **Sources:** 1. Alberta Agriculture and Rural Development. 2008. Irrigation District Data Information Database. Water Resources Branch Lethbridge, Alberta. Provided by Bob Winter, Data Management Coordinator, Water Resources Branch Lethbridge, Alberta. E-mail August 12, 2008. 2. TELUS Geomatics. 2007. SPOT5 Panchromatic Satellite Imagery, 2.5 m resolution, Digital Imagery. Imagery Acquired: 2006 and 2007. Edmonton, Alberta
Environmental Impacts	
Surface Water in or within 800m of R-O-W edge (hA)	Surface water is made up of hydrology polygons from the AltaLIS dataset and Irrigation Reservoir Dataset. **Source:** 1. AltaLIS Ltd. 2001. 1:20,000 Base Features, Geographic Information System (GIS) Spatial Database, Scale 1:20,000. Calgary, Alberta. Reservoirs dataset from Government of Alberta's Agriculture and Rural Development Ministry 2. Alberta Agriculture and Rural Development. 2008. Irrigation District Data Information Database. Water Resources Branch Lethbridge, Alberta. Provided by Bob Winter, Data Management Coordinator, Water Resources Branch Lethbridge, Alberta. E-mail August 12, 2008. 3. TELUS Geomatics. 2007. SPOT5 Panchromatic Satellite Imagery, 2.5 m resolution, Digital Imagery. Imagery Acquired: 2006 and 2007. Edmonton, Alberta
Sensitive Wetland Areas in or within 800m of R-O-W edge	**Sources:** 1. Important Bird Areas (IBAs) from BirdLife International. IBAs were obtained in a shape file from Birdlife International by AltaLink. Data is current to 2004 (Heck 2008)*. 2. Staging and Molting Wetlands were obtained from Ducks Unlimited Canada by AltaLink (Heck 2008)*. The data is current to 2006 and includes key molting and staging areas identified through field surveys and conservation efforts. * Heck, N. 2008. Environmental Advisor, AltaLink Management Ltd. Calgary, Alberta. E-mail March 20, 2008. 3. AltaLIS Ltd. Various Dates. 1:20,000 Base Features, Geographic Information System (GIS) Spatial Database, Scale 1:20,000. Calgary, Alberta.

Sensitive Wetland Areas in or within 800m of R-O-W edge (hA)	Sources: 1. Alberta Tourism Parks and Recreation (ATPRC). 2008. Protected Areas ArcView Shapefile . Updated to September 22, 2008. Available at: http://www.tpr.alberta.ca/parks/landreferencemanual/default.aspx 2. Alberta Tourism Parks and Recreation (ATPRC). 2007. Crown Reservation Areas ArcView Shapefile. Updated to April 24, 2008. Available at: http://www.tpr.alberta.ca/parks/landreferencemanual/default.aspx
Parks and Protected Areas Crossed (km)	**Sources:** 1. Alberta Tourism Parks and Recreation (ATPRC). September 22, 2008. Protected Areas Arc View Shape file . Available at: http://www.tpr.alberta.ca/parks/landreferencemanual/default.aspx 2. Alberta Tourism Parks and Recreation (ATPRC). April 23, 2008. Crown Reservation Areas Arc View Shape file . Available at: http://www.tpr.alberta.ca/parks/landreferencemanual/default.aspx 3. Fiera Biological Consulting, Environmentally Significant Areas Provincial Update 2009. Arc Shape file accompanying Environmentally Significant Areas Provincial Update 2009. Report prepared for: Resource Data Division, Alberta Environmental Protection. Edmonton, Alberta. Available at: http://tpr.alberta.ca/parks/heritageinfocentre/environsigareas/default.aspx
Residential Impacts	
Residential Impacts	Residences were digitized from Spot 2.5m panchromatic imagery acquired in 2008 (November to December). Residence types include, rural, country residential and urban (first row). Rural residences were interpreted based on the size of buildings, roof type of building, location of shelterbelts, and knowledge of typical rural settlement patterns (e.g., a residence surrounded by barns and other out buildings, driveways for vehicles versus farm machinery, etc.) were used. Country residential residences were digitized primarily based on density in both rural areas. Country residential was defined as a cluster of residences located on sub-divided rural land. Country residential clusters can vary in density depending on how the land was sub-divided. First row urban includes the first row of residences in urban subdivisions adjacent to the R-O-W. Where subdivisions curve, angle away from or run perpendicular to the line, first row residences are included based on estimated visibility. **Source:** Digitized from SPOT 2.5m panchromatic imagery for 2007. SPOT Imagery provided by TELUS Geomatics. Additional residences were added to the set as a result of field verified data provided by AltaLink. 40 cm Colour Imagery Source: Valtus. 2008. Colour orthophotography, 40 cm resolution, Digital Imagery.
Residences within 150 m of centreline (#) 2	
Special Considerations	

Historical Resource Values (HRV) within R-O-W edge (#)	**Source:** Alberta Culture and Community Spirit. 2009. Listing of Historic Resources September 2009 edition. Historic Resources Management Branch, Alberta Culture and Community Spirit. Edmonton, Alberta.
Airfields / Airports in or within 800 m of R-O-W edge (#)	**Source:** Digitized from SPOT5 Panchromatic Satellite Imagery, 2.5 m resolution, Digital Imagery for 2007. SPOT Imagery provided by Telus Geomatics. Imagery Acquired: 2006 and 2007. Edmonton, Alberta.
Total ROW Length	**Sources:** 1. AltaLIS Ltd. Various Dates. 1:20,000 Base Features, Geographic Information System (GIS) Spatial Database, Scale 1:20,000. Calgary, Alberta. 2. Digitized from SPOT5 Panchromatic Satellite Imagery, 2.5 m resolution, Digital Imagery for 2007. SPOT Imagery provided by Telus Geomatics. Imagery Acquired: 2006 and 2007. Edmonton, Alberta.
Electrical Considerations	
Paralleling Existing Linear Disturbance within 130 m of centreline (km)	**Sources:** 1. Existing transmission lines provided by AltaLink Management Ltd. 2. National Road Network. Government of Canada, Natural Resources Canada, Earth Sciences Sector, Mapping Services Branch, Centre for Topographic Information - Sherbrooke. Published June 20, 2008. 3. AltaLIS Ltd. 2000-2009. 1:20,000 Base Features, Geographic Information System (GIS) Spatial Database, Scale 1:20,000. Calgary, Alberta.