



 **SaskPower**
Powering the future[®]

Birtle to Tantallon

230 kV NEW TRANSMISSION LINE PROJECT

November 2017



Project Need

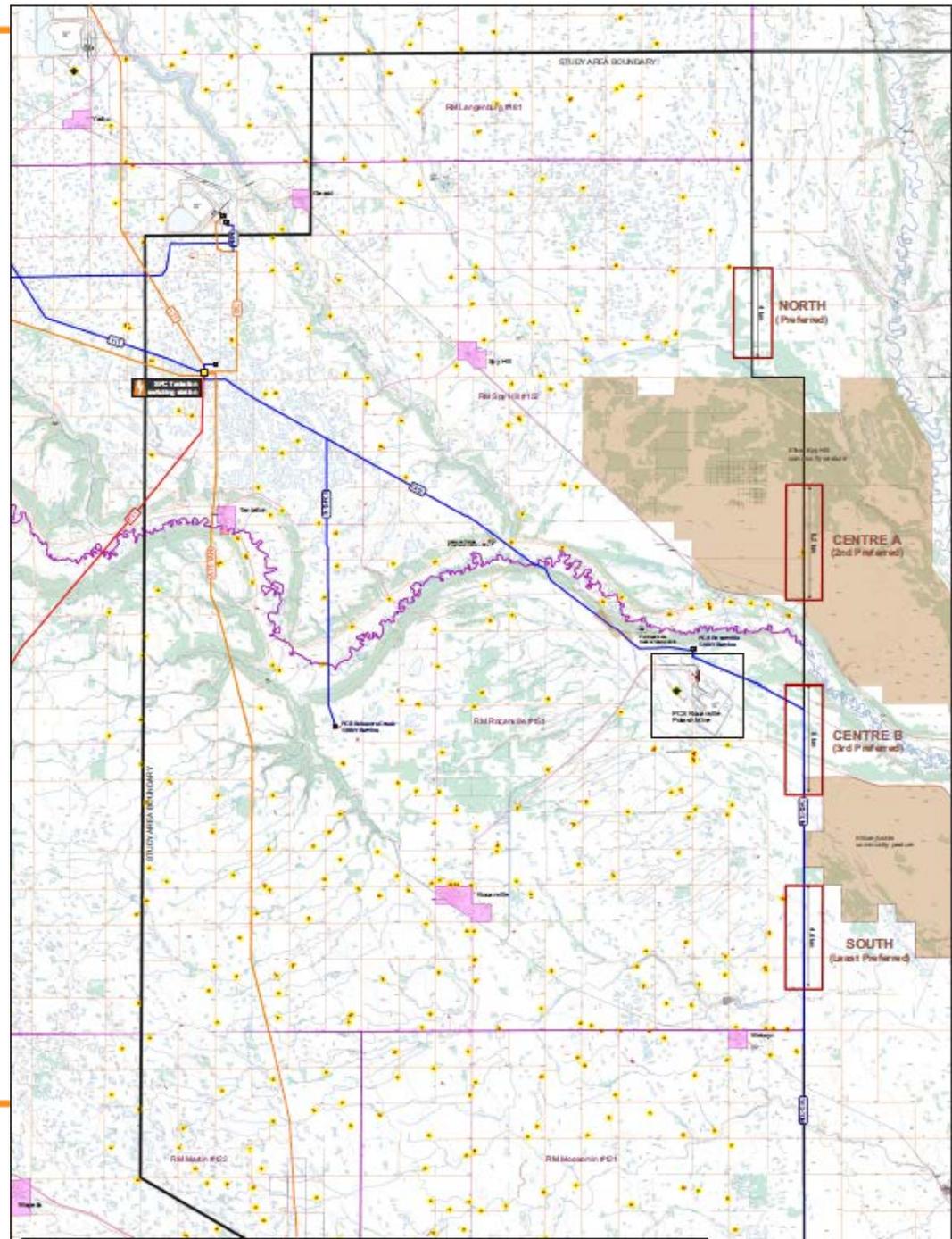
- SaskPower continues to invest in the province's electricity system to ensure we have the infrastructure in place to meet the growing need for reliable, sustainable and cost-effective power in Saskatchewan.
- As part of this investment, SaskPower is increasing the amount of its renewable capacity to meet new and emerging emissions regulations through importing 100 megawatts (MW) of renewable baseload hydropower from Manitoba Hydro.
- While SaskPower and Manitoba Hydro worked together to establish common border tie point locations and have been in constant communication on the timing of the project , we have agreed to conduct separate route location and assessment studies for our respective portions of the interprovincial transmission line.

