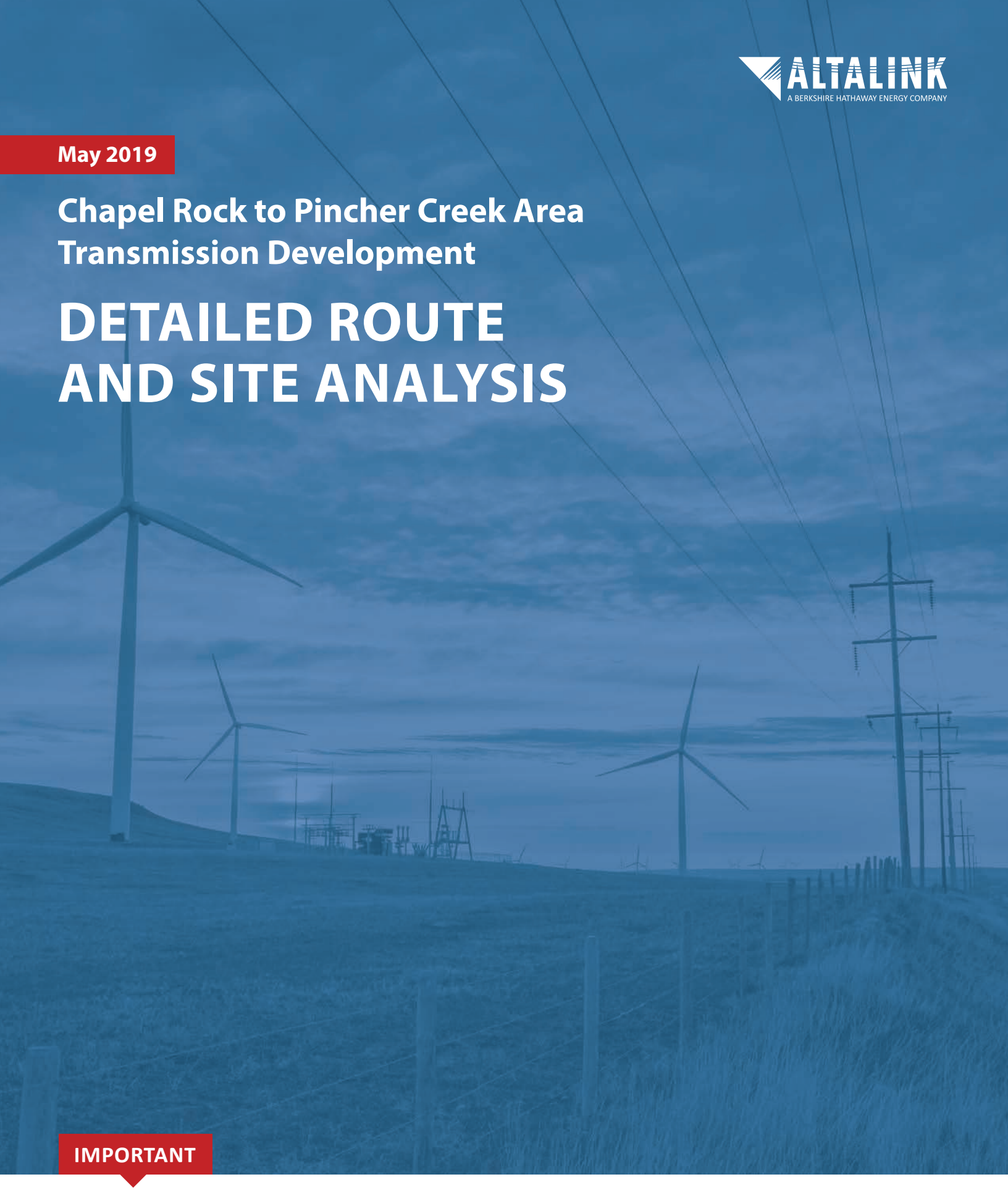
ALTALINK
A BERKSHIRE HATHAWAY ENERGY COMPANY

May 2019

Chapel Rock to Pincher Creek Area Transmission Development

DETAILED ROUTE AND SITE ANALYSIS



IMPORTANT

Please refer to the newsletter included in this package for details about the proposed structure types for this project and how you can provide your input, including our upcoming open house schedule.

Detailed route and site analysis

There are two different scenarios that we are proposing for this project to meet the two technical solutions proposed by the Alberta Electric System Operator (AESO).

