Environment Act Proposal Form

Name of the development: Neepawa Gas Transmission Project	
Type of development per Classes of Development Regulation (Manitoba Regulation 164/88): Class 2, transmission pipeline over 10 km	
Legal name of the applicant: Centra Gas Manitoba Inc.	
Mailing address of the applicant: 360 Portage Avenue (18th floor)	
Contact Person: James Matthewson	
City: Winnipeg · Province: MB · Postal Code: R3C 0G8	
Phone Number: (204) 360-3119 · Fax: · email: jmatthewson@hydro.mb.ca	
Location of the development: Municipality of North Cypress-Langford	
Contact Person: James Matthewson	
Street Address: 360 Portage Avenue	
Legal Description:	
City/Town: Winnipeg · Province: MB · Postal Code: R3C 0G8	
Phone Number: (204) 360-3119 · Fax: · email: jmatthewson@hydro.mb.ca	
Name of proponent contact person for purposes of the environmental assessment: James Matthewson	
Phone: (204)360-3119 Fax:	Mailing address: 360 Portage Avenue (18) Winnipeg, MB R3C 0G8
Email address: jmatthewson@hydro.mb.ca	
Webpage address:	
Date: Dec 17, 2025	Signature of proponent, or corporate principal of corporate proponent: Original signed by James Matthewson Printed name:

PRINT

RESET

A complete **Environment Act Proposal (EAP)** consists of the following components:

- ☑ **Cover letter**
- ☑ **Environment Act Proposal Form**
- ☑ **Reports/plans supporting the EAP** (see "Information Bulletin - Environment Act Proposal Report Guidelines" for required information)
- ☑ **Application fee** (Cheque, payable to Minister of Finance, for the appropriate fee)

Per Environment Act Fees Regulation (Manitoba Regulation 168/96):

Class 1 Developments	$1,000
Class 2 Developments	$7,500
Class 3 Developments:	
Transportation and Transmission Lines	$10,000
Water Developments	$60,000
Energy and Mining	$120,000

Submit the complete EAP to:
Director
Environmental Approvals Branch
Environment and Climate Change
Box 35, 14 Fultz Boulevard
Winnipeg MB R3Y 0L6
EABDirector@gov.mb.ca

For more information:
Toll-Free: 1-800-282-8069
Phone: 204-945-8321
Fax: 204-945-5229

https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/licence/index.html

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$1,000......C1 B-02
$7,500......C2 B-02
$10,000....TT B-02
$60,000.....WD B-02
$120,000...EM B-02

2025 12 17

Agnes Wittmann, Director
Environmental Approvals Branch
Manitoba Environment and Climate Change
Box 35, 14 Fultz Blvd
Winnipeg MB R3Y 0L6

Dear Agnes Wittmann:

ENVIRONMENT ACT PROPOSAL – NEEPAWA GAS TRANSMISSION PROJECT

Enclosed with this cover letter are an Environment Act Proposal Form and a cheque for the application fee for the proposed Neepawa Gas Transmission Project submitted by Manitoba Hydro on behalf of its wholly owned subsidiary Centra Gas Manitoba Inc. ("Centra Gas"). Manitoba Hydro provided notification to the Environmental Approvals Branch about the project by submitting an Intent to Apply on May 6, 2025.

The environmental assessment report, sent by email, provides project information and documents the environmental assessment activities, including project engagement, leading up to this application.

We trust that the provided information is sufficient for the Environmental Approvals Branch to undertake its review process under *The Environment Act*. Should you have any questions or require further information, please contact James Matthewson at (204)-360-3119.

Regards,

Original signed by James Matthewson

James Matthewson, Manager
Transmission & Distribution Environment and Engagement
Manitoba Hydro

360 Portage Ave (18) • Winnipeg Manitoba Canada • R3C 0G8
Telephone / *Nº de téléphone :* 204-360-3119 • Fax / *Nº de télécopieur :* 204-360-6176
jmatthewson@hydro.mb.ca

Neepawa gas transmission project

Environmental assessment

Prepared by Manitoba Hydro on behalf of its wholly owned subsidiary, Centra Gas Manitoba Inc.

Indigenous & Community Relations and Environmental Stewardship Division

Transmission & Distribution Environment and Engagement Department

December 2025

Land acknowledgement

Manitoba Hydro operates throughout Manitoba, on the original territories of the Anishinaabe, Cree, Anishininew, Dakota, and Dene peoples and the National Homeland of the Red River Métis. We acknowledge these lands and pay our respects to the ancestors of these territories. We also acknowledge the ancestral lands of the Inuit in northern Manitoba.

The proposed Neepawa gas transmission project is located on Treaty 1 and Treaty 2 lands, the original territories of the Anishinaabeg, Anishininewak, Ininewak, Dakota Oyate, and the National Homeland of the Red River Métis. We acknowledge these nations who have occupied and cared for these lands for thousands of years and their longstanding cultural and spiritual connections with the land. Through this we recognize the importance of learning and considering the unique perspectives each of these nations have and share with us throughout the project.

Executive summary

The Neepawa area is currently supplied natural gas thorough a single, four-inch steel pipeline system owned by Centra Gas Manitoba Inc., a wholly owned subsidiary of Manitoba Hydro. Neepawa and the surrounding area have experienced notable growth for several years and capacity limitations have been identified. The Neepawa gas transmission project, proposed in this environmental assessment report, is intended to respond to growing customer demand and support near-term approved and planned developments in the Neepawa area.

The proposed project consists of construction, operation, and decommissioning of a six-inch steel natural gas transmission pipeline and above-ground control structures at the south and north limits of the pipeline. The new pipeline will be approximately 20 km in length, beginning at a control point located approximately 22.5 km south of Neepawa and terminating at another control point located approximately 3.5 km south of Neepawa.

As a pipeline greater than 10 km in length, the proposed project is considered a Class II development in the provincial Classes of Development Regulation (M.R. 39/2016) and requires a licence under The Environment Act (Manitoba) to proceed. Manitoba Hydro has developed this report on behalf of its wholly owned subsidiary, Centra Gas Manitoba Inc., to document the environmental assessment carried out for the project. This report outlines the proposed project, environmental assessment approach, project engagement, the biophysical and socioeconomic environments in which the project will be built and operated, and the potential effects of the project; identifies mitigation measures; and determines the significance of anticipated residual project effects.

The environmental assessment approach was developed through a review of regulations, current environmental assessment practices, experience undertaking assessment of similar projects, site visits, and feedback received during project engagement. The environmental assessment focused on the following seven valued components:

- Important sites
- Vegetation
- Wildlife and wildlife habitat
- Commercial agriculture
- Human health risk
- Economic opportunities
- Infrastructure and community services

The proposed project is located in the Municipality of North Cypress-Langford and is located on Treaty 1 and Treaty 2 lands, the original territories of the Anishinaabeg, Anishininewak, Ininewak, Dakota Oyate, and the National Homeland of the Red River Métis. Manitoba Hydro acknowledges these nations who have occupied and cared for these lands for thousands of years and their longstanding cultural and spiritual connections with the land. Manitoba Hydro also recognizes the importance of learning and considering the unique perspectives each of these nations have and share with us throughout the project.

Potential effects to the natural environment are limited as most of the proposed project area is previously disturbed and developed. Land cover in the proposed transmission line right-of-way is dominated by agricultural land. No Crown land is traversed by the proposed project. Anticipated project effects to the seven valued components are anticipated to be most pronounced during the construction phase of the project.

The few areas of natural habitat crossed by the proposed project include the Brookdale Drain and small wooded areas. However, direct disturbance of these natural areas will be largely avoided through use of horizontal directional drilling to install the pipeline beneath these areas.

As a result, adverse residual project effects to vegetation, as well as wildlife and wildlife habitat, are anticipated to be of low magnitude. Being located within previously disturbed and developed areas, the proposed project has low potential to affect species of conservation concern. The project is anticipated to directly alter less than 2.1 ha of forest and is not anticipated to alter wetlands.

Important sites, including heritage resources and cultural sites or features, have the potential to be adversely affected primarily through project activities involving ground disturbance. Cultural experiences in the area may also be adversely affected due to project-related changes to the sensory experience and access.

The project will have adverse residual effects on agricultural land and agricultural activities. A total of 49 ha of land will be temporarily lost from agricultural production during project construction. There will be a small loss of agricultural land that will be occupied by the above-ground control points throughout the lifetime of the project, resulting in the permanent loss of an estimated 0.80 ha (1.98 ac) of land from agricultural use. Construction of the project will also result in a short-term disruption to agricultural activities during one growing season. Routing the pipeline to parallel existing gas pipeline easement has mitigated overall project conflicts with agricultural activities. Compensation will be provided to affected agricultural producers to offset the effects of project-related temporary and permanent land loss. With topsoil stripping and other construction mitigation measures, land capability classes along the pipeline route are anticipated to return to pre-disturbance levels. Manitoba Hydro understands that even though overall project effects will affect a relatively small area, local effects at individual field level can have a meaningful impact on individual operations. Communications with landowners prior to land access for project activities may result in additional site-specific mitigation, further reducing potential for conflict with agricultural activities. Compensation will be provided to address the residual potential conflict with agricultural activities and damages that may be caused by project activities.

Anticipated residual effects related to human health risk include an anticipated temporary increase in noise levels resulting from project activities. Project-related effects on air quality are anticipated to be negligible and the project is not anticipated to result in emissions that exceed provincial air quality guidelines.

The project is anticipated to result in small potential increases in the strain on local infrastructure and community services including the availability of short-term accommodations, increased traffic, and strains on transportation infrastructure, health and emergency response services, and waste management facilities.

Economic opportunities related to the project are anticipated to be positive outcomes of the project and include potential opportunities for employment and local spending on goods and services.

Although not required in provincial environmental assessment guidelines for Class 2 developments, this report also includes an assessment of cumulative effects to each valued component as applicable, a discussion of effects that may occur because of environmental changes and hazards acting on the project, and an assessment of the environmental outcomes of potential accidents and malfunctions that might occur in connection with the project.

Per provincial guidelines for Class II Environment Act Proposals, this report also presents a discussion of climate change implications including a greenhouse gas (GHG) inventory. Based on the GHG assessment conducted for the project, project infrastructure related GHG emissions are anticipated to be most pronounced during the construction phase of the project.

As part of its contractor evaluation process, in pursuit of retaining a contractor to construct our licensable projects, Manitoba Hydro evaluates bids on specific environmental aspects including each bid's proposed methodology for reducing GHG emissions and other climate change mitigations that will be implemented during the work. Manitoba Hydro will implement mitigation measures including the following to address project-related GHG emissions from construction and maintenance activities:

- Limiting the amount of vegetation removed to what is required to safely construct and operate the pipeline
- Encouraging the productive use of wood/timber removed during clearing activities
- Ensuring all vehicles and equipment are regularly inspected and maintained to optimize energy efficiency
- Reducing idling to the extent possible and utilizing equipment or vehicles with auto-shutoff, if available and practical
- Encouraging vans/shuttle buses and/or carpooling of workers when practical.
- Using electric and/or hybrid vehicles to the extent practical
- Developing a waste management plan that promotes reuse and/or recycling whenever feasible and promoting the composting of organic waste when feasible/practical
- Planning work activities to reduce the distance of travel, e.g., using direct routes of travel, reducing the amount of transport trips (full vs. half loads), and utilizing appropriate local facilities near the project site to source materials and/or for waste disposal, when practical

Manitoba Hydro's environmental protection program and associated protection plans, including project specific mitigation measures, have been adapted and updated to minimize the overall impacts of the project. Based on Manitoba Hydro's planned mitigation and past outcomes from similar projects in southern Manitoba, the overall assessment conclusion is that the proposed project's residual effects to the environment will be not significant, and the project will provide a benefit to Manitobans, bringing energy to life.

Résumé

La région de Neepawa est actuellement approvisionnée en gaz naturel par un seul réseau de pipelines en acier de quatre pouces appartenant à Centra Gas Manitoba Inc., une filiale à 100 % de Manitoba Hydro. Neepawa et ses environs connaissent une croissance notable depuis plusieurs années et des limites de capacité ont été relevées. Le projet de transport de gaz de Neepawa, proposé dans le présent rapport d'évaluation environnementale, vise à répondre à la demande croissante des consommateurs et à soutenir les développements approuvés et prévus à court terme dans la région de Neepawa.

Le projet proposé consiste en la construction, l'exploitation et la mise hors service d'un pipeline de transport de gaz naturel en acier de six pouces et de structures de contrôle en surface aux limites sud et nord du pipeline. Le nouveau pipeline aura une longueur d'environ 20 km, commençant à un point de contrôle situé à environ 22,5 km au sud de Neepawa et se terminant à un autre point de contrôle situé à environ 3,5 km au sud de Neepawa.

Comme il s'agit d'un pipeline de plus de 10 km de long, le projet proposé est considéré comme un projet d'exploitation de catégorie II dans le Règlement sur les diverses catégories d'exploitations de la province (R.M. 39/2016) et nécessite un permis en vertu de la *Loi sur l'environnement* (Manitoba). Manitoba Hydro a élaboré le présent rapport au nom de sa filiale à 100 %, Centra Gas Manitoba Inc., afin de documenter l'évaluation environnementale réalisée pour le projet. Le présent rapport décrit le projet proposé, l'approche de l'évaluation environnementale, la mobilisation relative au projet, les environnements biophysiques et socioéconomiques dans lesquels le projet sera construit et exploité ainsi que les effets potentiels du projet; il détermine les mesures d'atténuation ainsi que l'importance des effets résiduels anticipés du projet.

L'approche de l'évaluation environnementale a été élaborée d'après un examen de la réglementation, les pratiques actuelles en matière d'évaluation environnementale, l'expérience acquise dans l'évaluation de projets similaires, les visites sur le terrain et les commentaires reçus lors de la mobilisation relative au projet. L'évaluation environnementale s'est concentrée sur les sept composantes valorisées suivantes :

- Sites importants
- Végétation
- Faune et habitat de la faune
- Agriculture commerciale
- Risque pour la santé humaine

- Possibilités économiques
- Infrastructures et services communautaires

Le projet proposé est situé dans la municipalité de North Cypress—Langford sur les terres des Traités nº 1 et nº 2, les territoires originaux des Anishinaabeg, des Anishininewak, des Ininewak et des Dakota Oyate, ainsi que sur la patrie des Métis de la rivière Rouge. Manitoba Hydro reconnaît ces nations qui ont occupé ces terres et en ont pris soin pendant des milliers d'années ainsi que leurs liens culturels et spirituels de longue date avec la terre. Manitoba Hydro reconnaît également l'importance d'apprendre et de prendre en compte les perspectives uniques que chacune de ces nations a et partage avec nous tout au long du projet.

