

3.0 PROJECT DESCRIPTION

3.1 Overview

This chapter of the environmental assessment report provides a description of the proposed Tyndall 115 kV Transmission Line and DSC Project including system context, Project location, land ownership, alternatives, phases, components and activities, construction materials, waste products, workforce, schedule, and funding. Information on the proposed transmission line and DSC is described to facilitate the identification and analysis of potential environmental effects, and mitigation measures for adverse effects.

3.2 System Context

The proposed 115 kV Transmission Line and DSC will form part of Manitoba Hydro's system in southern Manitoba. Since 2001, Manitoba Hydro has installed 24 DSCs. The corporation has installed three DSCs in the region to service the growing load demand — two in Winnipeg's new Waverley West subdivision and one at Poplar Point. Other DSCs in the vicinity of the Tyndall Project include Seddons Corner and Melrose. The Melrose DSC and the proposed Tyndall DSC will resolve extensive reliability and performance issues with the current Garson Station.

3.3 Project Location

The proposed 115 kV Transmission Line and DSC is situated in the Rural Municipalities of St. Clements and Brokenhead, north of PTH 44. The proposed 115 kV Transmission Line will begin at the tapping location at TS44 (SE Quarter Section 14, Township 13, Range 5 East of the Prime Meridian) and run to the proposed DSC location (Map 1-1). The DSC would be located approximately 800 m west of the Community of Tyndall and 1.6 km east of the Community of Garson at the intersection of PTH 44 and Road (Rd.) 34E.

The property description for the proposed DSC is SE Quarter Section 10, Township 13, Range 6, East of the Prime Meridian. The proposed transmission line would occur along Sections 14 and 24, Township 13, Range 5, and Sections 10, 11, 15, 16, 17, 18 and 19, Township 13, Range 6, East of the Prime Meridian.

Garson Station is located in SW Quarter Section 7, Township 13, Range 6, East of the Prime Meridian, at the northeast corner of intersection PTH 44 and Provincial Road (PR) 212.

3.4 Land Ownership

Land ownership information for the 115 kV tap location, preferred transmission line route and DSC site are provided in Table 3-1 (Source: Manitoba Hydro; RM of Brokenhead Map, 2011). Easements for the 115 kV tap and transmission lines will be negotiated with the land owners, and land for the DSC will be purchased upon receipt of an Environment Act Licence for the proposed Project. The certificate of title for the DSC will be provided once the property has been purchased. The Crown owns the mineral rights for the land upon which the DSC site will be developed. Manitoba Hydro will not require mineral rights for the proposed Project.

Table 3-1: Land Ownership Information for the Tyndall Transmission and Distribution Project

Project Component	Property Description	Land Use	Property Owner(s)
115 kV Tap	SE ¼ 14-13-5 EPM	Agricultural	Privately owned
115 kV Transmission Line	OTM Lots 73-85	Agricultural	Parish of St. Clements Privately owned
115 kV Transmission Line	SE ¼ 24-13-5 EPM	Agricultural	Privately owned
115 kV Transmission Line	SW ¼ 19-13-6 EPM	Agricultural	Privately owned
115 kV Transmission Line	NW ¼ 18-13-6 EPM	Decommissioned rail line	Parish of St Clements
115 kV Transmission Line	NE ¼ 18-13-6 EPM	Decommissioned rail line	Parish of St Clements
115 kV Transmission Line	NW ¼ 17-13-6 EPM	Decommissioned rail line	Parish of St Clements
115 kV Transmission Line	SE ¼ 17-13-6 EPM	Decommissioned rail line	Parish of St Clements
115 kV Transmission Line	SW ¼ 16-13-6 EPM	Decommissioned rail line	Parish of St Clements
115 kV Transmission Line	SE ¼ 16-13-6 EPM	Decommissioned rail line	Parish of St Clements
115 kV Transmission Line	SW ¼ 15-13-6 EPM	Decommissioned rail line	Her Majesty the Queen
115 kV Transmission Line	N ½ 10-13-6 EPM	Decommissioned rail line	Privately owned
115 kV Transmission Line	N ½ 10-13-6 EPM	Decommissioned rail line	Privately owned
115 kV Transmission Line	N ½ 10-13-6 EPM	Decommissioned rail line	Privately owned
115 kV Transmission Line	NW ¼ 11-13-6 EPM	Pasture/grassland	Privately owned
115 kV Transmission Line	SW ¼ 11-13-6 EPM	Agricultural/forest	Privately owned
Distribution Supply Center	SE ¼ 10-13-6 EPM	Agricultural	Privately owned
Garson Station	SW ¼ 7-13-6 EPM	Sub-transmission station	Manitoba Hydro

3.5 Project Alternatives

3.5.1 Need

Manitoba Hydro System Planning have identified the need for a new source to replace the existing Garson Station due to extensive reliability and performance issues attributed to line condition, lack of capacity, and voltage issues related to the 33kV sub-transmission system supplying the station.

The risk associated with not proceeding is extended outages during peak loading conditions affecting approximately 1,008 customers in the communities of Garson and Tyndall as well as the surrounding area.

The proposed 115 kV Transmission Line and DSC will remove all remaining load from the 33 kV system between Parkdale Station and Garson Station facilitating decommissioning of Garson Station and a potential for decommissioning Line 13.

3.5.2 Purpose

The purpose of this Project is to establish a new 115 kV-12.47kV source capable of absorbing approximately 8 MVA of load from existing 33 -12.47 kV Garson Station as well as supporting the area's 10 year historical load growth of 4.7% beyond 10 years. Transfer all of the load from the Garson Station to the new Tyndall DSC will facilitate decommissioning of sub-transmission line 13 as well as Garson Station. After decommissioning of Garson Station, a second DSC at Tyndall will be installed if required.

3.5.3 Alternatives

3.5.3.1 Reliability and Performance Options

The following three options were considered to address the issues of reliability and performance related to Garson Station and its associated 33 kV sub-transmission infrastructure (Manitoba Hydro 2012a).

Option 1: Install a 9 km 115 kV transmission radial tap supplying a 10 MVA, 115-12.47 kV DSC located between the communities of Tyndall and Garson with an in-service date of October 31, 2014.

The option involves installation of a 10 MVA, 115-12.47 kV DSC to supply approximately 8 MVA of load currently supplied by the 33-12.47 kV Garson Station. This DSC would be centered between the communities of Garson and Tyndall. The site would originally incorporate one DSC (with provisions for a second), three regulators and one 4-way switching cubicle to provide three feeder positions. Additional 4-way switching cubicles would be required for future feeders. Feeder reconfiguration would be required which would result in protection and voltage regulation changes.

