5.0 Environmental and socio-economic setting

5.1 Overview

This chapter provides an overview of the physical, ecological (aquatic and terrestrial), and socio-economic environment with respect to the Project. It begins with a summary of the regional setting that discusses historic, present and potential future conditions for the region. The physical environment section then provides information on the existing:

- Atmospheric conditions(climate, noise and air quality);
- Surface water;
- Geology and hydrogeology; and
- Terrain and soils.

This is followed by a section on the existing ecological environment, which discusses:

- Fish habitat and resources;
- Vegetation;
- Terrestrial invertebrates;
- Reptiles;
- Amphibians;
- Mammals; and
- Birds.

The socio-economic environment section then provides information on:

- Population;
- Infrastructure and services;
- Employment and economy;
- Property and residential development;
- Agriculture;
- Other commercial resource use;
- Recreation and tourism;
- Health;

- Traditional land and resource use; and
- Heritage resources.

The information in this chapter provides the basis of this environmental assessment. Additional information regarding the existing physical and ecological environment is provided in Appendix D, and additional information regarding the socioeconomic environment is provided in Appendix E.

5.2 Regional setting summary

5.2.1 Historic conditions

The Project is located in the Interior Plains Physiographic Region, which covers southwest Manitoba, southern Saskatchewan and most of Alberta (Weir 2012). The generally low relief and soils in the area were formed through retreating glaciers and Lake Agassiz, and are generally very fertile. Relief in the region is primarily as a result of large rivers such as the Assiniboine and its tributaries, which have eroded deep valleys and ravines in some areas. Historically, much of the area was covered with large open prairie grassland areas interspersed with aspen parkland, with elm, ash and Manitoba maple along watercourses, and oak on drier sites.

The strategic location and varied geography of the region resulted in a rich history of Indigenous land use during the Precontact Period and well as after the first contact. The Precontact Period in Manitoba dates back to at least 10,000 Before Present with the earliest evidence of human occupation beginning in the southwest corner of the Province and expanding northwards, coinciding with the melting of the last glaciers and the draining of Glacial Lake Agassiz. After deglaciation, the first peoples in the region would likely have arrived after the local ecology emerged from under the meltwater and animal life reoccupied the area. The confluence of the Assiniboine and Qu'Appelle rivers, along with a number of smaller tributaries located within the study area would have acted as a central hub for the congregation of people, animals and resources.

The region continued to be a place where the exchanging of ideas and trade would occur. For example, James Settee, an Indigenous schoolmaster was sent out in the winter of 1841 to determine the need for a school in the Fort Ellice area. Settee reported that "*Fort Ellice is a very desirable locality for the establishment of a new station. The Missionary might have access to the Sioux, the Assiniboine, the Mandans, the Crees and the Chippeways*" (Ledohowski 2009).

The fur trade played a major role in this region from the late 1700s to late 1800s and while most major fur trade posts were located strategically on waterways, overland

access was just as important. This was manifested in an extensive network of cart trails and overland transportation routes that criss-crossed the southern Prairies, connecting various trade posts and communities. These trails typically followed early Indigenous travel and trade routes. One of the main trails was known as the Carleton Trail, an approximately 1,400 km long overland route which connected Fort Garry (now Winnipeg) and Fort Edmonton (Kermoal 2007). By the mid-1800s, a number of Metis freighters in Red River Carts would routinely travel long distances transporting goods and furs across the prairies. At this time, Fort Ellice was one of the major trade posts in the region. The post located at the on the upper plateau of the junction of Beaver Creek and Assiniboine River was in operation from 1831 to 1890. By the 1890s, the Carlton Trail stopped being used for transportation, a result of the Canadian Pacific railway expansion into the northwest. The first transcontinental railroad reached Birtle in 1886 (Bird 1961) and gradually replaced carts as a means of transportation. A large Metis population in the region dates back to these earliest days of the fur trade especially around the Fort Ellice area. Ste. Madeleine is one of several areas settled by Metis homesteaders in the late 1800s after being displaced from the Red River Settlement.

In 1870, formal acquisition of lands governed by the Hudson Bay Company was granted to the Federal government, who implemented the Dominion Land Survey, parcelling thousands of acres into a grid system for homesteading, as well and the building of the transcontinental railway, causing a boom in settlement. This pioneer-settlement period from 1878 to 1914 attracted several different cultural groups who were drawn by agricultural incentives. The first wave of settlers included the dominant Anglo-Ontario group who were first to arrive and occupied the majority of the region. Smaller communities of Francophone, Romanian and Ukrainian settlers also established permanent settlements in the area.

5.2.2 Existing conditions

The following information on the Ecozone is taken from Smith et al. (1998) unless otherwise noted. The Project is located primarily within the Aspen Parkland Ecoregion of the Prairies Ecozone, which occupies the southwestern corner of the province and a small area in the Riding and Duck Mountains. It forms part of the extensive parkland belt between the closed boreal forest cover to the north and northeast and the treeless grasslands to the west. A mosaic of trembling aspen, oak groves and rough fescue grasslands extends in a broad arc from south-western Manitoba northward through Saskatchewan to its northern apex in north-central Alberta. The Ecoregion slopes gently eastward and is drained by the Souris, Assiniboine, Qu’Appelle and Pembina rivers flowing in deeply incised broad valleys carved by glacial meltwaters.

The Prairies Ecozone has been heavily altered by human activity. Farmland dominates the Ecozone, covering nearly 94% of the land base. It contains the majority of the country's productive agricultural cropland, rangeland, and pasture. As a result of the export of grains, oilseeds, and animal products, the Ecozone is an important source of foreign exchange.

Agriculture is the major agent of change in this Ecozone, influencing most native communities of plants and animals. Agricultural activities such as cropping, livestock operations and aerial spraying have been occurring in southern Manitoba for over a century, and will continue into the future. Loss of habitat is the most critical threat to the flora and fauna, with little of the natural vegetation remaining. Wetlands have been altered by agricultural practices and only half the pre-settlement wetland area remains. Today, the Prairies Ecozone and its native ecosystems contain some of the most endangered natural habitats in Canada and provides habitat for several threatened and endangered wildlife species.

While agriculture is the dominant activity in the region, there are other activities and developments that have ongoing effects (both positive and negative) to the regional environment and economy. Residential subdivisions have and continue to be developed. The community of Russell is the largest urban center in the region, with smaller settlements including McAuley, Beulah and the Village of St. Lazare, and ongoing development around St. Lazare.

Quarries, potash withdrawal and oil wells have been developed and are operating in the region. There are no active mines in the region, but mining activities are associated with 13 quarry leases, 22 casual quarry permits, 18 quarry withdrawals (either sand or gravel), 179 private quarry permits, one potash exploration permit and 19 potash withdrawals. There are also 439 oil wells in the region, with 26 in the Binscarth area, 129 near Prairie View, and 284 in the RM of Ellice Archie.

As described further in section 5.5.8 hunting, fishing, trapping and other domestic resource use activities have been undertaken in southern Manitoba and will continue. Recreational activities in the region include all-terrain vehicle use, snowmobile use, multi-trail use and boating.

The Project region also contains infrastructure such as roads, railways, and existing transmission and pipelines, with approximately three times as much on the east side of the Assiniboine River than the west. Section 5.5.3 contains a description of existing infrastructure, which is also mapped (Map 5-2). Roads include Provincial Trunk Highways (PTH), Provincial Roads (PR) and mile or half mile roads. The Project route crosses PTH 16 and PTH 41 and parallels PR 568 for 13 km in length.

In addition to roads there are rail and transmission lines that run through the region (Map 5-2). Railways include the Rocanville Subdivision, Rivers Subdivision and Bredenbury Subdivision. Transmission lines include a 230kV line from Birtle South Station south to Virden West Station, and a 230kV transmission line from Birtle South Station east to Raven Lake Station. There are two pipelines in the region; one (Minell Pipeline) runs in a north-south direction through the RMs of Ellice Archie and Binscarth and the other (TransCanada Pipeline) runs in an east-west direction through the RMs of Ellice Archie and Prairie View.

Other existing physical works and activities in the region include airports, communication facilities, water treatment and waste facilities. While there are no aerodromes or airstrips located in the region the Russell Airport is a public airport just north of the region, and Brandon Municipal Airport is located at Brandon. Communication facilities/towers, including microwave and cellular towers can also be found in the region, and a number of centers and rural areas are served by public drinking water and wastewater utilities. Drinking water is primarily supplied by groundwater well sources; typically through private wells. The St. Lazare water and wastewater utility is the only utility that is supplied by surface water and has recently undergone upgrades to meet potable water needs of existing residents; its wastewater treatment lagoon is scheduled for upgrading. There are also several waste disposal sites and landfills in the region, as described in section 5.5.3.

5.2.3 Future conditions

In terms of future projects and activities in the region, agriculture will continue to dominate the landscape, and residential development will likely continue in more urban centres. It is difficult to predict what types of reasonably foreseeable development will occur, but there are several development activities being planned. Transportation infrastructure will include construction of Municipal Road 155 between Municipal Roads 82 and 83, and embankment construction is planned for a bridge over the Assiniboine River on PTH 16 in the vicinity of Russell. A new water treatment plant is being constructed in Russell, with a regional water supply pipeline between Russell, Binscarth, Rossburn, and Inglis. There is also a new water treatment plant planned for the town of Birtle, including a new supply line along PR 568, Municipal Road 157, and Municipal Road 94; in addition, new water wells and a pumping station are being built on the south side of PR 568. Mining and oil and gas exploration and development are also expected to continue in the region, including the possibility of a new potash mine and a new oil and gas well and associated road in the Spy Hill Community.

In terms of future environment conditions, climate change is expected to have an increasing influence over time. There is a general understanding within the scientific community that increased greenhouse gas (GHG) concentrations will increase global temperatures (IPCC, 2013); however, there is less confidence in how the climate will change at the regional or local scale, and levels of confidence in projections for future climate vary from one region to another and among climate variables. To address these uncertainties, the Intergovernmental Panel on Climate Change's (IPCC) Task Group on Data and Scenario Support for Impact and Climate Assessment (TGICA) recommends that climate impact assessments should follow an approach that uses a number of plausible future climates scenarios (IPCC-TGICA, 2007). Following this approach, a historic and future climate study was undertaken in the general Project region in 2015, as part of the Manitoba-Minnesota Transmission Project (MMTP; Manitoba Hydro 2015b). Since the MMTP study area is located in the same Ecozone and within close proximity to the Project region, outputs from the MMTP study were used to generally characterize the future climate conditions for the Project.

The MMTP study area had an eastern boundary at the Ontario border, the western boundary 10 km west of Brandon, the southern boundary 100 km south of Winnipeg (across US border), and the northern boundary being 150 Km north of Winnipeg. It was located in the Prairie Ecozone, and covered most of the Grassland Transition Ecoclimatic Region where the Project is located.

Future climate scenarios were developed for Winnipeg, characterizing projections of temperature, precipitation and wind speed for the 2020s (2010-2039), 2050s (2040-2069) and 2080s (2070-2099). Several Global Climate Models (GCMs) and emission scenarios were used to create an ensemble of future climate scenarios. Ensemble average projections are shown in Table 5-1.

Table 5-1: Future climate scenarios

Year	Temperature (^{0}C)	Precipitation Change (%)	Wind Speed Change (%)
2020	+1.5	+3.5	-0.7
2050	+2.9	+4.2	-1.4
2080	+4.1	+6.7	-2.1

The results from the study suggest that mean annual temperature and precipitation will generally increase with time, while mean annual wind speed will decrease. By 2020 temperatures are projected to increase by more than 1^0C, 3^0C by 2050, and approximately 4^0C by 2080. Precipitation is expected to increase by more than 3% by

2020, more than 4% by 2050 and more than 6% by 2080. The study showed that of the four seasons, winter is likely to experience the greatest increase in mean temperature and greatest increase in relative precipitation. Summer months are projected to experience the greatest relative reduction in surface wind speed.

As indicated above, the mean temperature and precipitation projections from an ensemble of GCMs is projected to increase with time, while wind speed is projected to decrease. In addition, changes to temperature and precipitation will likely be greater in winter, while reductions in wind speed will likely be greater in summer. It was also noted above that the uncertainty in predictions increases as the models are applied to a more local scale. Therefore, while the models provide specific numerical outputs for the target time frames, it is not possible to accurately predict what this will mean to various aspects of the natural and socioeconomic environment.

Uncertainties in local climate change projections are substantially compounded when they are used to project what these changes mean for the natural and socioeconomic environment. On a continental scale changes to the environment are often very apparent over time, but at more local scales factors such as land cover, topography, watercourses and other barriers may have a greater influence on the distribution of a local wildlife species population. Increased variability in weather could increase the frequency of more extreme events such as flooding, drought and wildfires. The potential effects of extreme events are discussed in chapter 8 (Effects of Environment on the Project). The consequences of the more subtle changes are much more difficult to assess. Increases in temperature and precipitation outside of extreme events could have positive consequences for agriculture, but there may be increased risks of invasive species. Temperature increases in the region suggest a shorter winter and longer growing season, which could result in an expansion in distribution of species less tolerant of cooler conditions. The effects of climate on the natural environment at the local level are particularly complex when factoring in food web aspects such as competition and predation. An earlier spring and later fall may encourage migratory species to arrive earlier and stay later, animal species may move into new areas now more suitable, and plant species may begin to encroach into areas previously less suitable. Thresholds of sustainability may change in either positive or adverse ways. While it is not possible to accurately project how climate change will affect the environment in the region, a subjective discussion on this topic will be brought into the cumulative effects discussions in chapter 7.

5.3 Physical environmental setting

5.3.1 Overview

Based on the guidance provided by Manitoba Sustainable Development's Environmental Approvals Branch (Government of Manitoba 2015a), the existing physical environment of the region is organized into the following:

- Atmospheric conditions (climate, air quality and noise);
- Surface water;
- Geology and hydrogeology; and
- Terrain and soils.

5.3.2 Atmospheric conditions

5.3.2.1 Climate

As indicated, the Project is situated in the Aspen Parkland Ecoregion of the Prairie Ecozone, in a subdivision of the Grassland Transition Ecoclimatic Region (Smith et al. 1998) that lies between the driest subdivision to the southwest and the most humid subdivision to the east and northeast. The region is characterized as having a Continental climate, with short, warm summers and long, cold winters. Seasonal temperatures and precipitation for the closest meteorological station[1], in the town of Binscarth, is shown in Figure 5-1.

The annual wind rose for Brandon is presented in Figure 5-2. The mean annual wind speed (measured at 10 m) is 14.9 km/h and blows most frequently from the west or north east, with gusts exceeding 90 km/h in all months, and maximum observed gust speeds of 139 km/h.

[1] Code "A" - World Meteorological Organization standards.

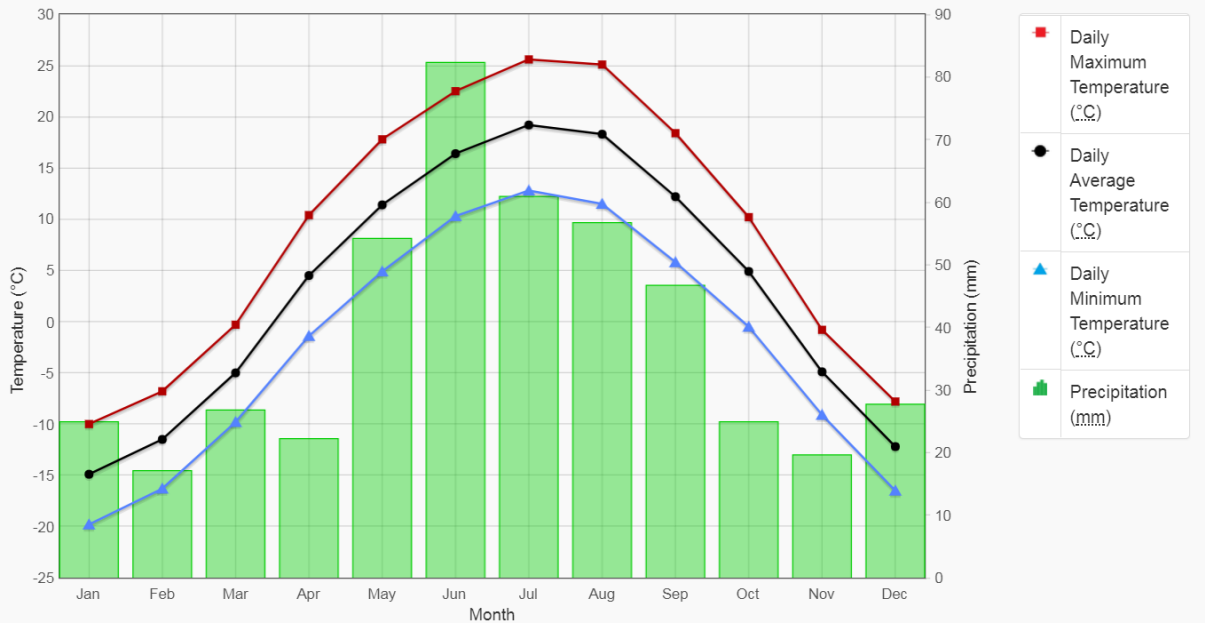


Figure 5-1: Temperature and precipitation graph for 1981 to 2010 Canadian Climate Normals for Rocanville, SK (Government of Canada 2017a)

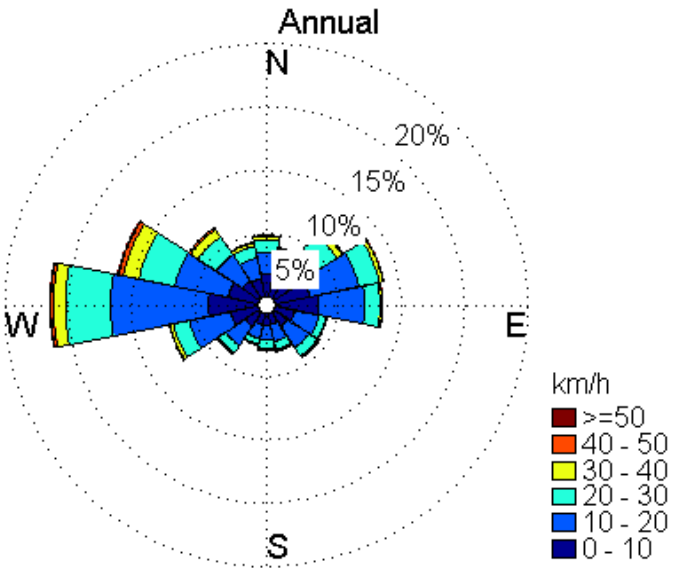


Figure 5-2: Brandon annual wind rose for hourly wind normal (1981-2010; Environment Canada 2014a)

5.3.2.2 Noise and air quality

The Project is located in an area predominantly used for agricultural purposes. Land used for agriculture accounted for greater than 70% in the region (section 5.5.6.1) Existing noise and air quality conditions would not be expected to be an issue for the majority of the year. The exception may occur at harvest time when harvesting activities result in increased vehicular and equipment activities that would increase local noise and local air quality, including emissions and particulate matter from and reduced visibility from local crop residue burning programs.

5.3.3 Surface water

5.3.3.1 Hydrology

The Project falls almost entirely within the Assiniboine-Birdtail watershed, with a small portion falling within the lower Qu'Appelle River sub-watershed. All waterways crossed by the Project are within the Assiniboine-Birdtail watershed.

The hydrology of the Assiniboine River Basin is consistent with that of prairie river systems with large variability in annual stream flows with peaks occurring during the spring freshet and low flows during fall and winter (Genivar 2012). Figure 5-3 shows the distribution of annual flow for the six Water Survey of Canada streamflow gauging stations located in the watershed.

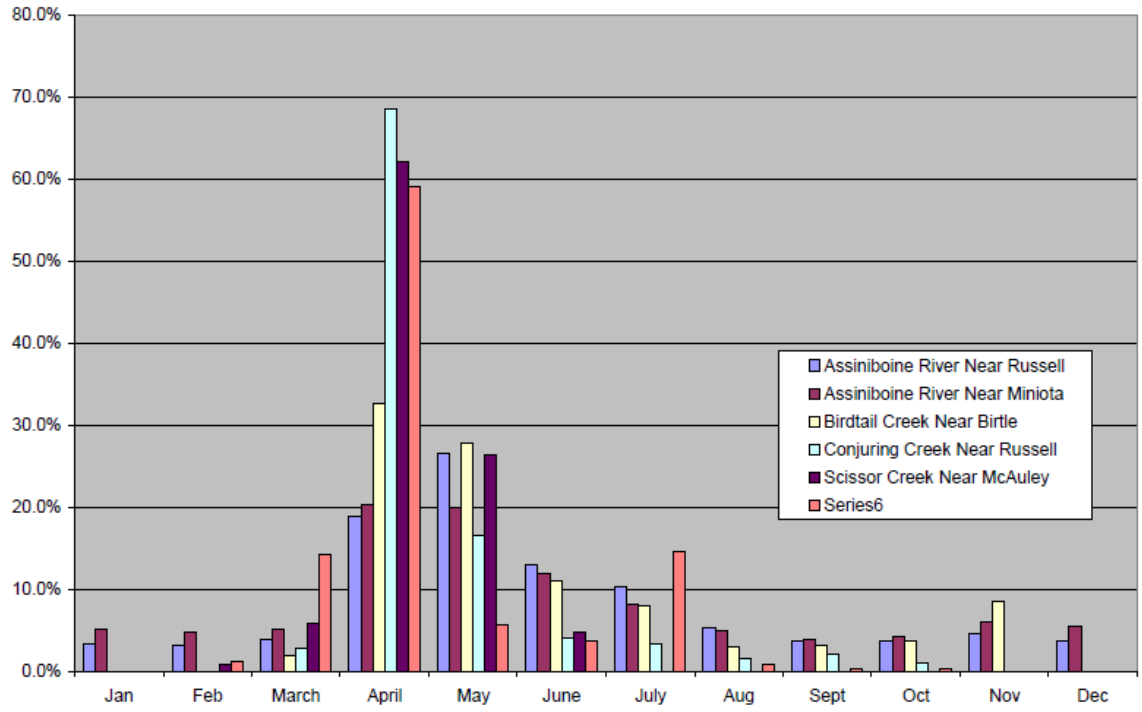


Figure 5-3: Distribution of annual flow for the six Water Survey of Canada streamflow gauging stations located in the watershed (Manitoba Sustainable Development 2017b)

5.3.3.2 Water quality

Surface water quality on the Assiniboine River was assessed by Manitoba Water Stewardship (2007) using the Canadian Council of Ministers of the Environment (CCME) water quality index which provides a convenient means of summarizing complex water quality data (CCME 2001). The water quality index was calculated for the Assiniboine River at Miniota and Birdtail Creek at Birtle with available data from 2001 to 2007 and the Assiniboine River at Russell in the upstream portion of the watershed with data collected from 2006 to 2007 (Manitoba Water Stewardship 2007). The Water Quality Index was rated as 80[2] for the Assiniboine River at Miniota, 81 for Birdtail Creek at Birtle and 88 for the Assiniboine River at Russell (Manitoba Water

[2] Excellent (95-100) - Water quality never or very rarely exceeds guidelines; Good (80-94) - Water quality rarely exceeds water quality guidelines; Fair (60-79) - Water quality sometimes exceeds guidelines and possibly by a large margin; Marginal (45-59) - Water quality often exceeds guidelines and/or by a considerable margin; Poor (0-44) - Water quality usually exceeds guidelines and/or by a large margin

Stewardship 2007), all of which are considered ‘good’ - water quality rarely exceeds water quality guidelines (CCME 2001). Water quality objectives for the protection of aquatic life for total suspended solids were exceeded occasionally in the Assiniboine River at Miniota and Birdtail Creek, mostly due to suspended sediments increasing after spring runoff and summer precipitation events (Manitoba Water Stewardship 2007). Bank erosion and poor land-use practices such as removing vegetated buffer strips were described as contributing to increased suspended sediments (Manitoba Water Stewardship 2007).