Les effets potentiels sur l'environnement naturel sont limités, car la majeure partie de la zone du projet proposé a déjà été perturbée et aménagée. L'occupation du sol dans l'emprise de la ligne de transport proposée est dominée par les terres agricoles. Le projet proposé ne traverse aucune terre de la Couronne. Les effets anticipés du projet sur les sept composantes valorisées devraient être les plus prononcés pendant la phase de construction du projet.

Les quelques zones d'habitat naturel traversées par le projet proposé comprennent Brookdale Drain et de petites zones boisées. Toutefois, la perturbation directe de ces zones naturelles sera largement évitée grâce à l'utilisation d'un forage directionnel horizontal pour installer le pipeline sous ces zones.

Par conséquent, les effets résiduels négatifs du projet sur la végétation, ainsi que sur la faune et son habitat, devraient être de faible ampleur. Étant situé dans des zones déjà perturbées et aménagées, le projet proposé a un faible potentiel d'incidence sur les espèces dont la conservation est préoccupante. Le projet devrait altérer directement moins de 2,1 ha de forêt et ne devrait pas altérer les zones humides.

Les sites importants, y compris les ressources patrimoniales et les sites ou caractéristiques culturels, risquent d'être affectés principalement par les activités du projet impliquant des perturbations du sol. Les expériences culturelles dans la région peuvent également être affectées par les changements liés au projet en matière d'expérience sensorielle et d'accès.

Le projet aura des effets résiduels négatifs sur les terres et les activités agricoles. Au total, 49 hectares de terres seront temporairement retirés de la production agricole pendant la construction du projet. Il y aura une légère perte de terres agricoles qui seront occupées par les points de contrôle en surface pendant toute la durée du projet, ce qui entraînera la perte permanente d'une superficie estimée à 0,80 ha

(1,98 acre) de terres agricoles. La construction du projet entraînera également une perturbation à court terme des activités agricoles pendant une saison de croissance. L'acheminement du pipeline parallèlement à la servitude de gazoduc existante a permis d'atténuer les conflits globaux du projet avec les activités agricoles. Les producteurs agricoles concernés seront indemnisés pour compenser les effets des pertes de terres temporaires et permanentes liées au projet. Grâce au décapage de la terre végétale et à d'autres mesures d'atténuation des effets de la construction, les classes d'aptitude des sols le long du tracé du pipeline devraient retrouver leur niveau d'avant la perturbation. Manitoba Hydro comprend que même si les effets globaux du projet affecteront une zone relativement petite, les effets locaux au niveau des champs individuels peuvent avoir un impact significatif sur les opérations individuelles. Les communications avec les propriétaires fonciers avant l'accès aux terres pour les activités du projet peuvent donner lieu à des mesures d'atténuation supplémentaires propres au site, réduisant encore plus le risque de conflit avec les activités agricoles. Des compensations seront accordées pour remédier aux conflits potentiels résiduels avec les activités agricoles et aux dommages susceptibles d'être causés par les activités du projet.

Les effets résiduels prévisibles liés aux risques pour la santé humaine comprennent une augmentation temporaire des niveaux de bruit résultant des activités du projet. Les effets du projet sur la qualité de l'air devraient être négligeables et le projet ne devrait pas entraîner d'émissions dépassant les lignes directrices provinciales en matière de qualité de l'air.

Le projet devrait entraîner une légère augmentation potentielle de la pression sur les infrastructures locales et les services communautaires, notamment en ce qui concerne la disponibilité de logements de courte durée, l'augmentation du trafic et la pression sur les infrastructures de transport, les services de santé et d'intervention d'urgence, ainsi que sur les installations de gestion des déchets.

Les possibilités économiques liées au projet devraient entraîner des résultats positifs et inclure des possibilités potentielles d'emploi et de dépenses locales en biens et services.

Bien que les lignes directrices provinciales en matière d'évaluation environnementale pour les projets d'exploitation de catégorie 2 ne l'exigent pas, le présent rapport comprend également une évaluation des effets cumulatifs sur chaque composante valorisée, le cas échéant, une analyse des effets susceptibles de se produire en raison des changements et des dangers environnementaux agissant sur le projet, ainsi qu'une évaluation des conséquences pour l'environnement des accidents et des défaillances susceptibles de se produire dans le cadre du projet.

Conformément aux lignes directrices provinciales relatives aux propositions de loi sur l'environnement de catégorie II, le présent rapport présente également une analyse des effets du changement climatique, y compris un inventaire des gaz à effet de serre (GES). D'après l'évaluation des émissions de gaz à effet de serre réalisée pour le projet, les émissions de gaz à effet de serre liées à l'infrastructure du projet devraient être les plus importantes pendant la phase de construction du projet.

Dans le cadre de son processus d'évaluation des entrepreneurs, afin de retenir les services d'un entrepreneur pour la construction de projets nécessitant un permis, Manitoba Hydro évalue les offres d'après des aspects environnementaux précis, notamment la méthodologie proposée par chaque soumissionnaire pour réduire les émissions de GES et d'autres mesures d'atténuation du changement climatique qui seront mises en œuvre pendant les travaux. Manitoba Hydro mettra en œuvre les mesures d'atténuation suivantes pour réduire les émissions de GES liées au projet et provenant des activités de construction et d'entretien :

- Limiter la quantité de végétation enlevée à ce qui est nécessaire pour construire et exploiter le pipeline en toute sécurité.
- Encourager l'utilisation productive du bois prélevé lors des activités de défrichement.
- Veiller à ce que tous les véhicules et équipements soient régulièrement inspectés et entretenus afin d'optimiser l'efficacité énergétique.
- Réduire la marche au ralenti dans la mesure du possible et utiliser des équipements ou des véhicules dotés d'un système d'arrêt automatique, s'ils sont disponibles et pratiques.
- Encourager les camionnettes, les navettes et le covoiturage des travailleurs lorsque c'est possible.
- Utiliser des véhicules électriques ou hybrides dans la mesure du possible.
- Élaborer un plan de gestion des déchets qui favorise la réutilisation ou le recyclage chaque fois que cela est possible et qui encourage le compostage des déchets organiques chaque fois que cela est possible/pratique.
- Planifier les activités de travail de manière à réduire la distance de déplacement, par exemple en utilisant des itinéraires directs, en réduisant le nombre de trajets de transport (chargements complets contre demi-chargements) et en utilisant des installations locales appropriées à proximité

du site du projet pour l’approvisionnement en matériaux et l’élimination des déchets, lorsque c’est possible.

Le programme de protection de l’environnement de Manitoba Hydro et les plans de protection connexes, y compris les mesures d’atténuation propres au projet, ont été adaptés et mis à jour afin de réduire au minimum les impacts globaux du projet. Compte tenu des mesures d’atténuation prévues par Manitoba Hydro et des résultats antérieurs de projets similaires dans le sud du Manitoba, l’évaluation globale conclut que les effets résiduels du projet proposé sur l’environnement ne seront pas importants et que le projet sera bénéfique pour les Manitobains, car il permettra de créer de l’énergie pour la vie.

Authors’ acknowledgement

Staff from the following Manitoba Hydro departments and external consultant companies contributed to the preparation of this environmental assessment report:

Department/Role	Organization
Staff from the departments of Transmission & Distribution Environment and Engagement; Geospatial Data Services; Gas Engineering & Construction; Partnerships & Projects Support; Water Resources; Energy Resource Planning; Property, Stakeholder Relations	Manitoba Hydro
Environmental assessment authoring (soils and agriculture) and soil survey consultant	AgriEarth Consulting Ltd. and Montrose Environmental
Project archaeologist and heritage technical report author	InterGroup Consultants Ltd.
Vegetation technical data reports	Szwaluk Environmental Consulting

Glossary

Term	Definition
Accident	An unexpected and unintended interaction of a project component or activity with environmental, health-related, social, or economic conditions (Impact Assessment Agency 2025).
Biosecurity	Management practices that can help minimize and/or control the introduction, transfer or multiplication of pests (e.g., weeds, diseases) in crops and livestock.
Climate normals	Thirty (30)-year averages of climate variables such as temperature and precipitation, used to summarize or describe the average climatic conditions of a specific location.
Commercial agriculture	For-profit production of crops and livestock.
Committee on the Status of Endangered Wildlife in Canada (COSEWIC)	An independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction. Members are wildlife biology experts from academia, government, non-governmental organizations and the private sector responsible for designating wildlife species in danger of disappearing from Canada.
Control point	An above grade natural gas facility consisting of a combination of above grade piping and valves that is used to control and direct the flow of natural gas within the greater pipeline network.
Cumulative effects	Incremental effects resulting from residual project effects combined with effects from past, existing, and other reasonably near future projects and activities.

Direct effect	An environmental effect that is: A change that a project may cause in the environment; or Change that the environment may cause a project. It is a consequence of a cause-effect relationship between a project and a specific environmental component.
Economic opportunities	Unique training, employment or business opportunities business or employment that enhance the economic status of individuals, communities, Indigenous Nations or regions.
Ecoregion	Characterized by distinctive regional ecological factors including climate, physiography, vegetation, soil, water and fauna.
Ecozone	An area of the earth's surface representative of large and very generalized ecological units characterized by interactive and adjusting abiotic and biotic factors.
Effects	Changes to the environment or socio-economic conditions, and the positive and negative consequences of these changes.
Effects of the environment on the project	Effects that may result from forces of nature physically interacting with a project or hampering the ability to conduct project activities in their normal, planned manner.
Engaged audiences	This includes First Nations, the Manitoba Métis Federation, and interested parties.
Flaring	The controlled combustion of natural gas with a visible flame.
Gate station	An above grade gas facility that regulates the pressure and meters the flow of natural gas moving from one pipeline to another.

Greenhouse gas	A gas that contributes to the process through which heat is trapped near earth's surface by absorbing infrared radiation, e.g., carbon dioxide and methane
Interested parties	A general term used to describe individuals or groups outside of First Nations and the Red River Métis that have the potential to provide feedback, may be affected by the project or its decisions, have a specific interest or mandate in the area, possess relevant data to share, or have the capacity to disseminate information to their membership. This term is used in place of the term stakeholder.
Leak	A failure of the pipeline in the form of pinholes or punctures, resulting in a gas leak.
Malfunction	A failure of a piece of equipment, a device, or a system to operate as intended (Impact Assessment Agency 2025).
Mitigation	Means measures to eliminate, reduce, control, or offset the adverse effects of a project, and includes restitution for any damage caused by those effects through replacement, restoration, compensation, or any other means (Impact Assessment Act, 2019).
Project engagement	A process of sharing information and seeking feedback to inform decision-making from those affected by or interested in our projects.
Purging	Purging a gas pipeline into service involves injecting an inert gas into the pipeline, followed by natural gas. The natural gas flows towards the other end of the pipe, pushing the inert gas ahead of it until the gas reaches the end of the pipe and is purged out of the pipeline. The inert gas serves as a buffer between the natural gas and ambient air, preventing air/gas mixtures from forming and reaching flammable limits.

Residual effect	An effect of a project that is predicted to remain following the implementation of mitigation measures.
Rupture	A longitude or circumferential crack, resulting in a gas leak.
Species of conservation concern (SOCC)	Species that are rare, disjunct, or at risk throughout their range in Manitoba and in need of further research. The term also encompasses species that are listed under (Manitoba) The Endangered Species and Ecosystems Act Manitoba, (federal) Species at Risk Act, or that have a special designation by the Committee on the Status of Endangered Wildlife in Canada.
Species at risk (SAR)	Is an extirpated, endangered, threatened, or species of special concern as defined by the Species at Risk Act.
Valued component	A biophysical, social, cultural, and economic element that, if altered by the project, may be of concern to regulatory agencies, First Nations people and Métis citizens, resource managers, scientists, other interested parties, and/or the public.

Acronyms and abbreviations

AOC	Area of concern
CAAQS	Canadian Ambient Air Quality Standards
CHRPP	Culture and Heritage Resources Protection Plan
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
ECCC	Environment and Climate Change Canada
FPR	Final preferred route
GDP	Gross domestic product
GHG	Greenhouse gas
GS	Gate station
HDD	Horizontal directional drilling
HRB	Historic Resources Branch
HRIA	Heritage Resources Impact Assessment
LAA	Local assessment area
LCA	Life cycle assessment
MBCA	Migratory Birds Convention Act
MBCDC	Manitoba Conservation Data Centre
MBESEA	Manitoba Endangered Species and Ecosystems Act
PIG	Pipeline inspection gauge
PDA	Project development area
PR	Provincial road

PTH	Provincial trunk highway
RAA	Regional assessment area
ROW	Right of way
RM	Rural municipality
SAR	Species at risk
SOCC	Species of conservation concern
SOP	Standard operating procedure
TAC	Transportation Association of Canada
TLE	Treaty Land Entitlement
VC	Valued component
WHMIS	Workplace Hazardous Materials Information System

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1.0 Introduction

This report outlines the environmental assessment undertaken for the proposed Neepawa gas transmission project (the project) which aims to increase natural gas transmission capacity to accommodate growing demand and support near-term developments in the Neepawa area.

The project consists of construction, operation, and decommissioning of a six-inch steel natural gas transmission pipeline and above-ground control structures at the south and north limits of the pipeline. The new pipeline will be approximately 20 km in length, beginning at a control point located approximately 22.5 km south of Neepawa and terminating at another control point located approximately 3.5 km south of Neepawa. The proposed project is described in detail in Chapter 2 (Project description) and illustrated on Map 2-1.

This introductory chapter provides information about the proponent, the regulatory framework applicable to the project, and the purpose and structure of this report.

1.1 The proponent

The proponent of the project is Centra Gas Manitoba Inc. (Centra Gas). Centra Gas is a wholly owned subsidiary of Manitoba Hydro and is the principal distributor of natural gas in the Province of Manitoba. This report has been prepared by Manitoba Hydro on behalf of Centra Gas.

Manitoba Hydro is a provincial Crown Corporation and one of the largest integrated electricity and natural gas distribution utilities in Canada. Manitoba Hydro's vision and mission are to empower Manitoba's future with affordable and reliable energy, and to meet customer's energy needs.

The energy services that Manitoba Hydro offers Manitobans rely on natural resources which are of critical importance to us all. For this reason, environmental leadership is identified as a key principle of Manitoba Hydro's business. Manitoba Hydro has developed an Environmental Management System (EMS) that aligns with ISO 14001 Standard and commits to considering the environmental impacts of their activities, products, and services in the Manitoba Hydro Environmental Management Policy (2020).