Project Description

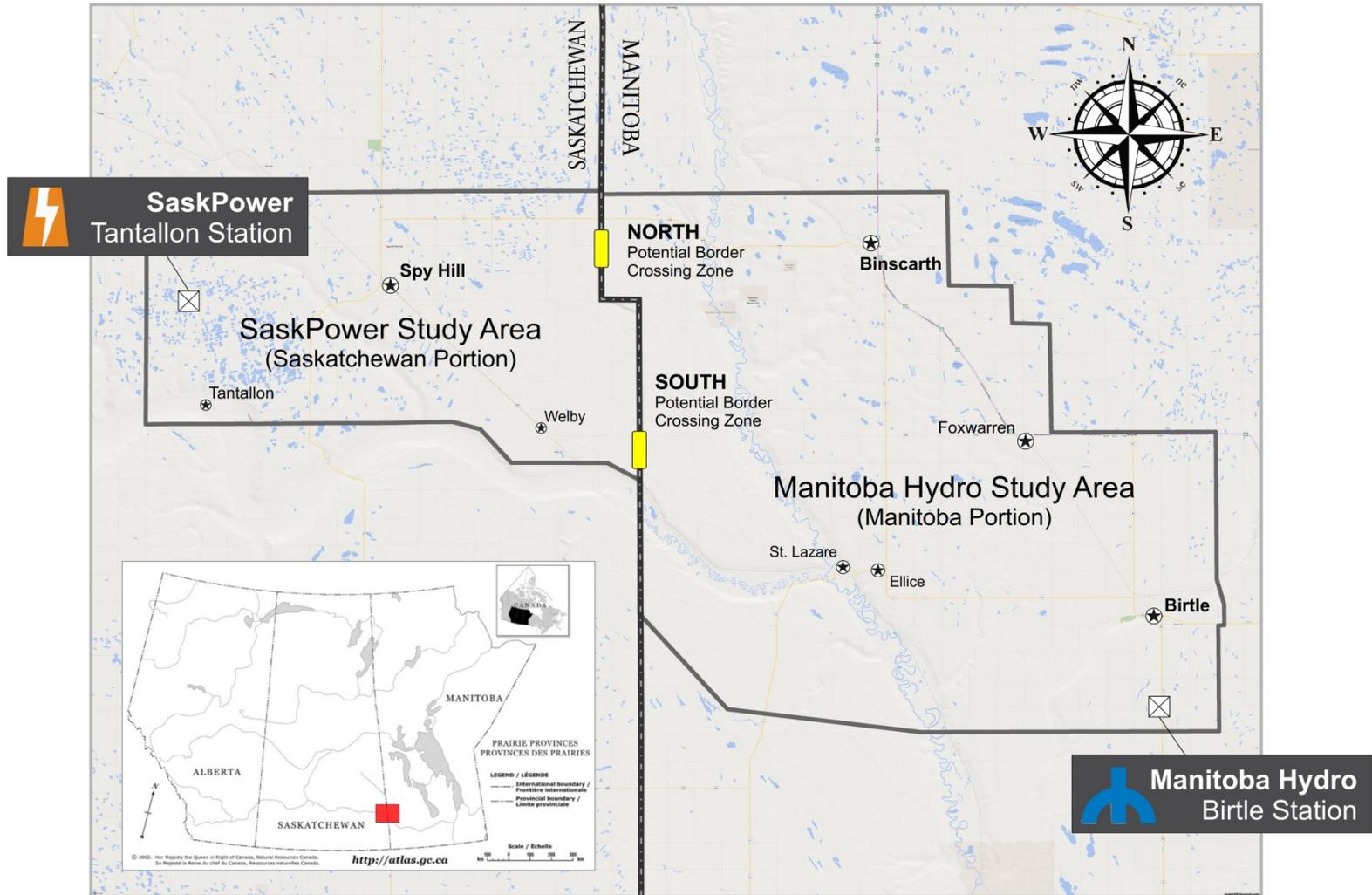
- The 230 kilovolt (kV) transmission line to run from Manitoba Hydro's Birtle Station (5 kilometres south of Birtle, MB) to SaskPower's Tantallon Switching Station (6 kilometres north of Tantallon, SK).
- 2 potential transmission line "tie points" along the provincial border were selected by Manitoba Hydro and SaskPower to put forward for consultation.
- 7 route alternatives ranging between 25-35 km in length from Tantallon Switching Station to the Saskatchewan-Manitoba border were been identified for SaskPower's first round of public consultation, with multiple route alternatives ending at each of the 2 tie point locations.
- The transmission line tie point ultimately selected by Manitoba Hydro and SaskPower after the first round of public consultation is the **SOUTH** tie point zone, located within the Spy-Hill Ellice Community Pasture.
- The preferred route selected is 30.2 km in length. Based on feedback, approximately 5.5km of that route will utilize the open circuit position on SaskPower's existing TA13 transmission line, meaning only 24.7 km of new construction will be required.

