

Dawson Creek/Chetwynd Area Transmission Project Update and Introducing the Peace Region Electricity Supply Project

Peace River Regional District Board

August 22, 2013



FOR GENERATIONS

August 22, 2013

Today's presentation

Demand for electricity is growing at an unprecedented rate in the Peace Region, mainly due to the boom in unconventional gas production, and companies wishing to power their facilities from the BC Hydro grid

Today's presentation:

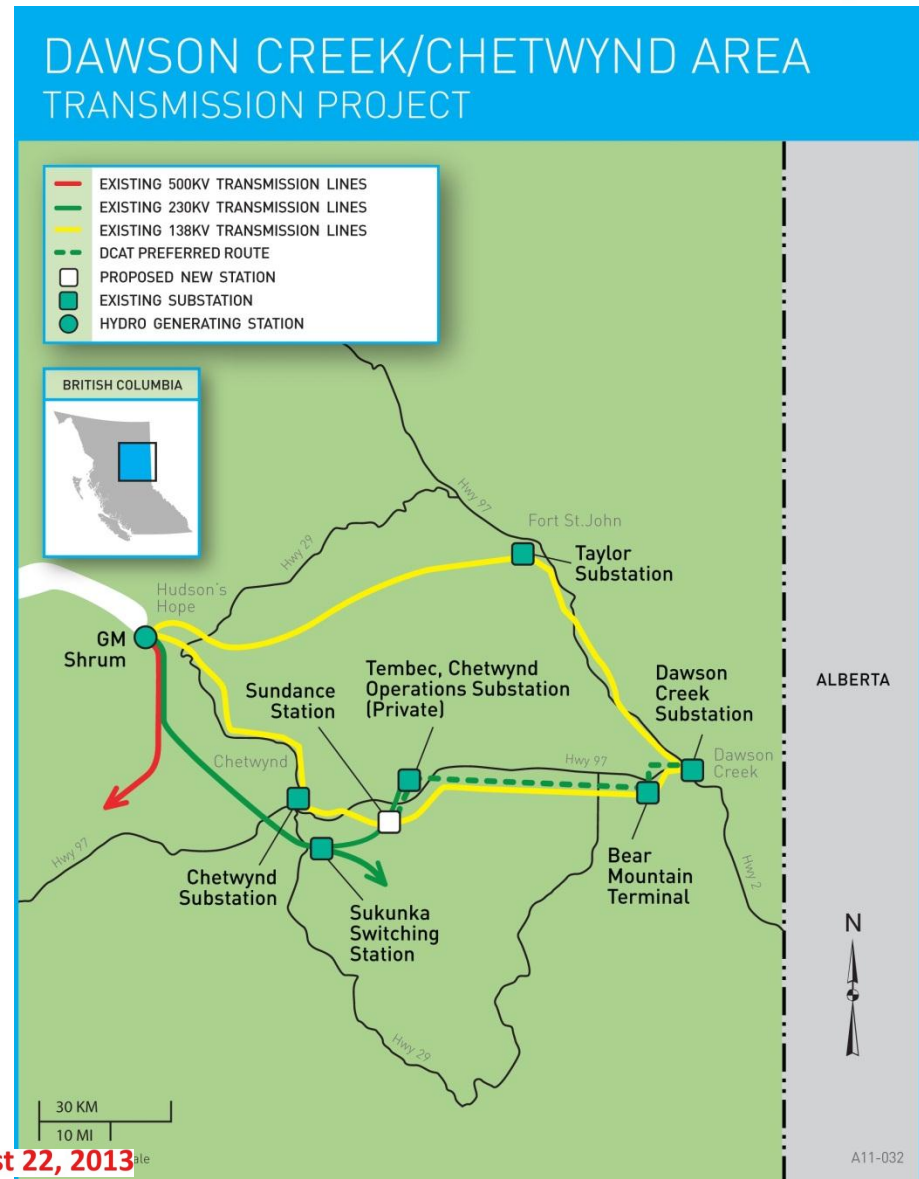
- DCAT update, with a focus on Bear Mountain Terminal
- Peace Region Electricity Supply Project



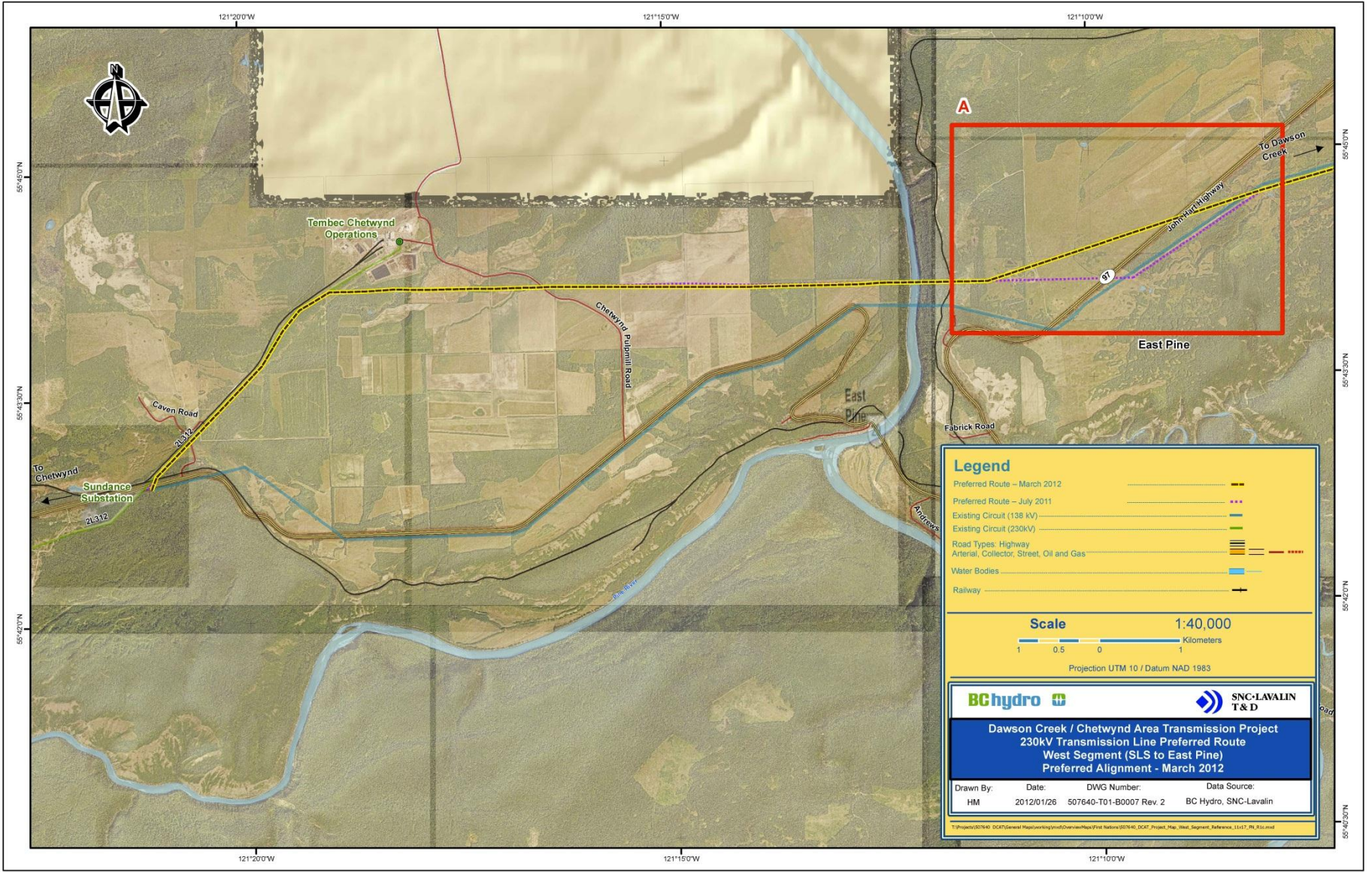
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DCAT Project