5.3.4 Geology and hydrogeology

This section describes the geology and hydrogeology of the region. Further details are provided in the biophysical technical data report (Appendix D). Bedrock consists of Mesozoic and Cenozoic shales and sandstones with minor limestones and evaporites (Betcher et al. 1995). Surficial geology in the region is dominantly till comprised of calcareous clay diamicton (poorly sorted sediment) that is mainly derived from shale from the Mesozoic era, ranging from one to 75 m thick on areas of low relief (Matile and Keller, 2004).

Sand and gravel aquifers are found in the overburden commonly as discrete buried lenses or layers (Phipps 2008). Water quality is variable with most sources exceeding one or more aesthetic objectives for drinking water (Phipps 2008). The Odanah member of the Pierre Shale Formation, present throughout most of the watershed, consisting of brittle layers of rock separated by of softer clay layers, forms the bedrock water source (Phipps 2008).

5.3.5 Terrain and soils

This section describes the terrain and soils of the region. Further details are provided in the biophysical technical data report (Appendix D).

Information on terrain is summarized from the four ecodistricts (St. Lazare, Hamiota, Melville, and Stockton) from Smith et al. (1998). The Project region consists of a undulating to hummocky and kettled glacial till plain dissected by broad river valleys in which the Assiniboine and Qu’Appelle rivers flow. These valleys form the most visible physiographic elements in the area. The river valleys are steep (15 to >60 % slope), with lengths ranging from 50 to 150 m. Maximum relief from valley wall crest to valley floor ranges from 30 m to 60 m. Slopes in this hummocky terrain are relatively short, ranging from 50 to 150 m, with usually less than 5 percent inclination. Apart from these valleys, the area ranges from nearly level to areas of moderate local relief of less than

30 m. Slopes are generally less than 5 percent, of medium length and usually between 50 to 150 m long.

The dominant soil materials found in the region consist mainly of loamy textured glacial till (morainal deposits) (Land Resource Unit, 1998a, b, c and d). Predominant soils include well-drained Black Chernozems developed on strongly calcareous, water-worked, glacial till derived from limestone, granitic rock and local bedrock shale, and Black Chernozemic soils developed on calcareous, glaciofluvial deposits. Valley floors are characterized by imperfectly drained Regosolic soils on river alluvium. Local areas of imperfectly drained, carbonated and variably saline Gleyed Rego Black Chernozems ring poorly drained Gleysolic soils found in depressions.

Most of the cultivated soils on well-drained knolls have been variably affected by moderate to severe wind and water erosion, discussed further in section 7.3.5. Current management practices of continuous cropping, virtual elimination of summer fallow, retention of crop residues as surface cover and tree shelterbelts have greatly reduced the risk of soil erosion.

5.4 Ecological environment setting

5.4.1 Overview

Based on the guidance provided by Manitoba Sustainable Development's Environmental and Assessment Branch (Government of Manitoba 2015a), the existing ecological environment of the Project area is organized into the following:

- Fish habitat and resources;
- Vegetation;
- Terrestrial invertebrates;
- Reptiles;
- Amphibians;
- Birds; and
- Mammals.

5.4.2 Fish habitat and resources

5.4.2.1 Overview

Field and desktop data were analyzed to characterize the existing in-water and riparian physical environment and habitat suitability for fish as well as fish presence and distribution. Details are provided in Appendix D.

5.4.2.2 Priority species

Priority species were identified through discussions with Indigenous communities, regulators, and the public, and include species of conservation concern, species important for Indigenous peoples, and invasive species.

Species of conservation concern include those listed by the Manitoba Conservation Data Centre (MBCDC), the *Manitoba Endangered Species and Ecosystems Act* (ESEA), the federal *Species at Risk Act* (SARA), and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The Species at Risk public registry and the MBCDC website were reviewed to determine species presence in the regional assessment area. The following aquatic priority species are potentially present:

- Chestnut lamprey (Ichthyomyzon castaneus);
- Silver chub (Macrhybopsis storeriana);
- Bigmouth buffalo (Ictiobus cyprinellus); and
- Mapleleaf mussel (Quadrual quadrula).

In addition to these species of conservation concern, additional considerations are commercial, recreational, aboriginal fisheries, which are protected by the *Fisheries Act* and invasive species such as the zebra mussel. The Project should not increase the spread of invasive species.

Chestnut lamprey

The Chestnut Lamprey is currently listed as Special Concern on Schedule 3 of the *Species at Risk Act*. It has been found historically in the Qu'Appelle and Assiniboine rivers, but has not been captured since 2001 in either (COSEWIC 2010). Sightings in Saskatchewan by anglers on the Assiniboine and Qu'Appelle rivers indicate that it may still be present in the area (COSEWIC 2010). Lamprey are not effectively sampled by any collection gear so may be more common and widespread than current data suggests (Stewart and Wilkinson 2004).

Spawning occurs in mid- to late-June and the presence of suitable hosts is likely the most important factor for habitat suitability for adults (Stewart and Wilkinson 2004). Larval chestnut lamprey burrow in firm sand-mud substrates in fast flowing water (Scott and Crossman 1979).

Potential threats to the chestnut lamprey include destruction of spawning habitat through soil erosion causing siltation, eutrophication through runoff of fertilizers and pesticide and herbicide pollution affecting both Chestnut Lamprey and its hosts (COSEWIC 2010).

Silver chub

COSEWIC considered the Silver Chub populations a single unit and designated it Special Concern in April 1985 and May 2001 (COSEWIC 2012). In May 2012, the Great Lakes - Upper St. Lawrence populations unit was designated Endangered and the Saskatchewan - Nelson River populations unit was designated Not at Risk (COSEWIC 2012). Therefore the Silver Chub population in Manitoba is currently considered not at risk. Factors limiting the abundance of Silver Chub include habitat degradation, water temperature, sediment and nutrient loadings, oxygen levels, food, predators, and exotic species (COSEWIC 2012).

Bigmouth buffalo

The bigmouth buffalo is listed as special concern under Schedule I of the *Species at Risk Act*. A disjunct population of the Bigmouth Buffalo is found in the Assiniboine River drainage (COSEWIC 2009a). In Manitoba, it is found mainly in the lower reaches of the Assiniboine River downstream of Portage la Prairie (Stewart and Watkinson 2004). The Saskatchewan Water Security Agency (2014) lists the bigmouth buffalo as being present in the lower reaches of the Qu'Appelle River. Based on the distribution map (COSEWIC 2009a) it is unlikely to occur in the region. As successful reproduction appears to be associated with flooding of shoreline vegetation, loss of spawning habitat associated with regulated water levels is a threat to Bigmouth Buffalo (COSEWIC 2009a).

Mapleleaf mussel

The mapleleaf mussel was designated Endangered in April 2006, but was re-examined and designated Threatened in November 2016 (COSEWIC 2016b). It is listed as Endangered under Schedule I of the *Species at Risk Act* and under *The Endangered Species and Ecosystems Act* (Manitoba)

In Manitoba, the species is found in the Red River and some tributaries, the Assiniboine River, and Lake Winnipeg and some tributaries (COSEWIC 2016b). In the late 1990s

mussels were sampled at 185 sites all along the Assiniboine River and larger tributaries, including sites as far upstream as Silver Creek and the Qu'Appelle River (Watson et al. 1998). Mapleleaf were captured at six sites, all downstream of Portage la Prairie. In 2007, four live Mapleleaf were recorded near the city of Brandon, providing evidence that Mapleleaf distribution spans the Assiniboine River both above and below the Portage Diversion (Bouvier and Morris 2011). Mapleleaf are found in a variety of habitats, including medium to large rivers with slow to moderate current and has been recorded from mud, sand, and gravel substrates (COSEWIC 2016b).

In Manitoba this species is threatened by habitat loss and degradation and the effects of invasive species, particularly Zebra mussel (COSEWIC 2016b). Zebra Mussels now threaten mapleleaf mussel in Manitoba, with Zebra Mussel populations becoming established in the Red River, Lake Winnipeg, and in reservoirs in the Red River watershed in North Dakota and Minnesota (COSEWIC 2016b). Habitat changes associated with Zebra Mussels and modifications to the banks of the Red and Assiniboine rivers (e.g., rip-rap and dikes) that alter the flow hydrology of these rivers are threats (COSEWIC 2016b). The Project is not expected to increase the spread of aquatic invasive species as the transmission line will fully span waterways, including a riparian buffer.

5.4.2.3 Current Status

Fish habitat and resources includes the various watercourses and species in the region. As transmission lines are able to span most watercourses with no instream work the risks to fish habitat and resources, including aspects such as aquatic macrophytes and benthic invertebrates, are typically minimal.

The Project is located predominantly within the Assiniboine-Birdtail sub-watershed, where fish habitat has been historically affected by agricultural activity. These agriculture and drainage practices continue to the present day throughout the region. Historical and present day land use practices have directly influenced existing ecological conditions, including fish and fish habitat. Long-term effects include changes in riparian ecosystem structure (i.e., decreased vegetation cover and bank stability) and surface water quality (i.e., increased sedimentation and water temperature). The Project crosses 11 watercourses within the Assiniboine-Birdtail sub-watershed, five of which are classified as being fish-bearing (Milani 2013). Various fish habitat parameters were characterized at the five watercourse crossings during field studies and through desktop assessment (see Appendix D).

The Assiniboine River and its tributaries have 65 species of fish (Cleator et. al. 2010), including many recreationally important species (Nelson and Franzin 2000). Fish

species included northern pike (*Esox lucius*), walleye (*Sander vitreus*), goldeye (*Hiodon alosoides*), channel catfish (*Ictalurus punctatus*), lake sturgeon (*Acipenser fulvescens*) and suckers (e.g., *Catostomus spp*). Fish species include spring-spawners (with species such as walleye and sucker spawning in rocky areas in larger rivers or lakes, and species such as northern pike spawning in weedy flooded areas of terrestrial vegetation), and species such as lake whitefish that spawn in rocky areas in larger rivers or lakes in the fall (Stewart and Watkinson 2004). Several forage species such as brook stickleback (*Culaea inconstans*) and fathead minnow (*Pimephales promelas*) can spawn in the early summer and are tolerant of warm low oxygen conditions in the weedy ponds they inhabit. The burbot (*Lota lota*) spawns in midwinter (Stewart and Watkinson 2004)

Fisheries and Oceans Canada's (2013a) Fisheries Protection Policy Statement focuses on fish that are part of, or support, commercial recreational, Aboriginal fisheries. Manitoba Conservation (2010) identifies 42 sport fish species that are targeted recreationally in Manitoba.

Information provided during the Indigenous engagement process (section 4.3 and Appendix C) indicated that the waterways in the region are used for fishing. For example, the importance of fish to Indigenous communities using the region is noted in the Waywayseecappo Traditional Knowledge Study, where Elders described "how Waywayseecappo families used to fish as a means to supplement their diet. Some of this fishing took place on the nearby Birdtail Creek; however, community members would also travel to other locations to fish. The most prominent location was Rossman Lake, which, according to community members, used to be called "Fishing Lake" (Waywayseecappo First Nation, 2017). Members from Gambler First Nation (Manitoba Hydro 2017h) fish along the Assiniboine River. Oak Lake is an important fishing area, primarily harvesting in the spring, for Canupawakpa Dakota Nation (Manitoba Hydro 2017b). The Manitoba Metis Federation (MNP 2017) identified that within the regional area, members fish for northern pike, walleye, goldeye, lake sturgeon and suckers.

5.4.3 Vegetation

5.4.3.1 Overview

Field and desktop data were analyzed to characterize the existing biophysical information and vegetation in the RAA. Sources included Rowe (1959), Smith et al. (1998) field reports from the Spy Hill Ellice and Ellice Archie Community Pastures (1987, 1993, 1995, 2006, 2011), and public engagement documents (section 3). Both reconnaissance and detailed field surveys were conducted during appropriate

vegetation growing seasons. Details are provided in Biophysical Technical Report in Appendix D.

The proposed Project occurs almost entirely within both the Hamiota and St. Lazare Ecodistricts; the Melville Ecodistrict occupies a minor portion.

Map 5-1 shows the land cover in the RAA. Within the region 14 land use/land cover classes are identified from the Manitoba Land Cover Classification (Table 5-2). These classes include native vegetation of grassland/rangeland, wetlands, and coniferous, deciduous and mixedwood forests. The water class includes rivers and streams. Agricultural cropland, cultural features and roads are also identified. The land use/land cover was determined (calculated) for classes for the regional area.

Table 5-2: Land use / land cover classes for the regional area

Land Use/ Land Cover Classes	Area (ha)	%
Agricultural Cropland	69.0	37.3
Grassland/Rangeland	61.5	33.3
Deciduous Forest	22.8	12.3
Roads and Trails	16.6	9.0
Open Deciduous	5.9	3.2
Forage Crops	5.9	3.2
Marsh and Fens	2.5	1.4
Water	0.5	0.3
Mixedwood Forest	-	-
Treed and Open Bogs	-	-
Coniferous Forest	-	-
Cultural Features	-	-
Forest Cutover	-	-
Bare Rock, Gravel and Sand	-	-

5.4.3.2 Priority vegetation species

Priority vegetation species are identified through discussions with Indigenous communities, regulators, and the public, and include species of conservation concern, species important for Indigenous peoples, and invasive species. Species of conservation concern include those listed by the Manitoba Conservation Data Centre (MBCDC) as rare to uncommon, the Manitoba *Endangered Species and Ecosystems Act* (ESEA), the federal *Species at Risk Act* (SARA), and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Information on invasive species was collected by reviewing relevant legislation and sources identifying these species (e.g., Invasive Species Council of Manitoba 2017). Information on vegetation species important to Indigenous peoples was received through the Indigenous engagement process (section 4). This information highlighted the values of many plants for food, medicine, and ceremonial purposes.

Based on reviewing this information several species of conservation concern (approximately 46) are known to occur in the region, with increased concentrations located in the vicinity of St. Lazare. The uplands and river valleys in this area support a number of species considered provincially rare in the province (Hamel and Reimer 2004). In 2002, surveys in the Qu'Appelle Valley near the town of St. Lazare, and within the Spy Hill-Ellice and Ellice-Archie Community Pastures resulted in 41 new or updated occurrences of 11 species of conservation concern. Information was collected on one nationally rare plant species in this area, roundleaf monkey-flower (*Mimulus glabratus*) (Reimer and Hamel 2003).

5.4.3.3 Current status

Overview

This section organizes information into the following topics:

- Grasslands;
- Forests; and
- Wetlands.

Grasslands

Historically, across North America, grassland ecosystems existed over large areas (Sampson and Knopf 1994), yet few undisturbed natural areas remain today, as losses to grasslands have exceed those of other major biomes (Hoekstra et al. 2005). Although at a slower pace, grasslands losses continue in some areas. The health and persistence of native grasslands is threatened by a combination of agricultural expansion, energy development, fire suppression, trembling aspen encroachment, invasion of exotic species, and fragmentation. Despite these pressures, remnant grasslands remain important habitats for threatened species, and their preservation is vital to conserve biodiversity.

Two intact native mixed-grass prairies exist in the general region totalling 23,450 ha in two Community Pastures: the Ellice-Archie (15,160 ha) and Spy Hill-Ellice (8,290 ha on the Manitoba side) Community Pastures (Reimer and Hamel 2003). These large prairie landscapes have been maintained as a result of the Community Pasture Program, currently administered by the Association of Manitoba Community Pastures (AMCP). The AMCP was formed in 2014 in response to the federal divestiture of the Prairie Farm Rehabilitation Association Community Pasture program, previously administered by Agriculture and Agri-Food Canada. The AMCP is a non-profit organization that seeks to support the livestock industry by providing custom grazing services for local producers balanced with sustainable rangeland stewardship practices – where the diversity and

productivity of the prairie ecosystems are managed using livestock grazing as the primary tool. The AMCP holds the provincial Crown Lease Agreements covering the lands at both Community Pastures, which include stipulations pertaining to the maintenance of healthy diverse, landscapes supported by cattle grazing, and which are representative of natural functional prairie ecosystems. It is governed by a Board of Directors of pasture patrons from across Manitoba. On-site staff provide animal care, cattle rotations, infrastructure and land and water maintenance, and range management (Whidden pers. comm. 2017).

There are in excess of 150 species of plants known to occur in mixed grass prairie, each adapted in its own way to topography and changes in temperature, precipitation, fire, and grazing. Typical grasses and forbs of the mixed grass prairie include little bluestem (*Schizachyrium scoparium*), spear grasses (*Hesperostipa* spp.), blue grama (*Bouteloua gracilis*), prairie crocus (*Anemone patens*), dotted blazingstar (*Liatris punctata*) and purple coneflower (*Echinacea angustifolia*).

Forests

The Aspen Parkland Ecoregion is a matrix of grassland, wetlands, upland forests, and land under agriculture uses. Within the Aspen Parkland, patches of good-growth closed forest occur where conditions are suitable (Rowe 1959). Deciduous and mixedwood forests of trembling aspen (*Populus tremuloides*) and balsam poplar (*Populus balsamifera*) occur on moist sites, while bur oak (*Quercus macrocarpa*) is common on drier sites (Smith et al. 1998). Balsam poplar is found locally throughout the RAA, while bur oak is sporadic in its distribution, occurring along rivers and south or west slopes. Other tree species growing in the RAA include American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), Manitoba maple (*Acer negundo*), eastern cottonwood (*Populus deltoides*), black ash (*Fraxinus nigra*) and basswood (*Tilia americana*) (Rowe 1959).

Rowe (1959) reported a vegetational shift of forest cover encroaching on grasslands and attributed the movement to the elimination of prairie fires and the reduction of grazing pressure, as well as climatic fluctuations. Over the years, others have noted this trend where the Aspen Parkland vegetation, which forms the transition between the boreal forest and the grasslands, has expanded southwards into the grasslands, possibly due to the suppression of natural prairie fires since settlement (Smith et al. 1998).

Wetlands

In Canada, freshwater wetlands cover approximately 16% of the land area (Federal, Provincial and Territorial Governments of Canada 2010). Halsey et al. (1997) estimates

that wetlands in Manitoba cover 233,340 km^2 or 43% of the terrestrial landscape, with peatlands representing 90% of all wetlands. In the region, the till plain is shaped by glaciation, and wetlands here commonly occur as ponds and sloughs, also known as prairie potholes. These mineral wetlands are classified as basin marshes according to the Canadian Wetland Classification System (National Wetlands Working Group 1997).

Within the region, other wetland types present include bogs and fens. Bogs are characterized by an accumulation of peat. Precipitation and snowmelt are primary water sources, resulting in acidic waters low in dissolved minerals. Vegetation largely consists of *Sphagnum*-dominated peat mosses and ericaceous shrubs. Fens are peatlands with a fluctuating water table, rich in dissolved minerals due to ground and surface water movement. The greater nutrient availability in fens supports unique vegetation, often dominated by graminoids (e.g., sedges) and brown mosses (National Wetlands Working Group 1997).

Over the years, wetlands have been reduced in number as a result of agricultural activities. Prior to 1990, the conversion of wetlands was rapid with an approximately 200,000 km^2 being removed. Although some wetlands are being conserved and restored, overall loss and degradation continue (Federal, Provincial and Territorial Governments of Canada 2010). Threats to wetlands include agricultural runoff, drainage, forestry activities, off-road vehicles, peat extraction, and right-of-way activities (Hamel and Foster 2005).

5.4.4 Terrestrial invertebrates

5.4.4.1 Overview

Field and desktop data were analyzed to characterize the existing biophysical information on terrestrial invertebrates in the Project area. Sources included Species at Risk Act Public Registry, COSEWIC List of Canadian Wildlife at Risk, *The Manitoba Endangered Species Act* List of Species at Risk, and the Manitoba Conservation Data Centre Database. Information on species important to Indigenous peoples was received through the Indigenous Engagement Process (section 4). Public engagement documents (section 3) were also reviewed. Details are provided in Biophysical Technical Report in Appendix D.

5.4.4.2 Priority invertebrates

A review of COSEWIC (2016c), the SARA Public Registry (Government of Canada 2017b), the Manitoba Species at Risk registry (Government of Manitoba 2017b) and the MBCDC (2017) revealed the presence of the following five terrestrial invertebrate

species of concern with the potential to occur within the region:

- Gypsy cuckoo bumble bee (Bombus bohemicus);
- Yellow-banded bumble bee (Bombus terricola);
- Transverse lady beetle (Coccinella transversoguttata);
- Nine-spotted lady beetle (Coccinella novemnotata); and
- Monarch butterfly (Danaus plexippus).