Preliminary Border Crossing (Tie-Point) Zones

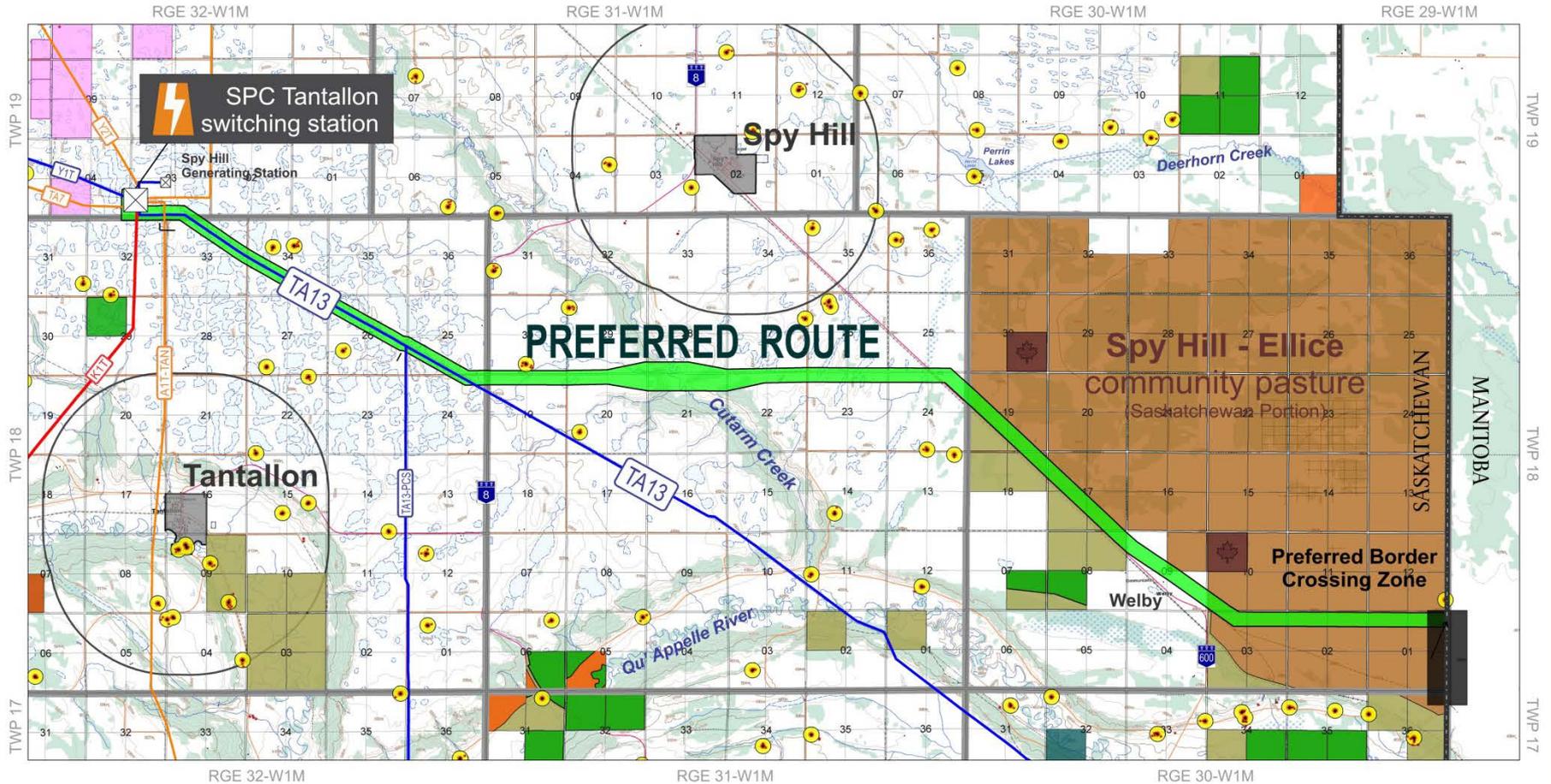
Through discussions with Manitoba Hydro, the following four tie point locations were originally identified. The 2 most southern locations were removed from consideration due to constraints on one or both sides of the border.