Manitoba Hydro remains committed to continuing our work on climate change and adapting our processes to ensure Manitobans' energy expectations are met in the future. Over 99% of the electricity Manitoba Hydro produces is from non-fossil generation sources and our electrical system will be required to support additional electrification in Manitoba. While reducing fossil fuel use is necessary, a key learning from Manitoba Hydro's integrated resource planning is that the strategic use of natural gas, by both industry and for home heating, supports an affordable pathway to net-zero in Manitoba.

1.2 Regulatory framework

Manitoba Hydro projects are subject to provincial and federal regulations. The following sections outline the regulatory frameworks relevant to the proposed project.

1.2.1 Provincial regulatory framework

Pipelines greater than 10 km, or located in environmentally sensitive areas, are considered Class 2 developments in the provincial Classes of Development Regulation (M.R. 39/2016). As a Class 2 development, the proposed Neepawa gas transmission project requires a licence under *The Environment Act* (Manitoba). This report forms part of Centra Gas' Environment Act Proposal in pursuit of a licence under *The Environment Act* (Manitoba).

1.2.2 Federal regulatory framework

The project is not considered a designated project under the federal Physical Activities Regulations SOR/2019-285 and therefore does not require an impact assessment under *The Impact Assessment Act* (Canada).

1.2.3 Municipal planning

The proposed project traverses the Municipality of North Cypress-Langford and is approximately 3.5 km south of the Town of Neepawa. Both the Municipality of North Cypress-Langford and the Town of Neepawa have their own municipal by-laws (laws, regulations, or rules of a local government), adopted under provisions of *The Municipal Act* (Manitoba) and *The Planning Act (Manitoba)*. Municipal by-laws have been considered, as relevant, with the environmental assessment process as presented in this report.

1.3 Purpose of the document

The purpose of this report is to support Centra Gas's application for a Class 2 development licence under *The Environment Act (Manitoba)*, to construct and operate the Neepawa gas transmission project.

For Class 2 developments, proponents are required to submit a cover letter, an Environment Act Proposal Form, an environmental assessment report, and an application fee to Manitoba Environment and Climate Change.

This report, forming part of Manitoba Hydro's Environment Act Proposal for the project, identifies and assesses the potential effects of the project and identifies the mitigation measures that will be used to address adverse environmental effects and enhance benefits associated with the project. It has been compiled in accordance with Manitoba Environment and Climate Change's Environment Act Proposal Report Guidelines (June 2023).

1.4 Environmental assessment report outline

The sections of this report that follow begin with a project description in Chapter 2.0 that discusses the various components of the Neepawa gas transmission project as well as the activities that will be undertaken during construction, operations, and decommissioning of the project.

Chapter 3.0 provides an overview of the methods used to conduct the environmental assessment for the project. This includes a description of the scope, temporal and spatial boundaries as well as how valued components were identified. Methods used to predict project effects on valued components, identify mitigation, characterize residual effects, and undertake cumulative effects assessment are also outlined in this chapter.

Chapter 4.0 describes project engagement process undertaken to date, including the purpose, goals and objectives, methods, a summary of feedback received to date, and the outcomes of that feedback.

Chapter 5.0 provides existing condition information for aspects relevant to the environmental assessment that are broad and that may apply to more than one valued component (*e.g.,* historic and cultural setting; climate; ecological setting; geology, soils, and terrain; aquatic environment; communities and population; and land and resource use).

The following chapters present the assessments of potential project effects on the valued components identified for the project including important sites (6.0), vegetation (7.0), wildlife and wildlife habitat (8.0), commercial agriculture (9.0), human health risk (10.0), economic opportunities (11.0) and infrastructure and community services (12.0). Each valued component assessment chapter begins with a summary of its conclusions. Mitigation measures are identified, and residual effects are characterized. When applicable, a cumulative effects assessment is included.

Chapter 13.0 summarizes climate and greenhouse gas assessment information related to the project, including mitigation measures for greenhouse gas emissions.

Chapter 14.0 discusses the effects of the environment on the project and Chapter 15.0 discusses unplanned events that may occur as the result of project activities (i.e., accidents and malfunctions).

Chapter 16.0 describes the environmental protection program developed for the project, including the various plans, roles, and communication protocols that will be in place to mitigate project activities and effects.

Chapter 17.0 provides a conclusion for the environmental assessment, including a comprehensive mitigation table capturing the mitigation measures that Manitoba Hydro has identified throughout this report. This mitigation table represents Manitoba Hydro's commitments related to the proposed project, if approved.

Chapter 18.0 lists the references from which information was drawn for the assessment, and the report closes with appendices.

2.0 Project description

The proposed Neepawa gas transmission project (the project) is an approximate 20 kilometre, 6-inch steel natural gas pipeline. The line will extend from a control point located approximately 22.5 kilometres south of Neepawa, running north to another control point located 3.5 kilometres south of Neepawa.

2.1 Project need and alternatives

Neepawa and surrounding areas are supplied natural gas thorough a single, 4-inch steel pipeline system with a one-way feed from the TC Energy sales tap immediately south of gate station (GS) GS-121. The area has experienced notable growth for several years. Capacity limitations with the existing pipeline and gate station, first identified in 2021, were also indicated in the 2024 hydraulic model developed by Manitoba Hydro. Investment in gas infrastructure is required to support near term approved and planned developments in Neepawa and surrounding areas.

The purpose of this project is to increase the supply of natural gas to the Neepawa area in response to growing customer demand. Key drivers of this demand include urban growth, the expansion of cereal crop production, and a shift by some users from propane to natural gas.

Alternatives considered for the project included different lengths and diameters of pipeline. Three pipe configurations were considered to meet capacity requirements:

- 19 km1 of 4-inch steel transmission pipeline,
- 16 km1 of 6-inch steel transmission pipeline, and
- 19 km1 of 6-inch steel transmission pipeline

The option of 6-inch steel transmission pipeline was selected as it properly sizes the pipe from the gas source to avoid the need for additional pipeline installation in the future as demand increases. A 19 km transmission pipeline length was selected as it accounts for forecasted growth on the periphery of Neepawa.

2.2 Scope

The project involves the construction and operation of:

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[1] Initial alternatives for the pipeline route considered “straight line” distance which measured 19 km. The proposed FPR has a straight-line distance of 19 km, but its final design distance is approx. 20 km.

- Approximately 20 km of 6-inch steel natural gas pipeline, and
- Tie-in and control points at south and north limits of the project.

2.2.1 Out of scope ancillary activities

Ancillary activities refer to activities that are outside the scope of the project but will need to be undertaken to accommodate the new gas pipeline. Applicable ancillary activities for the project include:

- Utility locates
- Geotechnical investigations within the road allowance and right-of-way
- Soil surveys
- Land surveys to establish the centerline of the proposed right-of-way, flag the edges of the proposed right-of-way, and establish the footprint for control point construction and gate station expansion

Upgrades/modifications to existing gas infrastructure, including work at gate station GS-122 which is in the Town of Neepawa.

These activities will adhere to existing provincial and municipal regulations. Any environmental damages caused during these activities will be remediated, as per Manitoba Hydro operational policies.

2.3 Design considerations

Design and construction of the project will meet or exceed standards as set out by the Canadian Standards Association (CSA Z662:23) along with Manitoba Hydro depth of cover standards.

2.4 Pipeline routing

Functionality, design optimization, construction conditions, operations and maintenance are considered when routing transmission pipelines.

Factors considered in determining the pipeline route included:

- Paralleling existing linear infrastructure in pursuit of limiting the needed new easement
- Having the shortest and most direct route possible, from the existing gate station, GS-121, to the point of tie-in to the existing 4-inch steel transmission line
- Deviating the route to avoid property and environmental features such as treelines and existing above-ground infrastructure

The proposed final preferred route (FPR) for the project is shown on Map 2-1. The FPR parallels an existing 4-inch steel transmission pipeline that is owned and operated by Centra Gas and runs north-south along Provincial Trunk Highway 5, for

13.1 km of the total 20.2 km pipeline length (i.e., 65%). There will be a separation distance of 5 m between the proposed pipeline and the existing pipeline.

The route shared during project engagement and the FPR shown on Map 2-1 are the same. As discussed in Section 2.5.1, new easement will be required for the pipeline. After Manitoba Hydro (on behalf of Centra Gas) begins the process of acquiring easements from landowners, some route adjustments may be required.

Manitoba Hydro may encounter information that could affect the proposed FPR during ongoing project engineering design and engagement activities with First Nations, the Manitoba Métis Federation, and interested parties such as landowners. Any future route adjustments contemplated by Manitoba Hydro may be the result of unforeseen engineering constraints, previously unidentified sensitive sites (*e.g.,* cultural and heritage resources, species at risk), or in response to landowner concerns. Based on experience on past projects, Manitoba Hydro expects that such potential route adjustments (*i.e.,* re-alignments) would likely be located within 250 m of either side of the FPR. Manitoba Hydro is requesting, as part of this proposal, that an area called a Mitigative Segment Development Area be considered during the province's consultation and licensing processes for the project. It is unknown at the time of this application if any adjustments to the FPR will be required, and as such, no specific potential changes have been contemplated in this assessment. Manitoba Hydro will provide additional information as an update to this assessment as required if it is confirmed that route adjustments are needed.

2.5 Pipeline right-of-way

Typically, the easement required for a pipeline right-of-way is 30 m wide, i.e., 15 m from the centreline of the pipeline on both sides. The exception to this is if the proposed pipeline would be adjacent to an existing pipeline's right-of-way, then the new easement width required can be reduced while still achieving required safety distances. If there are multiple pipelines within an easement, typically a 5 m separation distance between pipelines is required. Anticipated easement widths for the project are:

- New easement of 15 m in the area where the proposed pipeline will parallel the existing pipeline.
    - There is an existing 10 m wide pipeline easement that runs from gate station GS-121 in SE 21-12-15 W1 to the Town of Neepawa, generally along PTH 5.
    - Total pipeline easement will be 25 m, this includes 10 m existing easement and 15 m new easement. The new pipeline requires a 5 m separation distance from the existing pipeline and 15 m on the west side.
- New easement of 30 m in areas where the proposed pipeline will not parallel existing pipeline.

As the pipeline footprint will traverse privately owned lands, new easements will be required.

2.5.1 Easement procurement and compensation

This section outlines the easement and procurement process for obtaining land rights to construct and operate the gas transmission pipeline. It covers private land easement and compensation, namely land compensation, construction damage compensation, structure impact compensation, and ancillary damage compensation.

Typically, once a final preferred route for the pipeline is selected, Manitoba Hydro, on behalf of Centra Gas, begins the process of acquiring easements from landowners.

The conventional terms of the right-of-way easement agreement provide that: Centra Gas obtains the legal right to construct, operate, maintain, repair, and replace their transmission pipelines within a right-of-way. This right is obtained through easements on privately owned lands or by a Crown land reservation or pending easement for right of use on provincial Crown land.

The landowner can continue to use the land within the right-of-way (e.g., for farming, grazing, recreation, or other compatible uses) if the activity will not compromise safety requirements or hamper pipeline operation. Landowners are not permitted to plant trees, construct buildings, or place other structures within the easement area without prior approval from Centra Gas.

Manitoba Hydro personnel are permitted to enter and use the right-of-way for construction, inspection, maintenance, repair, or replacement of the gas transmission pipeline facilities.

2.5.1.1 Land compensation

Land compensation is a one-time payment to landowners for granting an easement for a transmission pipeline right-of-way. It is based on the following:

- Total land area (acres) of easement required,
- Current market value of the land (per acre), and
- Easement compensation factor, which is determined based on the location of the infrastructure (i.e., whether underground or above-ground). For underground gas transmission lines, Centra Gas's compensation factor is 100% of current market value.

2.5.1.2 Construction damage compensation

Construction damage compensation is provided to landowners who experience damage to their property due to the construction, operations, and maintenance of the pipeline. A one-time payment for construction damage is negotiated on a case-by-case basis. Centra Gas will:

- Compensate or be responsible for repairing, to the reasonable satisfaction of the landowner, any damage to a landowner's property.
- Compensate a landowner for any crop losses in areas affected by construction of the pipeline. This compensation generally considers the most recent average value of the harvested crop reported by Manitoba Agricultural Services Corporation.

Structure impact compensation is a one-time payment to landowners for any above ground infrastructure placed on land classed as agricultural. Structure impact compensation considers:

- lands permanently removed from production, determined by the size of structure constructed on the land
- reduced productivity in an area of overlap around each structure
- additional time required to manoeuvre farm machinery around each structure
- double application of seed, fertilizer and weed control in the area of overlap around each structure

2.5.1.3 Ancillary damage compensation

Ancillary damage compensation is a one-time payment that applies where Centra Gas's use of the right-of-way directly or indirectly affects property use. Ancillary damage compensation is negotiated. Landowners may be compensated for:

- agricultural effects (e.g., effects on irrigation, drainage, and aerial spraying activities)
- constraint effects, such as restricted access to adjacent lands

2.6 Project components

Project components include tie-ins to existing infrastructure, control points (i.e., valve sites), the pipeline, temporary work areas (i.e., marshalling yards, laydown areas, and other work areas), and crossings.

2.6.1 Tie-in to existing infrastructure

A gas pipeline tie-in is the process of connecting a new pipeline to an existing one by welding them together to create a safe connection where gas can flow through both pipelines in parallel.

The proposed new 6-inch steel pipeline will tie-in to the existing 4-inch pipe, approximately 15 m north of GS-121, an existing Centra Gas Manitoba Inc. gate station within legal land location SE 21-12-15 WPM (see Photos 2-1 and 2-2). Gate station GS-121 is approximately 22.5 kilometers south of the Town of Neepawa and immediately north of a TC Energy station.

Photo 2-1: Existing gate station (GS-121) in SE 21-12-15 WPM, facing northwest

Photo 2-2: Existing gate station (GS-121) in SE 21-12-15 WPM, facing southwest

2.6.1 Control points

Control points are above-grade assemblies with one or more valves that enable the control of gas flow. The dimensions of the above-grade assemblies are approximately 40 m x 50 m and 50 m x 120 m in easement area for the south and north ends of the pipeline, respectively. However, the actual assemblies themselves will be much smaller, likely only 3 to 4 square meters.

There will be two control points for the project as described below.

2.6.1.1 South end of the pipeline in SE 21-12-15 WPM

This control point will be the above grade portion of the tie-in to the existing 4-inch steel pipe within an anticipated easement area of 40 m x 50 m, and with the following components:

- Above grade piping
- Above grade valves
- Bollards to protect the control point
- Pipeline inspection gauge launcher

A pipeline inspection gauge (PIG) can clean the lines internal surface, gauge pipeline condition, gather data, and detect corrosion or imperfections while passing through the line. Photo 2-3 shows an existing control point with a PIG launcher.