Gypsy cuckoo bumble bee

The gypsy cuckoo bumble bee and the yellow-banded bumble bee are both found in a diverse range of habitats. The gypsy-cuckoo bumble bee is a nest parasite, inhabiting open meadows, mixed farmlands, urban areas, boreal forest and montane meadows where its hosts the western bumble bee (*Bombus occidentalis*) and the yellow-banded bumble bee can be found (COSEWIC 2014). There has been a large observed decline in the relative abundance of the species in the past 20-30 years, warranting a designation of Special Concern by COSEWIC. Primary threats include decline of the host species, pesticide use, and introduced pathogens from escaped non-native bees (COSEWIC 2014).

Yellow-banded bumble bee

The yellow-banded bumble bee was historically one of the most common bumble bee species in Canada, inhabiting mixed woodlands, farmlands, urban areas, montane meadows, prairie grasslands and boreal habitats (COSEWIC 2015). Recent mass declines in southern Canada have occurred, resulting in an assessment of Endangered by COSEWIC. Causes of decline remain unclear but are likely the result of a combination of factors, including habitat conversion, pesticide use, introduced pathogens from escaped non-native bees (COSEWIC 2015). Like the gypsy cuckoo bumble bee, the yellow-banded bumble bee forages on flowers from a variety of plant genera for pollen and nectar (COSEWIC 2014, 2015).

Lady beetles

The transverse lady beetle and the nine-spotted lady beetle are both known as habitat generalists that have seen a reduction in geographical range in Canada. The decline in relative abundance of both of these native lady beetles is concurrent with the arrival of non-native species such as the seven-spotted lady beetle (*Coccinella septempunctata*) and the multicoloured Asian lady beetle (*Harmonia axyridis*) (COSEWIC 2012). The transverse lady beetle is designated as Special Concern by COSEWIC, and inhabits agricultural areas (COSEWIC 2012). The nine-spotted lady beetle, designated by

COSEWIC as Endangered, inhabits areas of shrubs or small trees interspersed with open grassy areas. Habitats include agricultural areas, suburban gardens, parks, coniferous and deciduous forests, prairie grasslands, meadows, riparian areas and other natural open areas, found on a variety of host plants, often concurrent with aphid abundance across habitats (COSEWIC 2016d).

Monarch butterfly

The monarch butterfly has a large distribution range, associated with plant species such as milkweed that are widespread throughout southern Manitoba (COSEWIC 2010). The majority of the population overwinters in the Oyamil Fir Forest of Central Mexico, where forest degradation is likely the biggest threat facing the species (COSEWIC 2010). The monarch is currently listed as Special Concern under SARA but in 2016 it was designated Endangered by COSEWIC.

5.4.4.3 Current status

No field studies were specifically targeted for terrestrial invertebrates; instead, descriptions of terrestrial invertebrates known to occur in the region were based on a compilation of pre-existing data records published in scientific literature and other reputable sources. Invertebrates are the most abundant and diverse group of animal species in the world.

The region provides important habitat for terrestrial invertebrates. The diversity of plant communities gives rise to equally diverse terrestrial invertebrate communities. Such invertebrate communities include species living in the soil (nematodes, earthworms), on the ground (beetles, spiders), in the air (butterflies, moths, flies), and within the vegetation canopy (spiders, aphids, beetles). Terrestrial invertebrates are ecologically important for their role as nutrient cyclers and decomposers (e.g., earthworms), as predators of pest species, as pollinators of flowering plants (e.g., bees) and as food for other animals (e.g., birds).

5.4.5 Amphibians

5.4.5.1 Overview

Field and desktop data were analyzed to characterize the existing biophysical information on amphibians in the region. Sources included Species at Risk Act Public Registry, COSEWIC List of Canadian Wildlife at Risk, The Manitoba *Endangered Species and Ecosystems Act* List of Species at Risk, Manitoba Conservation Data Centre Database, and the Manitoba Herp Atlas. Information on species important to Indigenous peoples was received through the Indigenous Engagement Process (section

4). Public engagement documents (section 3) were also reviewed. Both reconnaissance and detailed field surveys were conducted during appropriate survey times.

5.4.5.2 Priority amphibian species

Priority amphibian species were identified through a review of COSEWIC (2016c), the SARA Public Registry (Government of Canada 2017b), the Manitoba Species at Risk registry (Government of Manitoba 2017b) and the MB CDC (2017) In the context of the Project, the following two species have been selected as priority amphibian species:

- Western tiger salamander (Ambystoma mavortium); and
- Northern leopard frog (Lithobates pipiens).

Western tiger salamander

The western tiger salamander is designated by COSEWIC as Special Concern (2012b) and overlaps the southwestern corner of Manitoba, including the region. The western tiger salamander has recently been designated as a separate species from the eastern tiger salamander (*Ambystoma tigrinum*), and inhabits a variety of open habitats, including moist grasslands or woodlands near wetlands in south-central Manitoba (COSEWIC 2012b). Juveniles can be found in ponds, and emerged terrestrial individuals can be found underground, burrowed into soil, leaf litter, or utilizing small mammal burrows. Key habitat features include sandy or crumbly soils surrounding semi-permanent to permanent water bodies lacking predatory fish (COSEWIC 2012b).

Northern leopard frog

The northern leopard frog (western boreal/prairie population) has been designated as Special Concern by COSEWIC and under SARA (COSEWIC 2009b). This species has a distribution range overlapping the southern two-thirds of the province, west of Lake Winnipeg, including the Project region. This grassland species requires three distinct habitat types throughout its life cycle (Kendell 2002). Breeding occurs April through May, usually in waterbodies with some degree of permanence, shallow shores and no predatory fish (Merrell and Rodell 1968). This includes ponds, quiet backwaters of streams, marshes, roadside ditches, borrow pits, channels and permanently flooded meadows (Eddy 1976, Merrell 1977, Seburn and Seburn 1998). After the breeding season, the northern leopard frog widely disperses to its summering range, which can include a variety of terrestrial habitats, including grasslands and wet woods (Preston 1982). Hibernation occurs at the bottom of lakes, rivers, and other permanent water bodies that are well-oxygenated and do not freeze solid (Eddy 1976), limiting overwintering opportunities. Overwintering sites tend to be within 1.6 km of breeding ponds (Hine et al. 1981).

Massive declines in the northern leopard frog had occurred across western Canada in the 1970s. The species has since recovered in Manitoba, but not to the same historical densities (Koonz 1992). The northern leopard frog is threatened by emerging diseases such as chytridiomycosis, introduced fish predators, and invasive plants, habitat loss and fragmentation, environmental contamination (COSEWIC 2009b).

5.4.5.3 Current status

There are 16 amphibian species found within Manitoba, five of which have distribution ranges overlapping the region. Amphibians were observed during amphibian field work, as incidental observations during reptile field work and stream crossing assessments, and as by-catch during salamander funnel trap surveys.

Four of the five amphibian species were observed at survey sites within the region, including the western tiger salamander, northern leopard frog, wood frog (*Lithobates sylvaticus*), and boreal chorus frog (*Pseudacris maculata*). Canadian toads (*Anaxyrus hemiophrys*) were not observed during the course of surveys. All amphibians with distribution ranges within the region require wetlands during at least some part of their life cycle. Within the region, the northern leopard frog was observed at ten of 22 sites surveyed, with high abundances (total numbers of 10 or greater) at four sites. High abundances were seen during summer and fall surveys.

5.4.6 Reptiles

5.4.6.1 Overview

Field and desktop data were analyzed to characterize the existing biophysical information on reptiles in the Project region. Sources included *Species at Risk Act* Public Registry, COSEWIC List of Canadian Wildlife at Risk, The Manitoba *Endangered Species and Ecosystems Act* List of Species at Risk, Manitoba Conservation Data Centre Database, and the Manitoba Herp Atlas. Public engagement document were also reviewed (section 3). Both reconnaissance and detailed field surveys were conducted during appropriate survey times. Details are provided in Biophysical Technical Report in Appendix D.

5.4.6.2 Priority reptile species

The following two reptile assemblages have been selected as priority species in the context of the Project, based on range overlap and vulnerability to disturbance:

- Snapping turtle (Chelydra serpentina); and

- Garter snakes (Thamnophis sirtalis and radix).

Snapping turtle

The snapping turtle has been designated as a species of Special Concern by COSEWIC and under SARA. It inhabits slow-moving, permanent waters, such as rivers, streams, lakes and ponds, with a preference for mud bottoms and dense vegetation (COSEWIC 2008). Although widespread and somewhat abundant in Canada, this turtle species is primarily limited by its life-history strategy, which is characterized by slow recruitment, late maturity, long lifespan, and high adult survival, and by its dependence on long warm summers for hatching success. As such, the snapping turtle has an unusual susceptibility to anthropogenic threats during its adult stage (COSEWIC 2008). Primary threats to adult individuals include harvesting and road mortality, but also include ongoing loss of habitat, decreased reproductive success due to environmental contamination, nest predation, boat propeller strikes, as well as "bycatch" from fishing and other commercial practices (COSEWIC 2008).

Garter snakes

COSEWIC has not assessed the status of garter snakes, nor are they listed under SARA (COSEWIC 2017; Government of Canada 2017b). Although garter snakes are currently not a listed species, the dependency of garter snakes on overwintering den sites leaves snake populations vulnerable to disturbance, degradation and local extirpation (Kendell 1998). The common garter snake (*Thamnophis sirtalis*) inhabits the southern half of the province, associated with grasslands and mesic vegetation, often at margins of ponds or further upland, likely dictated by the presence of food in these areas (Preston 1982). In the fall, common garter snakes congregate in the thousands in suitable hibernation sites such as limestone sinks (Preston 1982, Gregory 1977). Multiple landowners noted seasonal concentrations of garter snakes on their properties in the region, typically near rivers with rock outcrops. The western plains garter snake (*Thamnophis radix*) is found in the agricultural areas of the southwestern third of Manitoba, overlapping the range of the common garter snake over much of its provincial distribution range. Western plains garter snakes have been found hibernating in ant mounds (Preston 1982) but will also share denning sites with common garter snakes in northern-most population ranges (i.e., central Manitoba), where availability of suitable hibernacula becomes limited (Shine et al. 2004).

5.4.6.3 Current status

There are eight reptile species found within Manitoba. Of these, five have distributions that overlap the region. Snapping turtles and common garter snake (and several

unidentified species) were observed within the region during reptile visual encounter surveys, as incidental observations during amphibian visual encounter surveys and stream crossing assessments, and as by-catch during salamander funnel trap surveys.

The snapping turtle has a distribution range overlapping the southern third of the province, including the Project region. At the Assiniboine River crossing, one young-of-year individual was observed incidentally on the west shore. The Assiniboine River has slow moving permanent water with a mud bottom, making it ideal snapping turtle habitat.

The western plains garter snake and the common garter snake are widely distributed throughout the southern half of Manitoba, both with ranges overlapping the region. During site surveys, a total of five garter snakes were observed. Despite surveys conducted at the appropriate time of year, hibernacula were not found near the proposed Project area.

5.4.7 Mammals

5.4.7.1 Overview

Field and desktop data were analyzed to characterize the existing biophysical information about mammals in the Project region. Sources included *Species at Risk Act* Public Registry, COSEWIC List of Canadian Wildlife at Risk, Manitoba's *The Endangered Species and Ecosystems Act* List of Species at Risk, Manitoba Conservation Data Centre Database, and the Manitoba Sustainable Development wildlife branch website. Information on mammal species important to Indigenous peoples was received through the Indigenous Engagement Process (section 4). Public engagement documents were also reviewed (section 3). Both reconnaissance and detailed field surveys were conducted during appropriate survey periods. Details are provided in Biophysical Technical Report in Appendix D.

5.4.7.2 Priority mammal species

The following species of conservation concern are known to occur within the region:

- Mule deer (Odocoileus hemionus);
- Myotis (Myotis lucifugus);
- Northern myotis (Mytois septentrionalis); and
- American badger (Taxidae taxus taxus).

The region supports a small number of mule deer, which are listed as Threatened under *The Endangered Species and Ecosystems Act* of Manitoba. Mule deer habitat is generally found in the area west of the Assiniboine River in the Spy Hill-Ellice Community Pasture. Both of the bat species have recently been listed as Endangered under Schedule 1 of the federal *Species at Risk Ac*t due to large mortality events caused by outbreaks of white-nose syndrome in North America. While no bat hibernacula are known to occur in the region, it likely supports these species during the summer. The American badger, which is listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada also occur.

5.4.7.3 Current status

In this section information on mammals is organized into the following groups:

- Small mammals;
- Furbearers; and
- Ungulates.

Small mammals

Thirty-two species of small mammals occur within the region. Many small mammals such as shrews, mice, voles, squirrels, hares, and chipmunks are prolific breeders and experience relatively regular population cycles (Boonstra *et al.* 1998). Three species of small mammals were observed incidentally during field surveys: thirteen-lined ground squirrel (*Ictidomys tridecemlineatus*), Richardson's ground squirrel (*Urocitellus richardsonii*) and red squirrel (*Tamiasciurus hudsonicus*).

Furbearers

Sixteen species of furbearers occur within the region and two have been extirpated. The most common species of furbearer within the region is the coyote (*Canis latrans*). Grey wolves are also known to occur in the region in low numbers. Two wolves were observed during aerial surveys in 2013 and a single wolf was observed during a 2016 aerial survey. There is likely a small group of resident gray wolves within the region (K. Rebizant pers. comm.) Grey wolves occupy a wide range of habitats but are typically found in areas with limited human disturbance and sufficient ungulate prey (Paquet and Carbyn 2003). Black bear (*Ursus americanus*) also occur in low numbers in the region. Sixteen black bear signs were observed during the 2017 ground tracking survey, all on forest transects. The badger population is generally stable in southwestern Manitoba. The region is considered within the core range for badger in Manitoba (D. Berezanski pers. comm.). Several species of furbearer or their signs were observed incidentally

during field surveys, including striped skunk (*Mephitis mephitis*), white-tailed jackrabbit (*Lepus townsendii*), eastern cottontail (*Sylvilagus floridanus*), and snowshoe hare (*Lepus americanus*). Information gained through the public engagement program indicated that mink (*Neovison vison*), beaver (*Castor canadensis*), river otter (*Lontra canadensis*), coyote (*Canis latrans*), fisher (*Martes pennanti*), badger (*Taxidae taxus*) and weasels (*Mustela sp.*) are common in the area, and often trapped. The cougar (*Puma concolor*) has no officially recognized breeding population in Manitoba, but it is possible that one exists (W. Watkins pers. comm.). Members of Gambler First Nation indicate that there are cougars (*Puma concolor*) in the area (Manitoba Hydro 2017h).

Ungulates

Elk

Elk (*Cervus elaphus*) are a generalist species that use a wide range of habitats. Typically, deciduous forest is used for cover, while agriculture and haylands are used for foraging (Chranowski 2009). Elk typically avoid disturbances, such as roads, forestry cut-blocks, and cattle (Chranowski 2009).

Several aerial surveys have occurred in the region as part of ungulate monitoring in Game Hunting Area (GHA) 22 by Manitoba Sustainable Development, as well as field studies for the Project. In 2015, a single elk was observed during an aerial survey by Manitoba Sustainable Development. In 2016, 15 elk were observed during the survey conducted by Manitoba Hydro. The elk population in Manitoba and in the region is currently considered stable (K. Rebizant pers. comm.).

Moose

Moose (*Alces alces*) habitat typically consists of a mixture of early-succession forest interspersed with waterbodies and late-succession forest (Bowyer et al. 2003). This habitat is generally found within the aspen parkland and boreal forest regions of Manitoba and is strongly influenced by forest fires. Today, moose range from the agricultural transition zone in southern Manitoba to the Hudson Bay in the north. Information shared during the Indigenous engagement process identified moose as an important species in the region.

Manitoba Sustainable Development conducted aerial surveys in 2013 and 2015 and observed 195 moose (0.27 moose/km^2) and 72 moose (density not available), respectively. During the 2016 survey conducted by Manitoba Hydro, 165 moose were observed in the survey area (0.23 moose/km^2). While the moose population in Manitoba is generally decreasing, the population in the RAA is considered stable (K. Rebizant pers. comm.). Moose density in the RAA is greater than in some regions of the

province, but is lower than in high-density areas such as Duck Mountain, Riding, Mountain, and Porcupine Hills (K. Rebizant pers. comm.).

White-tailed Deer

White-tailed deer (*Odocoileus virginianus*) are a generalist species that occupies a wide range of habitats. In winter, dense forest is used for cover, while agriculture and haylands are often used for feeding (Miller et al. 2003). A landscape containing a mosaic of these habitats typically provides ideal habitat (Miller et al. 2003). The white-tailed deer population in Manitoba and in the region is currently considered stable (K. Rebizant pers. comm.).

Aerial surveys of white-tailed deer occurred in the region in 1987, 1996, 2001, 2013, and 2015 as part of monitoring of GHA 22 by Manitoba Sustainable Development, and in 2016 for the Project. The population estimates from these surveys ranged from a low of 0.40 deer/km^2 in 2016 to a high of 2.3 deer/km^2 in 1996. During these winter surveys, white-tailed deer were typically observed in small groups within forested areas, particularly in the Assiniboine River Valley (Chranowski 2001, Krause-Danielson and Harriman 2015). As part of the public engagement documents, white-tailed deer were noted as the most common ungulate species in the region.

Mule Deer

Mule deer prefer dry, open forest or shrublands associated with rough terrain (Mackie et al. 2003). In the prairies of Canada and Manitoba, this habitat is typically found in deep river valleys with nearby agriculture. In 2013, as part of Manitoba Sustainable Development's chronic wasting disease monitoring, seven mule deer were observed during an aerial survey that covered 728 km^2 of GHA 22. During a 2016 aerial survey of the region conducted by Manitoba Hydro, a single mule deer was observed. The population in southwestern Manitoba and in the region is currently considered stable (K. Rebizant).

5.4.8 Birds

5.4.8.1 Overview

Field and desktop data were analyzed to characterize the existing biophysical information about birds in the Project area. Sources included Species at Risk Act Public Registry, COSEWIC List of Canadian Wildlife at Risk, *The Manitoba Endangered Species and Ecosystems Act* List of Species at Risk, Manitoba Conservation Data Centre Database, the Manitoba Breeding Bird Atlas, The North American Breeding Bird Survey, and the Environment and Climate Change Canada Bird Conservation Regions.

Information on bird species important to Indigenous peoples was received through the Indigenous Engagement Process (section 4). Public engagement document were also reviewed (section 3). Both reconnaissance and detailed field surveys were conducted during appropriate migration and breeding seasons. Details are provided in Biophysical Technical Report in Appendix D.

5.4.8.2 Priority birds

Overview

Priority bird species, for the purposes of this assessment, are of conservation concern, and listed by the federal *Species at Risk Act* and/or by *The Endangered Species and Ecosystems Act* of Manitoba. In all, 27 could occur in the region (Lepage 2017; Table 5-3).

Table 5-3: Federally and provincially listed priority bird species that could occur in the region

Species	Federal Listing[1]	Provincial Listing[2]
Baird's sparrow	Special Concern	Endangered
Bank swallow	Threatened	None
Barn swallow	Threatened	None
Bobolink	Threatened	None
Burrowing owl	Endangered	Endangered
Canada warbler	Threatened	Threatened
Chestnut-collared longspur	Threatened	Endangered
Chimney swift	Threatened	Threatened
Common nighthawk	Threatened	Threatened
Eastern whip-poor-will	Threatened	Threatened
Eastern wood-pewee	Special Concern	None
Ferruginous hawk	Threatened	Endangered
Golden-winged warbler	Threatened	Threatened
Horned grebe	Special Concern	None
Loggerhead shrike	Threatened	Endangered
Olive-sided flycatcher	Threatened	Threatened
Red-headed woodpecker	Threatened	Threatened
Short-eared owl	Special Concern	Threatened
Sprague's pipit	Threatened	Threatened
Yellow rail	Special Concern	None

1. *Species at Risk Act*
2. *The Endangered Species and Ecosystems Act* of Manitoba

Priority grassland birds

Baird's sparrow (*Ammodramus bairdii*), bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur (*Calcarius ornatus*), loggerhead shrike (*Lanius ludovicianus excubitorides*), Sprague's pipit (*Anthus spragueii*), burrowing owl (*Athene cuniculaira*),

ferruginous hawk (*Buteo regalis*), and short-eared owl (*Asio flammeus*) inhabit and breed in grassland. Grassland bird populations are experiencing large declines, mainly due to the loss of native prairie habitat to agriculture (NABCIC 2012, ECCC 2017a, b). Well-managed pasturelands are important habitat for these species, as livestock grazing can maintain suitable grassland habitat (NABCIC 2012).

Priority forest birds

Forest-dwelling bird species of conservation concern include barn swallow (*Hirundo rustica*), golden-winged warbler (*Vermivora chrysoptera*), Canada warbler (*Cardellina canadensis*), eastern wood-pewee (*Contopus virens*), olive-sided flycatcher (*Contopus cooperi*), and red-headed woodpecker (*Melanerpes erythrocephalus*). All populations decreased in the prairie potholes region of Manitoba from 2005 to 2015 (ECCC 2017a).

Chimney swift (*Chaetura pelagica*), common nighthawk (*Chordeiles minor*), and eastern whip-poor-will (*Anstrostomus vociferus*) are aerial insectivores that inhabit open forests (Species at Risk Public Registry 2017). These populations are declining more rapidly than other bird groups, mainly due to habitat loss and to pesticides' effects on the abundance of insects (NABCIC 2012). There were no observations of chimney swift or eastern whip-poor-will during the Manitoba Breeding Bird Atlas (Manitoba Breeding Bird Atlas 2017), although a few eastern whip-poor-wills were detected during Project field surveys.

Priority wetland birds

The breeding ranges of three wetland bird species of conservation concern overlap the region. The populations of horned grebe (*Podiceps auritus*) and yellow rail (*Coturnicops noveboracensis*) decreased in the Prairie Potholes Region of Manitoba from 2005 to 2015 (ECCC 2017a). Breeding habitat for these species is described by the Species at Risk Public Registry (2017). Horned grebes nest in freshwater ponds, marshes, and lake bays with a combination of open water and emergent vegetation. These water bodies may be in open areas or in forests. Yellow rails nest in shallow, grassy marshes that are mainly found in meadows and damp fields (Species at Risk Public Registry 2017). The bank swallow (*Riparia riparia*) nests in vertical sandy banks along waterbodies and roads, and in sandpits, piles of sand and soil, and quarries. In Canada, 98% of its population has been lost over the last 40 years (Species at Risk Public Registry 2017).

5.4.8.3 Current status

In this section information on birds is organized into the following groups:

- Songbirds and other land birds;
- Grassland songbirds;
- Raptors;
- Upland game birds; and
- Waterfowl and other waterbirds.