This option would provide available capacity as well as system performance in accordance with planning criteria limits beyond 10 years in the Tyndall/Garson area based on the 10-year historical average load growth rate of 4.7%. After this time, a second 10 MVA DSC would be installed at Tyndall if required. Additional reliability benefits would be achieved in the form of viable feeder ties between East Selkirk, Melrose and Tyndall. Tyndall DSC would absorb all

remaining load from the existing 33 kV system between the Parkdale and Garson Stations facilitating decommissioning of Garson Station and Line 13.

Option 1: Recommendations

1. Build a 9 km 115 kV transmission line from TS44 to new DSC site.
2. Build one 10 MVA, 115-12.47kV DSC west of Tyndall.
3. Salvage 3.8 km of line 13 between Road 33 and Maple St. including the road crossing, capacitor bank and transformer 5980.
4. Salvage four capacitor banks and road crossing directly outside Garson Station. Install two tie points to ES12-2.
5. Install feeder ties and salvage 6.5 km of under build along PTH 44 west of the Community of Garson.
6. Install feeder ties ES12-2 and TDL12-1/MRE12-1/MRE12-2 utilizing upper circuit Z2/0A.
7. Line protection.
8. Applied escalation costs of 1.9%/year as per schedule G911-1.

Option 2: Install a 9 km 115 kV transmission radial tap supplying a new 7.5/10/12.5 MVA, 115-12.47 kV single bank steel structure station with an in-service date of October 31, 2015.

Install a new 12.5MVA, 115-12.47 kV single bank steel structure station to supply approximately 8 MVA of load currently supplied by 33-12.47 kV Garson Station. This new station would be centered between the communities of Garson and Tyndall and would follow the “mobile concept” commonly used for rural stations requiring the use of a mobile station bank in emergencies and maintenance situations. A “mobile concept” uses a transformer that is mobile and can be used to replace a failed transformer in an emergency situation until a permanent transformer can be installed.

This would provide available capacity as well as system performance in accordance with planning criteria limits beyond 10 years in the Tyndall/Garson area based on the 10-year historical average load growth rate of 4.7%.

Option 2: Recommendations

1. Build 9 km 115 kV transmission line from TS44 to new station.
2. Build one 7.5/10/12.5 MVA, 115-12.47 kV single bank steel structure station.
3. Salvage 3.8 km of line 13 between Road 33 and Maple St. including the road crossing and Capacitor Bank and Transformer 5980.
4. Salvage four capacitor banks and road crossing directly outside Garson Station. Install two tie points to ES12-2.
5. Install feeder ties and salvage 6.5 km of under build along PTH 44 west of the Community of Garson.
6. Install feeder ties ES12-2 and TDL12-1/MRE12-1/MRE12-2 utilizing upper circuit Z2/0A.

7. Line protection.

8. Applied escalation costs of 1.9%/year as per schedule G911-1.

Option 3: Upgrade 33 kV infrastructure, sub-transmission line 13 and line 17. This option was eliminated based on failure to address one or more of the area issues in the evaluation matrix below.

Option 1 is recommended as it addresses the area’s target issues of performance and reliability, and is the more economical of the two available solutions. Table 3-2 shows the evaluation matrix for options regarding Garson Station reliability.

Table 3-2: Evaluation Matrix for Options Regarding Garson Station Reliability

Evaluation Criteria	Option		
	1 (Install 115 kV DSC)	2 (Install 115 kV Station)	3 (Upgrade Line 13 & 17)
Adequate system voltage and protection for the next 10 years.	Exceeds	Exceeds	Meets
10 year capacity solution for the area with an in service date of winter 2015.	Exceeds	Exceeds	Meets
Reliable infrastructure supplying distribution station/supply center.	Meets	Meets	Fails
Cost Effectiveness.	Lower	Higher	--

3.5.3.2 Tyndall DSC Supply Options

Three possible options were considered to supply the Tyndall DSC (Manitoba Hydro 2012b). These include the following:

Option 1: 33 kV Supply

The area of Tyndall is currently supplied by Garson Station, which is supplied from L13 out of the Parkdale Station. Manitoba Hydro has indicated that this line is currently experiencing low voltage during winter peak conditions. The 33 kV system is old and the load is being converted to other voltage supplies when practical. L13 is also connected to the Whiteshell Station, but Whiteshell is unable to serve load at the Garson Station during winter peak due to the line length. Based on this information, the 33 kV system is not considered a viable supply.

Option 2: 66 kV Supply

Four 66 kV lines, from Pointe du Bois to Winnipeg, run near Tyndall and are known as P1, P2, P3, and P4. An earlier System Planning Report (SPD 2010) recommended that the P lines from Pointe du Bois be salvaged in 2014 based on their age and condition. The report highlighted that the P lines and their terminating equipment are a safety concern. Based on this information, the 66 kV system is not considered to be a viable supply.

Option 3: 115 kV Supply

A 115 kV supply to a Tyndall DSC would utilize either SV24 or TS44 based on their proximity to the distribution preferred DSC location. There is another possible 115 kV supply at Beausejour East which would be approximately the same distance as TS44 or SV24, but 115 kV line SG12 has already been tapped for two 115 kV stations. SG12 is also significantly longer than TS44 or SV24, which could affect line reliability. This in turn eliminates other 115 kV supplies as being viable and they weren't investigated any further.

The original concept for the Tyndall DSC involved tapping 115 kV line SV24. Further review indicated that tapping line TS44 for the Melrose DSC had design problems which could be eliminated by tapping off SV24. This resulted in the tap for the Tyndall DSC coming off of TS44 instead. The current conceptual Single Line Diagram (SLD) was updated showing TS44 as the 115 kV supply option.

The 115 kV supply from TS44 is therefore considered the most likely supply for the Tyndall DSC based on physical proximity to the community of Tyndall, and based on the ability of the 115 kV system to serve DSC sized loads which is confirmed later in the report. The tap for the DSC will require a 115 kV tapping structure, complete with a three-way 115 kV line disconnect, a new 9 km 115 kV line, and three 115 kV single phase fuses. The tapping point on TS44 will be approximately 11 km south of East Selkirk Station.

3.5.3.3 115 kV Transmission Line Routes

Initially, alternative 115 kV transmission line routes were identified from the proposed tapping location at TS44 to the proposed optional DSC sites. The alternative transmission line routes were separated into segments for the evaluation process. Segments were identified anywhere a new route option begins. In total, 15 segments were identified (Map 3-1).