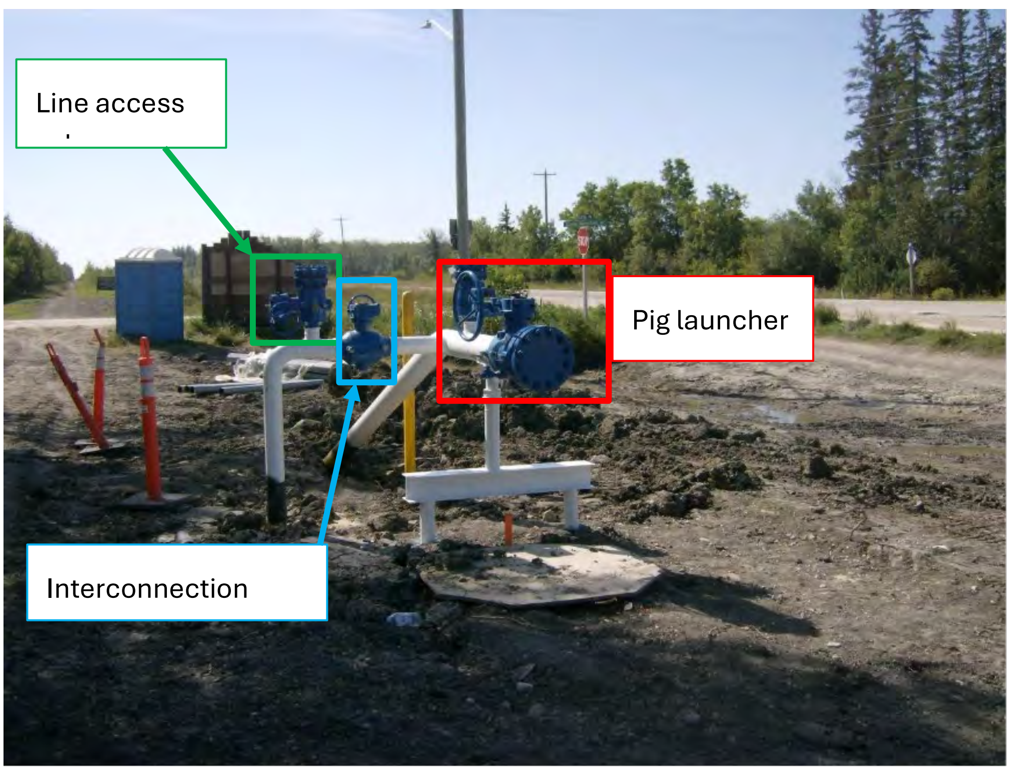


Photo 2-3: Example of a control point and PIG launcher

2.6.1.2 North end of the pipeline in SE 21-14-15 W1

This control point will be the above grade portion of tie-in to the existing 4-inch steel pipe within an anticipated easement area of 50 m x 120 m, and with the following components:

- Above grade piping
- Above grade valves
- Bollards to protect the control point

Photo 2-4 shows an existing control point with valves prior to paint application.

Photo 2-4: Example of control point with valves prior to paint application. In this example no tie-in is shown, only a control point on a single gas pipeline.

2.6.2 Pipeline

The proposed pipeline will be approximately 20 kilometres of 6-inch steel pipeline.

- The trench is typically 1.3 meters in depth to provide a minimum of one meter depth of cover.
- The pipeline location will be marked with signs at each mile road and in any location where the pipeline crosses waterways or other service roads.
- Corrosion on the pipeline will be controlled through use of pipe coating and cathodic protection.

2.6.3 Temporary work areas

Temporary work areas including marshalling yards and laydown areas will be established to store equipment and materials during construction. The location(s) will be finalized after a contractor is hired for the project.

Other temporary work areas required for construction of the project will be adjacent to the pipeline easement and will be temporary in nature.

2.6.4 Crossings

Seven types of crossings anticipated for the pipeline have been identified (see Table 2-1). In these areas, pipeline installation will be via horizontal directional drilling. Additional crossing sites may be identified during construction.

Horizontal directional drilling is a steerable trenchless method of installing underground pipe along a prescribed bore path by using a surface-launched drilling rig, with minimal impact on the surrounding area. This method is used when trenching or excavating is not practical or could result in undesirable environmental effects and is suitable for a variety of crossings including roadways, environmentally sensitive areas, and water bodies.

Table 2-1: Crossings where pipeline will be installed by horizontal directional drilling

Feature on the landscape	**Location**
Plains Midwestern Propane Pipeline	SE 21-12-15 WPM
Hwy Crossing PR 353	Between SE 33-12-15 WPM and NE 28-12-15 WPM Requires MTI crossing agreement
Hwy Crossing PR 465	Between SE 21-13-15WPM and NE 16-13-15WPM
Wet deciduous forest area	Between SE 33-13-15WPM and NE 28-13-15WPM
Brookdale Drain	NE 16-14-15 WPM
Utilities	Multiple locations
Municipal roads	Multiple locations
Driveways and accesses	Multiple locations

2.7 Project activities

This section describes the project activities that will take place during each of the construction, operation, and decommissioning phases.

2.7.1 Construction

The construction phase typically includes:

- Mobilization and staff presence
- Vehicle and equipment use
- Access development and use
- Preparing temporary work areas (e.g., marshalling yards, laydown areas)
- Right-of-way preparation (flagging, clearing of vegetation)
- Topsoil stripping
- Trenching
- Horizontal directional drilling
- Pipeline stringing, welding and lowering
- Backfilling
- Valve site connections
- Pipeline testing
- Clean-up and reclamation

2.7.1.1 Schedule

Construction is anticipated to commence in winter 2027 and would likely take up to a year to complete. Table 2-2 illustrates the anticipated construction schedule, including key construction activities.

Table 2-2: Anticipated construction schedule

Construction phase activities	**Winter 2027**	**Spring 2027**	**Summer 2027**	**Fall 2027**	**Winter 2028**
Mobilization and staff presence	■	■	■	■	■
Vehicle/equipment use	■	■	■	■	■
Access development and use	■	■	■	■	■
Temporary work areas, e.g., marshalling yards and laydown areas	■	■	■	■	■
Right-of-way preparation (survey/flagging, clearing of vegetation)	■	■	■		
Topsoil stripping		■	■	■	
Trenching		■	■	■	
Horizontal directional drilling		■	■	■	
Pipeline stringing, welding and lowering		■	■	■	
Backfilling			■	■	
Pipeline testing (pressure testing)			■	■	
Valve site connections			■	■	
Clean-up and reclamation				■	■

2.7.1.2 Mobilization and staff presence

Mobilization includes the movement of Manitoba Hydro and contractor staff, vehicles, and equipment to the job site. It also includes the presence of workers staying in the local community, and their commute to and from the work site. No construction work camps are planned for this project.

Mobilization will be ongoing throughout the construction phase as different types of equipment will be required for specific project activities like topsoil stripping, pipeline stringing, installation, and horizontal directional drilling. Based on the planned construction schedule, the workforce will range from 20 personnel to a peak workforce of approximately 100 personnel.

2.7.1.3 Vehicle and equipment use

Construction equipment may include the following:

- Materials delivery trucks and trailers
- Grader or dozer for topsoil stripping
- Drill rigs for horizontal directional drilling at crossings
- Excavators with bucket attachment for trenching
- Pipelaying crane or excavator to lower pipeline into trench
- Welding trucks and equipment
- Other smaller equipment for transportation and other minor tasks, as required

2.7.1.4 Access development

Access to the right-of-way will typically be from adjacent or intersecting roadways, existing approaches, or trails. The development of construction access routes, drainage facilities, and erosion and sediment control plans will be undertaken by the contractor, subject to provincial and municipal regulations, the project's Environment Act Licence, and the access management plan referenced in the Environmental Protection Program (see Chapter 16.0). Manitoba Hydro will secure all provincial permits as required. Manitoba Transportation and Infrastructure will be contacted for access from provincial highways.

2.7.1.5 Temporary work areas

Marshalling yards and laydown areas are temporary work areas that are required for construction projects and typically sited close to the construction area. They are used for the temporary storage of materials, tools, equipment and fuel storage associated with construction and may also be used as assembly areas.

The number and locations of such temporary work areas will be finalized after a contractor is hired for the project.

2.7.1.6 Right-of-way preparation

Preparation of the right-of-way prior to topsoil stripping may include the following:

- Surveying and flagging the right-of-way, the pipeline centreline, above grade valve sites/control points, and temporary work areas. This includes utility locates and identification of sensitive areas.
- Clearing of trees, shrubs and boulders. Vegetation clearing is scheduled to occur outside of the nesting and rearing period of birds (generally April 15 – August 31).
- Activities required to protect sensitive areas (these will be identified in the Environmental Protection Plan that will be developed for the project prior to construction)

In the event a licensing decision has not been made in a timeline that allows for the schedule above, Manitoba Hydro may seek approval from Environmental Approvals Branch to conduct right of way preparation activities in advance of a licencing decision as a mitigation measure to avoid the nesting and rearing period of birds. The total area that could be cleared for the project is less than 2.1 ha and primarily located on private lands. If approval for such pre-license clearing is not granted, Manitoba Hydro would use alternative mitigation measures such as conducting nest sweeps and applying buffers during the nesting and rearing period.

2.7.1.6.1 Topsoil stripping

On agricultural land, topsoil will be stripped in a manner to reduce mixing of topsoil with subsoil and either stored in stockpiles or windrowed along the right-of-way in locations where it will not be disturbed or contaminated. The topsoil would be stripped to the full depth of the topsoil in all excavation areas per topsoil depths identified during soil surveys that would be completed prior to construction.

2.7.1.7 Pipeline Installation

Most of the pipeline will be installed in an open-cut trench. The exception to this would be for areas such as road crossings, existing underground utilities, and water bodies where the pipe will be installed by horizontal directional drilling (see Table 2-1).

2.7.1.8 Trenching

A trench (typically 1.3 meters deep) will be excavated to provide a minimum of one meter depth of cover. The trench width would be approximately 1 metre. The trench will be deeper in places where the land varies in elevation as the pipe may not be able to bend with the contour of the land. There may also be some deeper trenching where the trenched pipe will tie into segments of pipe installed by horizontal directional drilling, and where there would be need to avoid other infrastructure or objects in the ground.

2.7.1.9 Horizontal direction drilling

Road crossings, existing underground utilities, and waterways will have pipe installed by horizontal directional drilling (Photo 2-5) to minimize ground disturbance in these areas. This technique typically involves drilling a controlled pilot hole along a predetermined bore path. After the pilot hole is complete, reaming tools are used to enlarge the bore to the desired diameter while the pipe is pulled through the enlarged hole.

Photo 2-5: Horizontal directional drill of entry/exit hole.

2.7.1.9.1 Pipeline stringing, welding and lowering

<u>Stringing</u>

Once the construction right-of-way has been sufficiently cleared and topsoil has been stripped, sections of pipe are laid out along the right-of-way. This process is called 'stringing' the pipe.

Welding

Welding will be required for pipe joints, reducers, elbows, flanges, etc., including aligning, necessary cutting, and bevelling.

Weld inspections.

Non-destructive inspection of the pipeline will be done by visual and radiographic means. Radiographic testing is used to find weld defects without damaging the pipe itself.

Coating and wrapping

Steel pipe and fittings will have coatings installed to protect them from corrosion. All buried steel valves and fittings will be externally coated and wrapped in the field using either petrolatum tape or visco-elastic tapes. A majority of the pipeline will be factory coated with a multi-layered coating system consisting of epoxies and polyethylene coatings. Welded connections will be coated with field applied sleeves.

Lowering

The pipe is lowered into the trench utilizing a pipelaying crane or excavator (see Photo 2-6).

Photo 2-6: Example of an excavated trench and lowering in steel pipe

2.7.1.10 Backfilling

After the pipeline is placed in the trench, backfilling would be completed by first placing sub-soil and then topsoil to minimize admixing. Topsoil will be contoured to promote similar grade and drainage as pre-construction conditions. Backfilling will often be completed in two stages: partial backfilling prior to pressure testing, and final backfilling after successfully pressure testing the pipe.

2.7.1.11 Pipeline testing

Once the trench has been partially backfilled and prior to putting the pipeline into service, the pipeline will be pressure-tested following Manitoba Hydro Natural Gas Standard 620.05, to test for strength and leaks. Water will be used as the test medium (i.e., hydrostatic pressure testing). The disposal of water used for testing will be conducted as per Standard 620.05 and Manitoba Hydro's Environmental Protection Plan (EPP) for the project.

The pressure test will adhere to specifications described in the engineered construction drawings. If not outlined, the minimum test pressure at any point in the pipeline shall be:

- 1.4 times the specified maximum operating pressure for the strength test
- 1.1 times the specified maximum operating pressure for the leak test
- 1.4 times the specified maximum operating pressure for a concurrent strength and leak test

Hydrostatic pressure testing will be conducted as follows:

- Before hydrostatically pressure testing the pipe, a PIG will be placed ahead of the water column during filling to prevent air pockets
- Water will be introduced into the pipe
- After the fill is complete, the pipe and test medium temperatures need to stabilize before testing begins
- When the stabilization is complete, the pressure will be brought to test pressure according to the test plan
- After testing, the pressure testing devices will be removed, and the pipe will be dewatered using a PIG and compressed air. The pipe will be dewatered in a manner that:
  - Properly captures and disposes of any fluid with a freezing point depressant
  - Discharges from the lowest end of the pipeline section
  - Uses compressed air to displace the water and utilizes a PIG to separate the air from the water

- The pipe will then be dried. Dry compressed air will be used during the drying procedure

2.7.1.12 Control points (Valve site installation)

The proposed locations of the new above grade valve assemblies (i.e., control points) in SE 21-12-15 WPM (south) and SE 21-14-15 WPM (north) are shown on Map 2-1.

Valve site installation will include the following:

Temporary bypass installation

To maintain a constant flow of natural gas in the existing 4-inch transmission pipeline, a bypass installation will be required. Welded fittings will be installed to accommodate temporary connections of pipe/hoses. This will allow the disconnection of the existing pipeline segment to permit installation of the new control point. Once the new pipeline is completed, the bypasses will be removed.

Hot tap fitting installation

Hot tap fitting installation is when a fitting is welded on a live pipeline (natural gas is present). Fittings are installed to allow for pipeline segment isolation and de-energization and commissioning (purging natural gas in or out). A hot tap fitting will be required on the existing 4-inch transmission pipeline. Photo 2-7 shows an example of hot tap fitting installation.

Photo 2-7: Example of hot tap fitting installation and bypass hoses

Compaction of subsoil

Backfill material is compacted at 6-inch lifts until reaching grade, per construction drawings.