Songbirds and other land birds

Songbirds are a diverse group that includes blackbirds, sparrows, warblers, and wrens, among others. Other land birds are swifts, hummingbirds, goatsuckers, doves, kingfishers, cuckoos, and woodpeckers. Songbirds and other land birds occupy a range of habitats, which in the region can very generally be described as forest, shrubland, or grassland. Habitat edges, such as the transition between forest and grassland, are occupied by some species (e.g., brown-headed cowbird [*Molothrus ater*]) and are avoided by others (e.g., ovenbird [*Seiurus aurocapilla*]), which inhabit closed-canopy forest interiors.

Brown-headed cowbirds are brood parasites that lay their eggs in other birds' species nests and trick them into hatching and caring for their young, often at the expense of the host birds' own offspring (Holland and Taylor 2003). They are a potential source of mortality for species such as sparrows, chestnut-collared longspur, and Sprague's pipit (Shaffer et al. 2003). A total of 100 brown-headed cowbirds were detected during ten- and three-minute point counts, in all habitats but agriculture forage. They were most common in forest (n = 41) and forest-grassland transition (n = 20) habitats, and also in grassland habitat during ten-minute (n = 13) and three-minute (n = 12) point counts.

Grassland songbirds

Sixty-nine chestnut-collared longspurs were observed during field studies, all during ten-minute point counts. All but one of the 143 Sprague's pipits observed were detected during ten-minute point counts (Table 5-4). A single individual was counted during three-minute point counts. Most of the two priority grassland species were observed in grassland habitat. A few were observed in forest-grassland transition and shrubland habitat and none were observed in forest. Both species were detected at 21 points, 20 in grassland and one in forest-grassland transition habitat. There were no observations of either species at 189 points, all of which were in forest or forest-grassland transition habitat.

Table 5-4: Chestnut-collared longspurs and Sprague's pipits observed in four habitat types during ten-minute point counts, June 2017

	Chestnut-collared Longspur		Sprague's Pipit	
Habitat	**Number of Individuals**	**Percentage of Individuals**	**Number of Individuals**	**Percentage of Individuals**
Forest	0	0	0	0
Forest-grassland transition	5	7	3	2
Grassland	61	88	109	77
Shrubland	3	4	30	21

Raptors

Raptors are birds of prey that hunt and feed on animals such as rodents, birds, and fish. Of the 28 species that could occur in the region, six were observed during raptor migration surveys in 2016 and 2017. The greatest number of raptors (n = 35) was observed at a site west of St. Lazare, near the confluence of the Qu'Appelle and Assiniboine rivers in 2016. Relatively few (n = 9) raptors were observed at the site where the Project proposed to cross the Birdtail Creek. Twenty stick nests were observed incidentally during field studies ten of which were recorded as unoccupied.

Upland game birds

Three species of grouse, sharp-tailed (*Tympanuchus phasianellus*), ruffed (*Bonasa umbellus*), and spruce (*Falcipennis canadensis*) are year-round residents. Some members of Gambler First Nation noted that prairie chickens, or grouse, are harvested in the region (Manitoba Hydro 2017h).

Thirty potential sharp-tailed grouse leks (grassy breeding areas) were identified during the aerial survey. Ground surveys were conducted at 17 of these sites and at 22 additional sites. In all, 29 leks, four of which may be satellites (alternate or temporary breeding areas close to a lek) were identified in the region.

Waterfowl and other waterbirds

Waterfowl include ducks, geese, mergansers, and swans, most of which require wetlands or other water bodies for breeding. Populations of many species of waterfowl are currently stable or increasing, due primarily to wetland conservation efforts (Environment Canada 2013).

Fourteen species were observed during an aerial survey for waterfowl, the most common of which were mallard (*Anas platyrhynchos*; n = 525) and Canada goose (*Branta canadensis*; n = 108). During a ground survey, fewer than 20 individuals were typically observed at each site. Seven species were identified, the most common of which was mallard (n = 27).

Areas with the largest concentrations of waterfowl (n ≥ 20) were generally along the Assiniboine River, where the largest number observed was 112. Some members of Gambler First Nation noted that ducks and geese are harvested in the region (Manitoba Hydro 2017h).

5.5 Socio-economic environment setting

5.5.1 Overview

The following sections provide the baseline information for the socio-economic and land use components of the Project. The information covers the geographic area (region) of the three rural municipalities in the vicinity of the Project: Ellice-Archie, Prairie View and Russell-Binscarth. Baseline information is organized into the following topics:

- Population;
- Infrastructure and services;
- Employment and economy;
- Property and residential development;
- Agriculture;
- Other commercial resource use;
- Recreation and Tourism;
- Health;
- Traditional resource use; and
- Heritage resources.

5.5.2 Population

5.5.2.1 Overview

This section provides an overview of the population of the region using multiple data sources. It includes information on the following:

- Regional Population;
- Indigenous Population; and
- Manitoba Health Population Statistics.

5.5.2.2 Regional population

The region had a total population of 5,417 in 2016 (Statistics Canada, 2016 a-c). As shown in Table 5-5, the RM of Russell-Binscarth had the largest population (2,442) while the RM of Ellice-Archie had the smallest population (887). The RM of Russell-Binscarth also had the highest population density with 4.3 people per square kilometer. Between 2011 and 2016, the population in the region cumulatively decreased by approximately 5.0%. The RM of Ellice-Archie experienced the largest decrease in population (-8.7%).

Table 5-5: Population characteristics for the Rural Municipalities in the region

Population Characteristics	**Municipality**		
	Russell-Binscarth	**Ellice-Archie**	**Prairie View**
Population - 2016	2,442 (M-1185/F-1255)	887 (M-1060/F-1030)	2,088 (M-485/F-405)
Population - 2011	2,553	971	2167
Population percentage change - 2011 to 2016	-4.3	-8.7	-3.6
Population density per square kilometre	4.3	0.8	1.2

Notes:

1. The RM of Ellice, RM of Archie and Village of St. Lazare amalgamated January 1, 2015 to form the RM of Ellice-Archie

2. The RM of Birtle, RM of Miniota and the Town of Birtle amalgamated January 1, 2015 to form the RM of Prairie View
3. The RM of Russell, Town of Russell and Village of Binscarth amalgamated January 1, 2015 to form the RM of Russell-Binscarth
4. Numbers may not add up due to rounding and data suppression

Source:(Statistics Canada, 2016 a-c)

Manitoba Health provides population numbers on an annual basis on records of residents registered with Manitoba Health as of June 1 of that year. Information is provided for cities, towns, villages, RMs, local government districts and unorganized territories. Appendix B-1 provides population numbers and percent change in population for the region between 2006 and 2016 (Manitoba Health, Healthy Living and Seniors, 2010, 2015, 2016).Appendix B-1 provides population numbers and percent change in population for the region between 2006 and 2016 (Manitoba Health, Healthy Living and Seniors, 2010, 2015, 2016).

Manitoba Health data show that the regional population is decreasing, while the provincial population is increasing in size. The RM of Russell-Binscarth is the only census subdivision in the region with an increasing population but is growing at a slower rate than the provincial average (13.6%). The RM of Ellice-Archie's population decreased the most of the communities in the region with approximately a 17.0% decrease. These population trends are consistent with the Statistics Canada data presented in Table 5-6.

5.5.2.3 Indigenous Population

Table 5-6 depicts the Indigenous population in the region from Statistics Canada. The largest Indigenous population is in the RM of Russell-Binscarth with approximately 260 individuals. The RMs of Prairie View and Ellice-Archie have a similar number of Indigenous peoples with 195 and 185, respectively.

Table 5-6: Indigenous population in the region

Rural Municipalities	Total Population	Aboriginal identity	Single Aboriginal responses	First Nations (North American Indian)	Metis	Inuk (Inuit)	Multiple Aboriginal responses	Aboriginal identities not included elsewhere	Non-Aboriginal identity
RM of Russell-Binscarth	2,390	260	260	25	225	10	0	0	2,130
RM of Prairie View	1,930	195	190	65	125	0	0	0	1,735
RM of Ellice-Archie	905	180	185	0	185	0	0	0	72

Notes

1 numbers may not add up due to rounding and data suppression

Source:(Statistics Canada, 2016a-c)

5.5.3 Infrastructure and services

5.5.3.1 Overview

Information on infrastructure and services is organized into the following topics:

- Temporary Accommodations;
- Emergency Services;
- Municipal Services;
- Transportation and Utility Infrastructure; and
- Transmission Lines and Associated facilities.

Note that oil and gas pipelines are discussed in section 5.5.7.

5.5.3.2 Temporary Accommodations

Temporary accommodations in the region include hotel/motels, resorts, campgrounds and bed and breakfasts (Table 5-7). Larger communities outside the region that can provide temporary accommodations to workers include Brandon and Virden.

Brandon has 1,413 rooms available in 20 hotel, motels and inns that can be used by workers. There are also four campgrounds and one cottage/cabin rental available in close proximity to Brandon (Tourism Brandon, 2016). Hotels are at a premium during winter weekends and large events, including Manitoba Ag days that sell out all the rooms in Brandon each January. Other large events occurring in Brandon include the Dakota Ojibway Winterfest, Tournament of Champions Brandon, Brandon Jazz Festival, Royal Manitoba Winter Fair, Source for Sports AAA Hockey Challenge, Manitoba Summer Fair, Canadian National Arabian & Half-Arabian Championship Horse Show, Association of Manitoba Municipalities Conference (every 2nd November), and the Municipal Officials Seminar (every second year). Virden has five hotels, motels and inns.

Table 5-7: Hotels, motels, B&Bs and campgrounds in the region

Hotel/Motel/B&B/Campground Name	Capacity (rooms, unless otherwise noted)
RM of Prairie View	
Peace in the Valley Bed & Breakfast	1 room
The Desjard-Inn	6 rooms

Miniota Campground	23 camp sites
Hooper's Lake	15 camp sites
Birtle Riverside Campground and Park	35 campsites, 5 cabins
Miniota Motor Inn	8 rooms
Foxwarren Campground	10 sites
RM of Russell-Binscarth	
Russell Inn	96 rooms
Jolly Lodger	22 rooms
The Stone Haus	5 rooms
Cedar House	3 suites
Sanderson's Hill Bed & Breakfast	1 Suite, 2 rooms
Silver Creek Bed & Breakfast	3 rooms
Big Grass Lodge and Cabins	2 cabins
Little Sand Bay Recreation Area	32 RV and 6 tent sites
Russell Peace Park	9 sites
Binscarth Park and Pool	7 sites

Source: (Assessippi Ski Area & Resort, 2014) (Travel Manitoba, 2016)

5.5.3.3 Emergency Services

Emergency services in the region include police and fire services. Emergency medical services are discussed in section 5.5.9.

Police

The Royal Canadian Mounted Police (RCMP) are the primary provider of policing services in the region. There are three detachments that serve the region from Russell, Hamiota and Virden.

Table 5-8: Police detachments serving the region

Detachment/Location	Staff	Communities Served in the RAA	RMs Served in the region
Russell RCMP Detachment	8 RCMP members and 1 public servants	Gambler Victor St. Lazare	Russell-Binscarth Ellice-Archie
Hamiota RCMP Detachment	3 Constables, 1 Corporal, 1 Staff Sargent	Uno Beulah	Prairie View
Virden RCMP Detachment	19 RCMP members, 5 public servants	McAuley	Ellice-Archie

Source: RCMP 2016a-c

Firefighting

Firefighting services in the region are provided by a combination of professional and volunteer firefighters based out of various fire departments. Fire departments serving the region typically have less than 25 members. Fire departments, staff and areas served are presented in Table 5-9.

Table 5-9: Fire departments serving the region

Fire Department	Staff	Areas Served
Russell Fire Department	16 firefighters	The RM of Russell-Binscarth and part of the RM of Riding Mountain West
Birtle Fire Department	20 volunteer members	RM of Prairie View
Miniota Fire Department	22 volunteer members	Miniota area in the RM of Prairie View
McAuley Fire Department	12 volunteer firefighters	Villages of McAuley and Manson along with 3 townships in the RM of Ellice-Archie
St. Lazare – Ellice Fire Department	24 firefighters	Village of St. Lazare and surrounding area

Source: RM of Russell-Binscarth, 2015a; RM of Ellice-Archie, 2015a, RM of Prairie View, 2016aSource: RM of Russell-Binscarth, 2015a, RM of Ellice-Archie, 2015a, RM of Prairie View, 2016a

5.5.3.4 Municipal services

Water and wastewater

A number of centers and rural areas in the region are served by public drinking water and wastewater utilities (Table 5-10, Map 5-2). Drinking water in and around the region is primarily supplied by groundwater well sources. The St. Lazare Water and Wastewater Utility is the only utility supplied by surface water and has recently undergone upgrades to meet potable water needs of existing residents. Other residents not served by a municipal utility typically obtain water through private wells.

Wastewater facilities operated by municipal utilities typically consist of wastewater treatment lagoons. The Village of St. Lazare's wastewater treatment lagoon is an unlicensed facility and will need to be replaced in order to accommodate new development in the community that requires full services.

Table 5-10: Water utilities serving the communities in and near to the region

Rural Municipality	Utility	Water Source and Treatment	Wastewater Treatment
RM of Russell - Binscarth	Binscarth Water and Wastewater Utility	• Two production wells with a 700m^3 reservoir • 425 customers • Greensand filtration, chlorine disinfection	Binscarth Wastewater Treatment Lagoon • Two-celled lagoon • Discharged biannually in Silver Creek
	The Town of Russell Water and Sewer Utility	• Production well • Lime-soda ash softening, filtration, chlorine disinfection • 1,587 customers	Town of Russell Wastewater Treatment Lagoon • Primary and secondary cells
RM of Ellice - Archie	St. Lazare Water and Wastewater Utility	• Surface water source • Ozone assisted bio-filtration • 265 customers	Village of St. Lazare Sewage Lagoon • Unlicensed facility
	District No. 1	• Production well • Greensand filtration,	

	(McAuley) Water and Sewer Utility	chlorine disinfection • 106 customers	
RM of Prairie View	Birtle Utility	• One production well beneath Birtle with an underground concrete reservoir • Aeration tank, pre-chlorination injection and Pyrolusite filters at the primary well • 750 customers	Birtle Wastewater Treatment Lagoon • two-celled stabilization pond (lagoon system)

Source: (RM Prairie View, 2016b) (MCWS, 2010) (MCWS, 2002)

Solid waste

Disposal sites, landfills and eco-depots operate throughout the region, collecting household, yard and hazardous wastes. Household hazardous waste collection eco-depots have been established for a variety of wastes throughout the region under Green Manitoba's Recycling Programs initiative, including for the collection of tires, pesticide containers, oil and antifreeze and e-waste (Recycle Manitoba 2016). Municipal solid waste facilities are presented in Table 5-11 and in Map 5-2.

Table 5-11: Waste disposal facilities serving the region

Rural Municipality	Facility	Accepts
RM of Russell - Binscarth	Russell-Silver Creek/ Riding Mountain West Nuisance Grounds	Household waste, oil, oil filters, oil containers
	Binscarth Nuisance Grounds	Household waste
RM of Prairie View	Birtle Landfill Site	Household waste, recyclables, oil, oil filters, oil containers, antifreeze, e-waste
	Foxwarren Landfill Site	Household waste, empty triple rinsed commercial/pesticide containers, tires
	Birtle Compost Site	Leaf and yard waste
	Miniota Waste Disposal Grounds	Household waste, recyclables, porcelain products, windows, automotive batteries, tires,

		e-waste, fridges, propane tanks, paint cans
RM of Ellice – Archie	McAuley Waste Disposal Site	Household waste, pesticide containers
	St. Lazare Waste Disposal Site	Household waste, oil, oil filters, oil containers, antifreeze, tires

Source: (RM of Russell Binscarth, 2015b) (RM of Ellice Archie, 2015b) (RM of Prairie View, 2016b)

5.5.3.5 Transportation and Utility Infrastructure

Roads and existing traffic flows

The lands traversed by the Project can be accessed by Provincial Trunk Highways (PTH), Provincial Roads (PR) and mile or half mile roads. Key highways and roads in the region are noted in Table 5-12 and on Map 5-2.

Existing (2014) traffic volumes for highways identified within the region were obtained from the Manitoba Highway Traffic Information System (MHTIS) database and presented in the table above (Manitoba Highway Traffic Information System 2016). The MHTIS is a partnership between Manitoba Infrastructure and Transportation and the University of Manitoba Transport Information Group. The data was primarily collected from coverage count stations, which take short-period samples of traffic conditions and are typically surveyed on a three year cycle. All roadways are currently operating under design capacity.

Table 5-12: Key highways and roads in the region

Road	From	To	Mileage	AADT[1]	ASDT (%)[2]
Manitoba Provincial Trunk Highway					
16	TCH and PR 305	Sask. border 16 km west of Russell	273 km	1530	117
41	PTH 1 and PR 542 (in Kirkella)	PTH 16 and PTH 83 just south of Binscarth	69 km	370	117
42	PTH 16 (in Shoal Lake)	PTH 41 (just east of St. Lazare)	53 km	520	112
83	US border south of Melita	PTH 10 just east of Swan River	402 km	930	116
Manitoba Provincial Road					
256	US Border (Lyleton)	PTH 41 near McAuley	160 km	65	110
472	PTH 42	PTH 16 near Solsgirth	5.6 km	NA	NA
475	PTH 41	PTH 16 / PTH 83 at Foxwarren	8.4 km	85	110
568	PTH 83	PTH 42 near St. Lazare	12.6 km	65	110
571	Saskatchewan border	PTH 41	4 km	230	117

[1] Average Annual Daily Traffic - averaged over all stations within the region

[2] Average Summer Daily traffic – as a percentage of AADT

N/A: no data available

Source: Manitoba Highway Traffic Information System 2016

Registered aerodromes

Brandon, Manitoba has a registered airport Brandon Municipal Airport (YBR). The Russell Airport (CJW5) is also a registered public airport operated by the Russell Flying Club. There is also one airstrip immediately east of Birtle.

Communication facilities

Communication facilities/towers, including microwave and cellular towers can be found across western Manitoba. Map 5-2 shows those located in the region. These are maintained by telephone communication companies, broadcast companies and radio stations and corporations, the Government of Canada, Provincial and municipal governments and utility companies. There are 29 communication towers located in the region.

Railways

There are three rail lines that run through the region that are owned and operated by Canadian Pacific Railway and Canadian National Railway (Table 5-13 and Map 5-2). There is also one rail spur operated by Agricore. The rail lines include a combination of both freight and passengers.

Table 5-13: Rail lines in the region

Carrier	Subdivision	Location	Length (miles)	Speed Limit (mph)
Canadian Pacific Railway	Rocanville	Virden, MB - Sylvite, SK	61	30
Canadian National Railway	Rivers	Winnipeg, MB - Melville, SK	280	60 freight/ 80 passenger
Canadian Pacific Railway	Bredenbury	Minnedosa, MB - Bredenbury, SK	119	30
Canadian Pacific Railway	Agricore spur	Binscarth north	2.5km	n/a

N/A: Data not available

5.5.3.6 Transmission Lines and Associated facilities

As shown in Map 5-2, there are two transmission lines in the region that are above 66 kV: Birtle South to Virden West (B70H), a 230 kV transmission line emanating from Birtle South Station and proceeding southward for 57 km to Virden West Station; and Birtle South to Raven Lake (B69R), a 230 kV transmission line emanating from Birtle South Station and proceeding eastward for 32 km to Raven Lake Station, south of Shoal Lake, Manitoba. In addition to the above, the Birtle South Station is in the region which is a 230 kV station.

5.5.4 Employment and economy

5.5.4.1 Overview

Information on employment and economy is organized into the following topics:

- Industrial Sectors and Employers in the region;
- Labour Force Activity;
- Labour Force by Occupation;
- Construction Labour Force; and
- Estimated Labour Availability in the region.

5.5.4.2 Industrial Sectors and Employers in the Region

Industrial sectors and employers in the region are presented in Table 5-14. As noted in the table, agriculture and agriculture-related business are an important part of the economy in the region.

Table 5-14: Industrial sectors and employers in the region

Rural Municipality	Sectors	Major Employers
RM of Russell-Binscarth	Agriculture, livestock, tourism	Vanguard Credit Union, Asessippi Ski Area and Resort
RM of Prairie View	Agriculture, livestock	Vanguard Credit Union
RM of Ellice-Archie	Agriculture, livestock	Vanguard Credit Union

5.5.4.3 Labour Force Activity

In recent years, Manitoba has enjoyed a lower rate of unemployment than Canada overall. In the period from 2010 to 2015 Manitoba's rate of unemployment ranged from a low of 5.4% in 2010, 2012, 2013 and 2014 to a high of 5.6% in 2015. During the 2010 to 2015 period, Canada's unemployment rate ranged from a low of 6.9% in 2014 and 2015 to a high of 8.0% in 2010.

In 2011, participation, employment and unemployment rates were lower in the region compared to the province. Within the region, participation, employment and unemployment rates varied between the RMs and communities (see Appendix B-2). Participation rates in 2011 ranged from a low of 54.9% in the Village of Binscarth to a high of 77.8% in the RM of Russell. Employment rates in 2011 ranged from a low of 54.9% in the Village of Binscarth to a high of 73.3% in the RM of Russell (Statistics Canada 2007a-i, Statistics Canada 2012a-i)

Unemployment rates in 2011 were all well below the provincial average of 6.2% for the census subdivisions. Unemployment rates increased between 2006 and 2011 in the province while they declined in the region.

5.5.4.4 Labour Force by Occupation

Employment by occupation type is shown in Appendix B-3 (Statistics Canada 2007a-i) (Statistics Canada 2012a-i). The region had a higher percentage of workers in management occupations and natural resources, agriculture and related production occupations than the province in 2011 (20% and 11%). The highest occupation types in the region during this year were management and sales and service with approximately 20% of the labour force employed in each occupation type. The number of workers employed in sales and service gives an indication of the ability of the region to provide accommodations and services to the construction force.

From the period of 2006 to 2011, there was a large decrease in the percentage of persons employed in trades, transport and equipment operators and natural resources, agriculture and related production. The province also experienced a decrease during the same period for natural resources, agriculture and related production occupations (6% to 3%), while trades, transport and equipment operators occupations remain stable at 15% both years. The least common occupations in the region were art, culture, recreation and sport (less than 1%) followed by natural and applied science and related occupations (1%) (Statistics Canada 2007a-I, Statistics Canada 2012a-i).