Segments were evaluated based on 13 criteria that included water, soil, vegetation, wildlife, fish, land use, resource use, heritage/historic site, residences and agricultural infrastructure, number of towers, number of angle towers, diagonal lines, and water crossings. The rationale for using the 13 criteria for evaluation was that no single criteria used alone would influence the segment or route selection.

Segments received a value of either 1 (poor) or 2 (good) for each criteria which was assigned on the ranking basis identified in Table 3-3. The objective was to determine which segments would generate high scores to assist with the selection of the preferred alternative for the 115 kV Transmission Line route. Desktop review of orthophotographs and maps along with site visits conducted on September 24 and October 1, 2012 assisted with the evaluation of segments.

Table 3-4 outlines the route segment comparison for the 115 kV transmission line. Each segment was evaluated based on the 13 criteria identified in Table 3-3. Scores for each segment were summed and scores ranged between 18 and 25. Preferred sections were identified based on higher scores (i.e., score ≥ 22). Based on the technical evaluation, preferred segments included 1A, 1B, 1E, 1F, 2B, 3A, 3B, 3C, 3D and 4B. The shortest distance and most straightforward route to the proposed DSC location (discussed below) considering preferred segments includes the following 1A, 1B, 1C, 3C, 3D and 3E.

Segments 1A, 1B and 1C run east from the tap location at TS44 for approximately 4.4 km, while segments 3C and 3D run southeast for approximately 3.2 km; segment 3E runs southeast for about 1.1 km and turns south towards the proposed DSC for 1.1 km.

- Segment 1A occurs along a deciduous forest on the south side of an existing gravel road and will cross Rd. 29E as it changes to Segment 1B.
- Segment 1B runs along an existing deciduous forest and through agricultural land with shelterbelts before crossing Rd. 30E, and continues to run along agricultural land.

Table 3-3: Tyndall 115 kV Transmission Line Evaluation Criteria

Component	Ranking Basis	Rank	
		1	2
Water	Proximity to water body (reservoir or wetland).	≤ 400 m	> 400 m
Soil	Soil suitability (excessive moisture, erodibility).	Unsuitable soil	Suitable soil
Vegetation	Plant species and communities of conservation concern.	Known species or high potential	Low potential
Wildlife	Fragmentation of wildlife habitat (contiguous forests).	Fragmentation	No fragmentation
Fish	Fish habitat.	Potential	None
Land Use	Removal of agricultural land out of production.	Occurring along ≥ 800 m of land	Occurring along < 800 m of land.
Resource Use	Removal of resource (forests, trees)	Effect on resource use	No effect on resource use.
Heritage / Historic Site	Proximity to heritage/historic site.	≤ 200 m	> 200 m
Residences and Agricultural Infrastructure	Proximity to residences and agricultural infrastructure	≤ 100 m	> 100 m

Number of towers	Count of towers	≥21	<21
Angle towers	Presence of angle towers.	Required	Not required
Diagonal Line	Occurrence of diagonal line.	Diagonal line on agricultural land	No diagonal line on agricultural land, or diagonal line along existing right-of-way
Water Crossing	Number of water crossings.	One or more	None

- Segment 1C runs along pasture and hay fields, crosses Rd. 31E and continues to run through a treed/shelterbelt area and agricultural land.
- Segment 3C runs along the abandoned Canadian Pacific Rail (CPR) line where shrubs and trees have encroached on to the line; this segment will cross Rd. 32E and 33E.
- Segment 3D continues along the abandoned CPR line, and runs south of the existing gravel road as it joins Segment 3E.
- Segment 3E continues along the abandoned CPR line and crosses Devils Creek and Rd. 34E. The segment runs along the east side of Rd. 34E through pasture/grassland, forested land and agricultural land to the proposed DSC where it will cross Rd. 34E.

Table 3-4: Tyndall 115 kV Transmission Line – Route Segment Comparison

Segment	Physical Factors		Biological Factors			Social Factors				Technical Factors				Score	Preferred Section
	Water	Soil	Vegetation	Wildlife	Fish	Land Use	Resource Use	Heritage/Historic	Residences and Infrastructure	No. Towers	Angle Towers	Diagonal Line	Water crossing		
1A	2	2	2	2	2	2	1	2	2	2	2	2	2	25	√
1B	2	2	2	2	2	1	1	2	1	1	2	2	2	22	√
1C	2	2	1	1	2	1	1	2	1	2	2	2	1	20	
1D	1	2	1	1	2	1	1	2	1	1	1	2	2	18	
1E	2	2	2	2	2	2	1	2	1	2	2	2	2	24	√
1F	2	2	1	2	2	2	1	2	1	2	2	2	2	23	√
2A	2	2	2	1	2	1	1	2	1	1	1	2	2	20	
2B	2	2	2	2	2	1	1	2	2	2	1	2	1	22	√
3A	2	2	2	2	2	2	1	2	2	2	2	2	1	24	√
3B	2	2	2	2	2	2	1	2	2	2	2	2	2	25	√
3C	2	2	1	2	2	2	1	2	1	1	2	2	2	22	√
3D	2	2	2	2	2	2	1	2	1	2	2	2	2	24	√
3E	1	2	2	2	1	2	1	2	1	1	1	2	1	19	
4A	2	2	1	1	2	1	1	2	1	1	1	2	1	18	
4B	2	2	2	2	2	2	1	2	1	2	2	2	2	22	√

3.5.3.4 Distribution Supply Centre Locations

Three alternatives were initially evaluated by Manitoba Hydro as potential sites for the DSC (Map 3-2).

Proposed Site 1 is located in Sections 15, 16, 21 and 22, Township 13, Range 6, East of the Prime Meridian. Four potential locations were considered for this site which were the four corners of the road intersection. The northwest corner is cultivated land with a residence less than 200 m away. The northeast corner is a hayfield surrounded by a shelterbelt of coniferous and deciduous trees, with a residence approximately 200 m away. The southeast corner occupies a residence surrounded by a shelterbelt of deciduous trees. Devils Creek also traverses the parcel of land. The southwest corner appears to be a moist hayfield with a residence approximately 200 m away.

Proposed Site 2 is located in Section 10, Township 13, Range 6, East of the Prime Meridian. This site consists of agricultural land adjacent to forest land from the south and west of the proposed site. Residences are less than 200 m away from the proposed site.

Proposed Site 3 is located in Section 10, Township 13, Range 6, East of the Prime Meridian. The site is cultivated land and is located immediately north of PTH 44.