Gravel application

Limestone gravel will be applied and graded per construction drawings.

2.7.1.13 Pipeline commissioning

After installation of the pipeline, control points and pipeline test, the pipeline is commissioned. This involves introducing gas to the pipeline and purging into service so that gas has completely filled the pipeline to the required pressure in accordance with Manitoba Hydro Natural Gas Standard 611.01.

2.7.1.14 Clean-up and reclamation

The final step in construction will be demobilizing the workforce from the project area. Demobilization includes the movement of Manitoba Hydro and contractor staff, vehicles, and equipment from the job site, as well as clean-up (and if required rehabilitation) of the right-of-way, temporary work areas, and access routes. Once the pipeline is constructed, all excess materials and equipment, including debris and unused supplies, will be dismantled, if required, removed from the site, and disposed of according to provincial and municipal regulations. Rehabilitation of any disturbed sites will be undertaken as required. All cleanup and rehabilitation activity will be subject to the requirements of the environmental protection program described in Chapter 16.0. Demobilization will be ongoing throughout construction phase as different types of equipment will be required for specific activities such as pipeline welding, horizontal directional drilling at crossings, and construction of above-ground control points.

Following pipeline and valve site installation, subsoil would be replaced, followed by topsoil and the topsoil will being re-spread and leveled in disturbed areas to allow pre-disturbance surface land use to resume. Other areas of exposed soils resulting from project construction activities, will be remediated to pre-construction conditions.

2.7.2 Operation and maintenance

The operational and maintenance phase for the project is estimated to be at least 50 years based on the pipeline's design life.

2.7.2.1 Pipeline operation

The pipeline will be designed to operate continuously, though pressure will vary with natural gas load requirements. To maintain the pipeline in a safe and reliable operating condition, regular inspections and maintenance will occur.

2.7.2.2 Vehicle and equipment use

Vehicle and equipment use during operation and maintenance may include the following:

- Passenger vehicles and smaller equipment for transportation and other minor tasks
- Material delivery trucks and trailers
- Grader or dozer for topsoil stripping
- Excavators with bucket attachment
- Hydrovac for soft digs (allows for material removal without damaging underground infrastructure)
- Drill rigs for horizontal directional drilling at crossings
- Pipelaying crane or excavator to lower pipeline into trench
- Welding trucks and equipment

2.7.2.3 Ground pipeline patrols

Once the proposed pipeline is operational, Manitoba Hydro implements an Integrity Management Program that assesses potential risk to the pipeline and specifies programs to monitor pipeline condition. This includes:

- Depth of cover surveys
- Cathodic protection monitoring
- Leak detection surveys

Depth of cover surveys

Measurements of soil cover above the pipeline are taken to assess potential risk to damaging the pipeline from erosion or typical land use activities.

Cathodic protection monitoring

Surveys are typically completed on foot by collecting data with a handheld device at predetermined intervals. The data collected assesses the effectiveness of the pipelines cathodic protection system, which protects the pipeline from corrosion.

Leak detection surveys

Inspection of entire length of the pipeline, completed on foot while using a gas detection device.

2.7.2.4 Valve operation checks

Operation and maintenance activities that will occur for the new above-grade control points include:

- Leak checks and equipment maintenance every 12-18 months
- Snow clearing of the site if necessary
- Supervisory Control And Data Acquisition (SCADA) monitoring, which is the remote control and monitoring of equipment at the site that will identify emergency situations that are occurring on the pipeline (i.e. damage to the pipeline). In the event damage has occurred, the SCADA monitoring will trigger alarms at specific low-pressure settings and the appropriate personnel will be notified to respond to the situation immediately.

2.7.2.5 In-line inspection

In-line inspection is a non-destructive examination technique used to identify defects on a pipeline. These inspections are every 5 to 15 years depending on condition of the pipeline. The process involves inserting specialized tools into the pipeline through a PIG launcher. The tools are then propelled inside the pipeline for a continuous length to a receiver. The primary inspection tool (commonly referred to as the “smart PIG”) is designed to detect both external and internal metal loss (with a focus on external corrosion) and geometric issues such as dents.

A staging area will be required near the launcher and receiver sites (typically 50 m x 50 m). The inspection process itself is generally considered non-intrusive to the land as it is performed without direct disturbance.

The in-line inspection process includes internal cleaning of the pipeline to ensure accurate results from the smart PIG. The inspection may dislodge substances typically in the form of dry powder debris. The debris is managed using filtering equipment and it is collected and disposed of at an approved waste facility.

In-line inspection using natural gas as the propelling medium involves flaring of gas to control tool speeds particularly if the normal flow rates are too low. Where nitrogen is used as the propelling medium, the pipeline must first be purged of natural gas through flaring. Flaring is the controlled combustion of natural gas, with a visible flame.

Additional work areas outside of gate station properties may be required during the inspection activities and temporary access agreements would typically be secured with landowners prior to the work as the space required is beyond normal easements.

2.7.2.6 Integrity excavations and repairs

Preventative maintenance excavations are typically performed because of in-line inspections or through routine verifications of select sites. These integrity excavations are approximately 10 m x 10 m and typically 2 m deep or less.

Excavations that result in the need to repair by pipe replacement (cutout) would involve purging (flaring) of the small section needing to be replaced.

Following completion of integrity excavations, the area is restored to its original condition as best as possible, consistent with the intended land use.

2.7.2.7 Vegetation management

Surface conditions along pipeline right-of ways are maintained to allow ready access by personnel and maintenance vehicles for maintenance and inspection. This means controlling any vegetation that would impede truck travel or prevent clear aerial visibility. A right-of-way with managed vegetation will help to identify the presence of a pipeline to the public, which forms part of a damage prevention strategy. Manitoba Hydro Natural Gas Standard 723.01 for Vegetation Management on Pipeline Rights-of-Way will be followed. Conditions will be examined and the vegetation management method employed will be tailored to right of way conditions. This may involve the use of herbicides. As this project is primarily routed through cultivated agricultural land, limited vegetation management activities are anticipated. It is anticipated that use of heribicides will be utilized at the control points on an as-needed basis.

2.7.3 Decommissioning and restoration

When the project reaches end of life or is no longer required, it will be decommissioned. It is estimated that the length of decommissioning activities will be less than one-year.

The decommissioning process aligns with the Canadian Energy Regulators "Guidance Notes for the Decommissioning Provisions under the Onshore Pipeline Regulations (OPR) (CER 2020) and typically includes the following:

Isolation

The pipeline, or segments of the pipeline, would be isolated using valves at the constructed control points.

Purging/flaring

When decommissioning, purging is done to replace natural gas with air. Natural gas will be purged rather than vented wherever possible. When purging a service line, main or pipeline out of service, natural gas shall first be conserved, secondarily, flared and as a last resort, vented.

Cap off pipeline and leave in place

Once the section of pipeline being disconnected from the system is isolated and purged, end caps are welded on either end, the pipeline will be decommissioned and left in place below-grade.

Removal of above-ground components

After dismantling the project, high value components will be removed for re-use or recycling. The remaining materials will be reduced to transportable size and removed from the site for disposal. Waste handling and disposal will be subject to Manitoba Hydro codes of practice and relevant provincial and federal legislation.

Rehabilitation

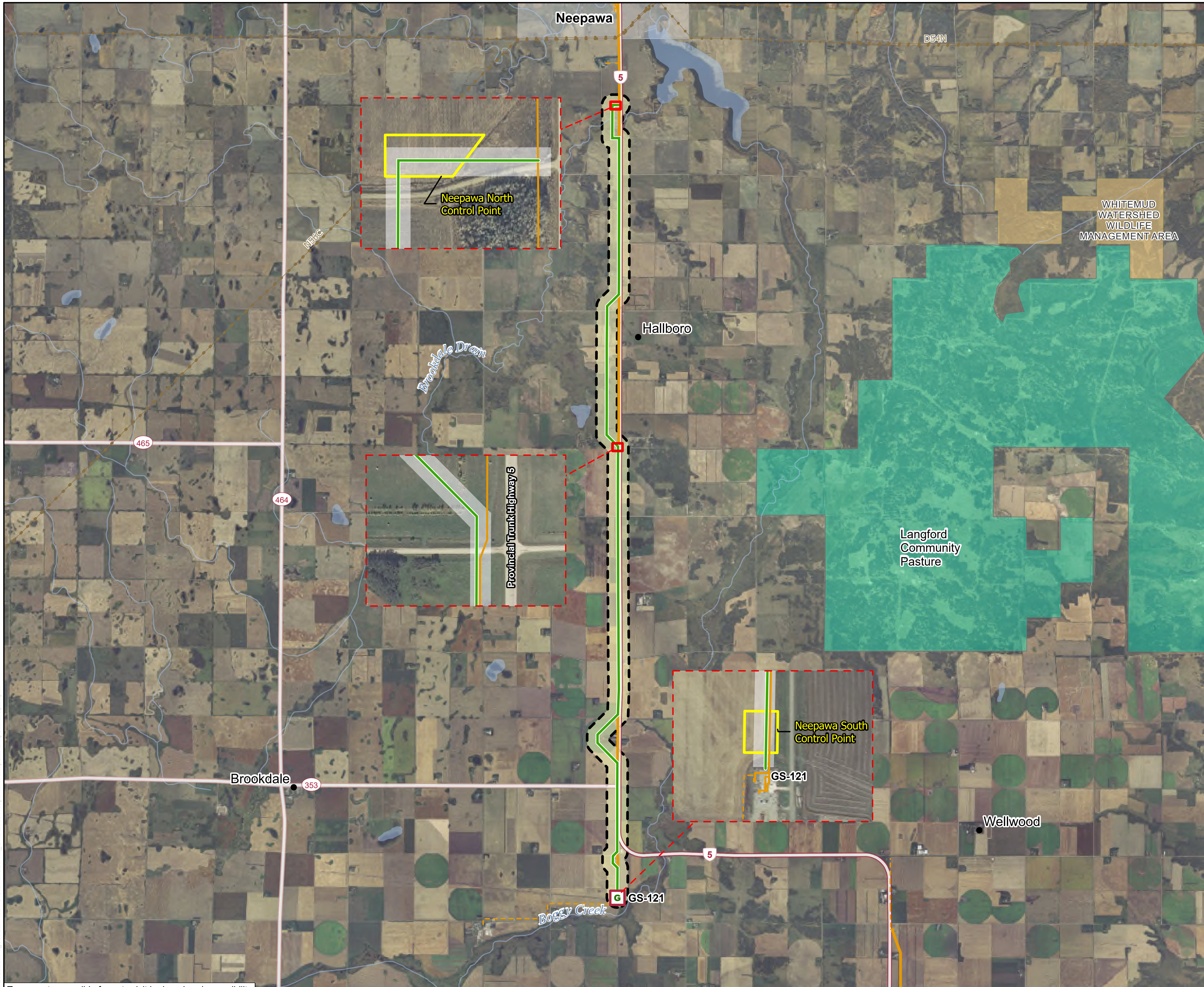
Following removal above-ground components, the area will be restored to the surrounding land use. Disturbed areas will be graded to original contours and the soils will be restored to a condition consistent with the intended land use. Disturbed areas will be rehabilitated consistent with the rehabilitation and invasive species management plan developed for the project. This will include the restoration of access areas along the right-of-way.

Clean-up and demobilization

Clean up and reclamation will generally be done as described in Section 2.7.1.14 (Clean-up and reclamation). Excess materials and equipment, other than what is capped and left in place, will be removed, and disposed of according to provincial and municipal regulations.

2.8 Funding

The project will be funded by Centra Gas Manitoba Inc.



Neepawa Gas Transmission Project

Project Infrastructure

- Final Preferred Route
- Project Development Area
- Above-Grade Easement Control Point

Mitigative Segment Development Area

- Mitigative Segment Development Area (250 m buffer around FPR)

Existing Infrastructure

- Gate Station
- Transmission Pressure Natural Gas Line
- Existing Natural Gas Pipeline
- Existing ≤230kV Transmission Line

Landbase

- Community
- Provincial Trunk Highway
- Provincial Road
- Railway
- Community Pasture
- Wildlife Management Area
- City/Town

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 16, 2025

0 2 4 Kilometres
0 1 2 Miles
N
1:90,000

Neepawa Gas Transmission Project Components

Map 2-1

3.0 Environmental assessment methods

This chapter describes the methods used for assessing the project's potential effects.

Effects are changes to biophysical, socio-economic, or cultural conditions of the environment and the positive and negative consequences of these changes.

To determine potential effects, the environmental assessment process progressed through the following steps:

- Scoping the project and the assessment (i.e., selecting valued components and defining spatial and temporal boundaries)
- Identifying project interactions with the environment
- Determining pathways of effects
- Developing mitigation
- Characterizing residual effects
- Assessing cumulative effects
- Determining significance of effects
- Developing follow-up and monitoring programs

In addition to describing the methods employed during each step, this chapter explains how the environmental assessment process is documented within this report.

The methods described in this chapter were informed by regulatory requirements and past and ongoing Manitoba Hydro assessments and initiatives. The environmental assessment approach was structured to meet the requirements of The Environment Act (Manitoba)'s Licensing Procedures Regulation (M.R. 163/88), Manitoba's Information Bulletin - Environment Act Proposal Report Guidelines (Government of Manitoba 2023), and considered feedback from project engagement on this project and past projects. The approach for assessment of cumulative effects was informed by the Policy Framework for Assessing Cumulative Effects under the Impact Assessment Act (Government of Canada 2023).

3.1 Scope

Scoping aims to focus the environmental assessment of a proposed project on relevant issues and concerns and establishes the boundaries of the assessment.

Scoping involves defining both the proposed project and the environmental assessment methodology, including identifying valued components to be studied, the geographic areas and timescales over which potential effects will be studied, and the thresholds of change to be used to make determinations about the significance of predicted residual effects.

Scoping the environmental assessment was an iterative process. Manitoba Hydro adjusted the scope as new information was learned or became available.

3.1.1 Project scope

The project scope is defined by the components that make up the project and the activities occurring throughout the project lifecycle that have the potential to result in environmental effects.

The scope of the proposed project is described in Chapter 2.0 (Project description) and includes construction, operation, and decommissioning of the following components:

- Approximately 20 km of 6-inch steel natural gas pipeline
- Tie-in and control points at south and north limits of the project.