5.5.4.5 Construction Labour Force

The construction labour force forecast for Manitoba for the period 2016 to 2025 by BuildForce Canada (2016) was reviewed to identify future provincial labour market conditions. The forecasting system tracks measures for 34 trades and occupations on a provincial basis. Since BuildForce data is not region-specific within the province, Statistics Canada data was used to supplement the estimated construction labour force availability for RMs.

Within Manitoba, construction labour force unemployment levels are at a record low, with few unemployed construction workers available to recruit for Projects. This trend is expected to continue until 2018 when large projects begin to wind down. For a forecast period of 2016 to 2025, it is estimated that Manitoba's construction labour force will grow by 2,200 workers (BuildForce Canada 2016). During this same period, 4,900 retirements are expected across the trades and occupations tracked by BuildForce. It is projected that Manitoba will need 7,100 new construction workers over the next ten years and that out-of-province workers will be required to help meet the demands of major projects (BuildForce Canada 2016).

Currently the non-residential construction labour in the province is concentrated in hydroelectric generation and transmission projects. These projects require distinct skills and trades that will be in short supply until 2018. It is anticipated that many of those jobs will be shed once large engineering and civil projects conclude (BuildForce Canada 2016).

5.5.4.6 Estimated Labour Availability in the Region

The number of workers employed in the occupations related to trade, transport and equipment operation gives an indication of local and regional supply of workers with appropriate skills for construction employment. The region had a lower percentage of workers in trade, transport and equipment operation in 2011 (13%) than the province (15%).

Using 2011 census figures (Statistics Canada 2012a-i), the Town of Russell, Town of Birtle and RM of Minota have the largest trades, transport and equipment operators' labour force with 115, 55 and 50 workers respectively. When applying the unemployment rate for each RM, the Town of Russell is the only census subdivision in the region with an estimated available labour force (four persons).

Table 5-15: Trades, transport and equipment labour availability in the region in 2011

Current Census Subdivision	Past Census Subdivision	Trades, Transport and Equipment Operators	Unemployment Rate (%)	Available Labour Force
Manitoba		95,085	6.2	5,895
Region				
RM of Ellice-Archie[1]	RM of Ellice	..	..	..
	RM of Archie	15	0	0
	Village of St. Lazare	15	0	0
RM of Prairie View[2]	RM of Birtle	..	..	..
	RM of Miniota	50	0	0
	Town of Birtle	55	0	0
RM of Russell-Binscarth[3]	RM of Russell	20	0	0
	Town of Russell	115	3.3	4
	Village of Binscarth	35	0	0
Region Total[4]		305	-	4

Notes:

Due to data suppression all totals (percentage) may not add to 100%

National Household Survey (NHS) data are not available for this area

[1] The RM of Ellice, RM of Archie and Village of St. Lazare amalgamated January 1, 2015 to form the RM of Ellice-Archie

[2] The RM of Birtle, RM of Miniota and the Town of Birtle amalgamated January 1, 2015 to form the RM of Prairie View

[3] The RM of Russell, Town of Russell and Village of Binscarth amalgamated January 1, 2015 to form the RM of Russell-Binscarth

Current Census Subdivision	Past Census Subdivision	Trades, Transport and Equipment Operators	Unemployment Rate (%)	Available Labour Force

[4] Due to data not available during 2011 Census years, total RAA population fluctuates with available data

Source: (Statistics Canada, 2012a-i)

5.5.5 Property and residential development

5.5.5.1 Overview

This section provides information on the following topics that influence property and residential development in the region:

- Land Use Planning;
- Land Use Development Controls; and
- Land Use and Property Ownership Patterns.

5.5.5.2 Land use planning

Land designations and boundaries are shown in Map 5-3. In Manitoba, *The Planning Act* establishes the mandate for municipalities to adopt development plans to guide land use decisions within their boundaries. Provincial Planning Regulation, M.R.81/2011 of *The Planning Act* reflects the provincial government's interest in land and resource use and sustainable development and provides policy direction to land use planning. It also serves as a guide to planning authorities in preparing, reviewing and amending development plans. Within the regulation, provincial land use policies express provincial interest in areas of community development, agriculture, natural lands, renewable resources, heritage and recreation, transportation and infrastructure and mineral resources.

Municipal government jurisdiction in southern Manitoba is divided primarily between RMs and urban centres (incorporated cities, towns and villages). Rural areas may be organized as planning districts, while many smaller urban settlements and communities have no independent municipal status. Development planning for these smaller settlements and communities is undertaken at the rural municipal level in the form of development plans and zoning by-laws.

Each municipal jurisdiction is governed by a Reeve or Mayor and an elected council and is responsible for a broad range of infrastructure, services and land use planning within their boundaries. The municipalities derive their authority from the provincial government which retains direct control over certain higher order regional services (e.g., PTHs and PRs).

The incorporated RMs located within the region are the RMs of Russell-Binscarth, Prairie View and Ellice-Archie. Prior to January 1, 2015, the Village of St. Lazare, Town of Birtle, Town of Russell and Village of Binscarth existed as unincorporated communities. The Village of St. Lazare has since been amalgamated with the RM of Ellice and the RM of Archie to form the RM of Ellice-Archie. The Town of Birtle has since been amalgamated with the RM of Birtle and the RM of Miniota to form the RM of Prairie View. The Town of Russell and the Town of Binscarth has since been amalgamated with the RM of Russell to from the RM of Russell Binscarth (Table 5-16).

Table 5-16: Rural Municipalities and unincorporated communities in the region

Current Rural Municipality	Past Rural Municipalities and Unincorporated Communities
RM of Ellice-Archie	RM of Ellice
	RM of Archie
	Village of St. Lazare
RM of Prairie View	RM of Birtle
	RM of Miniota
	Town of Birtle
RM of Russell-Binscarth	RM of Russell
	Town of Russell
	Village of Binscarth

Land use planning responsibility at the rural municipal level extends to land use control and development policy, which in some cases is shared to a degree with regional authorities such as Planning and Conservation Districts. Two or more adjoining municipalities may join to form a Planning District by regulation under The Planning Act (Manitoba). The Planning District is responsible for: the adoption, administration and

enforcement of the development plan for the entire district and member municipal by-laws, or a district-wide zoning by-law and any secondary plans; and building by-laws of member municipalities (Manitoba Municipal Government 2015). There are two planning districts within the region (in part), as follows:

- The TRI-Roads Planning District, including the member municipalities of Russell-Binscarth and Riding Mountain West; and
- The Mid-West Planning District, including the member municipalities of Ellice-Archie, Prairie View, Hamiota and Oakview.

Conservation Districts are managed under the Watershed Planning and Programs section of the Water Stewardship Division as defined by *The Conservation Districts Act*. Conservation Districts are formed as a partnership between the province and local municipalities to protect, restore and manage land and water resources on a watershed basis. Conservation Districts can also be designated as water planning authorities for integrated watershed management planning in Manitoba (MCWS, 2016). There are two Conservation Districts within the region as follows:

- The Upper Assiniboine River Conservation District, including member municipalities Ellice-Archie, Prairie View, Hamiota, Wallace-Woodworth, Yellowhead and Rossburn; and
- The Lake of the Prairies Conservation District, including member municipalities of Russell-Binscarth, Riding Mountain and Roblin.

5.5.5.3 Land use development controls

Municipal jurisdictions in the region have a variety of development controls, including planning districts, and are required under *The Planning Act* (C.C.S.M. c. P80) to adopt development plans and zoning bylaws to guide land use decisions within their respective boundaries. Manitoba Hydro is cognizant that neither *The Planning Act* (C.C.S.M. c. P80), nor its Regulations apply to the Crown or Crown agencies; however, it does seek to work cooperatively with the municipalities when planning, designing, constructing, and operating and maintaining its Projects to limit the extent of possible interactions with their developments and plans.

5.5.5.4 Land use and property ownership patterns

Overview

There is a mix of privately owned lands and crown lands within the region. Property ownership patterns are influenced by the pattern of historical land use survey, which in the region is primarily the section-township-range system. The majority of the lands in

the region are private, with the Community Pastures in the west representing large areas of Crown land. Crown land represents almost 23% of the land area in the RM of Ellice-Archie. Private land is the predominant land tenure east of the Assiniboine River and in the RMs of Prairie View and Russell-Binscarth.

Table 5-17: Land tenure in the region

Land Tenure	Ellice - Archie		Prairie View		Russell-Binscarth	
	Area (ha)	Percent	Area (ha)	Percent	Area (ha)	Percent
Crown	26,531	22.9	3,300	1.9	1,023	1.8
Private, Municipal, Urban	89,460	77.1	170,853	98.1	57,137	98.2
Total	115,991	100	174,153	100	58,160	100

Crown and municipal lands

Public lands include Crown Land parcels distributed through the region as well as the Spy Hill Community Pasture and the Ellice-Archie Community Pasture (Map 5-3). The Spy Hill-Ellice Community Pasture is located in the northwest corner of the region and borders Saskatchewan. The Ellice-Archie Community Pasture is located in west-central area of the region. The community pastures were operated by Agriculture and Agri-Food Canada but are being transferred to the provincial government. In 2014, the province established the Association of Manitoba Community Pastures to operate and manage the pastures. Fees are charged to individual users for the use of the community pasture. Crown and public lands in the region by RM include publically-owned parcels set aside as a community pastures, wildlife management, mineral extraction, and recreation areas. As indicated, these include the Spy Hill-Ellice Community Pasture and Ellice-Archie Community Pasture. Municipal-owned land also occurs within the region and often has designated uses to serve their community.

Provincial Crown lands throughout the region in western Manitoba are coded according to operational limits that set out land use, permissible level of development and requirements for multiple uses (MCWS 2016). Land uses must conform to the operational codes. Designated lands in Orders-in-Council areas (e.g. Provincial Parks, Provincial Forests and WMAs) are administered under the applicable statutory authority (e.g. The Forest Act for Provincial Forests). Operational land use classifications for Provincial Crown land by RM in the region are outlined in Table 5-18.

Table 5-18: Crown land operational land use classifications

Municipality	Crown Land Use Codes	Crown Land Designations/Uses
RM of Ellice	CP; 7a; 8b; 8n; WW; D/8n; 1n; 8n; C/7a/J/F2	Community Pasture; Hay and Grazing; Hay and Grazing; Grazing, Hay, Cultivation; Wildlife Management Area; Mineral Extraction/Grazing, Hay, Cultivation; Grazing, Hay, Cultivation; Grazing, Hay, Cultivation; Wildlife/Hay and Grazing/Erosion, Prone, Fragile, Hazard/Subject to the 100-year flood
RM of Archie	CP; CP/D; 7a; WW/PA; 7a/J/F1; C/D/7a; WW/SP; WW/C6; WW; C/7a/J; C/8n/J; 8n/D; 8n/D/J;C1; CP/MM; SP	Community Pasture; Community Pasture/Mineral Extraction; Hay and Grazing; Wildlife Management Area/Protected Area; Hay and Grazing/Erosion, Prone, Fragile, Hazard/Subject to the 100-year flood; Wildlife/Mineral Extraction/Hay and Grazing; Wildlife Management Area/Site Plan; Wildlife Management Area/Wildlife; Wildlife Management Area; Wildlife/Hay and Grazing/Erosion, Prone, Fragile, Hazard; Wildlife/Grazing, Hay, Cultivation/Erosion, Prone, Fragile, Hazard; Grazing, Hay, Cultivation/Mineral Extraction; Grazing, Hay, Cultivation/Mineral Extraction/Erosion, Prone, Fragile, Hazard; Wildlife; Community Pasture /Mineral; Site Plan
RM of Birtle	8b; WW/PA; WW; C8; 7a; C/J/7a	Hay and Grazing; Wildlife Management Area/Protected Area; Wildlife Management Area; Wildlife; Hay and Grazing; Wildlife/Erosion, Prone, Fragile, Hazard/Hay and Grazing
RM of Miniota	8a; 7a; WW; SP; WM; WW/SP; C/7a; C/J/F4; 8n; C/T/7a; C/T/8n; C/T/F1/8n	Hay and Grazing; Hay and Grazing; Wildlife Management Area; Site Plan; WM; Wildlife Management Area/Site Plan; Wildlife/Hay and Grazing; Wildlife/Erosion, Prone, Fragile, Hazard/Subject to the 5-year flood; Grazing, Hay, Cultivation; Wildlife/Fisheries/Hay and Grazing; Wildlife/Fisheries/ Grazing, Hay, Cultivation; Wildlife/Fisheries/Subject to the 100-year flood/Grazing, Hay, Cultivation

Municipality	Crown Land Use Codes	Crown Land Designations/Uses
RM of Russell	C/7a; 7a; SP; 8n; RM	Wildlife/Hay and Grazing; Hay and Grazing; Site Plan; Grazing, Hay, Cultivation; Recreation

Source: (MCWS, 2016)

Private residential development

Urban centres and residences are shown in Map 5-3. The community of Russell is the largest urban center in the region. Smaller settlements within the region include McAuley, Beulah and the Village of St. Lazare. Rural farm residential development is found sparsely throughout the region with the exception of larger developed areas such as the community of Birtle (unincorporated urban centre – population 642) and inside the designated community pastures. These residential developments are associated with agricultural operations including farm accessory buildings.

Private development within the region is described in terms of active and closed subdivision applications. There are nine active subdivision applications and 14 closed subdivisions in the region. Open applications are still under review; closed applications have completed the process. From a Project-planning perspective open applications represent uncertainties regarding land disposition. The subdivisions are mostly found around the Village of St. Lazare and through the central area of the region; however, others exist in the northern and southern parts of the region as well.

Table 5-19 describes the breakdown by housing types in the rural municipalities in the region. The number of occupied homes varies in region with the majority of occupied dwellings in Russell-Binscarth (1,075) and the least amount of dwellings in homes in Ellice-Archie (380). The large majority of the housing types in the region are single-detached homes.

Table 5-19: Number and type of dwellings in the region

Household and dwelling characteristics	RM of Ellice Archie	RM of Prairie View	RM of Russell-Binscarth
Occupied private dwellings by structural type	380	865	1,075
Single-detached house	335	760	890

Apartment in a building that has five or more storeys	0	0	0
Other attached dwelling	10	65	120
Semi-detached house	0	15	10
Row house	0	20	10
Apartment or flat in a duplex	0	5	50
Apartment in a building that has fewer than five storeys	10	25	55
Other single-attached house	0	0	0
Movable dwelling	35	40	65

5.5.6 Agriculture

Due to agriculture being such a predominant activity in the region agriculture is discussed and assessed independently from other commercial resource activities. Other commercial resource activities in the region are described in section 5.5.7. This section provides information on agricultural land use within the region, including:

- Agricultural land cover and capability;
- Farm types and infrastructure;
- Crop production; and
- Livestock operations.

5.5.6.1 Agricultural land cover and capability

Agricultural land cover

Map 5-4 shows agricultural land cover for the region. Land used for agriculture accounts for greater than 70% in the Rural Municipalities in the region with the RMs of Prairie View and Russell-Binscarth at 77% of RM area (Table 5-20). Cropland (annual cereal, oil seed and other specialty crops) accounts for between 34 – 50% of the land area and is the dominant agricultural land use in all the RMs. Rangeland and grassland is the next most common agricultural land use, ranging from 25-36% of area. The RM of Ellice-Archie has the highest occurrence of this classification at 36%. This can be

attributed to the Spy Hill-Ellice Community Pasture and the Ellice-Archie Community Pasture being located in the northern extent of the RM. Less than four percent of the total municipal area in each RM in the area is occupied by forage cropland cover.

Agricultural cropland is the dominant class cover within the RMs of Russell-Binscarth and Prairie View (44% and 50% respectively), which is characterized by all lands dedicated to the production of annual cereal, oil seed and other specialty crops. Forage cropland consists of perennial forage such as alfalfa, and clover or blends of these with tame species of grass as well as fall seeded crops such as winter wheat or fall rye. Rangeland and grassland, primarily consisting of mixed native or tame prairie grasses and herbs, occupies the greatest area (36%) in the RM of Ellice-Archie.

Table 5-20: Land cover in the region

RM of Russell-Binscarth		
Agricultural Cover Class	**Area (ha)**	**% of Total Municipality Area[2]**
Agricultural Cropland[6]	25,759	44
Forage Cropland[7]	1,975	3
Grassland/Rangeland[8]	16,184	28
Total Agricultural Land Cover Area[1]	**43,918**	**76**
RM of Prairie View		
Agricultural Cropland[6]	86,462	50
Forage Cropland[7]	2,920	2
Grassland/Rangeland[8]	44,054	25
Total Agricultural Land Cover Area[1]	**13,3437**	**77**
RM of Ellice-Archie		
Agricultural Cropland[6]	40,793	35
Forage Cropland[7]	988	1
Grassland/Rangeland[8]	41,804	36

Total Agricultural Land Cover Area[1]	**83,584**	**77**
RPA		
Agricultural Cropland[6]	48,476	34
Forage Cropland[7]	2,207	2
Grassland/Rangeland[8]	51,106	36
Total Agricultural Land Cover Area[1]	**101,788**	**72**

Notes:

[1] Total may not add up due to rounding

[2] Total area in the RM of Russell-Binscarth is 58,160 hectares

[3] Total area in the RM of Prairie View is 174,153 hectares

[4] Total area in the RM of Ellice-Archie is 115,991 hectares

[5] Total Area in the Route Planning Area is 141,652 hectares

[6] Consists of all lands dedicated to the production of annual cereal, oil seed and other specialty crops

[7] Consists of perennial forage such as alfalfa, and clover or blends of these with tame species of grass. Fall seeded crops such as winter wheat or fall rye are included here.

[8] Mixed native and/or tame prairie grasses and herbs. May also include scattered stands of willow (Salix L.), choke cherry (Prunus virginiana), pin cherry (Prunus pensylvanica) and saskatoon (Amelanchier alnifolia). Many of these areas are used for cutting of hay and grazing. Both upland and lowland meadows fall into this class. There is normally less than 10% shrub or tree cover.

Source: Manitoba Hydro 2017e

Agricultural capability

Map 5-5 shows agricultural capability for the region. The Canadian Land Inventory mapped and rated all of agro-Manitoba for land capability for agriculture (Manitoba Agriculture 2017a). Agricultural capability is an important concept in the type of crops grown and the value of production and land. Soils with lower capability classifications are limited in crops that can be successfully grown whereas land with higher classification has fewer limitations and can sustain a wide variety of annual crops. Agriculture capability is a 7-class rating of mineral soils based on the severity of limitations for dryland farming. This system does not rate the productivity of the soil, but rather its capability to sustain agricultural crops based on limitations due to soil properties and landscape features and climate. The scale ranges from Class 1 soils

which have no limitations, to Class 7 soils that have such severe limitations that they are not suitable for agricultural purposes.

The agricultural capability for soils in the RMs in the region indicates the land and crop uses and provides an overview of value to agriculture production – crops and livestock. None of the RMs contain Class 1 lands, which are generally not widespread in Manitoba. The RM of Prairie View has 75% of its soil as Class 2-3 (Table 5-21). These are highly productive soils with few limitations and indicate the excellent crop growing land in the RM (mostly Newdale clay loam) and mostly farmed for grains and oilseed. The RM of Ellice-Archie has 30.7% of the land classed as 4-6 with limitations on crops and has the highest percentage of this class of land of the three RMs in the region. The highly productive Class 2 and 3 soils predominantly occur between Birtle and the Assiniboine River valley in the area. In the river and stream valleys lower Class 6 soils occur due to the steep slopes.

The most common limitations cited in the subclass designation in the region are M and W, referring to moisture deficit (droughtiness; M) and excess moisture and poor soil drainage (W). Topography (T) on the river valleys is also frequently indicated and also the occurrence of some stoniness (P) in some soils.

When the RM of Ellice is examined separately from the amalgamated RM of Ellice-Archie the predominance of Class 4, 5 and 6 is pronounced at 45%, with most of it in the Spy Hill-Ellice Community pasture. Much of the land would be considered range and grassland used for forage and grazing and is on the Marringhurst coarse clay loam soil association (Erhlich et al. 1956). Similarly, when the RM of Birtle is examined separately from the amalgamated RM of Prairie View the predominance of Class 2 and 3 lands is more evident. Approximately 85% of the RM has land area classified as Class 2 and 3. As such there is a west to east transition from lower classed lands to higher capability land from the Saskatchewan border to the Town of Birtle.

The region is site of a large area of very high capability soils for crop production. West of the Assiniboine River there is a higher occurrence of soil capability Class 5 and 6 that are found in the community pastures and surrounding areas in the RM of Ellice-Archie. The RM of Prairie View has the largest area and proportion of Class 2-3 soil-landscapes.

Table 5-21: Agricultural capability in the region

Agricultural Capability Class	Ellice-Archie		Russel-Binscarth		Prairie View	
	Area (ha)	Percent	Area (ha)	Percent	Area (ha)	Percent
Class 1	0	0.0	0	0.0	0	0.0
Class 2	31,083	26.8	12,521	21.5	74,825	43.0
Class 3	45,850	39.6	25,772	44.2	56,125	32.2
Class 4	4,521	3.9	4,611	7.9	13,836	7.9
Class 5	19,519	16.8	6,533	11.2	15,385	8.8
Class 6	11,607	10.0	5,945	10.2	7,624	4.4
Class 7	1,941	1.7	1,989	3.4	5,231	3.0
Organic	711	0.6	0	0.0	0	0.0
Unclassified	31	0.0	210	0.4	94	0.1
Open Water	658	0.6	677	1.2	1,037	0.6

Source: Manitoba Hydro 2017d.

The distribution of agricultural capability across the three RMs shows the land area of the major classes and the proportions (Figure 5-4). The RM of Prairie View has the largest area and proportion of Class 2-3 soil-landscapes.