- New Sundance Substation (SLS) located about 19 km east of Chetwynd
- New 230 kilovolt (kV) double circuit overhead transmission circuit
- Expansion of Bear Mountain Terminal (BMT) and Dawson Creek Substation (DAW)
- Removal of much of 138 kV line between SLS and DAW
- Received CPCN April 25, 2013
- BMT expansion underway
- Line construction to start this fall
- Scheduled in-service: Early 2015

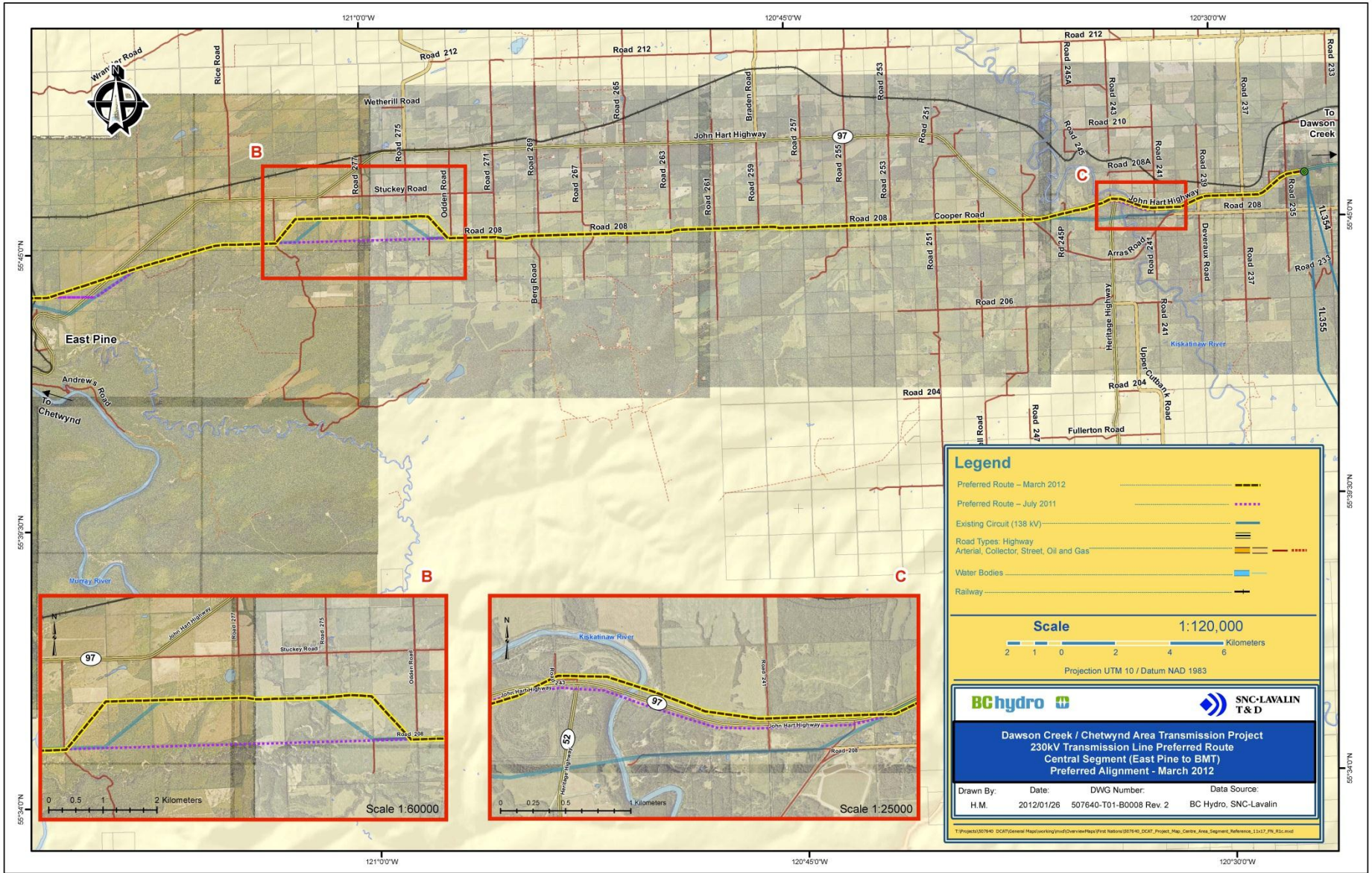


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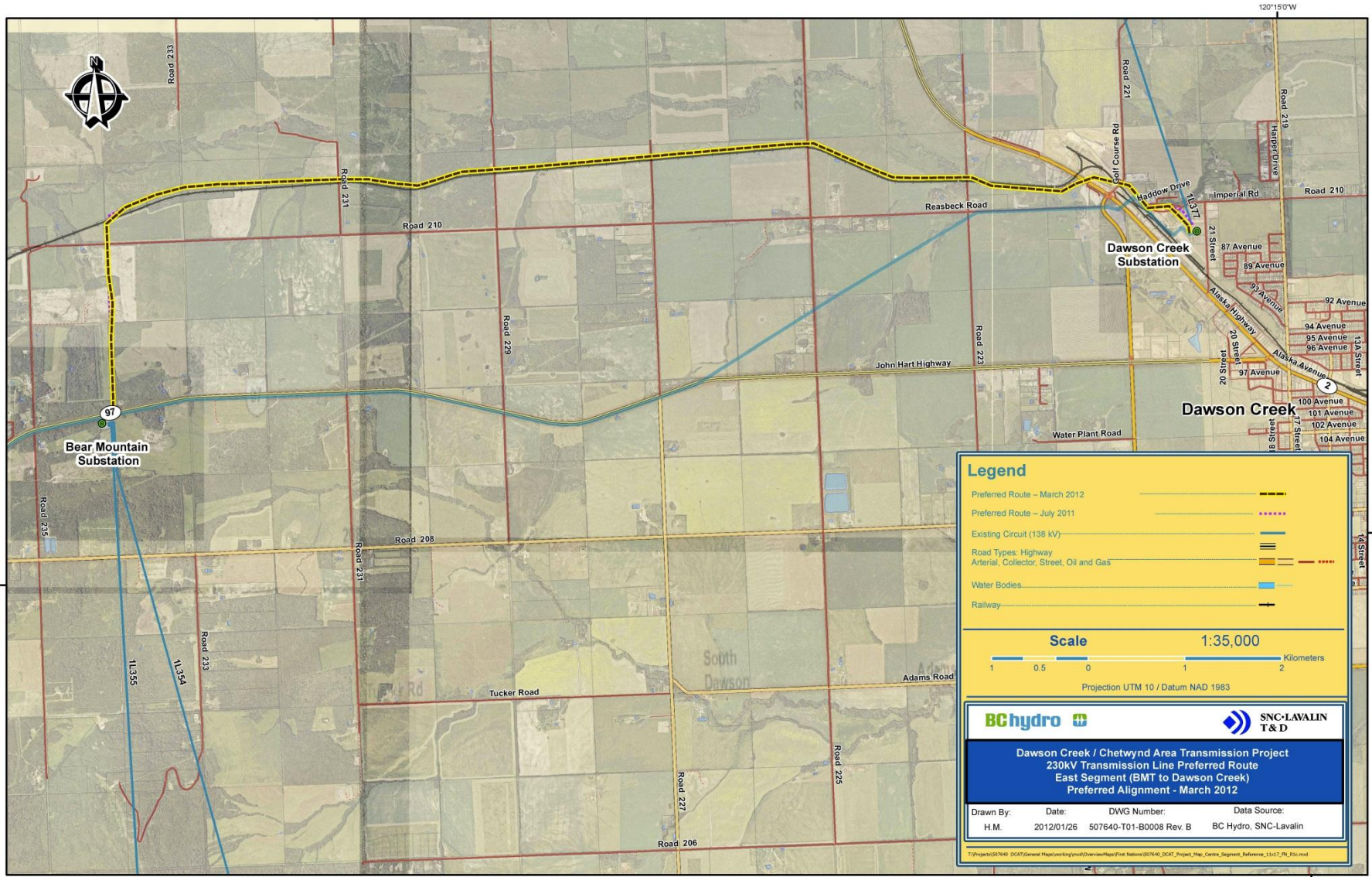
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DCAT western segment final route. Red box circles route revisions made in 2012



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DCAT central segment final route. Red boxes circle route revisions made in 2012



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DCAT eastern segment final route.

