

Lloydminster to Spruce Lake Project

138kV Transmission Lines, 25kV Distribution Lines & Substations

March 2017

PROJECT OVERVIEW

To meet the need for safe, reliable power for our farms, communities and businesses, SaskPower is investing in the province's power grid. As part of this investment, SaskPower is planning to replace aging infrastructure and construct new facilities in the Lloydminster, Paradise Hill and Spruce Lake areas. The project is designed to improve service reliability, help support oilfield development and contribute to the overall plan for reinforcing the area.

PROJECT DESCRIPTION

Project investment will include two new substations, a new 138kV transmission line and new 25kV distribution lines.

Substations

- SaskPower is planning to construct two new 138-25kV substations.
- The new Paradise Hill Substation will be constructed directly south of an existing 72-25kV substation located approximately 10 km south of the Village of Paradise Hill.
- Sites for the new Spruce Lake Substation are currently being investigated northeast of the Hamlet of Spruce Lake.
- The existing 72-25kV Paradise Hill and Bolney Substations will be salvaged.

Transmission Line

- SaskPower is planning to construct a new single-circuit 138kV transmission line.
- 1st Segment** of line will come from the existing Lloydminster Switching Station, cross the North Saskatchewan River and connect to the new Paradise Hill Substation.
- 2nd Segment** of line will go east from the new Paradise Hill Substation and parallel a portion of the existing 72kV GL6 transmission line.
- 3rd Segment** of line will tap off of the 2nd segment and go north to connect to the new Spruce Lake Substation.
- The total length of new line will be approximately 75 to 85 km, depending on the route selected.
- 1st and 3rd segments of line are planned to be constructed with H-frame structures. *(H-frame structure shown to the right)*
- A lattice tower structure will be used on either side of the North Saskatchewan River crossing. *(Lattice tower structure shown to the right)*
- The majority of the 2nd segment of line is planned to be constructed with single pole structures within the south side of the road allowance. *(Single pole structure shown to the right)*
- H-frame and tap structures are planned to be used where the 3rd segment of line taps the 2nd segment. *(H-frame and tap structure shown to the right)*
- Two line switches are planned to be installed on the 2nd segment of line. One switch will be located east of the new Paradise Hill Substation and the other switch will be located east of the tap point for the 3rd segment of line. *(Switch structure shown to the right)*

Distribution

- SaskPower is planning to construct new 25kV distribution lines from the Paradise Hill and Spruce Lake Substations.
- The total length of new distribution lines will be approximately 100 km.
- Single pole structures are planned to be used for the new distribution lines. *(Distribution structures shown to the right)*
- The distribution structures will be located 0.5 m in the road allowance.

CURRENT SCHEDULE

138KV TRANSMISSION LINE

Selection of Corridor Options	Nov – Feb 2017
1 st Round of Consultation	March 2017
Selection of Preferred Corridor	April – May 2017
2 nd Round Consultation	June 2017
Environmental Field Studies	July 2017 – Aug 2018
Submission to Saskatchewan Ministry of Environment	September 2018
Engineering Design	July 2017 – Nov 2018
Easement Acquisition	July 2018 – Oct 2018
Construction	Oct 2018 – Dec 2019
Energization	January 2020

CURRENT SUBSTATIONS SCHEDULE

Site Selection	Dec 2016 – March 2017
Site Design	Jan 2017 – Sept 2018
Construction	July 2018 – Dec 2019
Energization Paradise Hill Substation	April 2019
Energization Spruce Lake Substation	January 2020

CURRENT 25KV DISTRIBUTION SCHEDULE

Milestone Activity	Paradise Hill Distribution	Spruce Lake Distribution
Route Selection	Nov 2016 – June 2016	
Engineering Design	July – Oct 2017	July – Aug 2018
Construction	Oct 2018 – April 2019	Aug – Dec 2019
Energization	April 2019	Jan 2020

Project planning and analysis is currently underway and landowners and members of the general public are encouraged to provide their comments on the project. These comments and other input SaskPower receives are taken into consideration when making a final decision on the project.

CONTACT INFORMATION

For additional information on this project, please contact SaskPower's Stakeholder Engagement Department at 1-855-566-1908 or publicconsultation@saskpower.com.