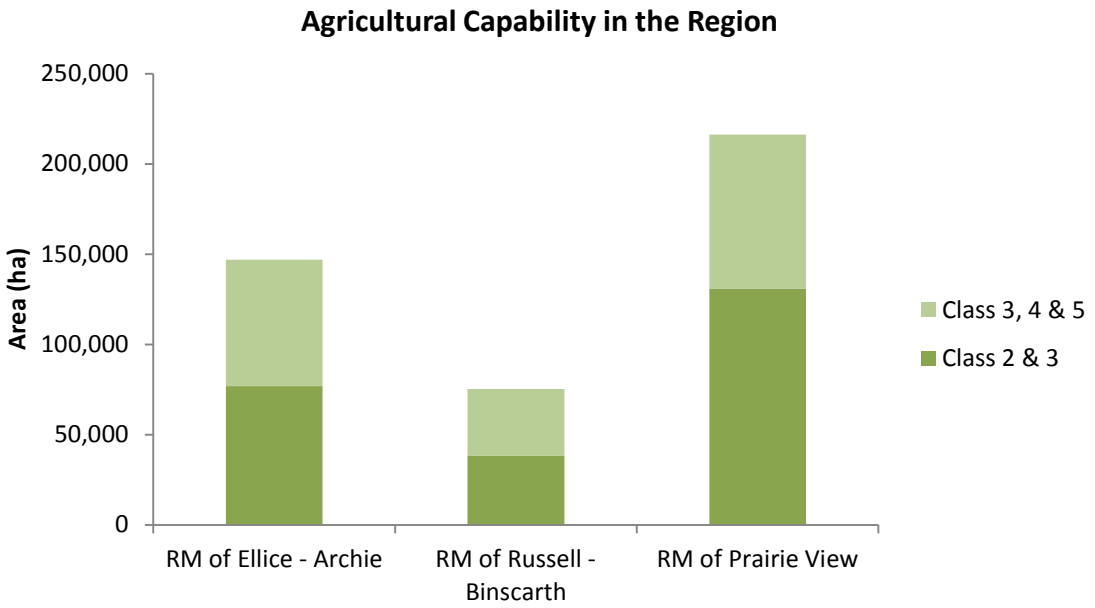


Figure 5-4: Agricultural capability classes in the region.

5.5.6.2 Farm types and infrastructure

Farming and ranching are the predominant land use in the region, with more farms overall in grain and oilseeds than livestock (Appendix E). There are 434 farms in the region; approximately 50-60% of them are involved in crop production while 40-50% of them are involved in livestock. Oilseed and grain production make up the majority of the farms in crop, while cattle ranching is the predominant livestock activity.

Community pastures

The region includes the entire Spy Hill-Ellice Community Pasture (CP) and part of the Ellice-Archie CP which is south of the Qu'Appelle River (Map 5-3). Both Pastures are in the RM of Ellice-Archie. Since 2016, the Spy Hill-Ellice and Ellice-Archie CPs have been operated by the Association of Manitoba Community Pastures (AMCP) a non-profit formed in 2014 as the federal government withdrew from the CP program.

AMCP's objectives are as follows:

- Enhance the livestock industry and support access for new and young producers; and
- Manage livestock grazing so that the Community Pastures remain productive, biodiverse and some of the largest intact areas of native prairie remaining in Manitoba.

To that end the Ellice-Archie and Spy Hill-Ellice Community Pastures provide grazing lands for a total approximately 6,000 head of livestock at both pastures from local pasture patrons. Managed livestock grazing systems and prescribed burns are the key land management tools to secure numerous conservation objectives such as the preservation of prairie ecosystems and species-at-risk and other wildlife habitats. The Community Pasture program overall provides large, contiguous blocks of unfragmented lands supporting the habitat requirements of numerous species-at-risk. Stewardship practices include: large fields sizes, sustainable stocking rates and managed grazing rotations in place for each field. Lands are intact, uncultivated and with diverse vegetation and healthy soils. Most work is done by horseback to protect the lands, and vehicle use is limited to existing trails to reduce any fragmentation or damage (Whidden, pers. comm.).

The CPs are a reservoir of adapted grassland species and biodiversity specific to native prairie. Home to a number of protected species the CPs provide a sustainable landscape that provides grazing and ecological benefits.

Soils in the CP are mostly of the Marringhurst association, which is characterized by sandy loam, with moderate to excessive drainage (Ehrlich et al. 1956). These soils are susceptible to drought and wind erosion. While the Spy Hill-Ellice CP is predominantly native vegetation, several of the pastures are seeded with alfalfa, wildreye or wheat grass, but these account for only a small portion of the CP.

The Manitoba portion of the Spy Hill-Ellice Community Pasture covers approximately 8,290 ha in the RM of Ellice-Archie and is managed using a twice-over rotational grazing system. The stocking rate is 1,640 adult head of cattle. It serves approximately 30 to 34 patrons every year. The pasture has considerable economic importance to the patrons and their operations (M. Erb, pers. comm.).

The Prairie Farm Rehabilitation Administration (PFRA) had been managing the Spy Hill-Ellice Community Pasture since 1941 and the Ellice-Archie Community Pasture since 1940. AMCP assumed management of both Community Pastures effective April 1 2016. Management strategies in the CPs include grazing and controlled burns. The grazing season lasts from approximately mid-May to mid-October with cattle rotated throughout the Pastures using a twice-over rotational grazing system which is adjusted throughout the grazing season as needed. Among other items, when making adjustments, Pasture Managers consider management goals, vegetation type, and available forage supply and water. The 2018 grazing fees are 75¢ per day for yearling cattle, mature cows, bulls, mares and stallions for a minimum 100 days and a $40 seasonal fee per calf or foal (AMCP 2017). Additional grazing fees are charged at the Spy Hill-Ellice Community Pasture to reflect Saskatchewan lease fees.

The Manitoba portion of the Spy Hill-Ellice Community Pasture is comprised of 21 fields used for grazing at different times of the season. In 2016, the Spy Hill-Ellice Community Pasture (both Manitoba and Saskatchewan portions of the Pasture) was grazed by 1,595 adult head of livestock (including yearlings) and 1,058 calves/foals from 33 pasture patrons. The preliminary 2017 actual stocking rate is similar to 2016 with 1,595 adult head of livestock and 1,055 calves/foals.

Animal unit months (AUMs) is a unit of measurement used to express stocking rates for the Community Pastures, both overall and for each field within the pastures. The stocking rates at both the Ellice-Archie and Spy Hill-Ellice Community Pastures are set conservatively to ensure the continued sustainability and productivity of the lands, and to mitigate any impacts of drought/dry conditions. The AMCP Pasture Managers calculate actual stocking rates based on grazing reports completed at the end of each grazing season. Stocking rates are adjusted every year based on previous grazing seasons and expectations for the next grazing season. The carrying capacity is the number of livestock that may be sustained to maintain or improve vegetation or related resources and/or is compatible with management objectives. AUM is based on the area of land to provide dry matter forage requirements per animal unit (considered one mature cow approximately 450 kg either dry or with calf up to 6 months, consuming about 26 lbs/12 kg of dry matter forage/day), which is approximately 780 lbs of dry forage per month (AAF 2017, Manitoba Agriculture 2017b).

Agricultural buildings and structures

Buildings were inventoried and recorded from surveys conducted in 2016. The results identified seven sites with structures and one site with a farm dugout within 300 m of the Project (Table 5-22). The 300 m distance was chosen mainly as a proximity concern expressed by farm operators on other Manitoba transmission projects.

Table 5-22: Agricultural buildings and structures

Site	Building Type	Estimated proximity to Centreline	Area
Site 1	2 Out buildings 2 Grain bins 1 Agricultural shed 1 Livestock barn	80 m 100 m 150 m 160 m	LAA
Site 2	3 Grain bins	Within Row	PFA
Site 3	Unused farm shed	55 m	LAA
Site 4	Outbuilding	120 m	LAA
Site 5	Agriculture building part of livestock operation	95 m	LAA
Site 6	Farm dugout, livestock watering	Within ROW	PFA
Site 7	Agriculture building	280 m	LAA

Site 8	Livestock watering facility in community pasture	160 m	LAA

Source: Manitoba Hydro 2017c

5.5.6.3 Crop production

Crop types

Data compiled on crops grown in the region illustrates the dominance of grain and oilseeds with over 85% of crop farms indicating growing crops in this category (Appendix E-5). A breakdown of crops grown was compiled from the Statistics Canada Annual Crop Survey 2016 and 2016 Census of Agriculture (Appendix E-6 and E-7). Both crop data sets are provided as one data set (Statistics Canada 2016a) and are reported based on landowner surveys, while the annual crop survey is based on satellite image interpretation. The survey data from the census of agriculture reports significantly higher acreages of canola and wheat than the observed data from the annual crop survey. While the gross acreages may be different the relative proportions are the same showing the same preferred crops of spring wheat, canola, and alfalfa (or forages). Annual crop survey data reports much higher occurrence of pasture and forages in comparison to alfalfa and tame hay in the Census. The most frequently grown crops in the region are shown in Figure 5-5, which shows the predominance of wheat and canola. The top three crops were the same for all three RMs in the region.

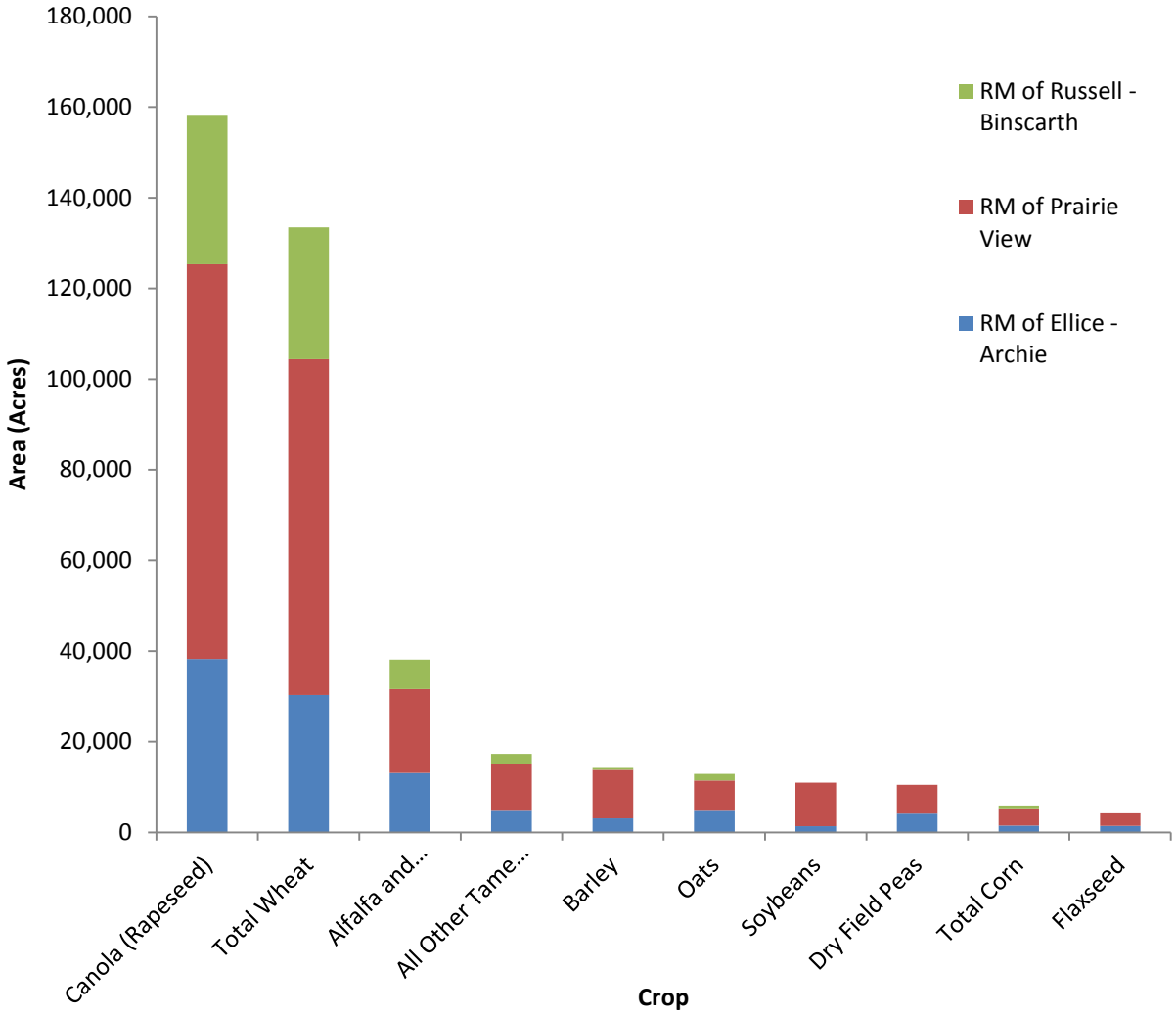


Figure 5-5: Most frequent crops in the region

Crop yield and value

Yield data was compiled to estimate crop value in the region. Appendix E-8 provides yield data that was used in determining crop values (Appendix E-9). The top three crops in value in the RMs the region are Argentine canola, red spring wheat, and soybeans. The RM of Prairie View (consisting of the former RMs of Birtle and Miniota) has the highest crop value and the most cropland both in percent of RM and in total hectares. Analysis of the data indicates the high value of crop production in the region and the intensity of annual crop farming.

Aerial application

High value crops like red spring wheat, Argentine canola and soybeans are often protected and managed with the use of herbicides, insecticides and/or fungicides. The region has a high predominance of these high valued crops and the use of pesticides is likely widespread. Many operations apply chemical on the ground but there can be efficiency as well as a necessity under wet conditions in aerial application. The prevalence of aerial spraying in the region is likely a function of the ability to ground spray which can be impeded by wet conditions on clay soils with poor drainage such as found in the Red River valley (Manitoba Hydro 2014). When high valued crop areas are on these soils there is a high likelihood of aerial application of pesticides.

Management Considerations maps produced for individual RMs in the region by AAFC (2001 a-e) provide an inventory of landscapes of soil texture and drainage among other variables. The inventory for the five RMs (pre-amalgamation) in the region shows that there is virtually no soil-landscape area for fine textured soil and combinations of fine texture with wetness or topography. Only the RM of Minota had and occurrence of fine texture soil and that was 367 ha or 0.4% of the RM (AAFC 1998d). A further look at soil drainage from the AAFC reports shows the very low incidence and area of poor to very poor drained soils which would make them susceptible to limitations on ground application of pesticides (Table 5-23). As such aerial application of crop protection chemicals is likely limited in the region.

Table 5-23: Soil drainage in RMs in the region

Soil Drainage	RM				
	Ellice (ha)	Archie (ha)	Birtle (ha)	Miniota (ha)	Russell (ha)
Very Poor	699 (1.2)	14 (0.0)	0	0	0
Poor	3389 (5.8)	2168 (3.7)	6062 (0.7)	4274 (4.9)	4164 (7.2)
Total	4088 (7.0)	2182 (3.8)	6062 (0.7)	4274 (4.9)	4164 (7.2)

Source: AAFC 1998 a-e.

* Percentage of RM land area in brackets.

Irrigation

According to the Manitoba Irrigation Survey completed for the province of Manitoba by Gaia Consulting Limited (2007), no lands in the region were under irrigation at the time of the survey. Irrigation suitability for some of the RMs in the region show fairly low risk

and large areas that could be suitable for irrigation (AAFC 1998 a-e). The largest majority of irrigated acres in Manitoba are for potatoes (Gaia 2007). There were no potato acreages recorded in census data for the Region. Market forces and availability and quality of water may be factors in limited to no irrigation in the region.

Organic farming

Organic farming does occur to a limited degree in the region. A Manitoba Hydro inventory (Manitoba Hydro 2017f) of organic farms only identified one organic farm in the area.

Biosecurity

The spread of disease, invasive species and pests is a concern for crop and livestock producers in the RAA. Soil-borne crop diseases such as clubroot, sclerotina stem rot and *verticillium* are of major concern for canola producers. Distribution and quantification mapping is not available for all crop disease but is reported on regularly in Insect and Disease Updates and weekly crop reports published by Manitoba Agriculture (2017c,d).

Clubroot is a disease that affects brassica crops including canola. It is caused by a fungus-like organism called Plasmodiophora brassicae. Manitoba Agriculture has published a distribution map of P. brassicae based on observed symptoms and soil test results (Figure 5-6). The region is in a relatively low to intermediate risk area with the RMs of Prairie View and Russell-Binscarth in a zone recording 1,001-10,000 spores/gram of soil - well below a threshold where field symptoms have been observed in fields. The RM of Ellice-Archie shows an even lower level of spores in soil and consequently, risk (Figure 5-6).

Verticillium was found in a Manitoba canola sample in 2015 and was the first time it was identified in Canada. Steps have been taken to isolate the area where it was found and prevent further spread. Biosecurity protocols will also contain the spread of the disease. Sclerotina stem often occurs in canola crops and varies in distribution and intensity from year to year. In 2017 some fields around Carman were recorded the highest incidence (Manitoba Agriculture 2017c).

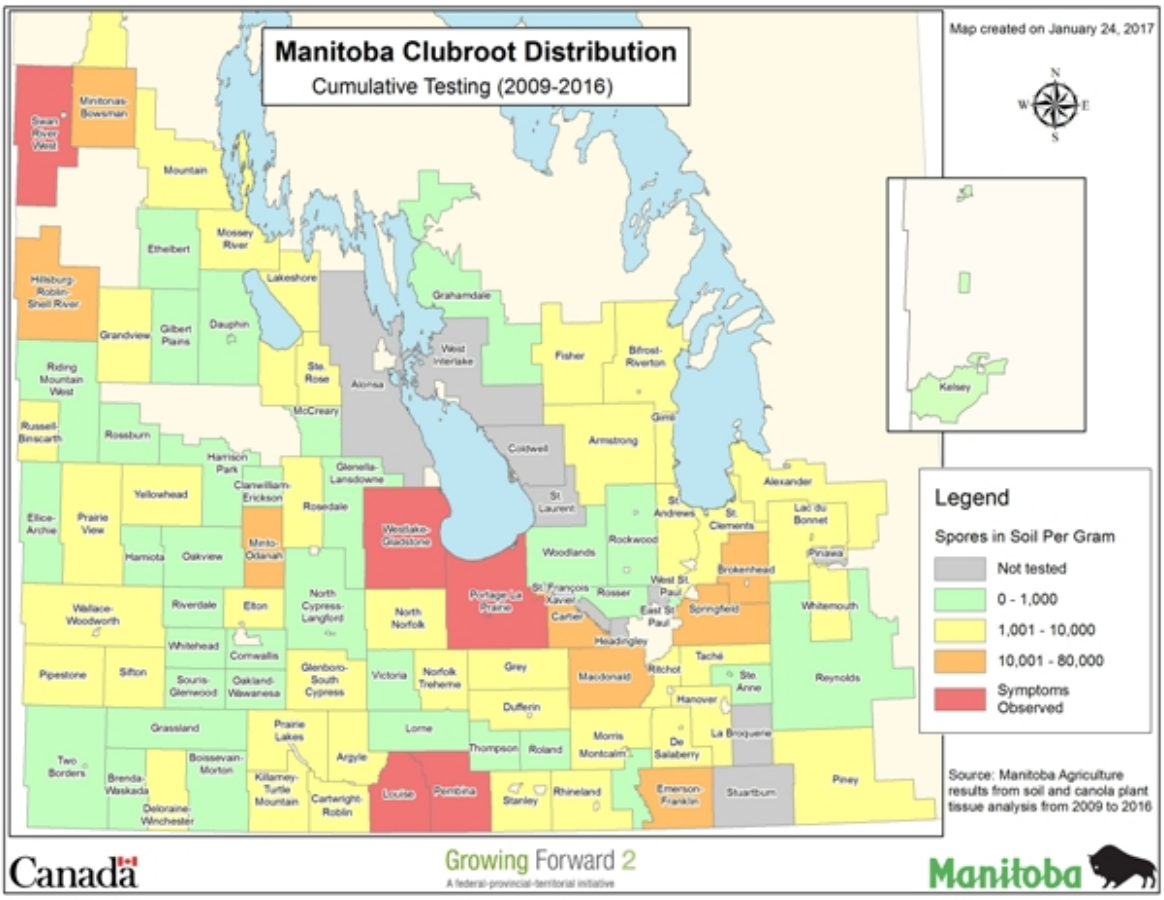


Figure 5-6: Clubroot distribution in Manitoba (Manitoba Agriculture 2017f).

5.5.6.4 Livestock operations

Table 5-24 shows the number and type of livestock operations by RM in the region for 2011. Statistics are also presented from the 2016 Census of Agriculture. Between 2011 and 2016 several municipalities in the region amalgamated resulting in different RM boundaries for the 2016 census (Table 5-25).

Livestock farming is a substantial activity in the region, accounting for between 39 – 51% of farms in the census. The predominant livestock production in the region is cattle ranching and farming, accounting for 30-35 % of all farms in the 2016 census and greater than 70% of all livestock farms in the region. There were only two dairy farms recorded in the 2011 census (RM of Miniota) and again in the 2016 census (RM of Prairie View).

Based on the census data there appears to be little hog production, and poultry and egg production in the region (Table 5-24). There were only three hog production farms and

two poultry and egg farms recorded for the area in 2016. Also, there were only three apiculture operations recorded in the area.

Horse and other equine production was the only other category of livestock production that occurred in the region with some frequency. In total, 22 of these operations were recorded in the region in the 2011 census (Table 5-24)

Table 5-24: Livestock farms in the region 2011

Livestock Data	RM					
	Ellice	**Archie**	**Birtle**	**Miniota**	**Russell**	**Total**
Total Number of livestock Farms	53	58	119	146	89	465
Cattle Ranching and Farming	18	16	40	52	23	149
Beef cattle ranching	18	16	40	50	23	147
Dairy cattle and milk production	0	0	0	0	0	2
Hog and Pig Farming	1	0	1	1	0	3
Poultry and egg production	0	0	0	0	3	3
Sheep Farming	0	1	0	1	1	3
Goat Farming	0	0	1	1	0	2
Other animal production	7	7	9	11	8	42
Apiculture	0	1	0	0	2	3
Horse and other equine production	5	2	8	6	1	22
Fur-bearing and rabbit production	0	0	0	0	0	0
Animal combination farming	2	2	1	5	3	13

Livestock Data	RM					
	Ellice	Archie	Birtle	Miniota	Russell	Total
All other misc. animal production	0	2	0	0	2	4

Notes: Other animal production includes; apiculture; horse and other equine production; fur-bearing animal and rabbit production; animal combination farming; and all other miscellaneous animal production

Source: (Statistics Canada 2011b)

Table 5-25: Livestock farms in the region 2016.