Bear Mountain Terminal

- Bear Mountain Terminal (BMT) is currently a 138kV switching station connecting the transmission lines from the Bear Mountain Wind Farm and transmission customer to the BC Hydro System
- To accommodate the double circuit 230 kV DCAT lines and facilitate customer interconnection, BMT must be expanded into a full substation, and the footprint will substantially increase
- Equipment installed will include two 230/138/12.6 kV transformers; as well as equipment to interconnect DCAT, the existing 138 kV lines and a 138 kV future customer line
- Ultimately, more equipment will be needed, as more customers interconnect. Enough land has been acquired (and will be fenced) for the ultimate forecasted build out

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Bear Mountain Terminal (cont'd)

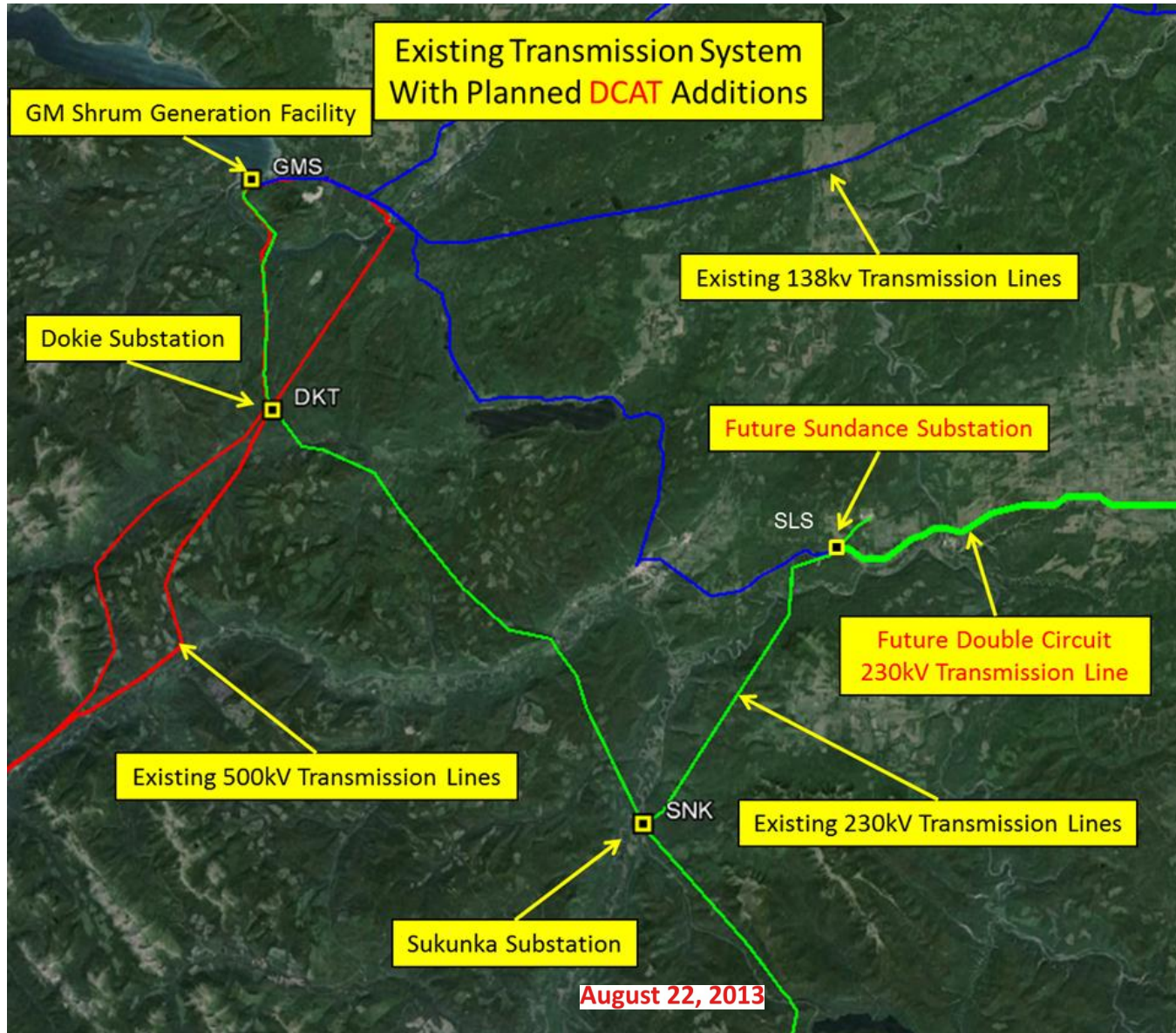
- BMT will also contain equipment to enable communications with a customer which will be taking power from BC Hydro's system. This will ensure the system operates reliably and effectively.
- The most visible of this communications equipment will be a 37 m high lattice tower, with a 6 m lightning rod on top. The narrow profile, triangular based tower will have a single 2 m diameter antenna positioned approximately 33 m from ground.
 - Similar towers are used throughout BC Hydro's system to support antennas and enable point-to-point communications between two stations.
 - The antenna is licensed by Industry Canada.
 - It is designed to send a very focused microwave signal directly to the antenna at the customer's station
 - There is capacity to add two additional antennas, as needed, for other customers that interconnect to the system

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System is still constrained...What's next?

- DCAT project will help meet load growth under normal system conditions
- Even after the DCAT project goes into service, the ability of the transmission system to maintain supply to all customers in the event of any system issues will be exceeded.
- At some point around 2019, assuming growth continues as forecast, there will be insufficient capacity to meet demand reliably even under normal system conditions.
- From the outset, BC Hydro indicated that DCAT would be a first step, and that a second project would be needed to reliably address the level of load growth that the area is experiencing
- BC Hydro is now studying what this second project could entail, and we are starting consultation with First Nations and stakeholders on the alternatives

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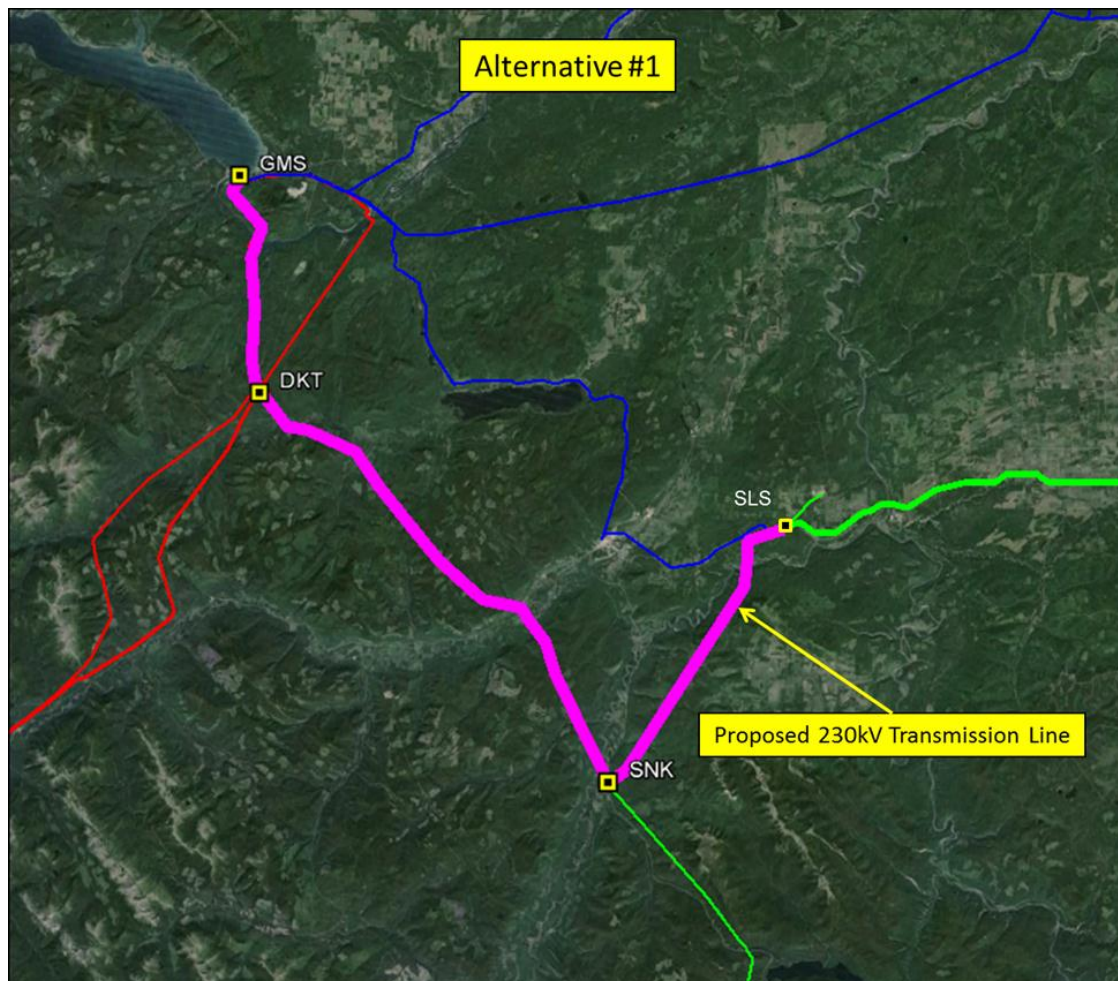
Peace Region Electricity Supply Project