North Technical Solution

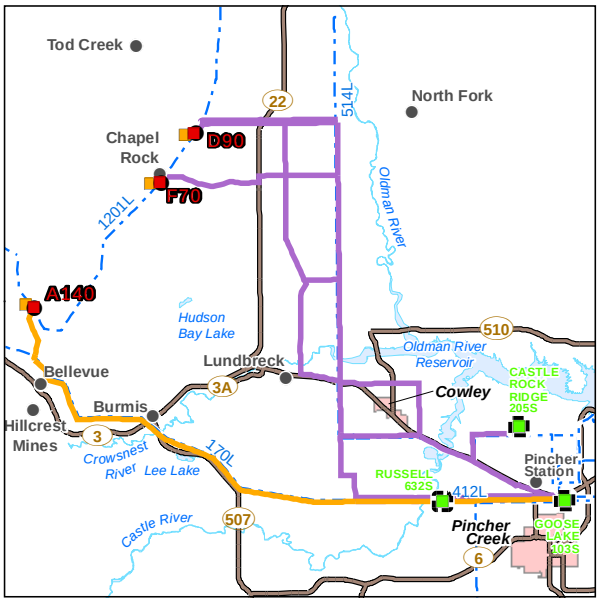
shown in purple on the map

This includes several proposed route options and two proposed substation site options.

South Technical Solution (New)

shown in orange on the map

This includes one proposed substation site and one proposed route that uses a portion of the existing 170L and 412L rights-of-way.



LEGEND

- Point Designation
- Proposed Substation
- Proposed Substation Upgrade
- Proposed Transmission Line Route - North Technical Solution
- Proposed Transmission Line Route - South Technical Solution
- Existing Transmission Line
- Hamlet or Locality
- Highway
- Urban Area
- Water Body

Other AltaLink Project

- Proposed Alberta/British Columbia Intertie Restoration Project Series Capacitor Location

If the project is approved, only one of the technical solutions will be built. If the North Technical solution is selected, only one of the proposed routes and one substation will be built.

Details about the sites and routes chosen for each technical solution are included on the following pages:

Substation details

Transmission line details – North Technical Solution

Transmission line details – South Technical Solution

Substation details

NEW CHAPEL ROCK SUBSTATION

We are proposing to build one new substation called Chapel Rock that will connect the new transmission line with the existing 1201L transmission line, which is the Alberta/British Columbia intertie.

We are no longer proposing a telecommunications tower at the new substation. Instead, we're proposing to place an optical fibre line within the road allowance, either above or below ground. You can see the location and orientation of these lines on the maps included in this package.

North Technical Solution

The substation site for the North Technical Solution will be approximately 195 x 210 metres in size and will be located at one of two proposed sites:

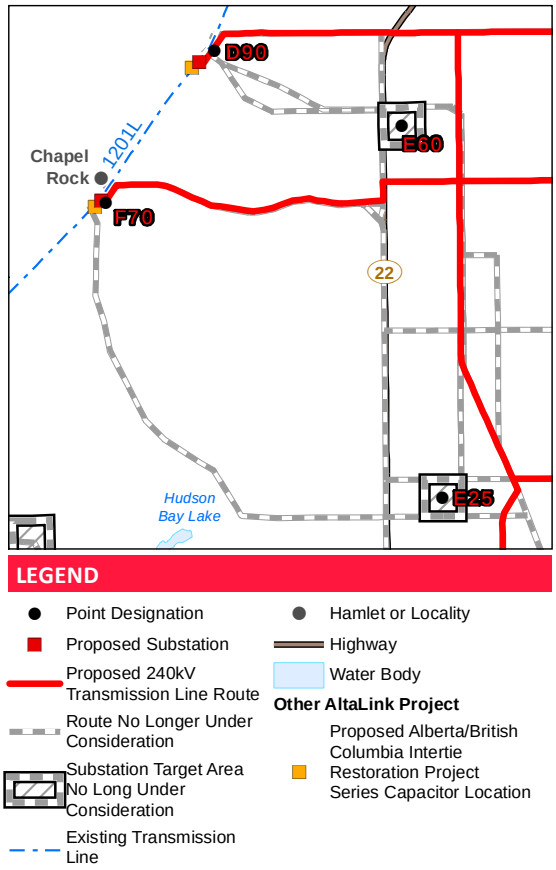
- NW-31-8-2-W5M located at the end of Chapel Rock Road (designation point F70 on the maps)
- NE-8-9-2-W5M located within the Wildcat Creek Valley (designation point D90 on the maps)

The E25 and E60 sites located next to Highway 22 were originally considered for this project because of potential future transmission lines that would need to connect to the substation. Since then, the AESO has reduced the future requirements of the substation, so as a result the E25 and E60 sites are no longer under consideration. In addition, when compared to the E25 and E60 sites, the F70 and D90 sites that we selected have:

- Approximately one kilometre of additional 240 kV line length
- The ability to locate the transmission line within road allowance
- Higher potential residential impacts
- Lower potential environment impacts
- Lower potential agricultural impacts
- Lower potential visual impacts from Highway 22
- Higher potential residential visual impacts
- Fewer acres of new right-of-way required across the landscape
- Lower overall cost by avoiding the construction of approximately 5-13 kilometres of new 500 kV transmission line that would otherwise have been required to connect the new substation to 1201L

The A93, B120 and A110 substation locations were removed from consideration because of the higher overall impacts of the routes associated with these sites. A description of these impacts is located under the route descriptions on page 5.