Project activities, also described in Chapter 2.0 (Project description), include the following:

- Construction:
  - Mobilization and staff presence
  - Vehicle and equipment use
  - Access development
  - Temporary work areas, e.g., marshalling yards, laydown areas
  - Right-of-way preparation, including flagging, clearing of vegetation, topsoil stripping
  - Pipeline stringing, including welding and coating
  - Pipeline installation by trenching and lowering into place
  - Horizontal directional drilling
  - Pipeline testing (hydrostatic pressure testing of pipeline, x-ray)
  - Backfilling and contouring
  - Control points where valves will be installed
  - Valve site connections
  - Clean-up and demobilization
- Operation and maintenance:
  - Presence of pipeline, gate station, and control points
  - Vehicle and equipment use
  - Ground pipeline patrols
  - Valve operation checks
  - Vegetation management

- Maintenance activities including in-line inspections (e.g., using pipeline inspection gauges [PIGs]) and integrity digs
- Decommissioning:
  - Mobilization and staff presence
  - Pipeline disconnection (isolating, purging/flaring, capping, and leaving in place)
  - Removal of above-ground components
  - Rehabilitation
  - Cleanup and demobilization

Chapter 2.0 (Project description) also describes activities that are not within the scope of the project or the assessment as well as alternatives considered prior to identifying the proposed project as Manitoba Hydro's preferred solution to meet the need driving the project.

3.1.2 Valued components

The environmental assessment presented in this report focuses on project-related environmental effects on valued components (VCs) identified as relevant to this project.

Valued components are biophysical, social, cultural, and economic elements that, if altered by the project, may be of concern to regulatory agencies, First Nations people, Red River Métis citizens, resource managers, scientists, other interested parties, and/or the public.

The following factors influenced the selection of VCs for this assessment:

- VCs adopted for previous environmental assessments and the feedback received about those assessments
- The professional judgment of the environmental assessment team in considering the proposed project components and activities, characteristics of the environmental setting, and regulatory requirements
- Engagement feedback from regulators, First Nations and their members, the Manitoba Métis Federation and Red River Métis citizens, landowners, interested parties, and the public on this project and past projects

Based on the above factors, seven VCs were selected for this assessment:

1. Important sites
2. Vegetation
3. Wildlife and wildlife habitat
4. Commercial agriculture

5. Human health risk
6. Economic opportunities
7. Infrastructure and community services

This report includes one chapter for each of the VCs (Chapters 6.0 – 12.0). The structure of each of the VC assessment chapters, which includes VC-specific scoping considerations, is described in Section 3.3.

3.2 Existing conditions

Before assessing project effects, it is necessary to understand the baseline conditions of the environment in which the project is proposed to take place. Existing conditions relevant to the assessment of potential project effects are based on data collected during desktop analysis, field studies, and project engagement in relation to specific spatial assessment boundaries.

In this assessment, existing conditions are described in two places:

- Existing conditions broadly relevant to the assessment or that relate to more than one VC are included in Chapter 5.0 (Environmental setting).
- Existing conditions directly relevant to a specific VC are described in the individual VC assessment chapters (Chapters 6.0 – 12.0).

In many cases, existing conditions expressly or implicitly include environmental effects that may be or may have been caused by other past or ongoing projects or activities. In focusing the assessment on VCs, the description of existing conditions is at a level of detail and scope that supports the assessment of environmental effects attributable to the project.

3.3 Assessment of project effects

An assessment of project-related environmental effects and cumulative effects was undertaken for each VC using a standard framework. Each VC chapter follows a standard format, covering each of the following topics:

- Scope of the assessment
- Existing conditions
- Assessment of project effects
- Assessment of cumulative effects
- Determination of significance of project and cumulative effects
- Prediction confidence
- Follow-up and monitoring
- Sensitivity to future climate change scenarios

3.3.1 Scope of each VC assessment

Each VC assessment chapter starts by defining the VC in the context of the assessment and explaining why it was chosen as a VC. The scope of each VC assessment is defined by describing the regulatory and policy setting, spatial and temporal boundaries, and VC-specific feedback from project engagement that informs the assessment.

The VC-specific scope sections also present the effects and effects pathways the assessment focuses on, and defines the measures and thresholds used to characterize residual effects and determine whether effects are deemed significant.

3.3.1.1 Regulatory and policy setting

Each VC chapter includes a description of federal and provincial laws, regulations, policies, and guidelines relevant to consider in the assessment of project effects to the VC. Manitoba Hydro policies may also be included.

3.3.1.2 Engagement feedback

A summary of engagement feedback specific to each VC, as applicable, is included. Each VC chapter also describes how the feedback from engagement influenced the scope of the assessment.

3.3.1.3 Spatial boundaries

Three spatial boundaries are defined for the assessment of potential project effects based on the geographic extent over which project activities and their effects on individual VC are anticipated to occur.

<u>Project development area</u>

The project development area (PDA) encompasses the anticipated area of physical disturbance associated with construction, operation, and decommissioning of the project components as described in the project description (Chapter 2.0).

The PDA is the same across all VCs.

<u>Local assessment area</u>

The local assessment area (LAA) encompasses the area where immediate or direct effects from a project’s components and activities are predicted to occur.

The definition of the LAA may vary by VC and is provided in each VC chapter.

Regional assessment area

The regional assessment area (RAA) is the area where residual environmental effects from project activities and components may interact cumulatively with the residual environmental effects of other past, present, and known, certain, or reasonably foreseeable future projects/physical activities.

The definition of the RAA may vary by VC and is provided in each VC chapter.

Summary of VC-specific spatial boundaries

Table 3-1 presents the LAA and RAA boundaries defined for each VC assessed in this report.

Table 3-1: Summary of VC-specific spatial boundaries

Valued component	**LAA**	**RAA**
Important sites	1 km buffer around the PDA	5 km buffer around the PDA
Vegetation	1 km buffer around the PDA	15 km buffer around the PDA
Wildlife and wildlife habitat	1 km buffer around the PDA	15 km buffer around the PDA
Commercial agriculture	Quarter sections of land traversed by the PDA	Administrative boundaries of the Municipality of North Cypress-Langford
Human health risk	1.5 km buffer around the PDA	Administrative boundaries of the Municipality of North Cypress-Langford and the Town of Neepawa
Economic opportunities	Administrative boundaries of the Municipality of North Cypress-Langford and the Town of Neepawa	
Infrastructure and community services	Administrative boundaries of the Municipality of North Cypress-Langford and the Town of Neepawa	

3.3.1.4 Temporal boundaries

Three temporal boundaries are used throughout this environmental assessment report to identify when project-related effects may occur. The temporal boundaries are based on the timing and duration of project activities across the project's lifecycle.

The temporal boundaries used in this assessment are the same across all VCs.

Construction

Project construction is anticipated to commence in winter 2027 and take approximately 12 months to complete.

Operation

The project is anticipated to be in service in by the end of 2027.

Once operational, the project is anticipated to last at least 50 years based on the design standards.

Decommissioning

Decommissioning would occur at the end of the serviceable life of the project (50 years or more into the future) and is anticipated to take approximately one year.

3.3.2 Interactions between the project and valued components

Project components and activities with the potential to interact with components of the existing environment through the construction, operation, and decommissioning phases were identified. The environmental assessment team then considered potential interactions between project activities and each VC individually.

Table 3-2 presents an interactions matrix identifying potential interactions between project activities and the VCs selected for the project. For each VC, the potential interactions identified in the interactions matrix (*i.e.,* marked with an 'X') are assessed within that VC's respective assessment chapter. Each project activity included in the matrix is described in Chapter 2.0 (Project description).

Table 3-2: Project valued components and project activity interactions matrix							
Project activity	**Valued components**						
	Important sites	Vegetation	Wildlife and wildlife habitat	Commercial agriculture	Human health risk	Economic opportunities	Infrastructure and community services
Construction of pipeline and control points							
Mobilization and staff presence	X	-	X	-	X	X	X
Vehicle and equipment use	X	X	X	X	X	X	X
Access development and use	X	X	X	X	-	-	-
Temporary work areas (e.g., marshalling yards, laydown areas)	X	X	X	X	-	-	-
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	X	X	X	X	-	-	-
Pipe stringing (including welding, coating)	X	-	X	X	-	-	X
Pipe installation – trenching and lowering	X	-	X	X	X	-	-
Horizontal directional drilling	X	-	X	X	X	-	X
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-	X	X	-	-	-
Backfilling and contouring	X	-	X	X	X	-	-
Control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	X	-	X	X	-	-	-
Clean-up and reclamation	X	X	X	X	-	-	X
Operation and maintenance of pipeline and control points							
Presence of pipeline and control points	X	-	-	X	-	-	-
Vehicle and equipment use	X	X	X	X	X	X	X

Table 3-2: Project valued components and project activity interactions matrix

Project activity	Valued components						
	Important sites	Vegetation	Wildlife and wildlife habitat	Commercial agriculture	Human health risk	Economic opportunities	Infrastructure and community services
Maintenance activities, including inline inspections using pipeline inspection gauges (PIGs) and integrity digs	X	X	X	X	X	X	X
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	X	X	X	-	-	-
Valve operation checks (annually)	-	X	X	-	-	-	-
Vegetation management	X	X	X	-	X	-	-
Decommissioning of pipeline and control points							
Mobilization and staff presence	X	-	X	-	X	X	X
Vehicle and equipment use	X	X	X	X	X	X	X
Pipeline disconnection (Isolate, purge, and cap off below grade)	-	-	X	X	X	-	-
Removal of above-ground components (dismantling, removal from site, disposal)	X	-	X	X	-	-	X
Rehabilitation	X	X	X	X	-	-	-
Clean-up and demobilization	X	X	X	X	-	-	X

Key: Interaction = X No interaction = -

3.3.3 Effects pathways

Following the identification of interactions between the project activities and VCs, each VC assessment continues with a description of the effect pathways through which the interactions between project activities and the existing environment may result in environmental effects on the VC. The term effect pathway refers to the cause–effect linkage between a project and components of the human or natural environment. Effect pathways can be direct or indirect.

Once effect pathways are identified, one or more parameter(s) are selected to facilitate quantitative and/or qualitative assessment of residual project effects and residual cumulative effects. The amount of change in these parameters is used to characterize the environmental effects and to assist in evaluating their significance.

Where practical, these parameters are measurable and quantifiable (*e.g.,* direct habitat loss or the expected number of workers anticipated to move into the area for project construction).

Measurable parameters provide an objective means to characterize change in a VC attributable to the project. However, some effects lack defined measurable parameters and are therefore assessed using qualitative categories defined based on scientific literature, professional judgement, engagement input, and past project experience.

3.3.4 Mitigation of project effects

Mitigation measures are features of a project intended to eliminate, reduce, control or offset the adverse effects of a project.

Routing, strategic placement of above-grade structures, and administrative aspects such as timing or duration of project activities are the primary means for mitigating project effects (*i.e.,* through avoidance of effects where possible).

Beyond the above-mentioned primary mitigations, additional mitigation measures have been identified to reduce or eliminate potential adverse effects and/or enhance potential positive effects of the project on each VC. These measures include site-specific and established general protection measures and practices, compliance with legislation, regulations, and guidelines, and planning considerations applicable to the project.

Mitigation measures are identified in each VC-specific effects assessment chapter.

Table 17-1 in Chapter 17.0 (Conclusion) provides a comprehensive record of mitigation measures identified throughout this report. This mitigation table represents Manitoba Hydro’s commitments related to the proposed project, if approved.

3.3.5 Characterizing residual effects

A residual effect is an effect of a project predicted to remain following the implementation of mitigation measures.

Residual effects are characterized for each VC, after considering how the application of proposed mitigation will avoid or reduce the potential effect. Residual effects are characterized using the following terms with specific criteria defined for each VC in the VC assessment chapters (Chapters 6.0 – 12.0):

Direction: the long-term trend of the residual effect (i.e., positive, adverse, neutral)

Magnitude: the amount of change in a residual effect for a VC relative to its existing conditions (i.e., low, moderate, high)

Geographic extent: the geographic area in which a residual effect occurs (i.e., PDA, LAA, RAA)

Duration: the time until the residual effect can no longer be measured or otherwise perceived (i.e., short-term, medium-term, long-term)

Frequency: how often the residual effect occurs during the project or in a specific phase (i.e., single event, irregular events, multiple regular events, or continuous)

Reversibility: refers to whether the residual effect on a VC can be reversed once the physical work or activity causing it ceases (i.e., reversible, irreversible)

A summary of the characterization of residual environmental effects is provided in each VC chapter.

3.4 Assessment of cumulative effects

Provincial environmental assessment guidelines do not require the undertaking of cumulative effects assessment for Class 2 developments. However, an assessment of cumulative effects is included in the assessment for each identified VC, as applicable considering:

- Manitoba Hydro’s utility footprint across the province
- feedback shared during engagement on past projects about interests in considering cumulative effects
- similar approach followed for environmental assessments of other recent Manitoba Hydro Class 2 transmission projects

Cumulative effects are incremental effects resulting from residual project effects combined with effects from past, existing, and other reasonably near future projects and activities.

To conduct a cumulative effects assessment, past, present, and reasonably foreseeable projects that may overlap spatially and temporally with those of the project are identified. The project's contribution to the cumulative effect is then evaluated. Within this process, it is acknowledged that the effects of past and current projects inherently contribute to baseline conditions upon which project effects are assessed.

Two conditions must be met to initiate an assessment of cumulative effects on a VC:

- There are predicted adverse residual project effects on the VC.
- The adverse residual project effects on a VC could act cumulatively with the residual effects of other past, present, and reasonably near future projects or physical activities on the same VC.

If both conditions are met, then the assessment of cumulative effects is undertaken and documented within the effects assessment chapter of the VC, following the assessment of project residual effects. Where a cumulative effects assessment is completed for a VC, the focus is on those other projects and physical activities that could result in similar residual effects to those being considered for the project.

3.4.1 Project/activity inclusion list

The project/activity inclusion list provided in Table 3-3 identifies known past, present and reasonably near future projects and physical activities with potential residual environmental effects that could overlap spatially and temporally with the residual environmental effects of the Neepawa gas transmission project.

Reasonably near future projects considered in the cumulative effects assessment include those that are publicly announced (with adequate descriptive detail), currently in a regulatory approval process, or under construction. To identify these projects, Manitoba Hydro reviewed the Manitoba Environment and Climate Change Public Registry and gathered information through the project engagement process, which included inquiring with municipal authorities about ongoing and potential future projects taking place within their jurisdictions.

Map 3-1 illustrates the general locations of the projects and activities in the inclusion list for the environmental affects assessment (*i.e.,* the projects and activities in Table 3-3), including the reasonable near future projects identified as well as those existing and ongoing projects and activities that have involved the placement of infrastructure across the landscape including roads, railways, electric and natural gas transmission and distribution lines.