- New project: objective is to bring more electricity to the Peace region from GM Shrum generating station
- Currently carrying out studies and consultation to determine a preferred alternative, which will form the basis of the project
- This will be a major project which will require approval of a CPCN from the BC Utilities Commission
- Preliminary target in service date: 2019

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Alternative 1

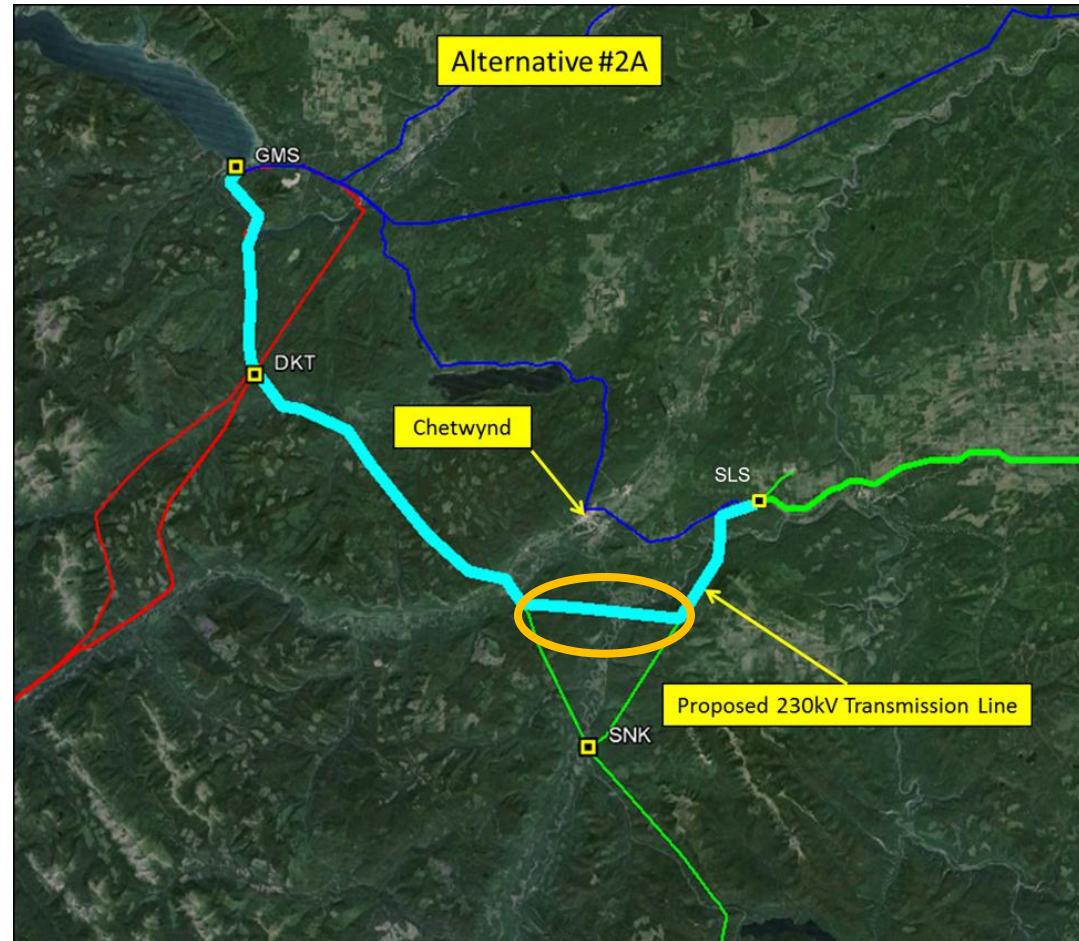
- New 230 kV transmission line from GMS to Sundance Substation, via Sukunka Substation
- Approximately 105 km
- Much of the route could likely parallel existing transmission lines
- Upgrades required to GMS, Sukunka and Sundance Substations



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Alternative 2A

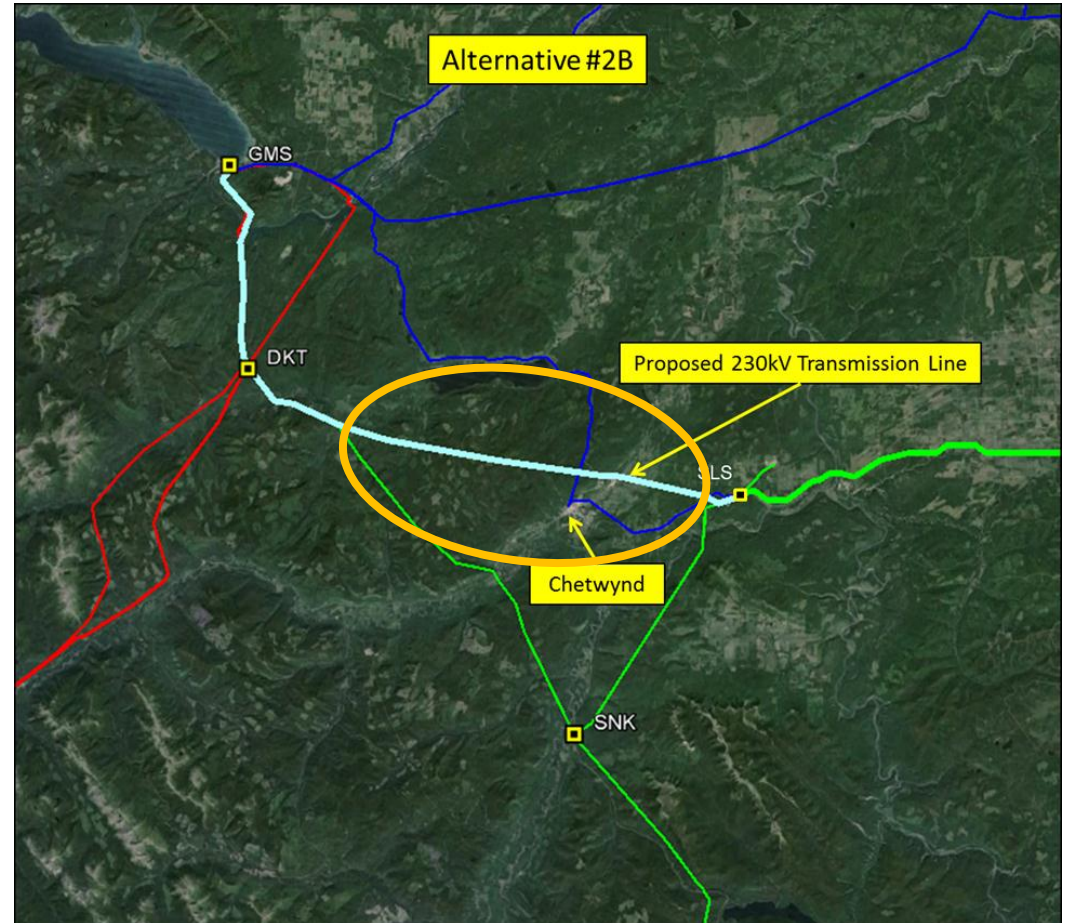
- New 230 kV transmission line from GMS to Sundance Substation via Dokie Substation, passing south of Chetwynd
- Approximately 85 km
- Approximately 70 km could parallel existing transmission lines. Approximately 15 km (circled) would not parallel existing lines
- Upgrades required to GMS, Dokie and Sundance Substations