TYPICAL STRUCTURE SPECIFICATIONS

Structure Type	Average Span	Structure Height	Pole Spacing
Transmission Line			
H-Frame (Steel)	~300 m (985 ft)	19-27 m (62-89 ft)	4.8 m (16 feet)
H-Frame (Wood)	~225 m (740 ft)	19.8-25.9m (65-85 ft)	4.8 m (16 ft)
Single-Pole	~150 m (490 ft)	19-27 m (62-89 ft)	n/a
Lattice Tower	1150-1450 m (3,773-4,757 ft)	50-120 m (164-394ft)	n/a
Distribution Line			
Single Pole (Single Circuit)	~90 m (295 ft)	12.2-13.7 m (40-45 ft)	n/a
Single Pole (Double Circuit)	~ 60 m (197 ft)	13.7-15.2 m (45-50 ft)	n/a

MINIMUM CONDUCTOR CLEARANCE

	138kV Transmission Line	25kV Distribution Line
Over Farmland	7.4 m (24.3 ft)	6.68 m (21.9 ft)
Over Highways	8.1 m (26.6 ft)	6.68 m (21.9 ft)
Over High Load Corridors	10.65 m (34.9 ft)	6.68 m (21.9 ft)
Over Railways	8.7 m (28.5 ft)	7.9 m (25.9 ft)

TYPICAL RIGHT-OF-WAY (ROW)

Structure & Line Type	Standard Width
H-frame Transmission	30 m (98 ft)
Single-pole Transmission	20 m (66 ft)
Distribution Lines	kept within road allowance

ENVIRONMENT ASSESSMENT & APPROVALS

The proposed project will be evaluated to determine if it requires a submission to the Ministry of Environment under the Environmental Assessment Act and will follow all applicable provincial environment assessment and approval processes which can include:

- Consultation with provincial and municipal officials, landowners, Aboriginal groups and other affected stakeholders as applicable;
- Environmental assessment analysis using existing information (database, satellite imagery) and field surveys;
- Developing a plan to mitigate or avoid impacts to rare and endangered species and their habitats, and sensitive landscape features (i.e. sand hills, wetlands, native prairie, heritage resources);
- Maximizing the use of existing rights-of-way and previously disturbed areas where possible; and
- Accommodating local land uses and infrastructure.

TYPICAL STRUCTURE IMAGES



138kV Single-Circuit H-Frame Structure



138kV Single-Circuit Single Pole Structure



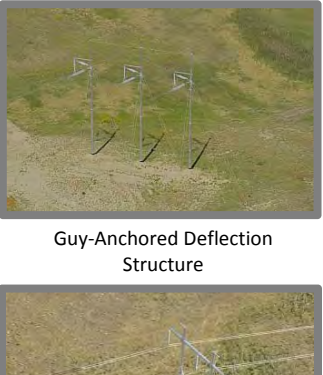
25kV Distribution Single-Circuit Structure