After further engineering we have determined that to accommodate the connection of the new substation to the existing 1201L, one new 500 kV structure will be required at the D90 site. No new 500 kV structures will be required at the F70 site.



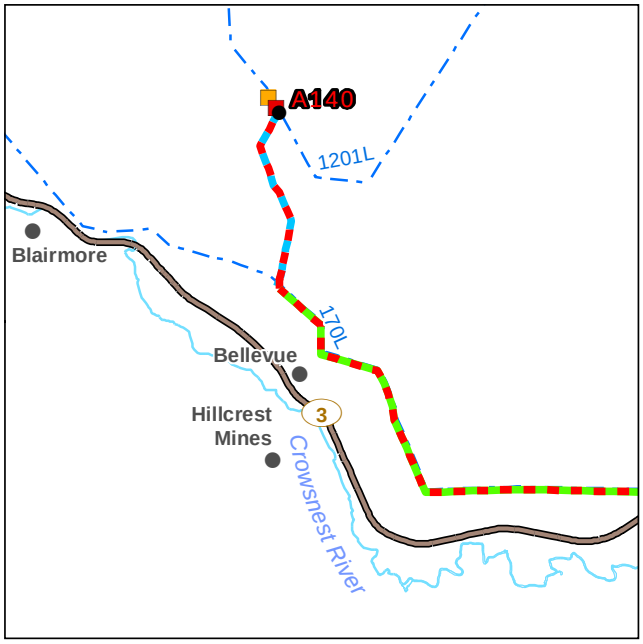
The Chapel Rock Substation will look similar to the one pictured here.

South Technical Solution

The substation site for the South Technical Solution will be approximately 200 x 220 metres in size and is proposed to be located in SW-8-8-3-W5M (designation point A140 on the maps).

This substation site is larger than the North Technical Solution site because additional equipment is required to connect the 170L to the substation.

After further engineering we have determined that to accommodate the connection of the new substation to the existing 1201L, one new 500 kV structure will be required at the site.



LEGEND

- Point Designation
- Proposed Substation
- Proposed 138kV/240kV Double Circuit Transmission Line Route
- Proposed 170L and 412L Replacement with 240kV Transmission Line Route
- Existing Transmission Line
- Hamlet or Locality
- Highway
- River or Stream

Other AltaLink Project

- Proposed Alberta/British Columbia Intertie Restoration Project Series Capacitor Location

EXISTING SUBSTATIONS

Depending on the technical solution that is chosen, modifications are required at existing substations in the area to accommodate the project. These substations are all located north or west of Pincher Creek on property owned by AltaLink.

NORTH AND SOUTH TECHNICAL SOLUTIONS | Goose Lake

For both technical solutions, the existing Goose Lake Substation site will need to expand by approximately 85 metres to the south and 45 metres to the east to accommodate new equipment that will help regulate the electric system.

NORTH TECHNICAL SOLUTION | Castle Rock Ridge

In the event that the transmission line connects to the Castle Rock Ridge Substation, the substation will need to expand approximately 13 metres to the east and 24 metres to the north to accommodate the equipment needed to connect the transmission line. This expansion will only occur if the transmission line connects to this substation.

SOUTH TECHNICAL SOLUTION | Russell and Pincher Creek

Since the 170L & 412L replacement route includes replacing two 138 kV transmission lines with one 240 kV transmission line, substation modifications are required to accommodate the proposed 240 kV connection.

- **Russell Substation** – A 240 kV transformer needs to be added to the substation to accommodate the connection of the new line, so the substation will need to expand by approximately 80 metres x 130 metres to the south and west.
- **Pincher Creek Substation** – modifications will be required to existing equipment at the substation. This includes modifying the 138kV connections between the Pincher Creek and Goose Lake substations. No expansion to the fence line is required.

Transmission line routes – North Technical Solution

Based on stakeholder feedback, engineering and cost analysis, the primary structure that we are proposing for this technical solution is a steel monopole. Please see a detailed description of the proposed structure types that have been chosen in the newsletter included in this package.