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Alternative 2B

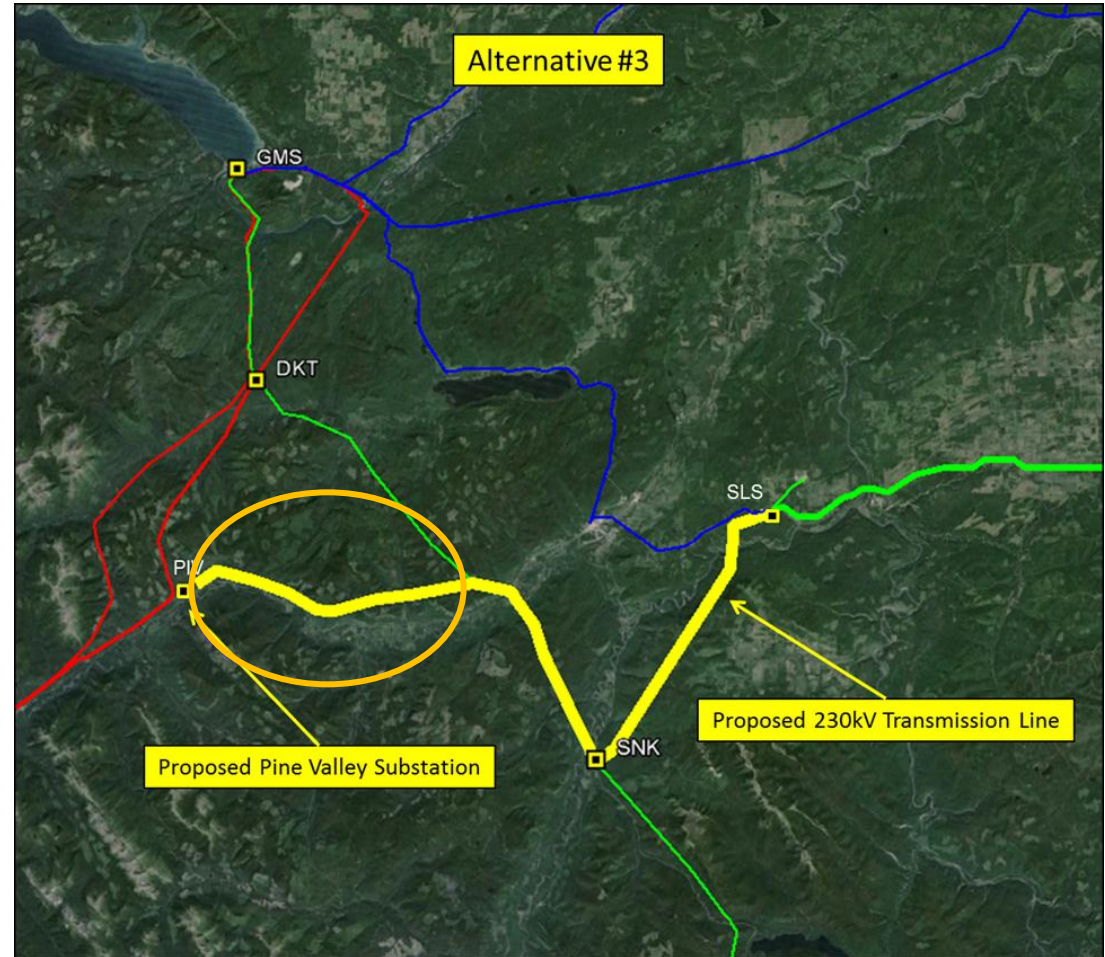
- New 230 kV transmission line from GMS to Sundance Substation via Dokie Substation, passing north of Chetwynd
- Approximately 76 km
- Roughly half could parallel existing transmission lines
- Balance (circled) would not parallel existing lines
- Substation upgrades the same as Alternative 2A



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Alternative 3

- New 500/230 kV Pine Valley Substation, connected to an existing 500kV transmission line from GMS
- New, approximately 84 km, 230kV transmission line from Pine Valley Substation to Sundance Substation via Sukunka; upgrades to both substations
- Approximately 53 km could parallel existing lines
- Balance (circled) would not parallel existing lines



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Next steps

- Identifying a preferred alternative by early 2014, through
 - Technical, environmental, cost estimating, constructability and other studies
 - First Nations consultation
 - Stakeholder consultation

- A project will be put forward for regulatory review and approval. However, alternative evaluation continues through to culmination of the regulatory process.

- Target in-service date: 2019

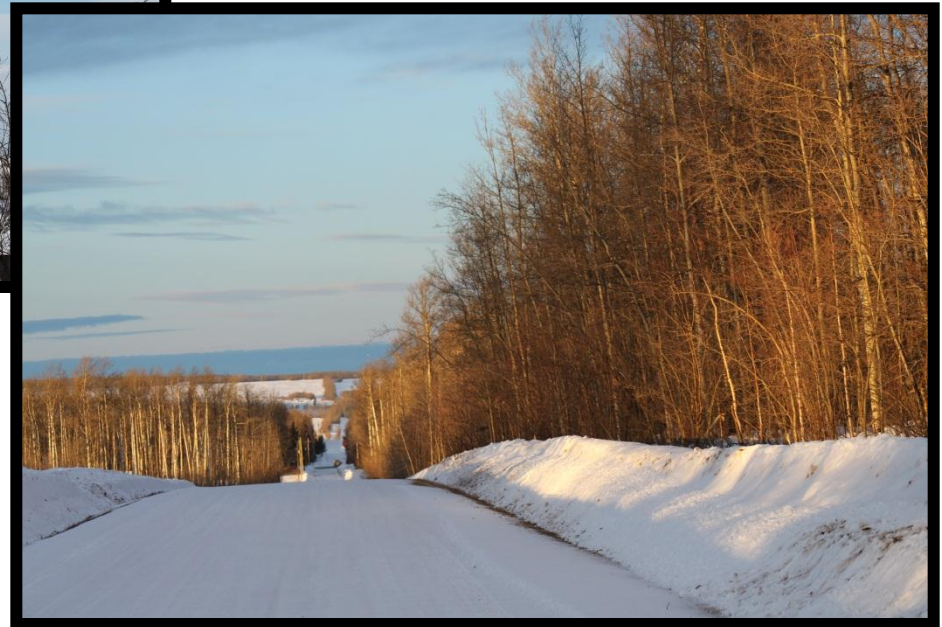
- BC Hydro will continue to monitor the load growth in the Peace Region area