Table 3-3: Project and activity inclusion list

Project / activity	Description of project /activity	Potential effects
Past and ongoing projects and activities		
Domestic resource use activities	Hunting, fishing, trapping, non-commercial agriculture, and other domestic resource use activities have been undertaken and continue throughout the regional assessment area.	Potential effects include pressure on local wildlife populations.
Recreational activities	Recreational activities (e.g. various sports and leisure activities) continue throughout the regional assessment area.	Potential effects include noise.
Industrial and commercial resource use activities	Industrial activities (e.g. potato processing) and commercial activities, including commercial agriculture (*e.g.,* cropping, livestock operations, irrigation, and aerial spraying) have been occurring in the regional assessment area for over a century, and will continue.	Potential residual effects include: • Vegetation clearing, loss of habitat for wildlife, habitat fragmentation, increased mortality • Noise and dust
Existing infrastructure (non-Manitoba Hydro)	Infrastructure, including roads, railways, telecommunication lines, pipelines, water treatment facilities, and wastewater treatment facilities, have been developed across the regional assessment area for over a century and will continue.	Potential residual effects include: • Loss of agricultural land • Inconvenience, nuisance and increased production costs associated with operating farming equipment around structures. • Compromised biosecurity for croplands and livestock operations • Risk of disturbing unknown heritage resources due to ground disturbance during construction
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	Hydroelectric transmission lines totalling 133 km Hydroelectric distribution lines (including sub-transmission lines) totalling 926 km Natural gas transmission pipelines totalling 50 km Natural gas distribution pipelines totalling 46 km	Potential residual effects include: • Loss of habitat for wildlife, habitat fragmentation, increased mortality • Noise and dust • Loss of agricultural land • Inconvenience, nuisance and increased production costs associated with operating farming equipment around structures. • Compromised biosecurity for croplands and livestock operations • Risk of disturbing unknown heritage resources due to ground disturbance during construction
Residential and institutional developments	Residential subdivisions and institutions have and continue to be developed in the regional assessment area.	Potential effects include vegetation clearance, loss of habitat for wildlife, habitat fragmentation, increased mortality, noise, dust and, increased demand for services.

Table 3-3: Project and activity inclusion list

Project / activity	Description of project /activity	Potential effects
Future projects and activities		
Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony	Proposed construction of a new domestic wastewater lagoon and livestock slaughter facility for Sprucewood Colony that would be located at NE 17-12-15 WPM, in the Rural Municipality of North Cypress – Langford. The location of the proposed lagoon is approximately 2 km southwest of the southern control point (*i.e.,* the initiation point) of the project.	Potential effects include: • Diminished surface water quality in Boggy Creek into which treated effluent from the proposed lagoon would be discharged • Diminished air quality for part of the year due to odour from the lagoon
Residential and institutional developments	During project engagement, the Town of Neepawa shared that new residential subdivisions and institutional developments are proposed and may have schedules that overlap that of the project. Details about specific proposed future developments were not yet available at the time this environmental assessment report was prepared.	Potential effects could include: • Reduced availability of short-term accommodation • Short-term strain on health and emergency response services • Increased traffic and strain on transportation infrastructure • Strain on solid waste management facilities

3.4.2 Pathways for cumulative effects

The assessment of each cumulative environmental effect begins with a description of the residual adverse project environmental effects and an analysis of the pathways through which such effects could interact with the residual effects from other projects and activities.

3.4.3 Mitigation of cumulative effects

Mitigation measures that can reduce the project cumulative environmental effects are described, with focus on those measures that are under Manitoba Hydro's control and would help to reduce the interaction of residual project effects with the effects from other projects and activities.

Manitoba Hydro will share information and knowledge with other proponents through this environmental assessment report which will be filed with the provincial regulator as part of the Environment Act Proposal. In developing mitigation measures for adverse cumulative effects, it is typically not feasible (or appropriate) for one proponent to manage effects in an area developed by several other proponents. It is the primary responsibility of a given proponent to manage their own projects.

3.5 Determination of significance of project and cumulative effects

The determination of significance involves assessing the predicted residual project and cumulative effects against established threshold criteria for each VC. Where residual and cumulative effects exceed threshold criteria, the associated effects are considered significant.

The thresholds are defined with consideration for regulatory requirements, standards, objectives, or guidelines applicable to individual VCs. Where thresholds are not set by guidelines or regulations, a threshold is developed using the measurable parameters established for the VC, along with professional judgement and previous experience assessing project effects on the VC.

The significance determination focuses on residual and cumulative adverse effects. If positive or neutral residual or cumulative effects are identified, they are not assessed for significance.

The assessment also provides a determination of significance for the project's overall residual effects and overall cumulative effects after the implementation of mitigation measures identified in the environmental assessment and captured in Chapter 17.0, Table 17-1.

3.6 Prediction confidence

The determination of significance of residual project environmental effects and residual cumulative environmental effects includes a discussion of the level of confidence in the prediction. Confidence in the prediction is based on certainty relative to the following:

- The quality and quantity of data used for the assessment, data limitations, and understanding of the effect pathways
- The anticipated effectiveness of the proposed mitigation measures

3.7 Follow up and monitoring

Follow-up and monitoring activities are intended to verify the accuracy of the environmental assessment, assess the implementation and effectiveness of mitigation and the nature of the residual effects, and to manage effects adaptively if required.

The framework for implementation, management, monitoring, and follow-up of environmental protection measures during construction and operational maintenance activities is provided by Manitoba Hydro's environmental protection program (see Chapter 16.0). As part of this assessment, three types of monitoring are considered:

1. Inspection monitoring during construction and maintenance activities in pursuit of verifying adherence to mitigation measures.
2. Valued component monitoring that is proposed in pursuit of better understanding potential project effects and effectiveness of mitigation measures.
3. Indigenous monitoring, where Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.

During construction and maintenance activities, inspection monitoring will be undertaken by Manitoba Hydro to ensure the appropriate implementation of mitigation measures. The need for and description of VC-specific biophysical or socioeconomic follow-up and monitoring activities (*e.g.*, monitoring change in wildlife habitat availability) during project operation, if applicable, is presented in each VC chapter. Indigenous monitoring is discussed briefly in the important sites VC.

3.8 Greenhouse gases and climate change

The *Environment Act* proposal report guidelines (Government of Manitoba 2023) require discussion of climate change implications including a greenhouse gas inventory calculated according to guidelines developed by Environment Canada

(Environment Canada 2021) and the United Nations (IPCC 2019). Climate normals and trends are provided in Chapter 5.0 (Environmental setting), while Chapter 13.0 provides details on climate change and the greenhouse gas inventory for the project.

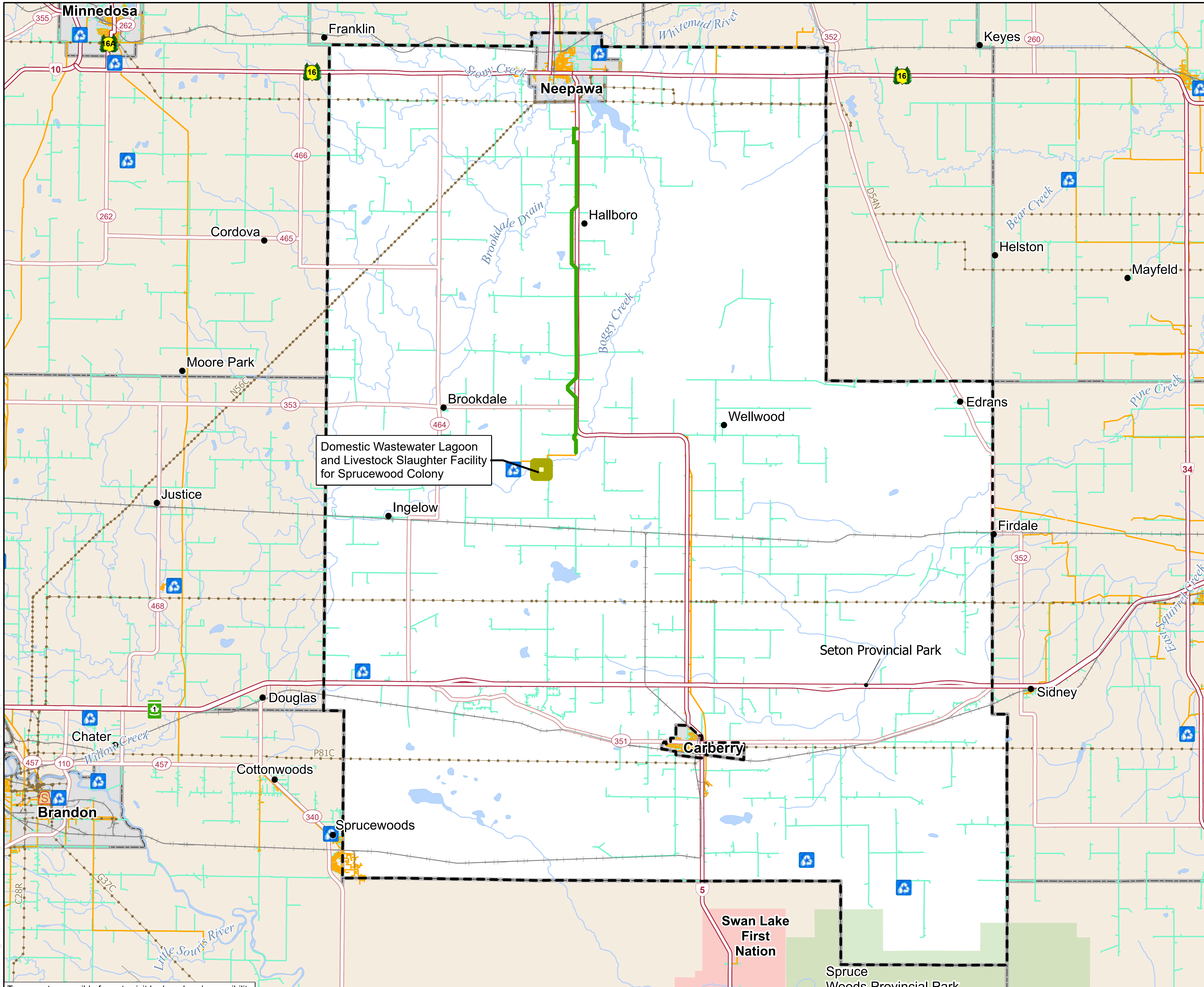
3.9 Effects of the environment on the project

The assessment includes an evaluation of effects that may occur because of the environment acting on the project. Potential environmental changes and hazards may include wind, severe precipitation, ice storms, flooding, grass and forest fire, or tornados. The influence of such environmental changes and hazards on the project will be discussed as well as the measures taken to avoid potential adverse effects. The effects of the environment on the project are presented in Chapter 14.0.

3.10 Accidents and malfunctions

As part of the assessment, potential accidents and malfunctions that might occur in connection with the project are identified and considered. This part of the assessment provides an initial basis for the development of emergency response planning. For each accident or malfunction considered, a possible scenario regarding how the event might occur during the life of the project is developed. Details on the types of accidents and malfunctions considered and the scenarios developed are discussed in Chapter 15.0.

Potential environmental effects on VCs resulting from accidents and malfunctions are assessed in a similar fashion to project environmental effects, including characterization using the same terms, prescribing mitigation measures, and determining significance of the effect using the same thresholds used for other project effects.



Neepawa Gas Transmission Project

Project Infrastructure
- Final Preferred Route

Projects in the Cumulative Effects Assessment
- Project in Cumulative Effects Assessment

Existing Infrastructure
- Solid Waste Site
- Wastewater Treatment Facility
- TransCanada Highway
- Yellowhead Route
- Provincial Trunk Highway
- Provincial Road
- Railway
- Existing ≤230kV Transmission Line
- Existing 500kV Transmission Line
- Natural Gas Transmission and Distribution Line
- Electrical Distribution Line

Assessment Area
- Regional Assessment Area

Landbase
- Community
- Provincial Park
- First Nation Lands
- City/Town

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

0 5 10 Kilometres
0 2.5 5 Miles

1:220,000

Existing and Future Infrastructure Considered in the Cumulative Effects Assessment

Map 3-1

4.0 Project engagement

This chapter provides an overview of the project engagement process Manitoba Hydro undertook for the Neepawa gas transmission project and includes sections about the following topics:

- Goal and objectives of engagement
- Approach to engagement
- Identification of engagement audiences
- Role of engagement in decision-making
- Communication methods
- Engagement methods
- Engagement feedback
- How feedback influenced project decisions
- Ongoing engagement

Participation, feedback, and shared perspectives have helped inform this environmental assessment report and have supported us in making project decisions.

4.1 Goal and objectives of engagement

Our goal with engagement is to understand and consider concerns and interests in project decisions, while building lasting relationships.

To achieve our engagement goal for the project, our objectives included:

- Fostering early and ongoing relationship-building with engaged audiences.
- Keeping engaged audiences informed with clear and accessible communication throughout the engagement process.
- Engaging audiences early and providing opportunities for ongoing participation throughout the project.
- Adapting engagement approaches based on audience needs and feedback.
- Using multiple methods of engagement tailored to audience preferences.
- Sharing how feedback and knowledge influence decision-making processes, providing opportunities for engaged audiences to share feedback throughout the project lifecycle, and working to resolve concerns that arise.
- Building long-term relationships through openness, honesty, and meaningful engagement.

In the context of engaging directly with First Nations and the Manitoba Métis Federation (MMF) we understand meaningful engagement means seeking, discussing, and carefully considering the views of others in a timely manner, and working to weave in ceremony, cultural values, Indigenous knowledges, Indigenous laws, and/or protocols throughout. We also recognize that the definition of meaningful engagement may vary depending on the audience.

Our engagement process is separate from any Section 35 Crown consultation process that may be initiated by the Province of Manitoba. We understand that the Crown may rely on the engagement activities and feedback generated through our engagement process to inform their consultation process. We sought to undertake a meaningful engagement process with the understanding that it may support the Province of Manitoba in fulfillment of their duty.

4.2 Approach to engagement

Through engagement, we worked to provide a variety of opportunities to share information and engage on the project. We recognized that different audiences have different preferences and levels of comfort with how and when they would like to be engaged.

Prior to initiating engagement, we developed an engagement strategy and plan that would remain adaptive and responsive to the feedback and preferences we learned from engaged audiences. The strategy sets the framework for respectful, inclusive, and transparent engagement, establishing clear objectives and responsibilities. The engagement plan provides detailed, dynamic information about engagement activities. The plan outlines which audiences are engaged, when, and how, supporting a structured yet adaptable approach to participation.