PROJECT OVERVIEW



Preliminary Route Options



Project Schedule

- Border tie point zones selection May 2016 – July 2016
- Alternative routes selection July 2016 – October 2016
- First round of public consultation October 2016
- Preferred route/border crossing selection November 2016 – January 2017
- Second round of public consultation January 2017 – March 2017
- Environmental field studies March 2017 – October 2017
- Transmission line design March 2017 – May 2018
- Easement acquisition May 2018 – July 2018
- Construction 2018 – 2020
- Energization 2020 – 2021
(depending on regulatory approvals)

Project Considerations

SaskPower's goal is to minimize its impact on the biophysical and human environment.

This is achieved by:

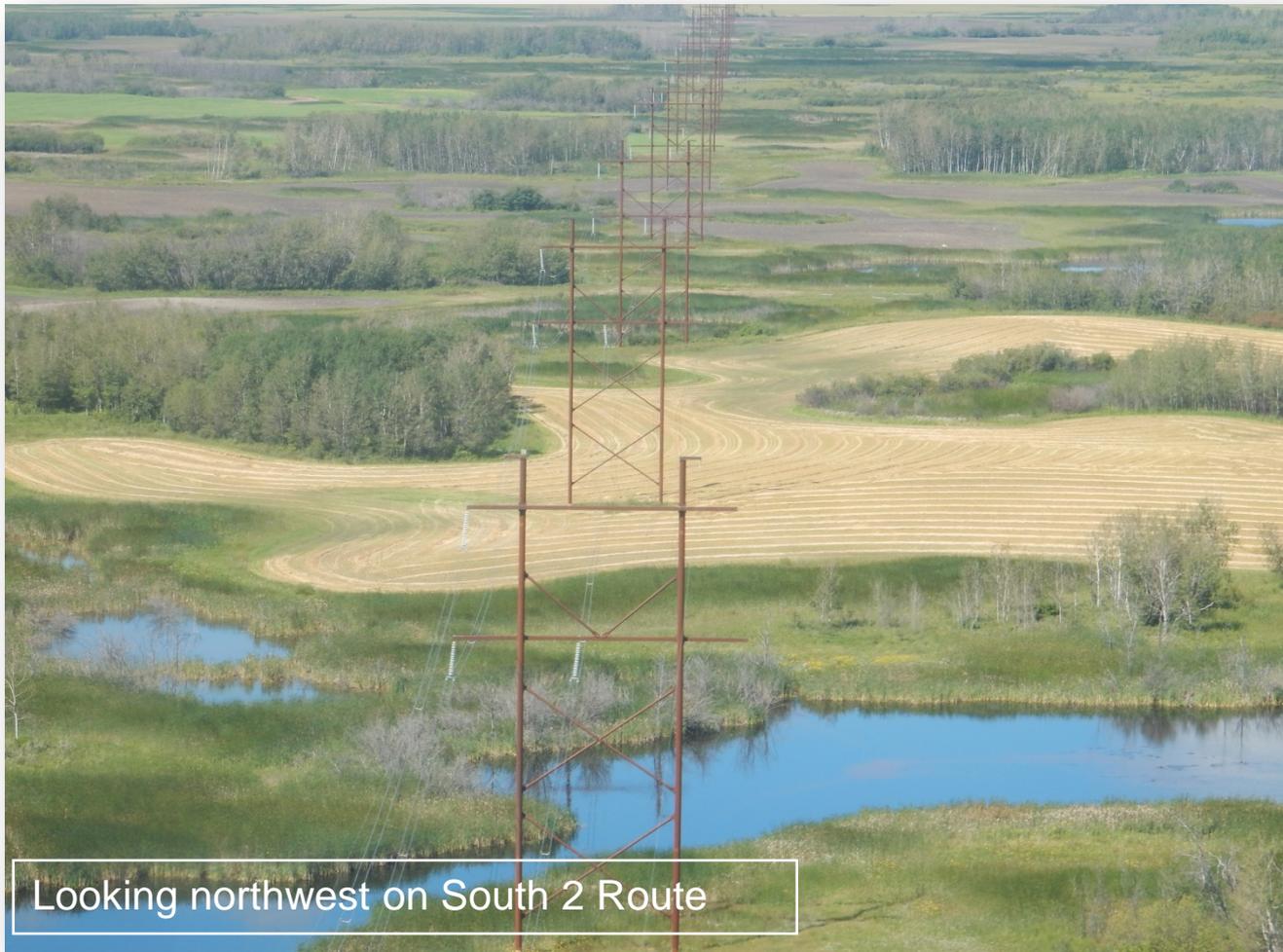
- Compliance with all regulatory requirements (Municipal, Provincial and Federal);
- Consultation with elected officials, Aboriginal groups, landowners, and other potentially affected groups and individuals as applicable;
- Avoiding or mitigating impacts to rare and endangered species and their habitats and sensitive landscape features (*i.e.*, sand hills, wetlands, native prairie, heritage resources);
- Use of existing rights-of-way and previously disturbed areas; and
- Accommodating local land uses and infrastructure.
- Potential environmental issues related to transmission line construction (*i.e.* off right of way access, access mats, etc.)