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QUESTIONS AND DISCUSSION



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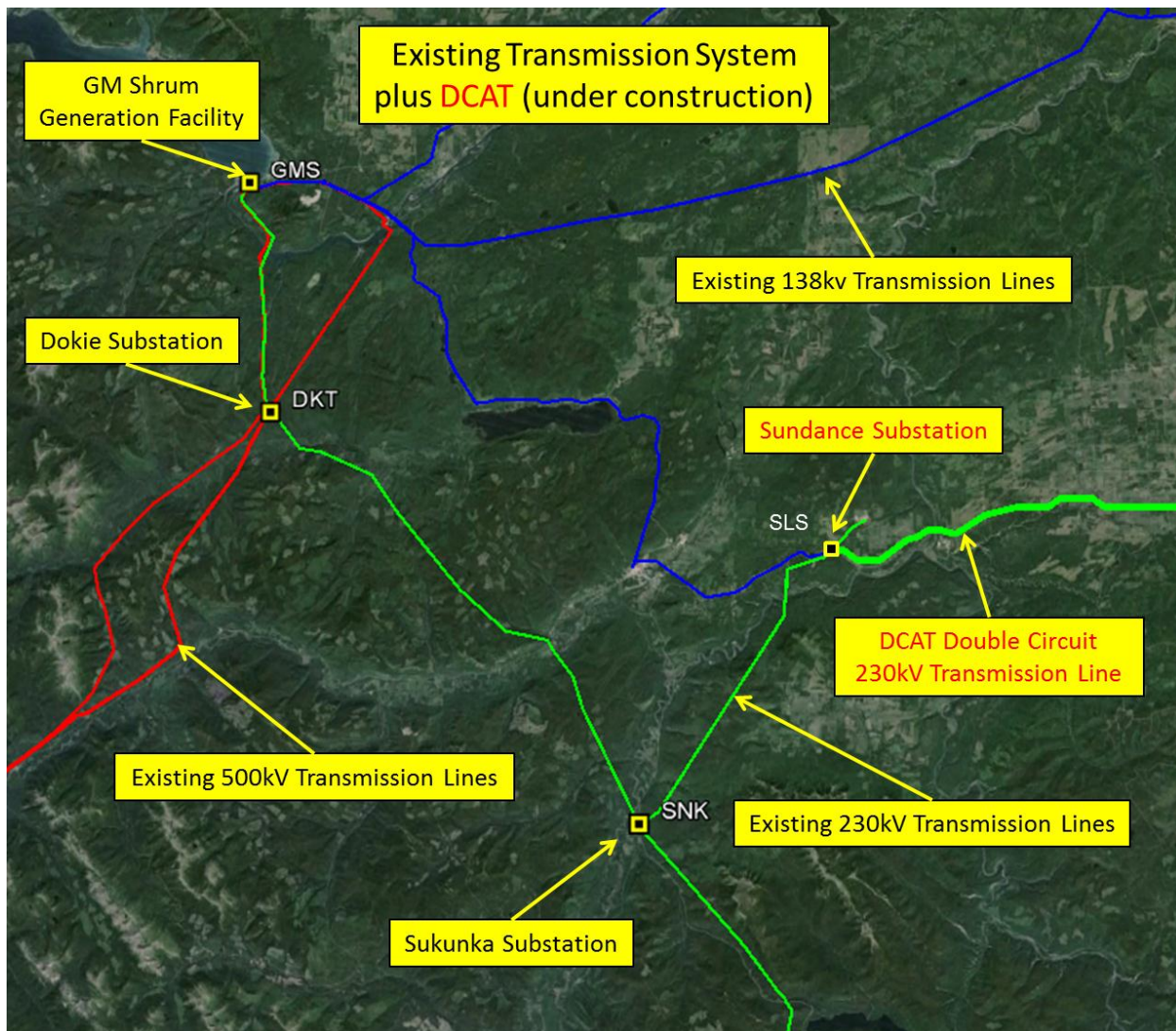
BC Hydro
Peace Region Electricity Supply Project
Overview and Feasible Alternatives

BC Hydro: Peace Region Electricity Supply (PRES) Project Overview and Feasible Alternatives

Background

The Peace Region of BC contains one of North America's most competitive natural gas areas - the Montney basin. Unconventional gas production is expected to dramatically increase over the next 10 years in all parts of the Peace Region, particularly in the Dawson Creek and Groundbirch areas. Gas producers have submitted load interconnection requests to BC Hydro to use electrical rather than gas fired equipment for their compression requirements. This has resulted in BC Hydro needing to serve some of the most dramatic, single industry load growth in a discrete area that it has experienced over the past 50 years.

The Dawson Creek / Chetwynd Area Transmission (DCAT) project currently being implemented will resolve the downstream constraints in the transmission system supplying the Dawson Creek and Groundbirch areas. Another project is required to resolve the upstream constraints in the transmission system supplying these areas and the rest of the Peace Region. This additional project is being studied as the Peace Region Electricity Supply (PRES) project.



The Peace Region is supplied by a network of 138kV and 230kV transmission lines feeding from the GM Shrum (GMS) generating facility. The load growth in the Peace Region (particularly in the Dawson Creek and Groundbirch areas) is expected to increase so rapidly that soon after the DCAT project goes into service in mid-2015, the ability of the transmission system to maintain supply to all customers in the event of any system issues will be exceeded. In addition to this, the ability of the system to supply the growing load under normal conditions is expected to be exceeded sometime in the 2019 timeframe meaning that the transmission system must be reinforced in order for BC Hydro to meet its obligation to serve customers.

Alternatives

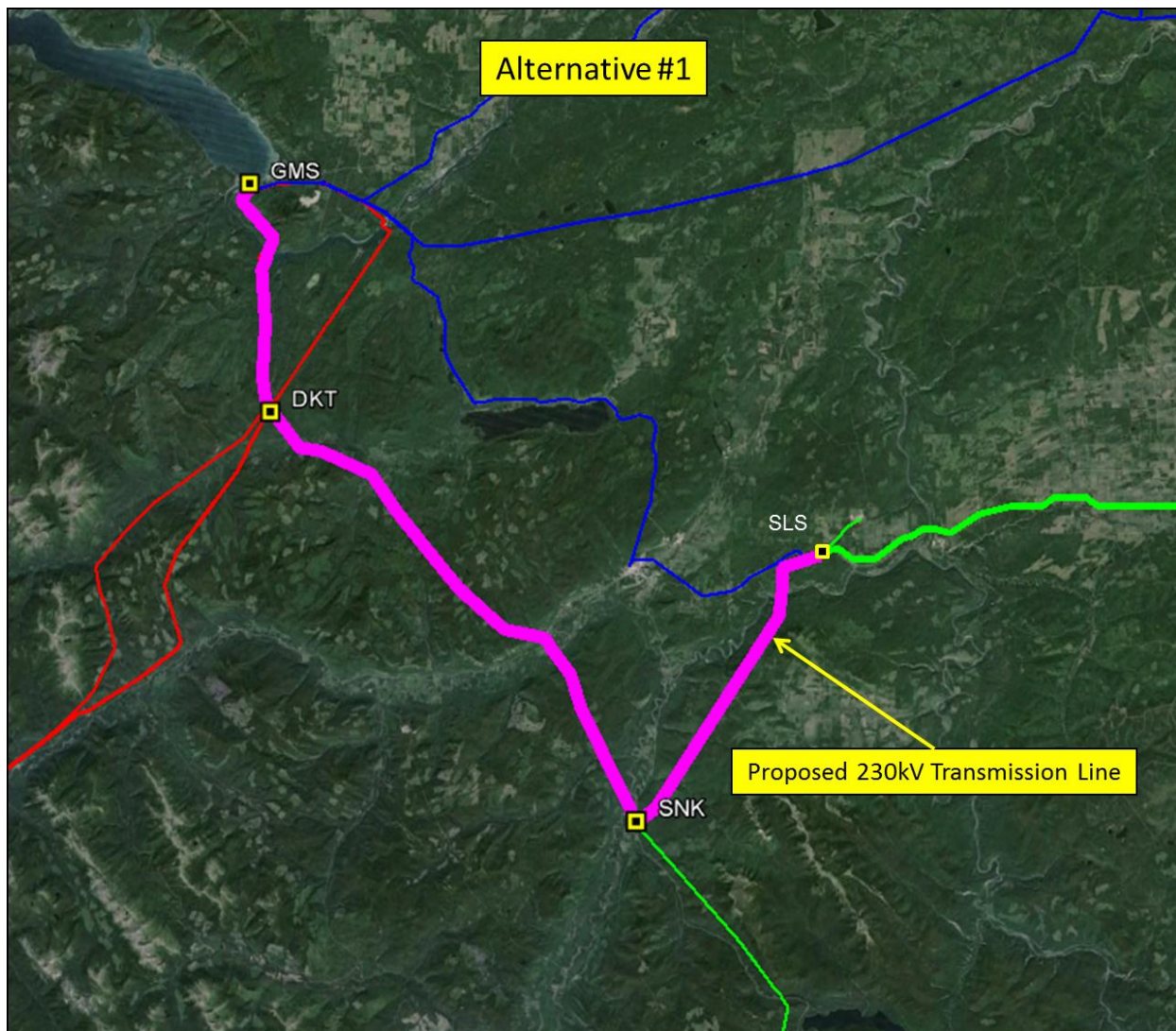
BC Hydro has identified a number of alternatives for serious consideration which are capable of addressing the problems associated with the load growth in the Peace Region. These alternatives are:

1. Alternative 1: 230 kV transmission line from GM Shrum generating station (GMS) to Sundance via Sukunka substation (SNK);
2. Alternative 2A: 230 kV transmission line from GM Shrum Generating Station (GMS) to Sundance Substation (SLS) via Dokie Substation (DKT), south of Chetwynd route.
3. Alternative 2B: 230 kV transmission line from GM Shrum Generating Station (GMS) to Sundance Substation (SLS) via Dokie Substation (DKT), north of Chetwynd route.
4. Alternative 3: 230 kV transmission line from a new Pine Valley substation (PIV) to Sundance substation (SLS) via Sukunka substation (SNK)

These alternatives are further described below.

Alternative 1: 230 kV transmission line from GM Shrum generating station (GMS) to Sundance substation (SLS) via Sukunka substation (SNK)

This alternative involves building a new 230kV transmission line from GMS to the existing Sukunka substation (SNK) and on to the Sundance Substation (SLS) which is to be constructed as part of the DCAT project. These new transmission lines would run alongside BC Hydro's existing transmission lines where feasible for a total length of approximately 105km. This alternative would also require upgrades to the three existing substations (GMS, SNK and SLS) that would connect to the new transmission line.



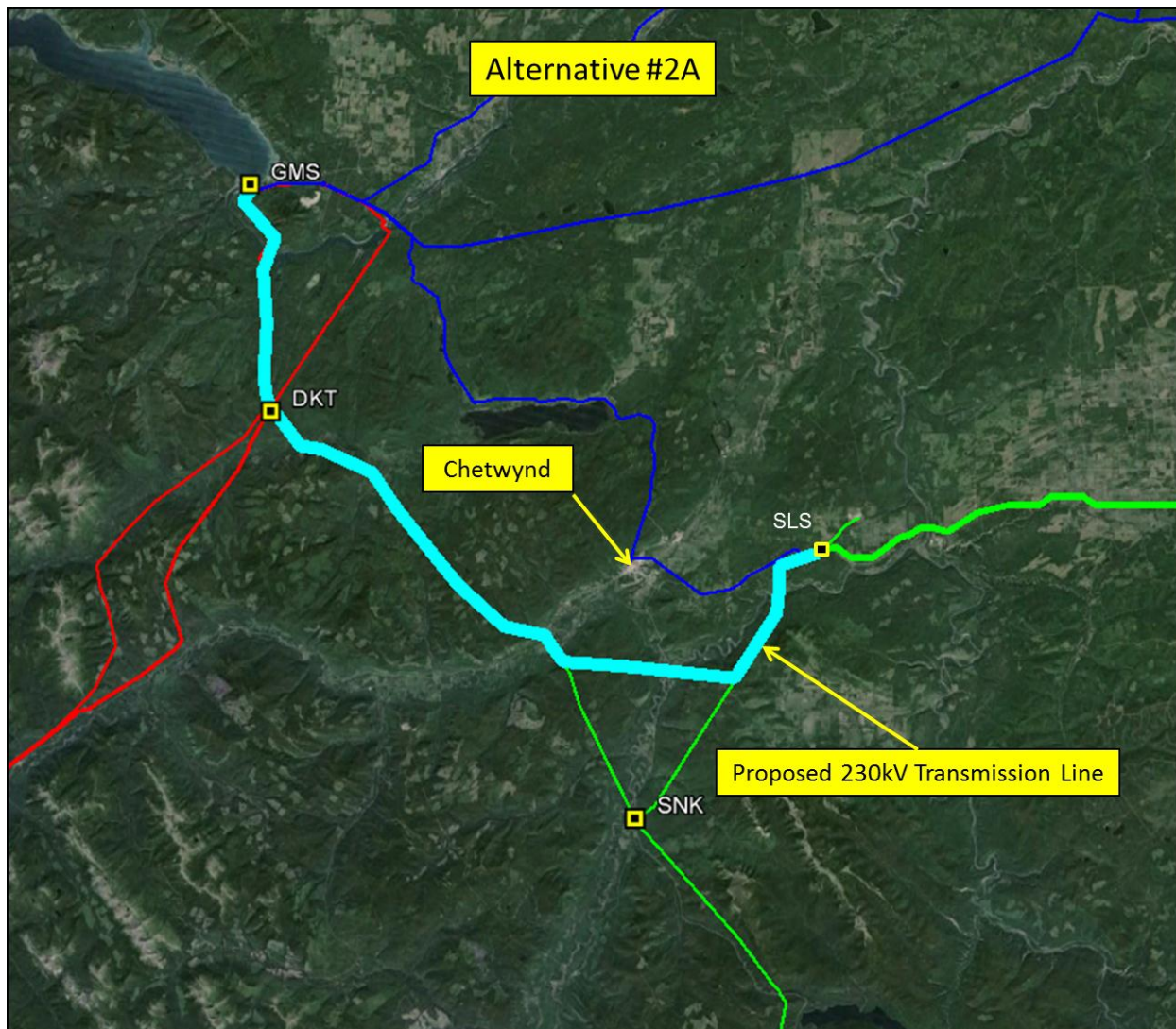
Alternative 2: 230 kV transmission line from GM Shrum Generating Station (GMS) to Sundance Substation (SLS) via Dokie Substation (DKT)

This alternative involves building a new 230kV transmission line from GMS to the existing Dokie substation (DKT) and on to the Sundance substation (SLS). This alternative differs from Alternative 1, in that the new transmission lines would only run alongside BC Hydro's existing transmission lines where feasible for part of the length. By avoiding extension to Sukunka substation (SNK) the length of the lines are shorter and some new rights of way are proposed. This alternative would also require upgrades to three existing substations (GMS, DKT and SLS).

Two different route options are being considered for this alternative, one being south of Chetwynd and the other north of Chetwynd, as follows.