Livestock Data	RM			
	Ellice - Archie	Prairie View	Russell - Binscarth	Total
Total Number of Farms in Livestock	57	93	33	183
Cattle ranching and farming	41	72	24	137
Hog and pig farming	1	2	0	3
Poultry and egg production	0	0	2	2
Sheep and goat farming	4	4	0	8
Other animal production	11	15	7	33

Source: (Statistics Canada, 2016b) Table 004-200.

5.5.7 Other commercial resource use

5.5.7.1 Overview

Information on other commercial resource use is organized into the following topics:

- Mining; and
- Oil and gas development.

5.5.7.2 Mining

Mining development in the region is shown in Map 5-6. Mining is Manitoba's second leading primary resource sector after agriculture. Aggregate mining (sand, gravel and crushed stone) is the largest mining sector in Manitoba, based on volume produced and land acreage used (Province of Manitoba 2014c). As a component of land and resource use, mining and aggregate use is important to communities, municipalities and individual owners of existing and proposed developments, because it is a source of primary income or supplementary income. Mining is also subject to regulation under provincial legislation (i.e., *The Mines and Minerals Act* (C.C.S.M. c. M162)).

Until the early 1900s, surface and mineral rights came with the purchase of land. Since the early 1900s, surface rights and mineral rights in Canada and in Manitoba have been government-owned. They cannot be purchased, only leased by individuals or companies. As a result, 90% of mineral rights in Canada are government-owned. In the 10% of privately-owned mineral rights, mineral rights on a property can be sold separately from surface rights (Natural Resources Canada 2015). The regulation of mining activities on publicly-owned mineral leases falls under provincial/territorial government jurisdiction.

The Project area does not have any active mines; however, the key mineral and quarry interests in the area include the following:

- 13 quarry leases;
- 22 casual quarry permits;
- 179 private quarry permits;
- one potash exploration permits;
- 19 potash withdrawals (which covers all three RMs); and
- 18 quarry withdrawals (either sand or gravel).

5.5.7.3 Oil and gas development

Oil and gas development is administered by the Manitoba Petroleum Branch via the *Oil and Gas Act* (C.C.S.M c. O34) as well as other applicable legislation. The objectives and purposes of the Act are as follows:

- To provide for, encourage and facilitate the safe and efficient development, and the maximum economic recovery, of the oil, gas, helium and oil shale resources of the province in accordance with the principles of sustainable development;

- To prevent waste of oil, gas, helium and oil shale resources;
- To protect the correlative rights of owners;
- To provide for the safe and efficient construction and operation of pipelines; and
- To provide for the safe and efficient development and operation of storage reservoirs.

Manitoba's current oil production is located in southwest Manitoba along the northeastern flank of the Williston Basin, a sedimentary basin that also occupies portions of southern Saskatchewan, North Dakota, South Dakota and Montana. There are currently 44 companies producing oil in Manitoba, ranging from large multinationals to small locally-based producers. A total of 81 new wells were drilled in 2016 and as of December 31, 2016, Manitoba had 3,907 producing oil wells and 693 support wells. Crude oil produced in Manitoba is shipped through the Enbridge pipeline system or Canadian National Railway to refiners in eastern Canada and the northeast and north-central areas of the United States (Manitoba Growth, Enterprise and Trade 2017).

Approximately 80% of the oil and gas rights are owned by private individuals or companies (freehold), the remaining 20% are owned by the Crown in the right of Manitoba. Total oil industry expenditures in Manitoba in 2015 were approximately $708 million (Manitoba Growth, Enterprise and Trade 2017). There are a total of 439 oil wells in the region. The breakdown of wells in the area is as follows:

- 26 RM of Russell-Binscarth;
- 284 RM of Ellice Archie; and
- 129 RM of Prairie view.

There are also two oil/gas pipelines in the region; one of the pipelines runs in a north-south direction through the RMs of Ellice Archie and Russell Binscarth, and the other one runs in an east west direction through the RMs of Ellice Archie and Prairie View. The north-south pipeline (Minell Pipeline) is a natural gas-steel pipeline. The east-west pipeline is owned and operated by TransCanada Pipelines.

5.5.8 Recreation and tourism

Recreation and tourism facilities in the region include snowmobile trails and shelters, boat launches for recreational boating/canoeing, hiking/biking, ATV trails, cross-country ski trails, campgrounds and parks (Map 5-7).

The Birtle Ski Club maintains four different cross country ski trail loops ranging between 500 meters and 16 kilometers in length southwest of Birtle, along with a warm-up cabin.

The trails meander through the Birdtail Valley and sections are open to hiking in the summer months.

The Snowtraxx Snowmobile Club Inc is a non-profit organization that maintains the snowmobile trails in and around the region. The trail network connects users to the communities of St. Lazare, Birtle, Foxwarren, Binscarth, Russell, Rossburn, Ohla and Oakburn. The Snowtraxx Snowmobile Club Inc. grooms the network of approximately 380 km of trails on a weekly basis during the riding season and provides shelters to trail users. In addition to the officially designated snowmobile trails, other community snowmobiles exist within the RAA.

The Parc de La Petite Fourche is located in the Village of St. Lazare at the junction of the Qu'Appelle and Assiniboine Rivers and offers walleye, northern pike and cat fishing. Fire pits and picnic tables line the river with excellent scenic viewing opportunities at the base of the valley.

Hoopers Lake recreational area provides slo-pitch, boating, waterskiing, swimming lessons, fishing and camping. An annual ice fishing derby is held on the lake by the Minota Fire Department.

5.5.8.1 Protected areas

The only designated protected area in the region is the Upper Assiniboine Wildlife Management Area (WMA). It is comprised of twelve units that stretch from north of St. Lazare, south to Miniota and southeast to the Oak Lake area. The northern section has one unit. The central section has seven units and the southern section has four units (Map 5-3).

5.5.8.2 Licensed hunting and trapping

Hunting opportunities are available on thousands of hectares of land in WMAs, community pastures, and other designated Crown lands, including some leased Crown lands within the area. Hunting on private land is allowed with permission from the owner or lawful occupant (MCWS 2015). Some municipalities have bylaw prohibitions or restrictions on the discharge of firearms or bows, particularly near urban areas (MCWS 2015). The regional area falls within the Game Hunting Area 22 and Game Bird Hunting Area 4 (Map 5-7), in which licensed hunting is managed for game species including white-tailed deer, black bear, wild turkeys, wolves, coyotes, migratory game birds and upland birds. Non-resident licensed hunting in the region is managed through outfitter allocations limited to migratory game birds, upland game birds, black bear and

archery hunting for white-tailed deer. The regional area also falls in open area trapping zone 1. Commonly trapped species include coyote, beaver, muskrat, mink and raccoon.

5.5.9 Health

5.5.9.1 Overview

Information on health is organized into the following topics:

- Healthcare services and infrastructure;
- Healthcare utilization;
- Emergency medical response services; and
- Chronic conditions.

5.5.9.2 Healthcare services and infrastructure

Healthcare services are those services that are responsible for meeting the primary health care needs of residents in the area, including diagnosis and treatment of disease and the promotion of health and well-being. Healthcare infrastructure includes hospitals and health care clinics and allied health services such as pharmacy, public health, mental health and addictions services, laboratory services, health promotion and other specialty areas.

Healthcare in Manitoba is administered by Manitoba Health Seniors and Active Living, which organizes service delivery through regional health authorities (RHAs). The region falls within the Prairie Mountain Health Authority, which organizes and administers all hospital care, in addition to most ambulance, public health and allied health services within the region.

Healthcare services for Indigenous communities in Manitoba are provided through a combination of community-based programs funded by the federal First Nations and Inuit Health Branch (FNIHB) and off-reserve services administered provincially through the RHAs.

The region is serviced by hospitals and health centres in Russell, Birtle, Virden and Hamiota. These hospitals and health centres are listed in 5-26 along with the services provided.

Table 5-26: Healthcare facilities in the region

Facility Name	Location	Key Services Provided	Number of Beds
Russell Health Centre	Russell	• Acute care • Outpatient services • Diagnostic Services • Emergency medical services	• 32 acute bed • 40 long term care beds
Russell Clinic	Russell	• Family physician services	• N/A
Birtle Health Centre	Birtle	• Transitional care • Inpatient services • Diagnostic services • Emergency medical services • Home care	• 14 acute beds
Virden Health Centre	Virden	• Acute care • Inpatient services • Outpatient services • Diagnostic services • Emergency medical services	• 25 acute beds
Hamiota Health Centre	Hamiota	• Acute care • Outpatient services • Diagnostic services • Emergency medical services	• 20 acute beds

Source: (Prairie Mountain Health, 2016)

5.5.9.3 Healthcare utilization

Table 5-27 presents a number of key indicators of how healthcare is utilized in the Prairie Mountain Health area. As shown in the table, the portion of residents in Prairie Health with access to a regular medical doctor is slightly below the Manitoba Average. Rates for physician use, ambulatory care visits, use of hospitals, in-patient hospitalization, day surgery and hospitalization for ambulatory care sensitivities were all higher than the provincial average.

Table 5-27: Rates of healthcare utilization

Utilization Rate	Prairie Mountain Health	Manitoba
Regular medical doctor (%) [2014]	81.5	83.9
Physician use (age-sex adjusted % of residents who used physician services)	82.6	81.9
Ambulatory care visits (age-sex adjusted average number of visits per resident)	4.1	4.0
Use of hospitals (age-sex adjusted % of residents admitted to an acute care hospital at least once in the fiscal year)	7.8	6.2
In-patient hospitalization (age-sex adjusted rate per 1,000 residents)	113.2	86.3
Day surgery (age-sex adjusted rate per 1,000 residents)	96.5	78.2
Hospitalization rates for ambulatory care sensitive (ACS) conditions (age-sex adjusted rate per 1,000 residents age 0-74)	9.3	6.5

Source: (Statistics Canada, 2015b) (Manitoba Health, Healthy Living and Seniors, 2015)

5.5.9.4 Emergency medical response services

Emergency medical response services consist of ground and air ambulance. Ground ambulance services in Manitoba are delivered by the RHAs and by other service providers, such as municipalities and Indigenous communities through an agreement with the RHAs. In a 2012 review of Manitoba's emergency medical services (EMS), Manitoba's ground ambulance services were likened to that of a "*patchwork quilt*", with wide variations in organization, staffing models and response times (Toews, 2013).

In the Project region, ambulance stations exist at the Birtle, Russell, Hamiota and Virden Health Centres. All ambulances in rural Manitoba are dispatched through one location in Brandon (outside the region). If a resident calls 911 or if the Brandon Regional Health Center requests an ambulance, it is dispatched through Brandon. The ambulance service uses geolocation, so that ambulances are always out on the road and moving around the region to ensure a response time of less than 30 minutes. This

is achieved about 92% of the time. In some rural places where ground service is not always possible, STARS (Shock Trauma Air Rescue Service) is available to provide emergency air rescue service, although the need for STARS is determined by the dispatch service in Brandon.

5.5.9.5 Chronic conditions

Disease burden describes the burden of disease and various health conditions in a population. These conditions can considerably impair an individual's overall quality of life and ability to function.

The rate of chronic conditions describes the proportion of the population age 20 and older having one or more of the following conditions: arthritis, asthma/COPD, diabetes, coronary heart disease, or stroke (Manitoba Health, Healthy Living and Seniors 2015). As shown in Table 5-28 Prairie Mountain Health has a higher rate of these conditions compared to the province as well as age- and sex-adjusted diabetes and high blood pressure.

It is only possible to directly compare the measures in Table 5-28 that are age- and sex-adjusted. Differences in measures that are not statistically adjusted may be driven at least in part by differences due to the effects of age and gender distribution. Regions with a higher proportion of older people are likely to have higher rates of conditions linked to older age and regions with a higher proportion of younger adults are likely to have higher rates of injury, which is more prevalent in younger populations. While the conditions listed in the table that are not adjusted for age and gender cannot be directly compared across the different regions, the information is still useful for understanding the extent to which the overall population in any one area experiences ill health and identifying which conditions poses the biggest health challenges to individuals and the health care system.

Table 5-28: Measures of disease burden

Disease Burden Parameter	Prairie Mountain Health	Manitoba
Chronic conditions (% age-sex adjusted of residents age 20 and older) 2013/14	48.9	46.3
Arthritis (%)	19.3	19.3
Diabetes (% age-sex adjusted) 2012/13	8.5	8.3
Asthma (%)	8.1	8.9

Disease Burden Parameter	Prairie Mountain Health	Manitoba
Chronic obstructive pulmonary disease (%)	3.6[E]	3.6[E]
High blood pressure (% age-sex adjusted) 2012/13	29.2	28.0
Pain or discomfort, moderate or severe (%)	12.5	13.1
Pain or discomfort that prevents activities (%)	15.4	15.5

Note: [E] Use with caution (Statistics Canada symbol)

Source: (Statistics Canada, 2015b) (Manitoba Health, Healthy Living and Seniors, 2015)

5.5.10 Traditional land and resource use

5.5.10.1 Overview

Manitoba Hydro understands that traditional land use is the knowledge held by Indigenous peoples regarding the use of land, water and resources. Information regarding traditional land and resource use is provided in the following section and is based on documents available in the public domain and documents received or conversations that have occurred between Manitoba Hydro and participating Indigenous communities and organizations to-date. It is organized into the following topics:

- Cultural places and history;
- Harvesting use and sites in the region; and
- Community perspectives.

5.5.10.2 Cultural places and history

Manitoba Hydro invited Anishinaabe Agowidiiwinan (Treaty 2) to participate in discussion on the Project as the lands within the region are located wholly within Treaty 2. According to the Treaty Relations Commission of Manitoba's website, accessed on October 26, 2017, the numbered treaties were signed by the British Crown and First Nations to enable the government of the day to actively pursue agriculture, settlement and transportation links and resource development in western Canada and the north. Treaty 2 was signed August 21, 1871 at Manitoba Post, located on the northwest shores of Lake Manitoba (now the RM of Alonsa) (Anishinaabe Agowidiiwinan, 2017)

Evidence provided in the Gambler First Nation Inquiry Treaty Land Entitlement report indicated that when Treaty 2 was signed in 1871 it did not include some First Nations that were historically located in the boundaries of Treaty 2 (Indian Claims Commission, 1998). These communities were referred to as the 'Fort Ellice Indians' and included Waywayseecappo, Rolling River, Gamblers and Tootinaowaziibeeng First Nations (Indian Claims Commission, 1998). The Fort Ellice First Nations did not attend the negotiations based on their distance to Manitoba House where Treaty 2 was signed. *"Most of the land identified in the petition was included in the territory ceded under Treaty 2 in August 1871. In that treaty, five chiefs – including "Mekis [Michis] (the Eagle), or Giroux," who was identified as the Chief of "the Indians of Riding Mountain and Dauphin Lake and the remainder of the territory hereby ceded" – claimed to represent the Indians in the area. However, the Fort Ellice Indians denied that they had given Mekis authority to speak for them and therefore did not consider themselves to be bound by the terms of Treaty 2"*and later noted that signatories of Treaty 2 did not have authority to sign for them (Indian Claims Commission 1998). To Manitoba Hydro this claim is important as it demonstrates the long use and occupation of the region by some Treaty 4 communities. A participant in a workshop held in Waywayseecappo First Nation identified a sacred site at Fort Ellice "*as there are burials and that is where Treaty 4 was signed by late Chief Waywayseecappo*"(Waywayseecappo interests and values workshop draft report, 2017. Additional information on Fort Ellice can be found in section 5.2.1.

Manitoba Hydro also invited First Nations not signatory to Treaties to participate in the Project process, including the Dakota Nations. The Canadian government did not include the Dakotas in the numbered treaties because they saw the Dakota as American refugees (Turtle Mountain – Souris Plains Heritage Association, 2010, Provincial Archives of Saskatchewan, 2011). The Dakota have consistently asserted that they have traditional territory in Manitoba and that they resided in Manitoba before European contact, which is backed by historical and archaeological evidence (Turtle Mountain – Souris Plains Heritage Association). The Dakota are now recognized as having use and occupation of territories within Manitoba (Treaty Relations Commission of Manitoba, n.d.). The Project region would overlap with parts of the description of the Dakota Nation Traditional Territory. Most recently, *"Ken Chalmers, Chief of the Birdtail Sioux, said all of southwest Manitoba — from Portage la Prairie in the east to the Saskatchewan border in the west, and from the Yellowhead Highway in the north to the American border in the south — is traditional Dakota territory, including the city of Brandon*" (CBC June 20, 2006). Dakota communities located within the region include Birdtail Sioux First Nation, Canupawakpa Dakota Nation, and Sioux Valley Dakota Nation.

The Manitoba Metis Federation (MMF) provided substantial information on the cultural occupation and history of Ste. Madeleine, an area north of the Project in the vicinity of the Spy Hill-Ellice Community pasture (MMF, 2017). The MMF report describes this site (and surrounding area) as historic as it was originally settled by a collection of Metis homesteaders, many of which were displaced from the Red River Settlement (MMF, 2017). Many Metis families left the Red River Settlement in search of a place where they could put down roots and raise their children (MMF, 2017). Ste. Madeleine was one of these places, settled in the late 1800s by Metis homesteaders (MMF, 2017). More information is available on the events at Ste. Madeleine in section 4.3.6.3.

5.5.10.3 Harvesting, Use and Sites in the Region

Overview

Descriptions of activities are organized by the following participating Indigenous groups:

- Waywayseecappo First Nation;
- Gambler First Nation;
- Canupawakpa Dakota Nation; and the
- MMF.

Waywayseecappo First Nation

Waywayseecappo First Nation harvesting activities in the region include hunting and fishing, berry and medicine picking (including sweetgrass, sage and tea). Wildlife noted by community members as valuable includes muskrat, beaver, moose, deer, ducks, geese and fish. Participants identified that hunting occurs on Crown land, as they are not allowed to hunt on private land. One participant indicated that they have to ask permission to hunt on their own land. Participants from Waywayseecappo indicated that Gambler members hunt in the [Assiniboine] valley, but not Waywayseecappo members. Participants indicated that there are important areas along the valley, and identified two sites in the Birdtail Valley, stating that ‘the area is the last undisturbed area.’ A participant indicated that they can ask to go hunting and fishing.

Participants indicated that they go to the [Community] pastures to gather plants. They find Weke (wee-kai or sweet flag) in the valley. A participant identified a Weke picking site.

A member from Waywayseecappo noted that there are burial sites by the Birtle residential school. Participants also identified unmarked gravesites, Gambler’s burial

sites and a site near St. Lazare / Fort Ellice that they visit every June for a ceremony (see map provided in the Waywayseecappo values and interests report).

Waywayseecappo First Nation representatives submitted a draft self-directed study prior to submittal of this environmental assessment (Appendix C).

Gambler First Nation

Gambler First Nation harvesting activities in the region include hunting, trapping, fishing (although members noted they are not 'big fishers'), firewood, medicine and berry picking (including raspberries, Saskatoon berries, pin cherries, strawberries, chokecherries and cranberries used to freeze, make jam and can). Wildlife noted by Gambler First Nation community members includes coyote, bear, skunk, caribou, elk, moose, rabbit, deer and cougar. Wildlife specified harvested for food includes rabbit. Participants identified hunting areas near Gambler First Nation (see map provided in the Gambler values and interests report). Participants noted that they use the [community] pasture for hunting. Some of the participants hunt for coyote, rabbit, elk, deer, moose and prairie chickens. There is also an important elk area near the community. Community members use the rapids [on the Assiniboine] for swimming and fishing.

Gambler First Nation members shared that the [community] pasture is full of wildflowers that are not found elsewhere. There is an important berry site where participants pick berries. Participants indicated areas east and west going into Gambler First Nation where they gather berries. There are areas with tiger lilies and crocuses that participants always visit throughout the year.

Gambler members indicated that the Ste. Madeleine site is sacred, as well as another location in Gambler First Nation Reserve. There is also a creek where ashes were spread. There are celebrations held annually in the Ste. Madeleine area, called Ste. Madeleine Days. Community members go there to pray for loved ones, share a meal and participate in traditions. Some participants indicated that all hunting areas would be sacred because it is their original territory. There were two burial sites identified (see Gambler First Nation values and interests report map). Ancestors were laid at the first site and it is a part of the community. The second is the cemetery located at Ste. Madeleine.

Gambler First Nation representatives submitted a draft self-directed study prior to submittal of this environmental assessment.

Canupawakpa Dakota Nation

Canupawakpa First Nation harvesting activities in the region include hunting, trapping, fishing, and gathering wood for fuel and plants for food and medicine. Wildlife noted as

important to the community includes fish, beaver, deer, bear, skunk, turtles, rabbits and gophers. The majority of people noted that they do not harvest in the route planning area as it is quite north of the community; however, a few do. It was noted that hunters hunted for their family and that important areas for animals, fish or birds are generally anywhere water is (i.e., rivers, creeks, and lakes). Participants noted that areas along the Assiniboine River where creeks and rivers branch off into marshy areas are important for gathering plants. Trees and red willow were noted as being used as medicines and willow is also used in ceremonies. Berries such as chokecherries and Saskatoons are mashed and mixed with deer meat. Plums were also mentioned as being abundant along creeks for harvesting. There is a particular plant that the community recognizes as important, a purple cedar that grows in light soil and was identified as a plant of key importance.

The Assiniboine River was noted as an important area as it was a main travel route and was compared to Highway #1. Participants spoke about a travel route that many families, including those from the other communities (Sioux Valley Dakota Nation, Birdtail Sioux Dakota Nation and Waywayseecappo First Nation), used to use for hunting (see Map 4-3 Canupawakpa Dakota Nation). Participants shared that part of this route was somewhat of a loop that went around quite a large area, including the region. It was noted that they would travel up the Assiniboine River in the spring and complete the loop. The travel loop would also be done again in the fall.

Cultural sites and activities important to the community are described here; however, during the verification process it was noted that the meaning of and value of the message is lost when translating from Dakota to English. Participants spoke a great deal about ‘Indian mounds’ or rocks that are set in a pattern. Participants stressed that it was highly likely for these types of sites to be found along the Assiniboine River and that extra caution should be taken along the river. It was explained that a ‘mound’ would have been a village or an area where a family gathered, and there would be a high potential of finding artefacts in these areas. Participants also noted that hills in fields close to the Assiniboine River can be places where ceremonies took place.

Additional information was shared about poplar trees and willows being considered sacred as they are used in ceremonies; birch as well. Participants noted that the majority of burials would be along the Assiniboine River given the importance it played as a major travel route. Participants noted that they do not use the community pastures for cultural activities but added that other people most likely do hunt in the pastures. One participant stated that the community pastures are a ‘touchy area’ for the community. They are important for communities with Treaty Land Entitlement (TLE) in the area as the pastures are the nearest Crown land for communities that have yet to

reach their equity allocation. It is unclear if the members were referring to a specific community or all communities with remaining TLE.