Four evaluation criteria identified by Manitoba Hydro including:

- Transmission infrastructure
- Distribution infrastructure
- System performance and
- System reliability

Based on the technical evaluation, Site 3 was the preferred DSC location.

3.5.3.5 Public Engagement Input for Transmission Routing and DSC Location

Through the Public Engagement Process for the Tyndall 115 kV Transmission Line and DSC, comments and suggestions were provided by property owners, municipal officials and other contacts for the Project (see Section 5). During the Round One Open House, the area for the proposed DSC was reduced by Manitoba Hydro to include the section of land that supported only DSC Sites 2 and 3 (Map 3-2). Site 1 was no longer presented as an option due to technical ranking criteria and cost.

A summary of input and concerns during Round One of the Public Engagement Process for the transmission line routing and proposed DSC location included the following:

- Landowner concerns regarding the tap location and for transmission line routing.
- Preference to avoid agricultural lands.
- Maximizing separation between residences and transmission line routing.
- Crossing creeks and drains.

- Transmission line and DSC aesthetics.
- Preference for routing along the decommissioned rail line.
- Concern with DSC location near residences.

A summary of input and concerns during Round Two of the Public Engagement Process included the following:

- Routing for the transmission line.
- Electric and Magnetic Field concerns from transmission line.
- Loss of shelterbelt.
- Transmission line aesthetics.
- Attendees acknowledged the decommissioned rail line as being the most logical route for the transmission line.
- Attendees were supportive of the need for the Project.

3.5.3.6 Preferred Route

Through consideration of physical, biological, social and technical factors as well as public engagement input, Hydro identified a preferred route for the Tyndall Project. The preferred route for the 115 kV transmission line includes segments 1A, 2A, 3A, 3B, 3C, 3D and a portion of 3E from the proposed tapping location at TS44 to the proposed DSC location (Map 3-1).

The transmission line along segment 1A relocated along the north side of the road due to a previously known native settlement in the forest on the south side of the road. Segment 1A will run east along agricultural land for about 300 m. The transmission line along segment 2A will run along agricultural land north for 800 m, west of an existing shelterbelt, adjacent to Four Mile Rd. The transmission line on this segment turns east to run 2 km which will be located on the north side of Four Mile Rd. and an undeveloped road allowance.

The transmission line on the undeveloped road allowance will cross agricultural land, with a hog farm operation to the north, bisect a small stand of deciduous trees and cross PR 212 (Rd. 30E). The transmission line will run southeast along the decommissioned CPR line for segments 3A, 3B, 3C and 3D for approximately 5 km and will cross Rd. 31, 32 and 33E.

Routing along segment 3E changed through public engagement input (Map 3-3). One property owner indicated that he keeps bees along the decommissioned rail line and plans to build a residence in the area. Another property owner indicated that he has planted an extensive shelterbelt along the rail line.

Previously, the transmission line on this segment routed south of Morden Rd. along the decommissioned rail line, across Devils Creek and continued to Rd. 34E, then turned south following Rd. 34E to the DSC. Hydro will route the transmission line south of Morden Rd. along the decommissioned rail line for approximately 400 m, based on public input.

The transmission line will cross Devils Creek and follow the creek along the north side for 900 m to Rd. 34E. The transmission line will turn south, cross Devil Creek, and run for 600 m along the east side Rd. 34E, adjacent to agricultural land and a small stand of trees to arrive at the DSC.

Hydro evaluated the new alignment based on the 13 criteria identified in Table 3-3. Based on the technical evaluation, the new alignment compared to the previously evaluated 3E segment had similar rankings, 18 and 19 respectively. The evaluation differed in factors for vegetation, number of towers, and diagonal line.

The preferred alternative for the DSC is to construct at the proposed Site 3 location. This site is located in the SE corner of Section 10 Township 13 Range 6 East of the Prime Meridian, northwest of intersection PTH 44 and Rd. 34E. The site will occur on agricultural land with no residences in the immediate vicinity of the DSC.

The proposed Project will accommodate approximately 10 km of 115 kV transmission line, a 10 MVA 115-12.47 kV DSC, three regulators and one 4-way switching cubicle to provide three feeder positions.

3.6 Project Phases

The proposed Tyndall 115 kV Transmission Line and DSC will be carried out in five phases as follows:

- Planning and Design
- Pre-construction
- Construction
- Operation and Maintenance
- Decommissioning

3.6.1 Planning and Design

During the planning and design stage of the proposed Tyndall Project, the municipal offices and property owners were contacted, public open houses were held, the property will be acquired and the environmental assessment was conducted. Mitigation measures identified during the environmental assessment will be incorporated into the final design of the Project.

3.6.2 Pre-Construction

Pre-construction activities will include surveying and flagging the locations for the transmission line and DSC by Manitoba Hydro. Access to the DSC site will be established which will include the installation of a drainage culvert from Rd. 34E. Access will also be required for the 115 kV

tap to TS44. Manitoba Hydro will also determine clearing requirements of tree and shrub cover for the proposed transmission line right-of-way prior to construction. Construction power and other required services may also be determined for the Project during pre-construction.

3.6.3 Construction

Project construction for the 115 kV transmission line will involve clearing the right-of-way as required, erecting a 115 kV tapping structure, erecting transmission line poles, tapping the existing transmission line (TS44), conductor stringing and connecting the proposed DSC.

Project construction for the proposed DSC will involve access to the site, clearing and leveling of the site and establishing drainage. The approximate footprint to be constructed is a 90 by 90 m aggregate foundation. Manitoba Hydro will construct the DSC that includes one 10 MVA (with provisions for a second), three regulators and one 4-way switching cubicle providing three feeder positions. The DSC site will be contoured, landscaped and receive Manitoba Hydro signage. There will be no fence around the DSC.

3.6.4 Operation and Maintenance

The Tyndall 115 kV Transmission Line and DSC will be operated continuously throughout the year, and will be maintained in accordance with Manitoba Hydro standards, guidelines and procedures. The DSC and transmission line performance will be monitored on an ongoing basis. Maintenance will include scheduled replacement of poles, lines and conductors, as well as periodic repair to damaged equipment and vegetation control. Vegetation along the transmission line will be managed in accordance with established guidelines (Manitoba Hydro 2007b).

3.6.5 Decommissioning

Any staging or laydown areas will be cleaned up and decommissioned upon completion of the construction phase of the Project.

The Tyndall 115 kV Transmission Line and DSC will be taken out of service at the end of its useful operational life and decommissioned in accordance with a decommission plan to be prepared for the Project.