138kV Double-Circuit Lattice Tower Structure



25kV Distribution Double-Circuit Structure



Guy-Anchored Deflection Structure

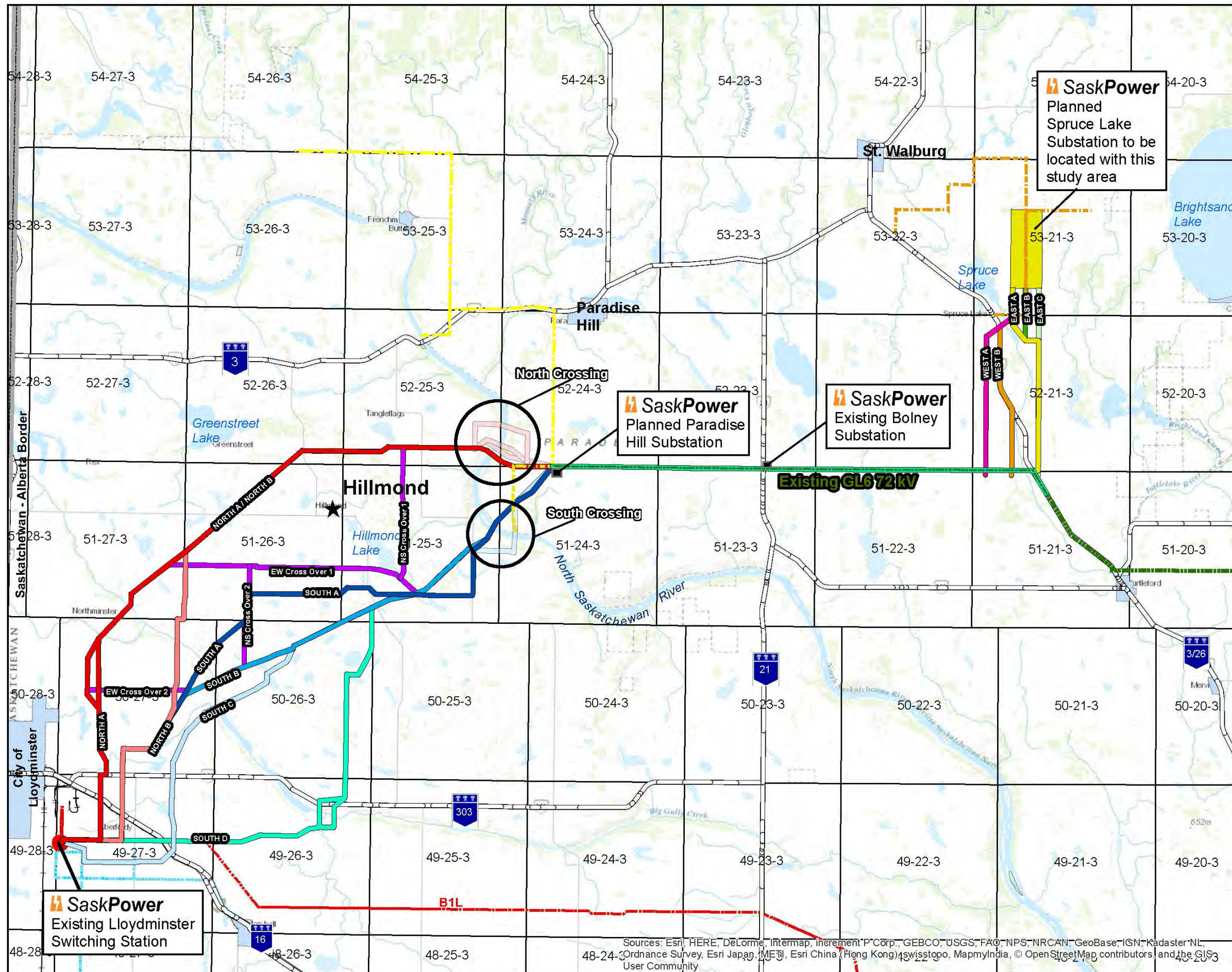


Guy-Anchored Tap Structure

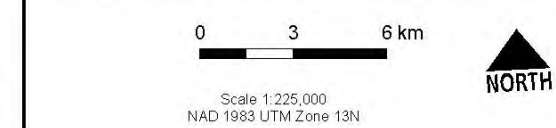


Switch Structure Adjacent to H-Frame Structure





- Legend
- Lloydminster to Paradise Hill Route Alternatives
- North A Corridor
 - North B Corridor
 - South A Corridor
 - South B Corridor
 - South C Corridor
 - South D Corridor
 - Cross Over Options
 - East A Corridor
 - East B Corridor
 - East C Corridor
 - West A Corridor
 - West B Corridor
 - Proposed GL6 Rebuild Corridor
 - Spruce Lake Distribution Proposed Feeder
 - Paradise Hill Distribution Proposed Feeders
 - Rail Line
 - 138 kV Lines
 - 230 kV Lines
 - 72-115 kV Lines
 - Highways
- GL6 Tap to Spruce Lake Route Alternatives
- East A Corridor
 - East B Corridor
 - East C Corridor
 - West A Corridor
 - West B Corridor



CLIENT: **SASKPOWER**

PROJECT: **Lloydminster to Spruce Lake 138 kV Transmission Line**

TITLE: **Study Area Overview**

General reference map only; not for survey or legal use. Although all reasonable attempts have been made to ensure the accuracy of this mapping product, JDMA, its clients, subcontractors or affiliates assume no responsibility for any loss or inconvenience experienced as a result of errors or omissions in this map.

Map Sources: IHS Pipelines; CanVec; SaskPower; and Gov't of SK.
FlySask Imagery acquired October 2010
Geomatics: JAO Revision date: 20/Mar/2017



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community