Tantallon Switching Station



Looking north, Mosaic Potash infrastructure can be seen in distance

138 kV TA13 Transmission Line



Looking northwest on South 2 Route

Cutarm Creek Valley



Looking west along Centre 2 Route, highway 8 can be seen on left

Wetlands



Looking east along Centre 1 Route, large water body in upper left is Perrin Lake

'NORTH' Border Tie Point



Looking east along NORTH 1 Route

'SOUTH' Border Tie Point



Looking east along Centre 1 Routes

Highway 600 / CN Rail Line



Highway 6/CN Rail looking southeast on South 1 Route

General Engineering Specifications

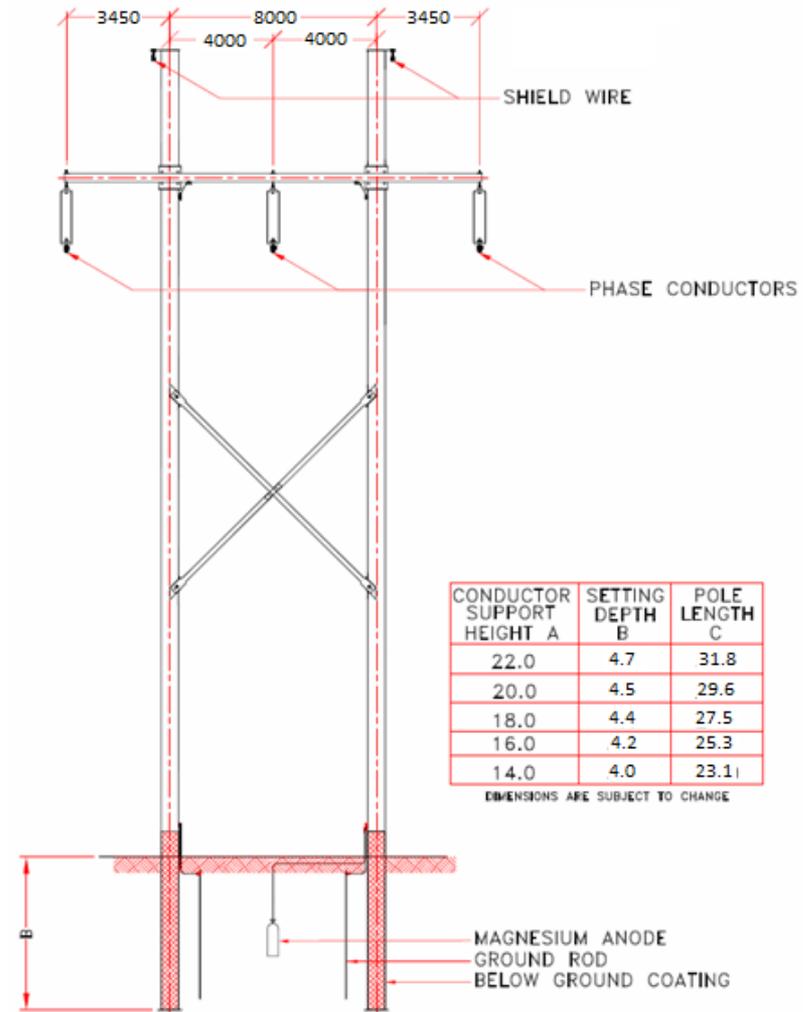
230 kV Single-Circuit
Galvanized Steel H-Frame
Tangent Structure
(T70/001)

Pole Spacing: 6.6m (22ft)

Structure Height: 19 - 27m (62 - 89ft)

Average Span: ~300m (985ft)

Deflection Structures: Guy-anchored



230 kV Single-Circuit
Galvanized Steel H-Frame
Tangent Structure
(T70/001)