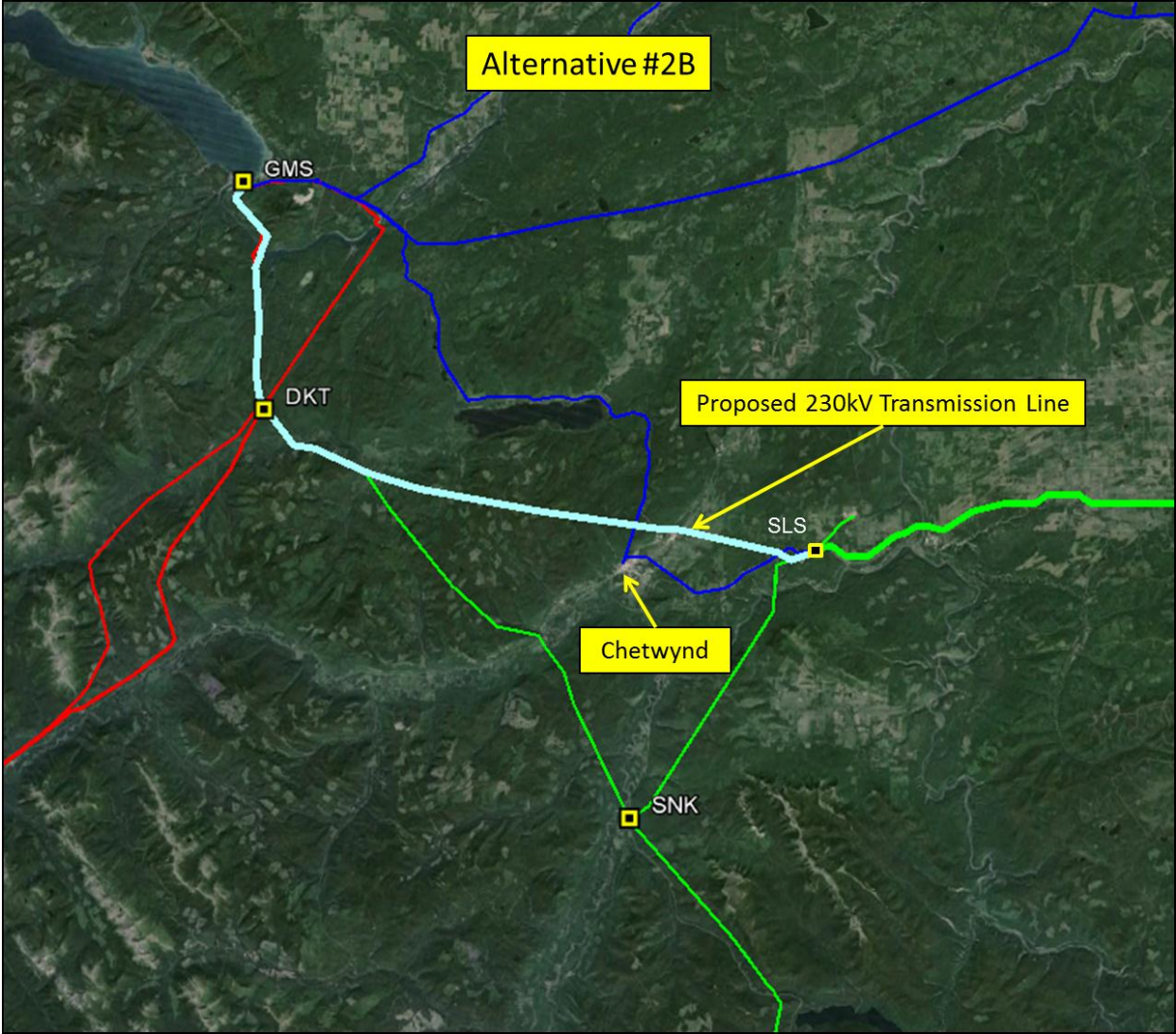
Alternative 2A - South of Chetwynd Route

For this routing the new transmission lines run alongside existing transmission line routes for approximately 75km and follow new routes for approximately 15km.



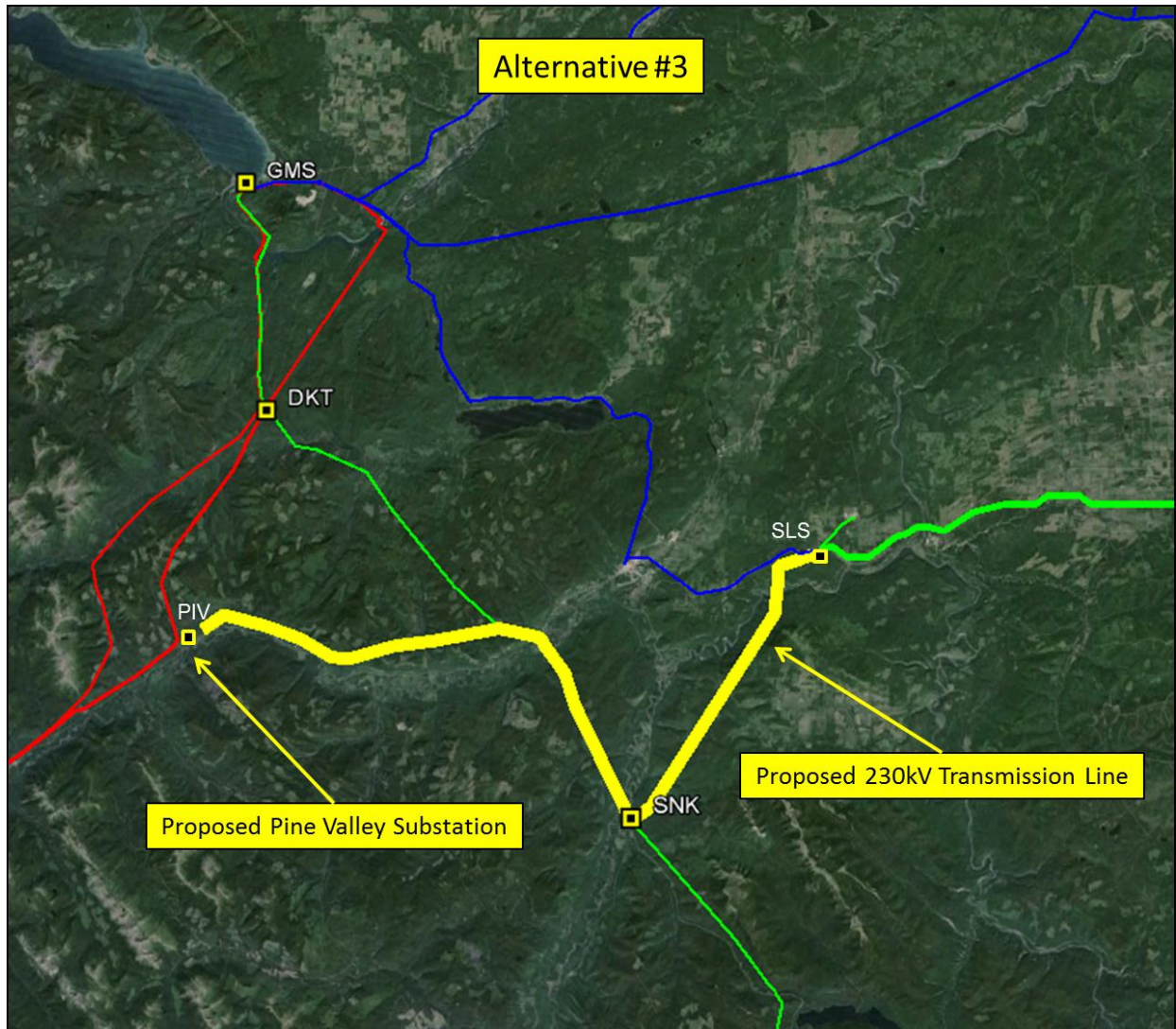
Alternative 2B - North of Chetwynd Route

For this routing the new transmission lines run alongside existing transmission line routes for approximately 37km and follow new routes for approximately 39km.



Alternative 3: 230 kV transmission line from a new Pine Valley substation (PIV) to Sundance substation (SLS) via Sukunka substation (SNK)

This alternative involves building a new 500/230kV substation, to be named Pine Valley substation (PIV), connected to the existing 500kV transmission line and building a new 230kV transmission line from the new PIV to the Sukunka substation (SNK) and on to the Sundance substation (SLS). The new transmission line would follow existing transmission line routes for approximately 53km but would also require some new routing, partly along highway 97, for approximately 31km. This alternative would also require upgrades to two existing substations (SNK and SLS).



Next Steps

BC Hydro will be conducting various studies on the alternatives (technical, environmental, cost estimating, constructability etc.) and gathering input from First Nations and impacted Stakeholders. Following this, BC Hydro will identify a leading or preferred alternative in early 2014 for further definition in order to support an application for regulatory review and approval. Alternative evaluation continues through to culmination of the regulatory process. BC Hydro is aiming to implement a project with a target

in service date of 2019 to meet the identified needs in the area. In addition to this, BC Hydro will continue to monitor load growth in the area to ensure proposed solutions will meet identified needs.