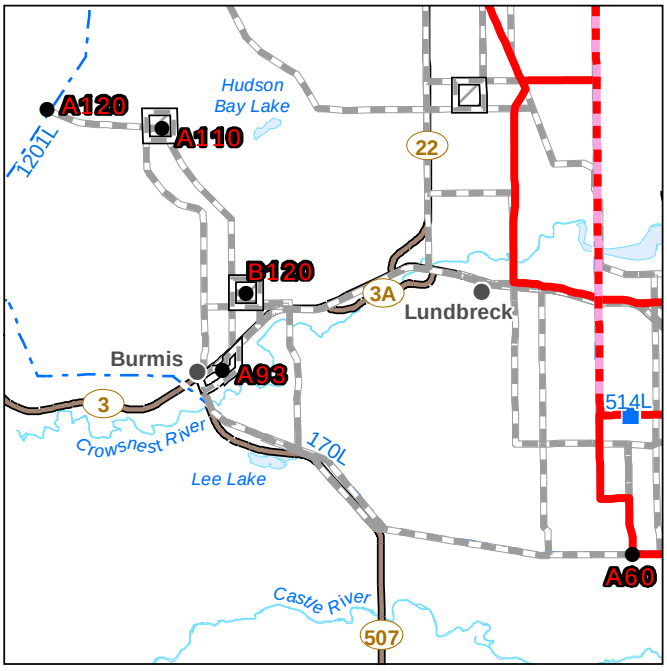
The use of monopoles allows us to locate the transmission line within in road allowance, which many stakeholders said they prefer because it follows an existing disturbance. As a result, a majority of routes that were located on quarter lines have been removed from consideration.

There are several possible routes proposed for the North Technical Solution, depending on which site is selected for the new substation and which existing substation the line connects to.

REMOVED FROM CONSIDERATION: Burmis area routes

The routes to the Burmis area are considered to have higher overall impacts and have been removed from consideration. When compared to other options that extend north, the Burmis area routes:

- Have greater residential impacts
- Have greater overall environmental impacts
- Cross conservation easements
- Cross critical fish habitat
- Require the construction of a twinned 500kV transmission line
- Have shorter route lengths



LEGEND

- Point Designation
- Existing Substation
- Proposed 240kV Transmission Line Route
- Proposed Re-use of Existing Transmission Line Route
- Route No Longer Under Consideration
- Existing Transmission Line
- Substation Target Area No Longer Under Consideration
- Hamlet or Locality
- Highway
- Water Body

ROUTE OPTIONS NORTH OF HIGHWAY 3

REMOVED FROM CONSIDERATION: Highway 3/22 route (B70-B80-D80)

The route option that follows Highway 3 and then goes north along Highway 22 has been removed from consideration. When compared to the other two options, it:

- Has a greater potential for historical resource impacts
- Has a greater potential for environmental impacts
- Has a greater potential for residential impacts
- Has greater visual impacts along Highway 22
- Does not cross the Provincial Recreation Area
- Is located almost entirely within developed road allowance

The 514L replacement route option (B50 – D70)

The existing 514L transmission line is nearing the end of its life and is planned to be rebuilt.

AltaLink is currently exploring potential options to serve the customers connected to the 514L. At this point in time, AltaLink anticipates that the portion of 514L north of our Cowley Ridge Substation along Range Road 15 may either be removed or relocated to a new alignment. As a result, we are exploring the possibility of using the existing 514L alignment to build the new line needed for this project and to do this we have moved the proposed route to the east side of Range Road 15. AltaLink will keep stakeholders informed as we further explore options regarding the existing 514L transmission line.

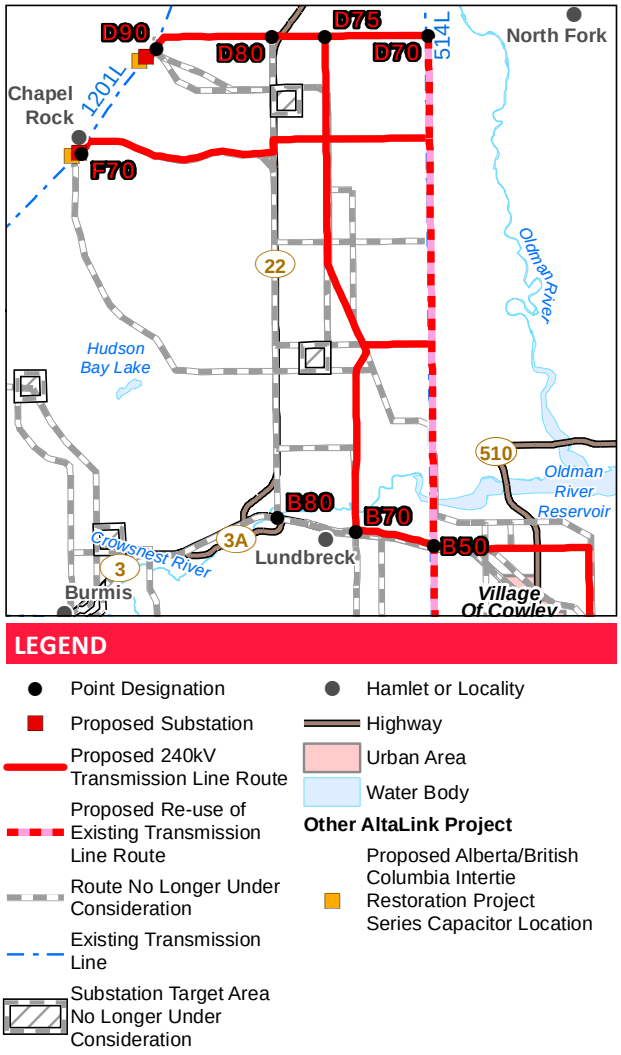
This option, when compared to the middle route option north of Highway 3:

- Has the potential ability to re-use the alignment of an existing transmission line
- Has a greater number of residences within 150 metres and a similar number within 800 metres, however residences will not be closer to a line than they currently are
- Crosses less amount of native prairie/tame pasture
- Crosses fewer Environmentally Significant Areas
- Has less potential for visual impacts along Highway 22
- Crosses the Provincial Recreation Area
- Is located almost entirely within developed road allowance
- Is in proximity to the Cowley Airport
- Has a similar line length

The middle route (B50-B70-D75)

In order to reduce the length of transmission line along Highway 22, we have extended the proposed route along undeveloped road allowance to D75. This also helped to reduce visual impacts along Highway 22 for this route. This option, when compared to the 514L replacement route option:

- Follows road allowance for approximately 65% of the route length
- Has a fewer number of residences within 150 metres but a similar number within 800 metres
- Crosses a greater amount of native prairie/tame pasture
- Crosses a greater number of Environmentally Significant Areas
- Has higher potential for visual impacts along Highway 22
- Similar line length

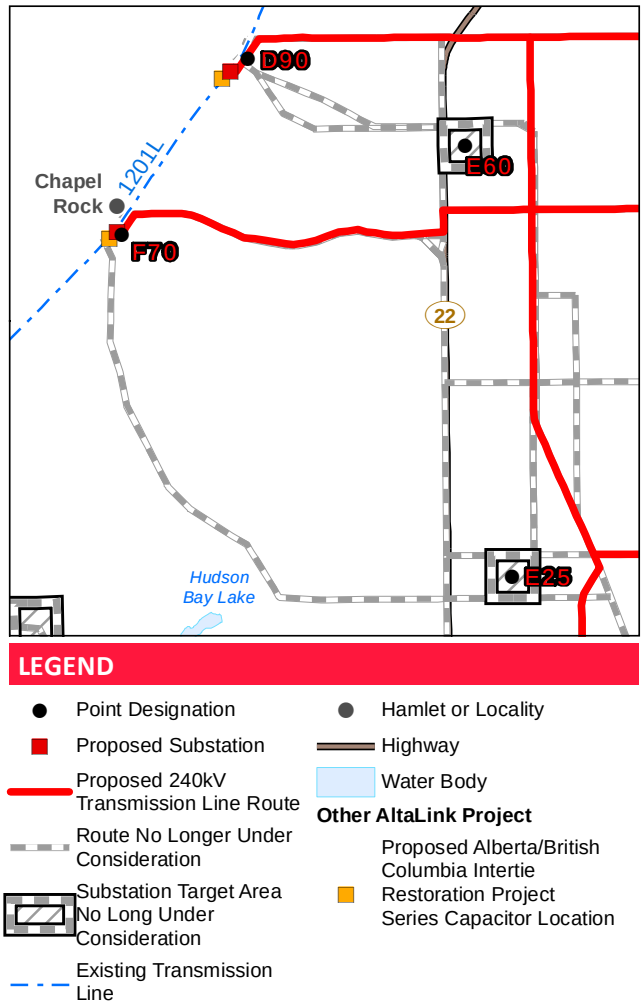


ROUTE OPTIONS IN THE CHAPEL ROCK ROAD AND WILDCAT CREEK AREA

Since substation locations F70 and D90 remain in consideration, the route options associated with these sites also remain in consideration. When comparing the F70 route (along Chapel Rock Road) and the D90 route (into the Wildcat Creek Valley), the F70 route:

- Is comparable in line length
- Is almost entirely located within developed road allowance
    - Approximately 50% of the D90 route is in developed road allowance
- Crosses less native prairie
- Has higher potential residential impacts
- Will likely not require road upgrades heading to the substation site
    - The D90 route may require road upgrades along Twp Road 91A (west of Highway 22) into the Wildcat Creek Valley

Along Chapel Rock Road to F70, we have decided to move a portion of the route to the north side of the road allowance based on information gathered during the first round of consultation.