Anchored Structures

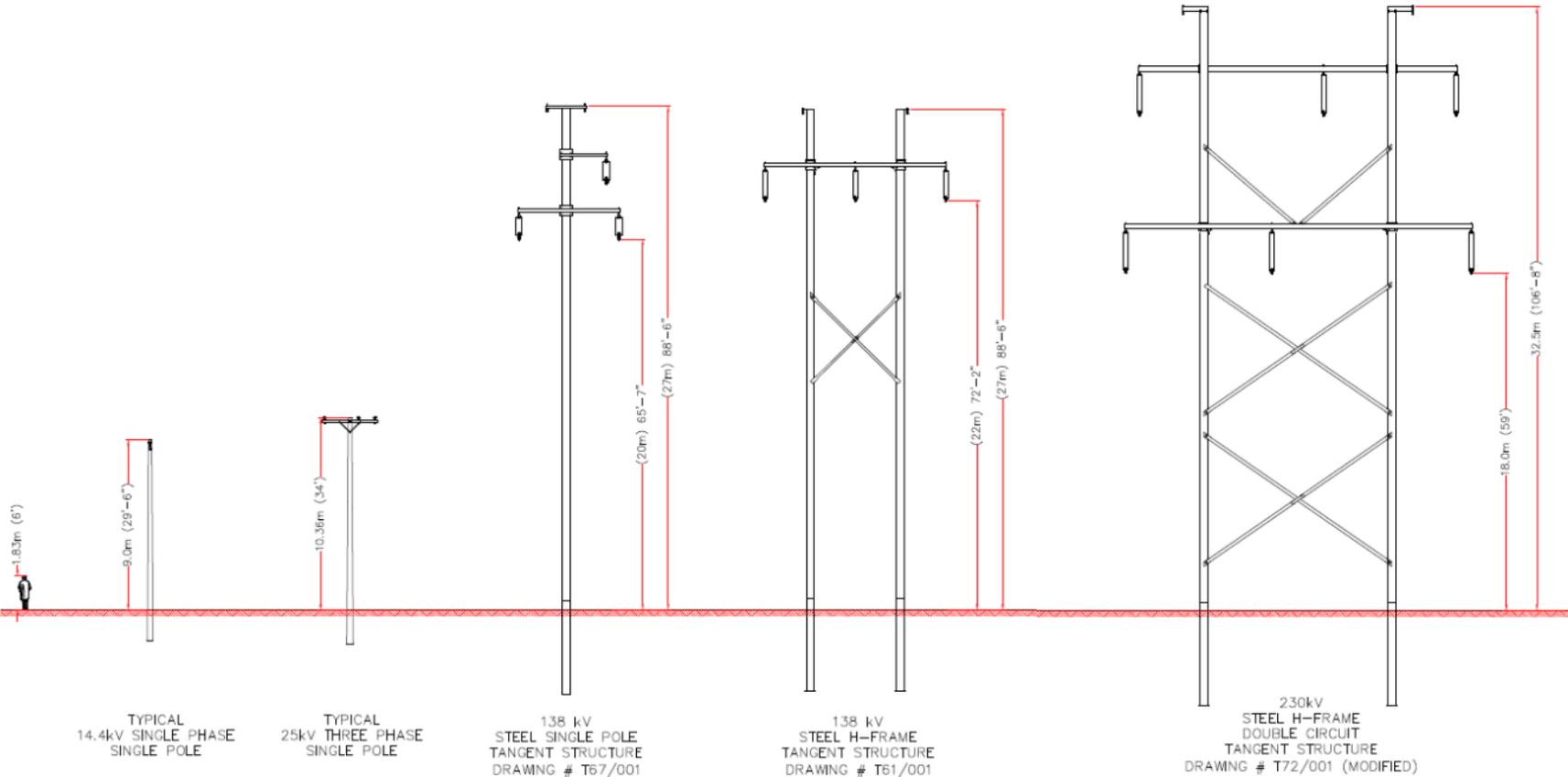


Medium Angle Deflection Structure



Heavy Angle Deflection Structure

Size Comparison of Distribution & Transmission Lines



230 kV Minimum Clearance of Conductor

Over Farmland	8.10 metres (26.6 feet)
Over Highway	8.40 metres (27.6 feet)
Over Railways	9.30 metres (30.5 feet)
Over High load Corridors	11.25 meters (36.9 feet)

Typical 230 kV Right-of-Way Width

H-Frame Standard Width	40 metres (131.2 feet)
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Technical Project Proposal Approach

- Meet MOE's June 2014 Technical Proposal Guidelines
- Identify baseline conditions, potential effects of the project, and mitigation measures
- Resources most directly affected:
 - Terrain and Soils
 - Vegetation
 - Wildlife
 - Human Environment (e.g., land use conflicts, residences)



Key Mitigation Strategies

- Routing
- Structure placement
- Construction timing, scheduling and planning
 - Will be constructing in dry/frozen conditions in pasture
- Environmental construction monitoring
- Reclamation



Staking of Structures and Environmental Concerns



Staking structure locations, anchors and right-of-way off sets



Environmental areas (i.e., noxious weeds, wetlands, nests, etc.) identified for avoidance

Right-of-Way Preparation



Drum-style mulcher used for tree clearing



Hydro-axe equipment used for tree clearing

Right-of-Way Preparation (cont.)