Canupawakpa community members clarified during verification activities that centennial farms are important to the community as some of their grandparents worked at those farms in their youth. Community members indicated that work at centennial farms was all the work available for a First Nations person. In addition, they noted that some centennial farms were used for raising horses.

MMF

The MMF conducted a land use and occupancy study (LUOS) based on interviews, surveys, past land use and occupancy studies and study team site visit to the Ste. Madeleine area. The authors of the MMF LUOS indicated that they want report information to be fully integrated into the assessment and that the information in the report should inform valued component (VC) selection and then should be used as baseline information in the assessment of those VCs. The MMF LUOS identified three key components of study: Metis use of and connection to the Ste. Madeleine site, Available Land and Harvesting in the vicinity of the Project.

The MMF study report described the history of the Ste. Madeleine area as being important. The events that occurred as the *Prairie Farm Rehabilitation Act* came into force are described in detail in the report. The description provides that rationale for why the area is important and development near this historic site is concerning. "*The importance of Ste. Madeleine is not bound by the confines of the cemetery – which, while a critical component of the Metis connection to this place and their ancestors, does not reflect the broader land use and connection that Contributors spoke of*."

The authors of the study report indicated that participants would prefer if the route did not go through either community pasture, suggesting it instead go through St. Lazare. It was explained by an MMF representative in the study that "*Ste. Madeleine is not just a symbol of the past but a marker of the future of the Metis in this area*." A total of 20 of the 23 contributors to the MMF LUOS had family connections to the Ste. Madeleine community. There is contemporary use of the area, where events such as The Ste. Madeleine Days, campfires, funerals and general visits are currently held in the area. Further information on the Ste. Madeleine topic can be found in the MMF LUOS in Appendix C.

Many participants exclusively harvest on the Spy Hill – Ellice Community Pasture and feel as though it is one of the few areas where Metis citizens are able to exercise rights-based activities unimpeded.

There was general concern from contributors to the report regarding the amount of lands available for Metis citizens to conduct activities considered as protected as a right. The LUOS provided a change in the number of hectares (ha) of available unoccupied Crown land pre- and post-Project approval in the ROW as 0, and the local and regional areas as 42 ha.

Study report authors considered the granting of an easement to Manitoba Hydro as acquiring a “priority” over the rights Metis citizens. Later in the report the authors note that contributors who provided survey responses indicated they believe the Project would change access to harvesting areas.

The MMF study report indicates that the majority of contributors would ‘avoid transmission lines for harvesting activities by at least 100 metres’. The report indicates that there will be changes to the physical attributes of the land; that “*Being on the land has distinct physical attributes that make the experience of land use for Metis citizens unique*” (pg 63). These would include changes to air quality, noise and visual quality near the Project. Contributors provided survey responses that indicated that even the perception of these changes (specifically smell) would deter harvesting.

Some information was drawn from a past land use and occupancy study conducted for other projects in 2015. From this past study they noted that area where the Project ROW is located is used for trapping coyote, mink, muskrat, rabbit and weasel and that the area provides seasonal habitat for moose and important habitat for deer. Fishing occurs in the Project area, including historic sturgeon fishing. A deer kill-site was noted in the MMF local area (a 3 km buffer on either side of the Project center line). Trapping occurs for beaver, mink, muskrat, and weasel in the MMF regional area (a 10 km buffer on either side of the Project centre line). Deer hunting and fishing for northern pike, pickerel, goldeye, catfish, sturgeon and suckers occurs in the MMF regional area. Plant and natural materials gathering occurs in the RAA and includes berries such as cranberry, raspberry and Saskatoons.

The MMF MLOUS report indicates that harvesting for Metis is not just a recreational activity, but that “*There are cultural, economic and subsistence components which encompass these exercises which are important for Metis identity and pride*.”

Some contributors noted that there may be a reduction in the availability of species with the Project. The study report instructs Manitoba Hydro to specifically assess effects to availability of species, and that mitigation must be developed in partnership with the MMF.

The MMF LUOS report notes a cart trail in the MMF regional area as well as a cultural site, a burial site, a historically significant Metis Site and a trading post (other than Fort Ellice). Locations of the aforementioned are mapped in Figures 5 through 10 in the

MMF LUOS (MMF MLOUS provided in Appendix C). The timing of various harvesting activities is provided in the study report.

The MMF LUOS report notes that the harvesting experience could be affected by the construction and operation of the Project through changes in locations available to those harvesters and changes to those species available for harvest. The report instructed Manitoba Hydro to specifically assess effects to harvester experience, and that mitigation must be developed in partnership with the MMF to ensure the effects are adequately reduced.

Contributors to the study noted that with the construction and operation of the Project there may be a reduction in harvesting success. Participants in the MLOUS were asked to provide the distance they would avoid a variety of land use type and developments. Specific buffer distances were provided to indicate areas 'where Metis citizens have diminished preference.' These areas of diminished preference are mapped in the MMF MLOUS report.

The MMF LUOS report included a discussion on the perception of effects of the Project. Based on information provided in the study, contributors had the perception of negative effects on MMF harvesters exercising their Metis rights. The report instructed Manitoba Hydro to specifically assess effects to perception, and that mitigation must be developed in partnership with the MMF to ensure the effects are adequately reduced.

The MMF LUOS report concludes that without mitigation the continuation of the MMF Community's rights and interests in the Project area may be impaired, as the ability for Metis to successfully exercise their rights in the vicinity may be diminished due to an already limited land base becoming more encumbered.

Summary

Based on the input provided by Indigenous communities and organizations, information on traditional land and resource use has been organized into the following key topics:

- Potential changes to culturally important places; and,
- Potential changes to the ability to conduct harvesting activities.

Concerns expressed about changes to culturally important places involved the potential for disturbance to cultural places or a change in access to those places.

Concerns about changes to the ability to conduct harvesting activities contemplated the following:

- Change to plant or wildlife availability;
- Change to access of harvesting areas or culturally important places; and

- Change to the harvesting experience, which includes factors such as:
    - the success of harvesting activities; and
    - the perception of the ability to conduct harvesting activities or access to harvesting areas or culturally important places.

The potential changes to culturally-important places and the ability to conduct harvesting activities (described above) are assessed within section 7.5.8 of this assessment.

5.5.11 Heritage resources

5.5.11.1 Overview

Heritage resources are the physical (or tangible) remains left behind by past peoples and includes things such as artifacts or animal remains. Heritage resources can also include the intangible, which are places or things that have natural or cultural significance that may be linked to the natural landscape of an area. Appendix E contains a detailed analysis of the culture and heritage resources of the region, based on research and field studies conducted on August 21-24 and October 10-13 during 2017.

The Project is located in the traditional territory of First Nations and Metis who have a deep connection to the land. These connections include ‘heritage, historic, cultural and sacred sites’. Section 5.2.1 provides an overview of the natural and cultural history of the region. As noted in section 5.2.2, much of the region has been modified by agricultural practices and the native tall grass prairie, marshes, prairie ponds and tree groves have been replaced by pasturelands or farmlands and extensive road and rail networks.

5.5.11.2 Predictive model

A predictive model was designed to provide a supplementary understanding of the Project region from an archaeological perspective. The objective of a predictive model is to identify areas that have moderate to high potential for heritage resources to help inform the route selection process (Map 5-8). The assumption is that ancient peoples preferred certain types of environments and selected land-based features over others for habitation, resource procurement, or protection. The model employs natural and cultural variables to predict the locations that have the potential to contain archaeological evidence. Using data from public sources such as GeoBase, Manitoba Land Initiative (MLI) and Natural Resources Canada (NRCAN) as well as Manitoba’s

Historic Resources Branch Archaeological Site Inventory, a high-level predictive model was created for the Birtle Transmission Project. Details on its development are found in Appendix E, but it is based on key variables known to influence likelihood of heritage resources, such as proximity to known archaeological sites, ground slope, proximity to waterways, soil drainage, and land cover.

5.5.11.3 Heritage sites

The Province of Manitoba, Historic Resource Branch (HRB), maintains archaeological site information in an archaeological site inventory database. There are also official federal, provincial and municipally-designated sites that are of historic and cultural significance for their contribution to the federal, provincial and local environment (centennial farms, commemorative plaques and monuments). The HRB's Heritage Resources Registrar provided the listing of previously recorded heritage sites in proximity to the Project. These sites represent material evidence from a wide temporal range of cultural occupations. The Paleo period (10,000-6,000 BP) is represented in eight of the 85 sites from this earliest culture. The Archaic Period (6,000-2,000 BP) is represented in 18 of the sites with 16 sites containing Woodland (2,000-350 BP) materials. Historic period (350-80 BP) include fur trade period sites related to Fort Ellice I and II, a burial location and the Ste. Madeleine cemetery.

Many sites in the study area are multi-component, meaning that the site was occupied by two or more distinct cultural groups over time. Due to the extensive land development and agricultural practices over the last 100 years, almost all known sites have undergone varying degrees of natural or man-made disturbances. Many sites have been removed from their original depositional context, while others do not contain dateable evidence to link to a specific cultural period and can only be assigned to the general Precontact period. Table 5-29 presents an overview of the cultural affiliations represented in the study area.

Table 5-29 Cultural affiliations found within sites in the Project area

Cultural Affiliation	# of Representation in Sites	Percentage
Paleo	8	7.8%
Archaic	18	17.6%
Woodland	16	15.7%
Historic	9	8.8%
Precontact	27	26.5%
Undetermined	24	23.5%

Of the 85 archaeological sites located within the general study area, 43 are Precontact campsites; two are permanent settlement/fur trade posts; two are lithic workshops; two

are burial locations; one site contains evidence of a possible petroform; 14 of the 85 sites have been found as isolated finds; while 21 other sites are Uninterpreted.

Table 5-30 Archaeological site types within the Project area

Site Type	Total	Percentage
A. Campsite	43	50.6%
B. Permanent Settlement/M. Fur Trade Post	2	2.4%
E. Workshop	2	2.4%
F. Burial	2	2.4%
G. Petroform	1	1.2%
H. Uninterpreted	21	24.7%
I. Isolated Find	14	16.5%

For the entire Study Area, 85 registered archaeological sites, 12 Centennial Farms (Table 5-31), and 13 Plaques have been recorded (Table 5-32).

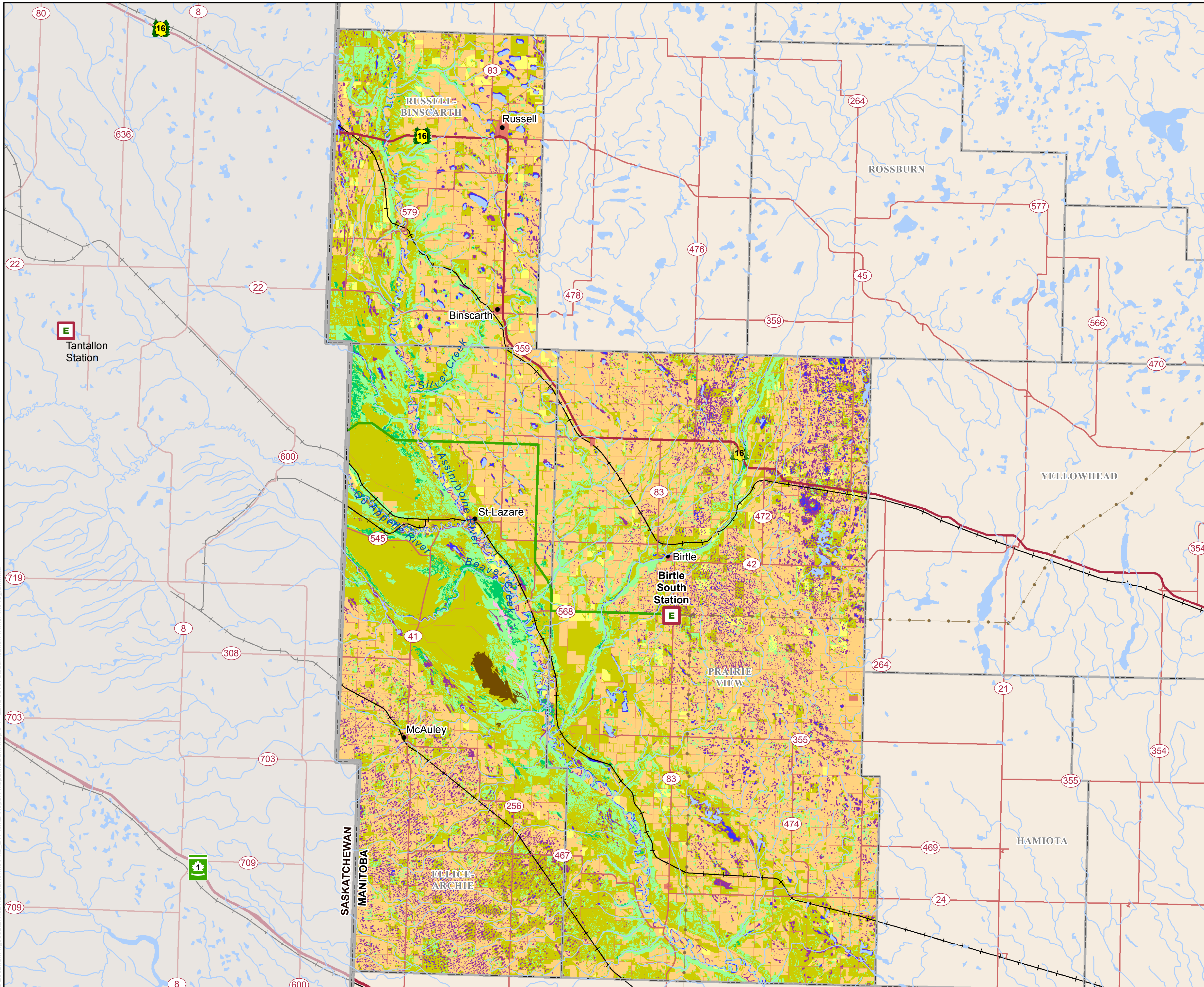
Table 5-31: List of centennial farms in the Project region

Centennial Farm	Original Date	Legal Description
Barteaux Family Farm	1907	S 18-16-27 W
Nettle Family Farm	1904	E 14-17-27 W
Prescott Family Farm	1887	SE 30-17-27 W
Falloon Family Farm	1881	NW 28-17-28 W
Laycock Family Farm	1891	SE 36-17-28 W
Hamilton Family Farm	1881	SW 6-18-27 W
Falloon Family Farm	1882	SW 10-18-28 W
Falloon Family Farm	1885	SE 10-18-28 W
Pizzey Family Farm	1904	NE 16-18-28 W
Bradshaw Family Farm	1908	SW 12-19-29 W
Lyon Family Farm	1903	E 17-19-28 W
Joyce Family Farm	1889	NW 16-19-28 W

Table 5-32: List of Plaques in the Project region

Plaque ID	Plaque Name	Legal Description
PLAQ1119	St. Albans Church and Blenheim Cemetery	SW13-15-27W
PLAQ890	Oxford Schools	SE19-16-27W
PLAQ1366	Fort Ellice	NW33-16-28W

Plaque ID	Plaque Name	Legal Description
PLAQ812	Morseby School	NW31-17-27W
PLAQ1747	Falloon Family	NE32-17-28W
PLAQ2389	Foxwarren Memory Garden	SW4-18-27W
PLAQ1751	Hamilton Farm	SW6-18-27W
PLAQ2486	Memory Garden, Foxwarren School Bell	NW of NW 4-8-27
PLAQ418	Foxwarren School Bell	NE5-18-27W
PLAQ1172	Ste.Madeleine	SE32-18-29W
PLAQ55	Baldwin School	NW5-19-28W
PLAQ1438	Wayside Store	NE18-19-29W
PLAQ1430	Crosby School	SW20-19-29W



Manitoba Hydro

Birtle Transmission Project

Project Infrastructure
- Birtle South Station
- Final Preferred Route

Infrastructure
- Transmission Line

Land Cover Classification[1]
- Agricultural Cropland
- Bare Rock, Gravel and Sand
- Coniferous Forest
- Cultural Features
- Deciduous Forest
- Forage Crops
- Forest Cutover
- Marsh and Fens
- Mixedwood Forest
- Open Deciduous Forest
- Range and Grassland
- Treed and Open Bogs
- Water

Landbase
- Community
- Yellowhead Highway
- Road
- Railway Line
- Province of Manitoba Boundary

Source:
1. Land Cover Classification (2006), Manitoba Conservation and Water Stewardship

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 10, 2018

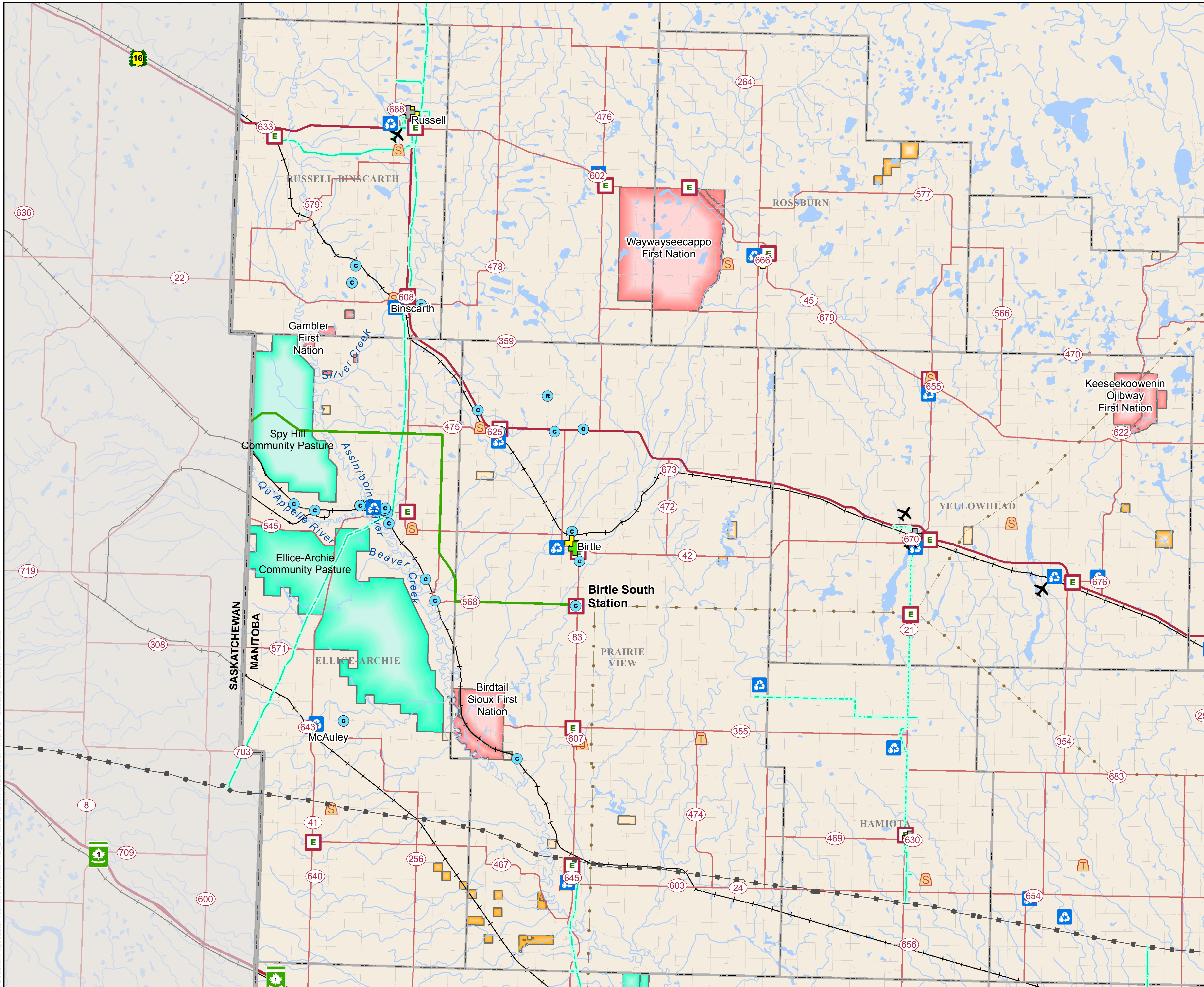
0 5 10 Kilometres
0 2 4 Miles

1:350,000

N

Land Cover Classification within the Region

Map 5-1



Manitoba Hydro

Birtle Transmission Project

Project Infrastructure

- Final Preferred Route

Existing Infrastructure

- Electrical Station
- Aerodrome
- Nursing Home
- Health Centre
- Personal Care Home
- Waste Transfer Station
- Wastewater Treatment Facility
- Solid Waste Site
- Communication Tower
- Radar Tower
- Transmission Line
- Existing Gas Line
- Trans Canada Pipeline

Landbase

- Community
- Yellowhead Highway
- Road
- Municipal Road
- Railway Line
- First Nation
- Wildlife Management Area
- Community Pasture
- Rural Municipality
- Province of Manitoba Boundary

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 10, 2018
Available in accessible formats upon request.

N

0 4 8 Kilometres
0 2 4 Miles

1:350,000

Existing Infrastructure

Map 5-2

Manitoba Hydro

Birtle Transmission Project

Project Infrastructure

- Birtle South Station
- Final Preferred Route

Landbase

- Building *
- Yellowhead Highway
- Road
- Railway Line
- Built Up Area
- First Nation
- Wildlife Management Area
- Community Pasture
- Crown Land
- Rural Municipality
- Province of Manitoba Boundary

* Building data restricted to Route Planning Area only.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: January 10, 2018
Available in accessible formats upon request.

N

0 4 8 Kilometres
0 2 4 Miles

1:150,000

Land Designations and Boundaries

Map 5-3

R.M. of Russell-Binscarth
R.M. of Riding Mountain West
R.M. of Rossburn
R.M. of Prairie View
R.M. of Ellice-Archie
Waywayseecappo First Nation
Gambler First Nation
Spy Hill Community Pasture
Ellice-Archie Community Pasture
Binscarth
Foxwarren
St-Lazare
Birtle
Birtle South Station
Silver Creek
Assiniboine River
Qu'Appelle River
Beaver Creek
SASKATCHEWAN
MANITOBA