ROUTE OPTIONS NEAR THE VILLAGE OF COWLEY

REMOVED FROM CONSIDERATION: Highway 3 and CPR railway parallel routes

Based on stakeholder feedback and further investigation, we have decided to remove the route options following Highway 3 and the CPR railway near the Village of Cowley from consideration for the following reasons:

Highway 3 option (B30-B50)

- Close proximity to the residences within the Village of Cowley
- Preference was given to a route following the Highway 3 expansion plan. This option would leave structures in a mid-field position until the highway is expanded, increasing agricultural impacts
- Other future development considerations within the Village of Cowley

CPR railway parallel option (B30-C50-B50)

- Close proximity to the residences within the Village of Cowley
- Potential additional costs for railway induction mitigation
- Structures would be located in a mid-field position adjacent to the CP railway, increasing agricultural impacts
- Concerns expressed by stakeholders regarding proximity to playgrounds and green spaces
- Concerns regarding impacts to local tourism

The 514L parallel route (B30-G25-B50)

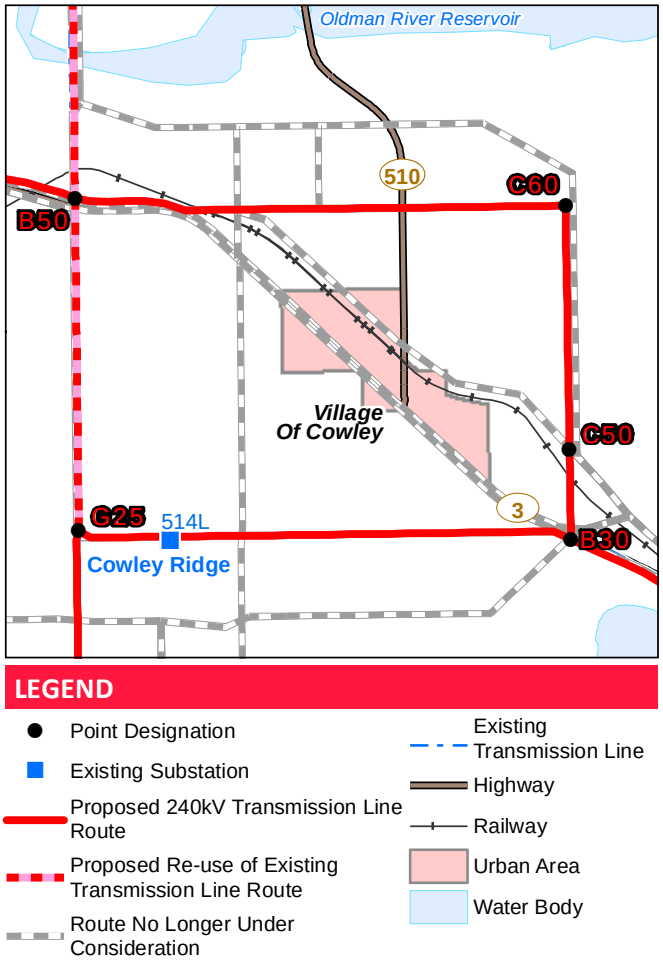
This option, when compared to the North Cowley option:

- Is located within developed road allowance for the majority of its length
- Has the potential to parallel and/or re-use an existing transmission line alignment
- Has more residences within 150 metres but the same within 800 metres
- Crosses more native prairie
- Is in an area where the current view has existing transmission lines and wind turbines within it

North Cowley route (B30-C50-C60-B50)

This option, when compared to the 514L parallel route:

- Is located in developed road allowance for approximately half of its length
- Does not parallel or re-use existing transmission line alignments
- Has less residences within 150 metres but the same within 800 metres
- Crosses less native prairie
- Is in an area where the view does not have existing transmission or wind infrastructure



ROUTES CONNECTING TO THE CASTLE ROCK RIDGE AND GOOSE LAKE SUBSTATIONS

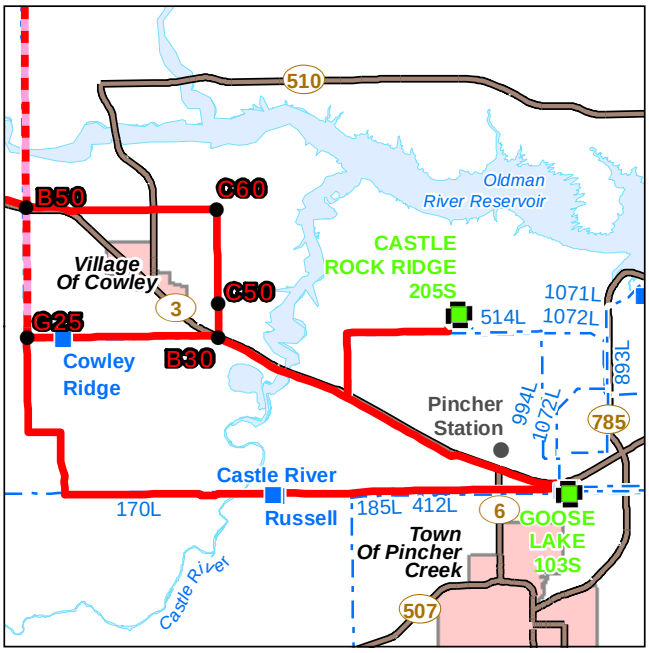
When looking at whether to connect the new line into the Castle Rock Ridge Substation or the Goose Lake Substation, the options are comparable and both remain in consideration. When compared to the Castle Rock Ridge option, the Goose Lake option has:

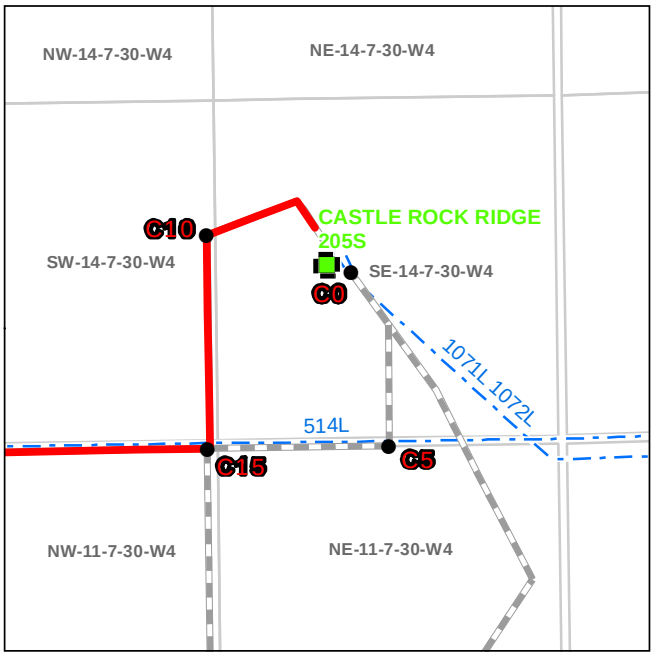
- Longer line lengths
- Greater potential for agricultural impacts
- Less potential environmental impacts
- Similar opportunity to parallel existing transmission line infrastructure
- Similar residential impacts

ROUTE OPTIONS NEAR CASTLE ROCK RIDGE

We are proposing to use the north route option (C0-C10-C15) to reach the Castle Rock Ridge substation, as opposed to the south route option (C0-C5-C15). This option, when compared to the south route option:

- Is closer in proximity to the existing wind turbines
- Avoids the need to re-align the existing transmission line to the south
- Reduces the agricultural impacts around the substation
- Reduces the expansion size of the substation





LEGEND

- Point Designation
- Proposed Substation Upgrade
- Existing Substation
- Proposed 240kV Transmission Line Route
- Proposed Re-use of Existing Transmission Line Route
- Existing Transmission Line
- Hamlet or Locality
- Highway
- Urban Area
- Water Body

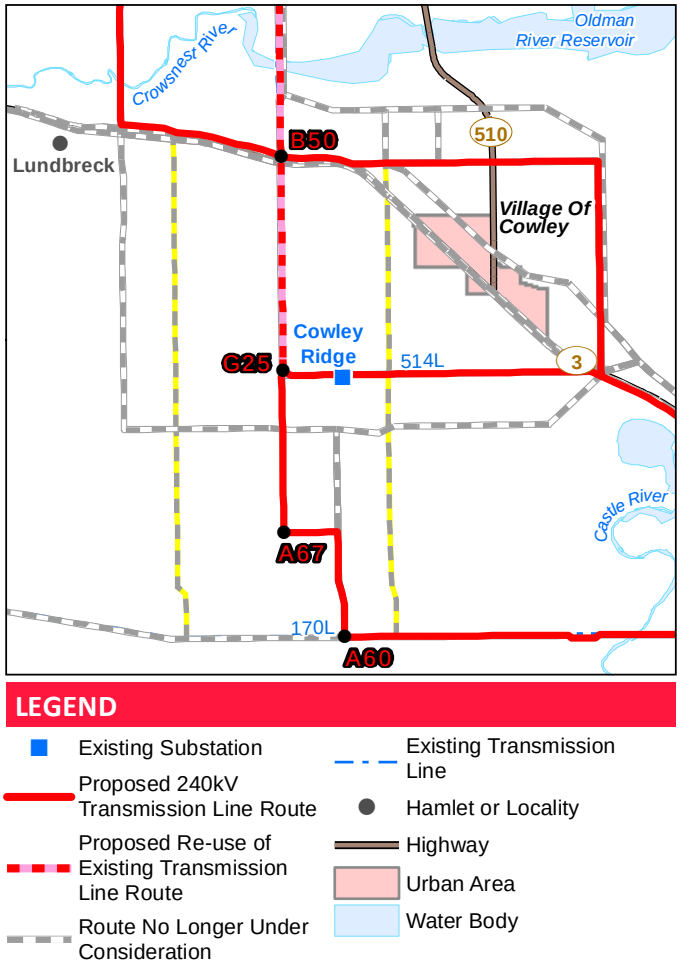
LEGEND

- Point Designation
- Proposed Substation Upgrade
- Proposed 240kV Transmission Line Route
- Route No Longer Under Consideration
- Existing Transmission Line