Drum mulcher clearing right-of-way



Cleared right-of-way ready for construction

Right-of-Way Preparation (cont.)



Hand clearing right-of-way in sensitive habitat



Chipping hand cleared vegetation

Installing Gates and Mending Fences



SaskPower Standard Gate

Hauling out Material



Loader and pole trailer



Picker truck



Trucks and trailer

Framing Structures



Loader used for framing structures



Crews bolting together structures

Structure Setting



Conductor Stringing



Temporary rider poles



Conductor on reels



Stringing equipment

Conductor on dollies during stringing

Other Construction Activities



Installing ground rods



Installing sacrificial anodes



Crushed rock backfill



Tension (proof) testing anchors

TOTAL LENGTH AND LAND USE

Route Alternative	Total Length (km)	Percentage Cultivated Land (%)	Percentage on legal boundaries (%)
PREFERRED ROUTE	30.2 km	30% (not including TA13)	64%
North 1	28.0	78% (highest)	69%
North 2	28.0	77%	0%
North 3	26.7	78%	0%
Centre 1 (North Tie Option)	26.5	60% (lowest)	17%
Centre 1 (South Tie Option)	31.5	69%	19%
Centre 2 (North Tie Option)	27.2	58%	45%
Centre 2 (South Tie Option)	30.7	68%	12%
South 1 (North Tie Option)	29.4	65%	60%
South 1 (South Tie Option)	32.3	73%	46%
South 2 (North Tie Option)	28.0	65%	0%
South 2 (South Tie Option)	30.3	72%	0%

ENVIRONMENTAL FACTORS

Route Alternative	Number of Waterbody Crossings	Required Tree Clearing (hectares)	Length in Community Pasture (km)
PREFERRED ROUTE	21	10.9 ha (lowest)	9.1 km
North 1	27	13.88	0
North 2	25	14.79	0
North 3	28 (highest)	11.96	0
Centre 1 (North Tie Option)	21	19.20	2.5
Centre 1 (South Tie Option)	19 (lowest)	16.36	9.0
Centre 2 (North Tie Option)	22	20.98	6.2
Centre 2 (South Tie Option)	19	15.7	9.1
South 1 (North Tie Option)	26	23.4	3.4
South 1 (South Tie Option)	25	12.5	4.8
South 2 (North Tie Option)	28 (highest)	26.1 (highest)	3.6
South 2 (South Tie Option)	27	15.4	4.8

RESIDENCES

Route Alternative	Residences within 60 m	Residences within 60 m - 160 m	Residences within 160 m – ½ mile
PREFERRED ROUTE	0	0	4 (lowest)
North 1	0	0	8
North 2	0	0	6
North 3	0	1	5
Centre 1 (North Tie Option)	0	1	7
Centre 1 (South Tie Option)	0	0	7
Centre 2 (North Tie Option)	0	1	6
Centre 2 (South Tie Option)	0	1	6
South 1 (North Tie Option)	0	0	8
South 1 (South Tie Option)	0	0	10 (highest)
South 2 (North Tie Option)	0	0	4 (lowest)
South 2 (South Tie Option)	0	0	7

ESTIMATED COST*

Route Alternative	Estimated Cost (Capital Costs Only)	Estimated Cost (with Rail Mitigation)
PREFERRED ROUTE	+7%	+28%
North 1	+13%	+13%
North 2	+14%	+14%
North 3	+11%	+11%
Centre 1 (North Tie Option)	+8%	+8%
Centre 1 (South Tie Option)	+31%	+58%
Centre 2 (North Tie Option)	+11%	+11%
Centre 2 (South Tie Option)	+28%	+54%
South 1 (North Tie Option)	+22%	+22%
South 1 (South Tie Option)	+33%	+60%
South 2 (North Tie Option)	LOWEST COST	LOWEST COST
South 2 (South Tie Option)	+9%	+36%

*percentage premium over lowest cost option

QUESTIONS & DISCUSSION