Included in the Project is the decommissioning of sub-transmission line 13 and the Garson Station. Decommissioning will involve the complete salvage and removal of the Garson Station including all equipment, structures and fencing (see previous Option 1, Section 3.5.3.1). The gravel station foundation will remain at the site. The date of decommissioning is dependent on

the actual in-service date of the Tyndall 115 kV Transmission Line and DSC. Decommissioning will follow the Environmental Protection Guidelines for decommissioning at Manitoba Hydro Work Sites and Facilities (Manitoba Hydro 2006a).

3.7 Project Components And Activities

3.7.1 Project Components

The proposed Tyndall 115 kV Transmission Line and DSC Project has three main components including:

- 1) 115 kV transmission line (including 115 kV tap),
- 2) 115 kV – 12.47 kV DSC, and
- 3) decommissioning of sub-transmission line 13 and the Garson Station.

3.7.1.1 Transmission Line

A 115 kV transmission line will be installed from the proposed radial tap location at TS44. Tapping refers to tying into an existing line by running a new single-circuit line. The transmission line will run from the tapping location at TS44, approximately 10 km to supply the 10 MVA, 115-12.47 DSC located between the communities of Tyndall and Garson. The location of the proposed transmission line with existing infrastructure and transmission is shown on Map 3-3. An example 115 kV pole structure (H-frame) is shown in Figure 3-1 . H-frames are typically between 15.9 and 22.7 m tall with 3.7 m between poles, with spans ranging from 60 to 175 m.

3.7.1.2 Distribution Supply Centre

A DSC is an alternative to constructing conventional substations developed for 115 kV in Manitoba. DSCs can be used as replacement for older substations nearing the end of their life cycle.

The proposed Tyndall DSC will be similar to other DSCs. Photographs of DSCs at Melrose are shown in Figure 3-2. These show typical infrastructure for a DSC.

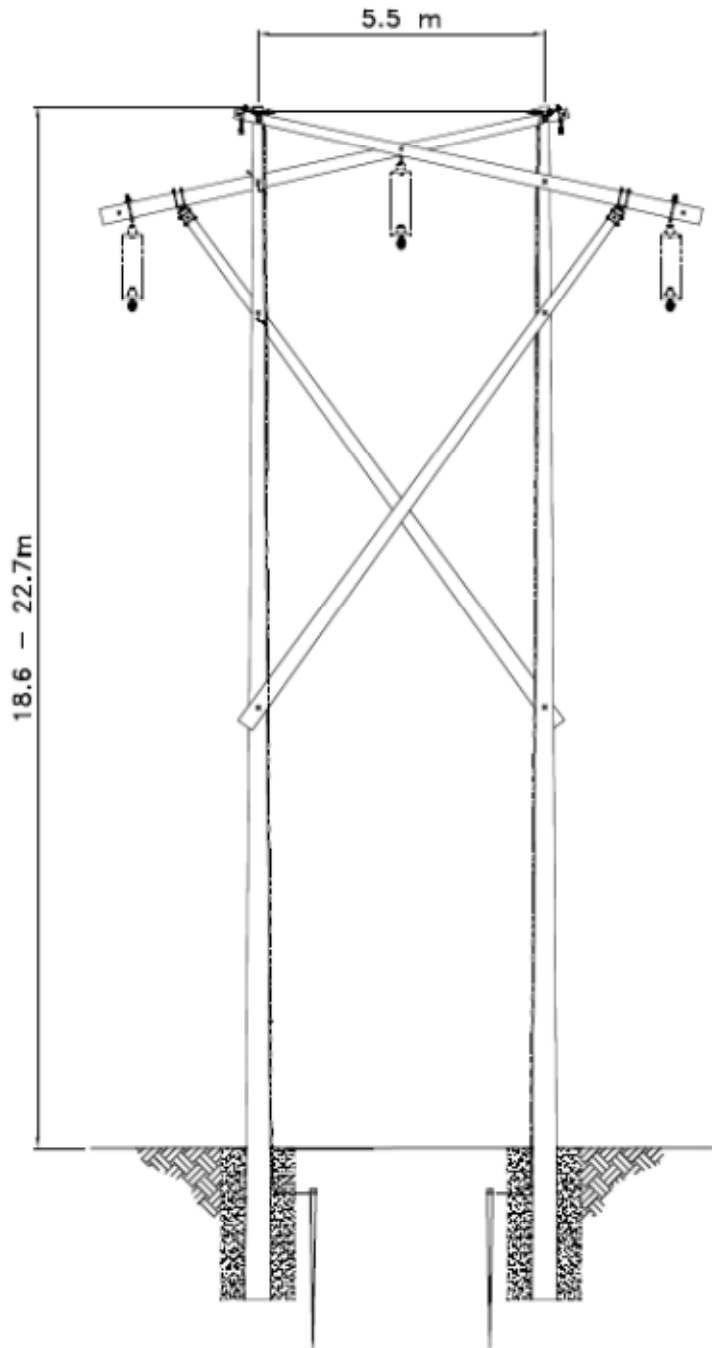


Figure 3-1: Typical H-Frame pole structure.



Figure 3-2: Photographs of the Distribution supply Center at Melrose.

3.7.1.3 Garson Station

Garson Station will be decommissioned with complete salvage of the station and removal of all equipment, structures and fencing (see previous Option 1, Section 3.5.3.1). The gravel station foundation will remain at the site.

3.7.2 Project Activities

Project activities that will be carried out for the Project components (i.e., 115 kV Transmission Line and DSC construction, and Garson Station decommissioning) during pre-construction (PC), construction (C), operation/ maintenance (O/M), and decommissioning (D) phases for the proposed Tyndall Project are provided in (Appendix A).