NORTH/SOUTH CONNECTION FROM HIGHWAY 3 TO 170L

Since connecting at the Goose Lake Substation remains an option, routes between Highway 3 and the existing 170L line were assessed. We have determined that the middle route (B50-G25-A67-A60) will be moving forward for consideration. When compared to the other two road allowance options in the area (highlighted in yellow in the map to the right), this route:

- Has comparable or less line length
- Has fewer residential impacts
- Crosses more native prairie than the eastern route but less than the western route
- Follows quarter line for a portion of its length to avoid residences
- Allows for the potential use of the existing 514L alignment
- Is located near the landfill
- Is in an area where the current view has existing transmission lines and wind turbines within it

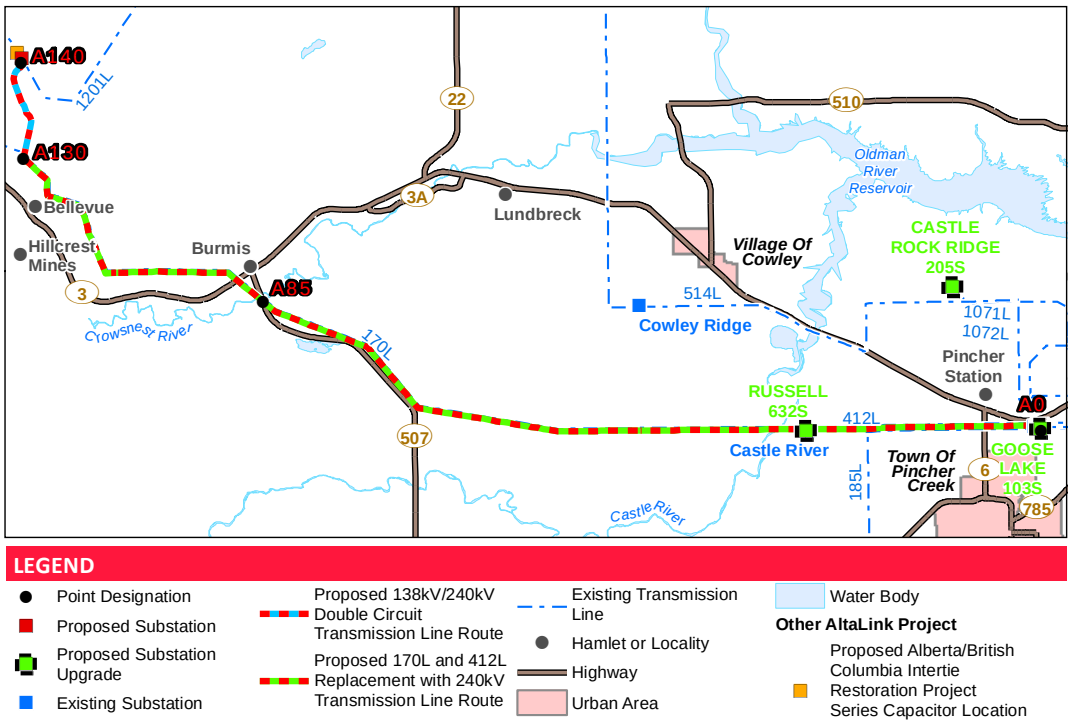


Transmission line routes – South Technical Solution (new)

As a result of stakeholder feedback, the AESO asked AltaLink to look into the possibility of a new option that includes replacing the existing 412L line and a section of the 170L line (both 138 kV) with one 240 kV line. After assessing the possibilities for the new South Technical Solution, we are now including a proposed route from A0-A85-A130-A140 for consideration.

When compared to the proposed routes under consideration for the North Technical Solution, this route:

- Reuses existing transmission line rights-of-way for the majority of its length
  - The right-of-way will generally need to expand by 7-65 metres depending on the structure type and span lengths when in hilly terrain
- Allows the use of an existing disturbance for a portion of the Chapel Rock Substation site
- Is comparable in length to route options from Castle Rock Ridge but has a shorter length than route options from Goose Lake
- Has more residences in proximity to the transmission line but has fewer residences that will be closer to a transmission line after the new line is built
- Crosses conservation easements
- Crosses the most Alberta Environment and Parks (AEP) ranges
- Crosses critical fish habitat
- Crosses the most forested areas
- Is located on steeper terrain west of Burmis
- Has comparable potential impacts to historical resources
- Requires an expansion at the Russell Substation



To learn more about the proposed
Chapel Rock to Pincher Creek Area
Transmission Development, please contact:

ALTALINK
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