3.8 Technical Specifications

Technical specifications for the proposed Project were obtained from the Customer Service and Distribution, Distribution Engineering and Construction Rural, and Distribution Engineering Rural report on Tyndall DSC Study NO: DER – S11-02 (Manitoba Hydro 2012a) and Transmission Planning and Design Division, System Planning Department report on Tyndall DSC Supply (Manitoba Hydro 2012b). Technical information on equipment is listed below:

- 10 MVA, 115-12.47 DSC
- 3 regulators
- 1 4-way switching cubicle to provide 3 feeder positions
- 115 kV tapping structure
- 1 3-way 115 kV line disconnect
- Approximately 10 km of 115 kV line
- 3 115 kV single phase fuses

3.9 Design Mitigation

The design of the proposed Tyndall 115 kV Transmission Line and DSC, including Garson Station decommissioning, will incorporate applicable environmental legislation, standards, guidelines and best practices including the following:

- Code of Practice for Storage and Handling of Petroleum Products and Allied Petroleum Products Storage Tank Systems (Manitoba Hydro 2003);
- Contractor/Non-Employee Safe Practice Guide (Manitoba Hydro 2005);
- Corporate Safety and Health Rules. Safety Policies, Publications and Training Department (Manitoba Hydro 2009a);
- Environmental Protection Guidelines, Construction, Operation and Decommissioning, Manitoba Hydro Work Sites and Operations (Manitoba Hydro 2006a);
- Fur, Feathers, Fins and Transmission Lines: How Transmission Lines and Rights of Way Affect Wildlife (Manitoba Hydro 2010);
- Guide to Environmental Legislation Applicable to Manitoba Hydro's Projects and Operations (Manitoba Hydro 2009b);
- Hazardous Materials Management Handbook (Manitoba Hydro 2007a);
- Overhead Transmission Line Construction Inspection Manual (Manitoba Hydro 2008);
- Shorelines, Shorelands and Wetlands: A Guide to Riparian Ecosystem Protection at Manitoba Hydro Facilities (Manitoba Hydro 2000);
- Transmission Line and Station Vegetation Management Guidelines (Manitoba Hydro 2007b).
- Generic Environmental Protection Plan for Distribution Supply Centres (Manitoba Hydro 2011a).

Chapter 4 provides a summary of applicable provincial, national and international legislation, guidelines and best practices.

3.10 Construction Equipment and Vehicles

Equipment and vehicles used during construction of the proposed Tyndall 115 kV Transmission Line and DSC, and decommissioning of Garson Station includes the following:

- All-terrain vehicles (Quad)
- Back hoes
- Bucket truck
- Compressor
- Concrete truck
- Crane
- Digger/drill
- Dozer
- Dump truck
- Excavator
- Fuel truck/trailer
- Grader
- Hand tools
- Loader
- Mower
- Pick-up trucks
- Semi-trailers
- Sprayer

3.11 Construction Materials

Construction materials likely to be used for the proposed Tyndall 115 kV Transmission Line and DSC are listed in Table 3-5. The type and amount of construction materials to be used have not been determined but are likely to include those listed.

Table 3-5: Construction Materials

Project Component	Construction Materials	Use
115 kV Transmission Line	Tapping tower	Supporting conductors
	Poles	Supporting conductors
	Conductor	Transmission of electricity
	Insulators	Prevents flow of electricity
10 MVA, 115-12.47 kV DSC	Transformer	Step down voltage
	Switch	System disconnection
	Regulator	Voltage control
	Fuses	Circuit breaker
	Tower/Pole	Running conductor
	Insulators	Insulation
	Anchors	Structure support
	Aggregate	Base material for DSC
	Concrete	Base material for DSC

3.12 Fuels and Hazardous Materials

Fuels and hazardous materials likely to be used during construction of the proposed Tyndall 115 kV Transmission Line and DSC, including Garson Station decommissioning, are listed in Table 3-10. No polychlorinated hydrocarbons (PCBs) will be used in electrical equipment or stored at the Project location. The types and quantities of all fuels and hazardous materials to be used in the construction Project have not been determined but are likely to include those listed. No fuels or other hazardous substances will be stored at the DSC location after construction.

Storage sites for fuel shall be secured with signage, and a permit will be obtained from Manitoba Conservation and Water Stewardship. Any hazardous wastes will be stored separately and transported, in accordance to applicable legislation (Manitoba Provincial Dangerous Goods Handling and Transportation Act), to a licensed disposal and/or treatment facility.

Table 3-6: Fuels and Hazardous Materials

Project Component	Fuel/Materials	Purpose
115 kV Transmission Line	Diesel	Construction equipment/vehicle fuel
	Gasoline	Construction equipment/vehicle fuel
	Propane	Heating if required
	CCA	Wood preservative
	Solvent	Cleaning conductors
10 MVA, 115-12.47 kV DSC	Diesel	Construction equipment/vehicle fuel
	Gasoline	Construction equipment/vehicle fuel
	Propane	Heating if required
	Solvent	Cleaning conductors
	Mineral oil	Insulation/arc dispersion
Garson Station and components	Diesel	Construction equipment/vehicle fuel
	Gasoline	Construction equipment/vehicle fuel
	Propane	Heating if required

3.13 Potable Water

Potable water for the proposed Tyndall 115 kV Transmission Line and DSC, including Garson Station decommissioning, will be trucked from existing sources, as required, to the construction sites.

3.14 Waste Disposal And Treatment

Trees and shrubs from clearing the transmission line right-of-way will be burned on site or removed to a licensed or approved waste disposal grounds. Non-hazardous solid waste (e.g., construction materials, earth) will be collected at the construction sites and transported to a licensed waste disposal facility. Porta-potties will be provided for field construction crews.

3.15 Workforce

Construction of the proposed Tyndall Project will be carried out under contracts tendered and managed by Manitoba Hydro. Presently, the number, scope and magnitude of the contracts are not known. Manitoba Hydro employees will be involved in the planning, design, pre-construction, construction and operation of the proposed Project. All construction activities will be supervised by Manitoba Hydro inspectors. No Manitoba Hydro employees will be required on-site on a full-time basis after commissioning of the Project.

3.16 Schedule

The proposed Project schedule to achieve an in-service date of October 31, 2014 is summarized in Table 3-7. Completion of the design component and property acquisition for the Tyndall 115 kV Transmission Line and DSC is dependent upon receiving an Environment Act License for the proposed Project from Manitoba Conservation and Water Stewardship.

Table 3-7: Project Schedule

Project Component	Project Phase	Start Date	Completion Date
115 kV Transmission Line	Planning/Design	2012	Spring 2014
	Construction	Summer 2014	Fall 2014
10 MVA, 115-12.47 kV DSC	Planning/Design	2012	Spring 2014
	Construction	Spring 2014	Fall 2014
Garson Station and components	Decommissioning	Fall/Winter 2014	Fall/Winter 2014

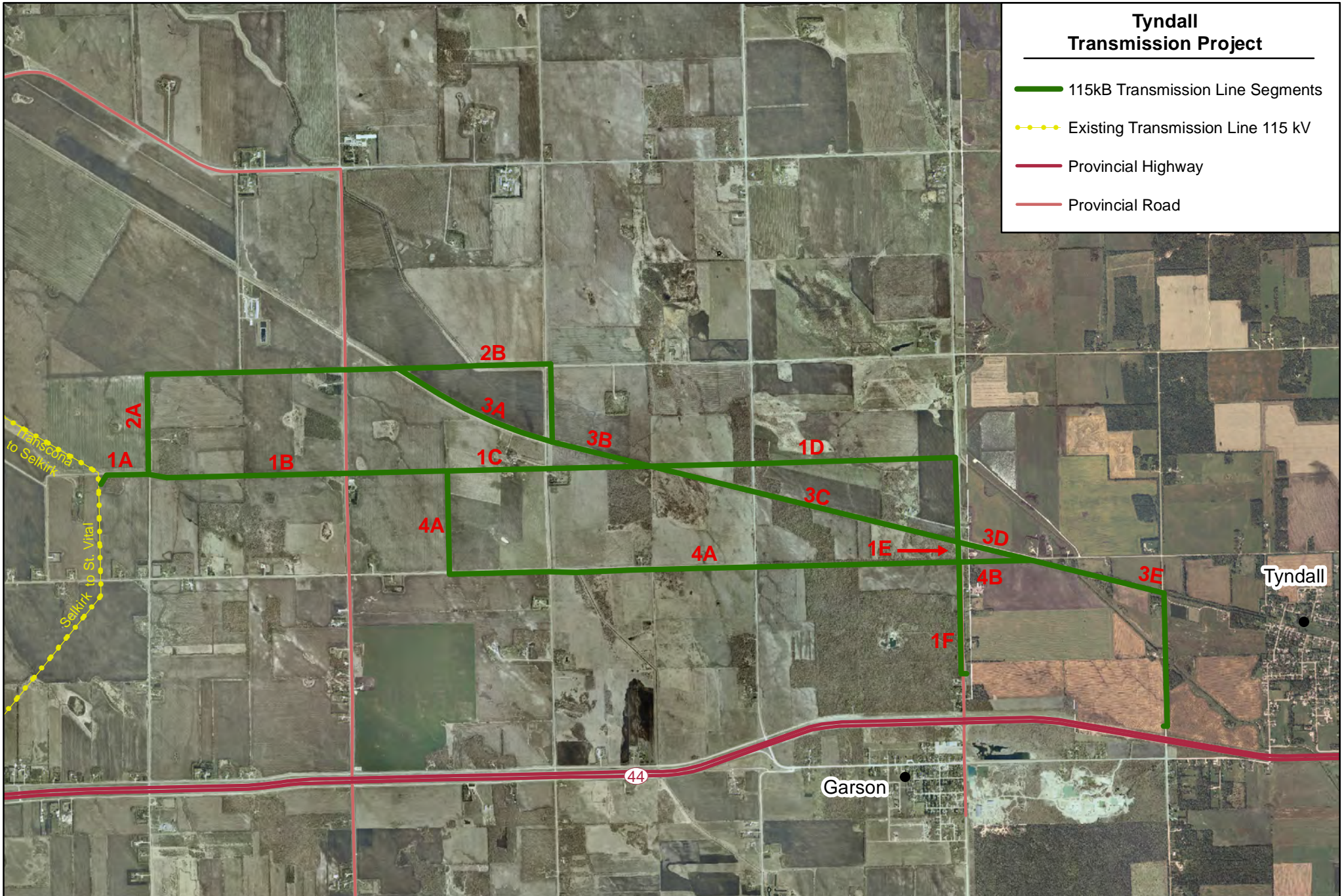
3.17 Summary

This chapter of the environmental assessment report provides a description of the proposed Tyndall 115 kV Transmission Line and DSC Project including system context, location, land ownership, alternatives, phases, components and activities, technical specifications, design mitigation, construction equipment and vehicles, construction materials, fuels and hazardous

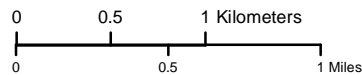
materials, waste products, workforce, schedule and funding. Information on the proposed Project is described to facilitate the identification and analysis of potential environmental effects, and the subsequent mitigation of adverse effects.

Tyndall Transmission Project

- 115kV Transmission Line Segments
- Existing Transmission Line 115 kV
- Provincial Highway
- Provincial Road



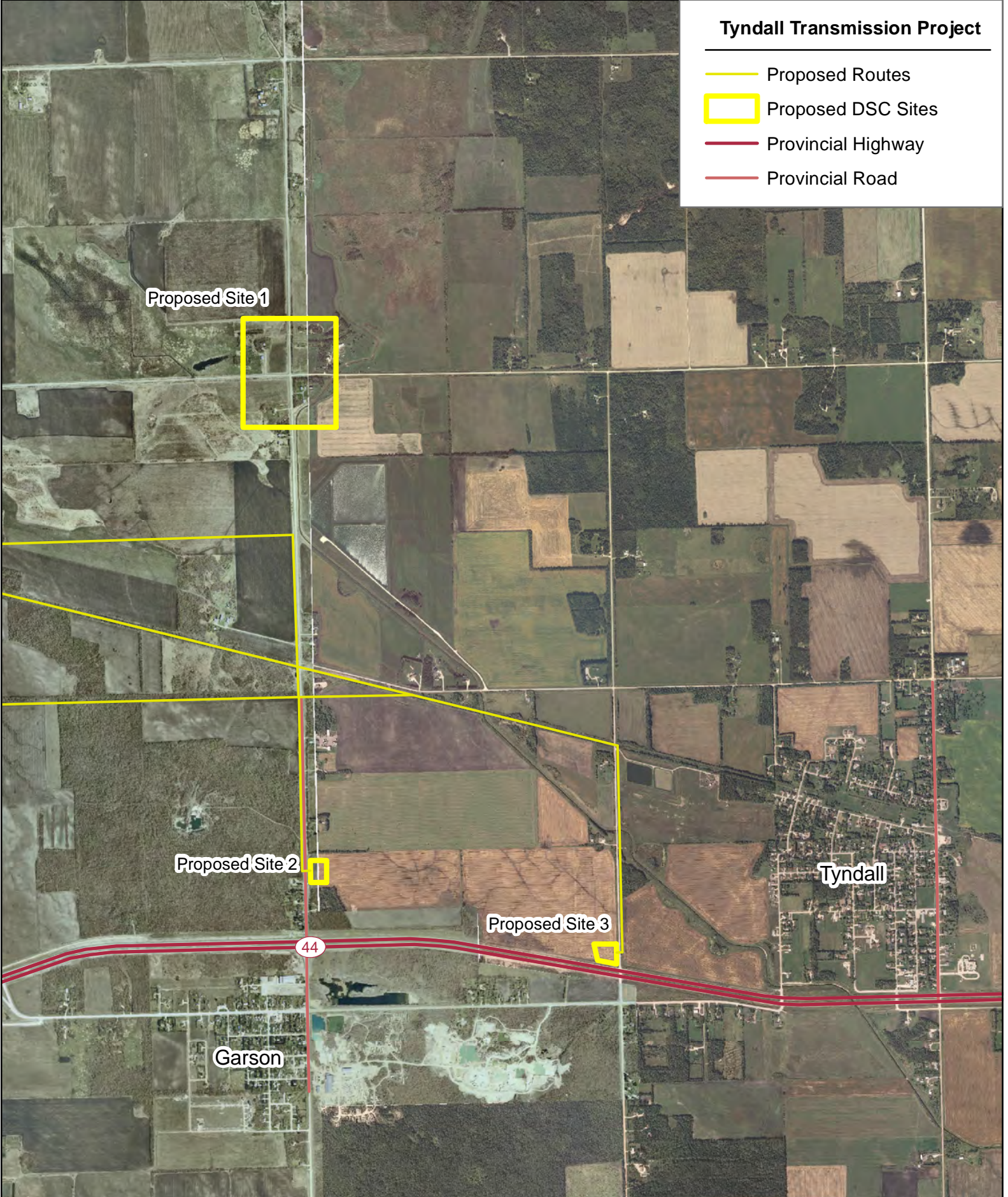
Coordinate System: UTM Zone 14 NAD 83
Data Source: MBHydro, ProvMB, NRCAN
Date Created: December 30, 2013



Alternate Routes Tyndall Transmission Project

Tyndall Transmission Project

- Proposed Routes
- Proposed DSC Sites
- Provincial Highway
- Provincial Road



Proposed Site 1

Proposed Site 2

Proposed Site 3

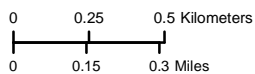
Garson

Tyndall

44



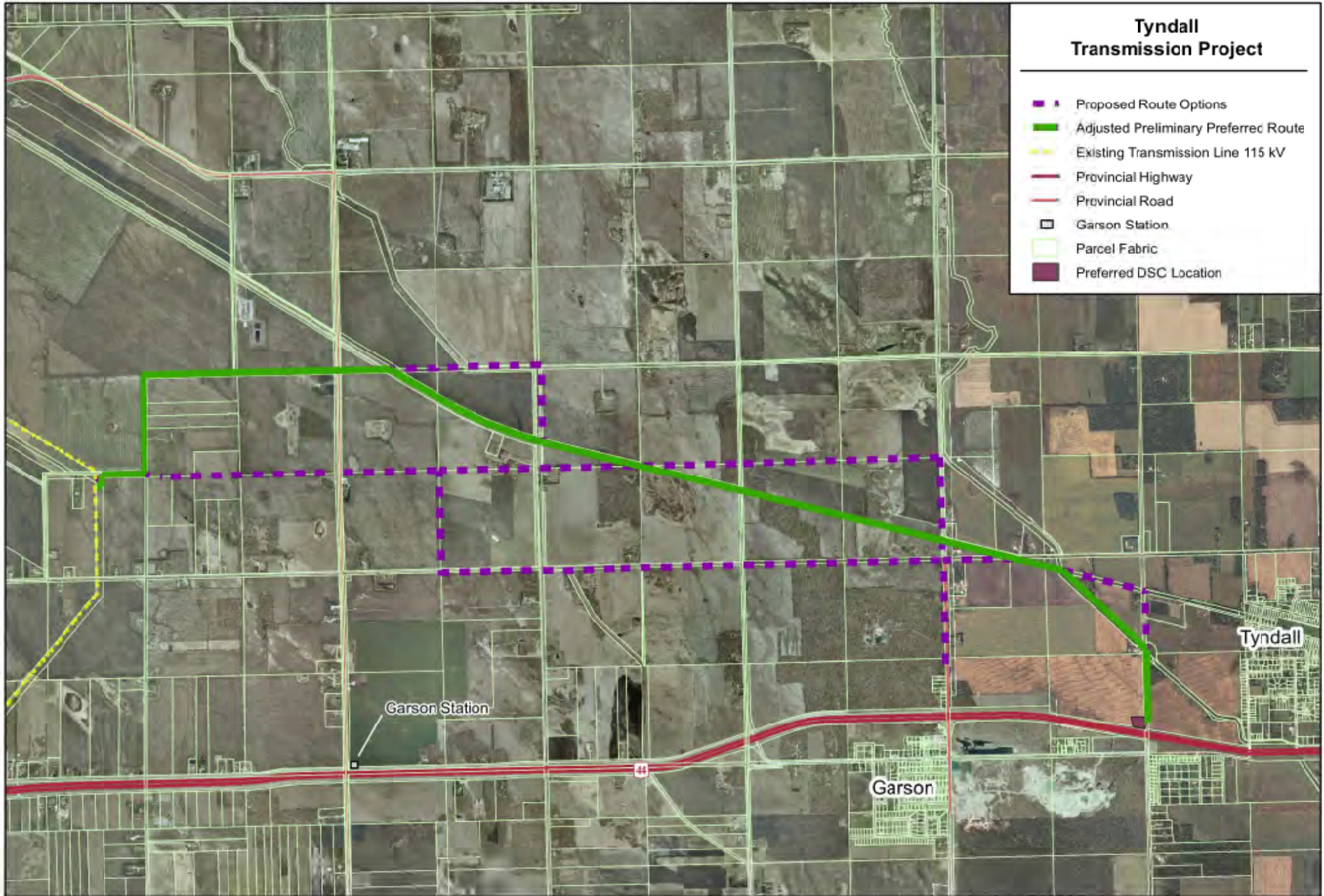
Coordinate System: UTM Zone 14 NAD 83
Data Source: MBHydro, MMM, Stantec, ProvMB, NRCan
Date Created: September 26, 2011



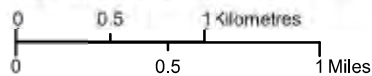
Proposed Distribution Supply Centre Locations

Tyndall Transmission Project

- Proposed Route Options
- Adjusted Preliminary Preferred Route
- Existing Transmission Line 115 kV
- Provincial Highway
- Provincial Road
- Garson Station
- Parcel Fabric
- Preferred DSC Location



Coordinate System: UTM Zone 14 NAD83
Data Source: MBHydro, ProvMB, NRCan
Date Created: June 13th, 2013



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Adjusted Preliminary Preferred Route

Draft: For Discussion Purposes Only

Map 3-3