Our engagement approach was influenced by several legislative Acts, guidelines, principles, standards, and beneficial practices. Examples include but are not limited to: Manitoba's *Environment Act*; Canada's Principles and Guidelines for Public Engagement; Canada's Principles respecting the Government of Canada's relationship with Indigenous peoples; Articles of the United Nations Declaration on the Rights of Indigenous Peoples; Manitoba's Path to Reconciliation Act; as well as the International Association for Public Participation (IAP2)'s core values and public participation spectrum. Manitoba Hydro uses tools and techniques for engagement that are informed and guided by best practices, lessons learned from previous projects, and input and feedback from those participating in our engagement processes.

We recognize that what is considered meaningful may vary by engagement audience. In the pursuit of meaningful engagement, we prioritized the following principles:

- **Respectful:** Acknowledge the potential project's impacts and approach conversations with an open mind, not a predetermined solution. Listen to understand, genuinely engage, and be open to adjusting plans based on input. Be sensitive to historical issues and conscious of individual backgrounds, cultures, beliefs, and traditions.
- **Transparent:** Be open and honest, helping engaged audiences understand the scope, potential impacts, and their level of influence so they can decide how involved they want to be. Be upfront about what they can and cannot influence, and why.
- **Proactive:** Identify audiences to engage and plan for engagement early in the decision-making process, allowing for timely and meaningful engagement. Strive to be informed, responsive, and timely in our communications.
- **Inclusive:** Make participation easy and convenient, being mindful of potential barriers to participation. Seek out and show value for diverse perspectives, including those from hard-to-reach or underrepresented groups.
- **Accountable:** Report back on how input was considered and influenced the decision, providing rationale if input did not lead to changes. Provide regular updates and a direct point of contact for inquiries.
- **Trust-building:** Demonstrate genuine interest in and care for perspectives. Be consistent and strive to build trust in the engagement and decision-making processes, even if outcomes are not favorable. Create opportunities for ongoing dialogue once specific engagement activities have ended.
- **Flexibility:** Recognize that a one-size-fits-all approach is not effective. Consider how different engaged audiences prefer to participate and adapt to unique circumstances, expectations, and preferences.
- **Continuous evaluation:** Evaluate engagement activities, document successes and opportunities for improvement, and share this information internally with those who could benefit from it.
- **Accessibility:** Foster inclusion, value diversity, and remove barriers in engagement activities by developing communication and engagement processes that are inclusive and considerate of the diverse needs and abilities of audiences. Offer accessible formats upon request, provide accommodations as needed, and adopt inclusive practices to promote equitable participation in engagement activities.

The following sections outline the engagement methods and activities we undertook to work to achieve the engagement goal and objectives on the Neepawa gas transmission project.

4.3 Identification of engagement audiences

4.3.1 Project area considerations

Manitoba Hydro operates throughout Manitoba, on the original territories of the Anishinaabe, Cree, Anishininew, Dakota, and Dene peoples and the National Homeland of the Red River Métis. We acknowledge these lands and pay our respects to the ancestors of these territories. We also acknowledge the ancestral lands of the Inuit in northern Manitoba.

The Neepawa gas transmission project is located on Treaty 1 and Treaty 2 lands, the original territories of the Anishinaabeg, Anishininewak, Ininewak, Dakota Oyate, and the National Homeland of the Red River Métis. We acknowledge these nations who have occupied and cared for these lands for thousands of years and their longstanding cultural and spiritual connections with the land. Through this we recognize the importance of learning and considering the unique perspectives each of these nations have and share with us throughout the project.

The project area falls within the Municipality of North Cypress-Langford, incorporated in 2015, when the RM of North Cypress and the RM of Langford amalgamated. The project area boarders the Town of Neepawa, which incorporated in 1883. Both the RM of North Cypress-Langford and the Town of Neepawa have strong agriculturally based economies focused on conventional and specialty crops, and livestock operations. Urban areas are home to industry, business, government organizations, and manufacturing operations that produce predominantly agriculture-based products and equipment.

4.3.2 Identification

To achieve our engagement goal, it was important that our engagement efforts reach audiences that may be affected by or interested in the project. We developed criteria to help guide the identification of audiences that reflected this.

Recognizing the enduring relationships between Indigenous peoples and the land and the fundamental Aboriginal and Treaty rights that set Indigenous nations and peoples apart from the broader public, we applied two sets of criteria to scope in engagement audiences.

To identify First Nation and Métis audiences for the First Nation and Métis Engagement Process (FNMEP) we considered:

1. Known historical and/or contemporary use of the project area.

2. Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives.
3. Anticipated inclusion in Crown consultation

To identify interested parties for the Interested Party Engagement Process (IPEP), we considered:

1. Proximity to the potential project area, including landowners, adjacent landowners, and local municipalities.
2. Governance and regional oversight, including Rural Municipalities (RMs) and government representatives.
3. Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives.
4. Relevant local or regional impact, including audiences with specific connections to or concerns about the potential project area, such as local businesses, resource users, or organizations with expertise in the affected environment or community.

Recognizing the diverse land use, ownership, and governance within the project area, Manitoba Hydro emphasizes the importance of working with those whose priorities, interests, and knowledge can inform and shape project decisions.

Through the above scoping process, we identified eleven First Nation and Métis audiences to engage with through the FNMEP, identified in Table 4-1. We also identified audiences to engage with through the IPEP, identified in table 4-2.

Table 4-1 lists the FNMEP audiences we have identified and engaged with along with the rationale for inclusion.

Table 4-1: FNMEP audiences engaged on the project and the rationale for their inclusion in project engagement

Audience	**Rationale for inclusion (criteria that apply):**
Dakota Plains Wahpeton First Nation	Known historical and/or contemporary use of the project area Anticipated inclusion in Crown consultation
Dakota Tipi First Nation	Known historical and/or contemporary use of the project area

Table 4-1: FNMEP audiences engaged on the project and the rationale for their inclusion in project engagement	
	Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives Anticipated inclusion in Crown consultation
Keeseekoowenin Ojibway First Nation	Known historical and/or contemporary use of the project area Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives Anticipated inclusion in Crown consultation
Long Plain First Nation	Known historical and/or contemporary use of the project area Anticipated inclusion in Crown consultation
Manitoba Métis Federation, the National Government of the Red River Métis	Known historical and/or contemporary use of the project area Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives Anticipated inclusion in Crown consultation
Peguis First Nation	Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives Anticipated inclusion in Crown consultation
Rolling River First Nation	Known historical and/or contemporary use of the project area Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives

Table 4-1: FNMEP audiences engaged on the project and the rationale for their inclusion in project engagement	
	Anticipated inclusion in Crown consultation
Sandy Bay Ojibway First Nation	Known historical and/or contemporary use of the project area Anticipated inclusion in Crown consultation
Sioux Valley Dakota Nation	Anticipated inclusion in Crown consultation
Swan Lake First Nation	Known historical and/or contemporary use of the project area Demonstrated interest in similar projects, based on engagement or feedback provided on past projects or initiatives Anticipated inclusion in Crown consultation

Table 4-2 lists the IPEP audiences we have identified and engaged with along with the rationale for inclusion.

Table 4-2: IPEP audiences engaged on the project and the rationale for their inclusion in project engagement

Audience	**Rationale for inclusion (criteria that apply):**
Town of Neepawa	• Proximity to the project area • Governance and regional oversight
Directly affected landowners	• Proximity to the project area
Local businesses	• Proximity to the project area • Relevant local or regional impact
Municipality of North Cypress-Langford	• Proximity to the project area • Governance and regional oversight
Subject matters experts	• Demonstrated interest in similar projects • Relevant local or regional impact

The identified engaged audiences above were developed as a starting point, intended to remain adaptive if we learn of additional audiences that may be affected by or interested in the project.

4.4 Role of engagement in decision-making

There are four main ways that engagement feedback influences project decision-making:

1. Feedback from engaged audiences helps inform the valued component selection and assessment of potential project effects for the environmental assessment through the identification of features of scientific, social, cultural, spiritual, economic, historical, archaeological, or aesthetic importance.
2. Feedback from engaged audiences helps refine the preferred route alignment to minimize potential impacts and better align the route with local land use practices.
3. Feedback from engaged audiences helps inform the development of mitigation measures and tailor the environmental protection program to address local environmental sensitivities and land use practices.
4. Feedback from engaged audiences influences construction method decisions (directional drilling vs. trenching) based on site-specific conditions, environmental sensitivity, and community preferences.

4.5 Communication methods

Communication methods for the project involved the following:

- Letters and emails
- Phone calls to landowners
- Information sheets
- Project webpage, information line, and email address

Copies of project engagement materials can be found in Appendix A.

Emails were sent to First Nations, the Manitoba Métis Federation, the Municipality of North Cypress-Langford and the Town of Neepawa in late September 2025. Subsequent letters were sent out to First Nations, the Manitoba Métis Federation, and landowners along the preferred route in early October 2025, followed by Interactive Voice Response and live agent phone calls to all landowners. In early November 2025, additional interested parties were emailed.

4.6 Engagement methods

Project engagement included one round of engagement to inform the environmental assessment and receive feedback on the preferred route. We offered several different methods for engaged audiences to ask questions and provide feedback on the project, including:

- One in-person public open house
- Three virtual information sessions
- Interactive Voice Response phone calls
- Live agent phone calls
- Meetings with specific engaged audiences
- Site visit for First Nations and the Manitoba Métis Federation
- Project email address and hotline phone number

We launched engagement for the project in September 2025 by notifying First Nations, the Manitoba Métis Federation, landowners, RMs and other interested parties via email, letters, and launching the project webpage. We reached out to landowners along the preferred route via mailed letters, Interactive Voice Response and live agent phone calls to inform them about the project. Notifications included a project overview map asking for initial feedback on the preferred route and information on how to participate in the virtual information sessions and in-person open house. During project engagement, we asked for feedback to understand if there were concerns with the preferred route, if there were proposed adjustments or mitigations, as well as general interests and concerns in the project area.

We welcomed feedback through email, phone calls, an open house, virtual information sessions, and meetings with engaged audiences.

We held the following information sessions as part of project engagement:

Table 4-3: Open house and information sessions

Table 4-3: Open house and information sessions

Date	Number of participants	Location
October 21, 2025	3	Open house, Neepawa Library
October 22, 2025	1	Virtual, Microsoft Teams
October 23, 2025	0	Virtual, Microsoft Teams
November 19, 2025	9	Virtual, Microsoft Teams

Based on interest expressed by engaged audiences, we held the following meetings.

Table 4-4: Individual project meetings

Table 4-4: Individual project meetings

Date	Participant / Community	Location	Notes
October 7, 2025	Peguis First Nation	In-person, Winnipeg	Project was part of meeting agenda
October 30, 2025	Long Plain First Nation	In-person, Long Plain	Project was part of meeting agenda
November 13, 2025	Peguis First Nation	In-person, Winnipeg	Project was part of meeting agenda
November 14, 2025	Landowner	Virtual, Microsoft Teams	To discuss routing
November 27, 2025	Landowner	In-person, North Cypress-Langford	To discuss irrigation lines
November 27, 2025	Landowner	In-person, North Cypress-Langford	To discuss private water lines
December 11, 2025	Peguis First Nation	In-Person, Winnipeg	To discuss heritage

FNMEP audiences were also invited to attend a field tour of the proposed project route on November 27, 2025. The purpose of the site visit was to provide an opportunity for First Nations and the Manitoba Métis Federation to directly inform and influence the proposed heritage work and the environmental assessment process for the project. The site visit included a driving tour of the proposed project route, where participants had the opportunity to provide feedback on the route, heritage areas of concern, areas of importance, and share other project related interests or concerns. Seven participants attended the tour. Following the tour, engaged First Nations and the Manitoba Métis Federation will be invited to meet and discuss training, employment, and business opportunities related to the project as it was a key topic of interest shared during the tour.

4.7 Engagement feedback

The following sections summarize key themes of interests and concerns we heard throughout project engagement.

4.7.1 First Nation and Métis feedback

4.7.1.1 Dakota Plains Wahpeton First Nation

As of December 2025, we have not received feedback on the project from Dakota Plains Wahpeton First Nation. Coordination efforts are ongoing to arrange a meeting to discuss this project and other non-project related items in response to a request to meet from the First Nation's leadership.

4.7.1.2 Dakota Tipi First Nation

As of December 2025, we have not received feedback about the project from Dakota Tipi First Nation.

4.7.1.3 Keeseekoowenin Ojibway First Nation

Keeseekoowenin Ojibway First Nation raised concerns about training, employment, and business opportunities for First Nations related to the project. A follow-up meeting is being arranged to clarify their concerns and address them where possible.

4.7.1.4 Long Plain First Nation

Long Plain First Nation expressed a desire to be kept up to date through notifications and be invited to participate in heritage work on the project.

4.7.1.5 Manitoba Métis Federation

The Manitoba Métis Federation shared interest in participating in heritage work on projects and learning about the training, employment, and business opportunities.

4.7.1.6 Peguis First Nation

Peguis First Nation expressed concerns about heritage along the proposed project route. A meeting occurred on December 11, 2025, to learn more about these heritage concerns. The current understanding of Peguis First Nation's heritage concerns and interests include ongoing participation in the heritage work, the possible presence of bison remains or other artefacts in the area around Brookdale Drain, and concerns with heritage methodology.

4.7.1.7 Rolling River First Nation

Rolling River First Nation expressed interest in learning more about the training, employment, and business opportunities on the project.

4.7.1.8 Sandy Bay Ojibway First Nation

As of December 2025, we have not received feedback about the project from Sandy Bay Ojibway First Nation.

4.7.1.9 Sioux Valley Dakota Nation

As of December 2025, we have not received feedback about the project from Sioux Valley Dakota Nation.

4.7.1.10 Swan Lake First Nation

As of December 2025, we have not received feedback about the project from Swan Lake First Nation.

4.7.1.11 Field tour feedback

Representatives from Keeseekowenin Ojibway First Nation, Long Plain First Nation, the Manitoba Métis Federation, Peguis First Nation, and Rolling River First Nation attended the site visit on November 27, 2025. Key feedback shared during the site visit included the following:

- Participants expressed interest in creating training opportunities for youth to meet qualifications for future job requirements. The importance of receiving a detailed work breakdown in advance of construction to align training programs with project needs and to support future job readiness was emphasized.
- Participants highlighted the importance of Manitoba Hydro improving commitments to Indigenous hiring and procurement for First Nations engaged on the project. Suggestions included setting measurable targets for First Nations employment and procurement, reporting on progress by project phase, and implementing measures for contractors who do not meet targets.
- Participants noted that the area near Brookdale Drain may have been a historical bison hunting site, where bison were driven into the valley as part of traditional practices. It was added that this could increase the likelihood of finding remnants and possibly artefacts in the area.

4.7.2 Interested party feedback

4.7.2.1 Municipality of North Cypress-Langford

The Municipality of North Cypress-Langford was notified about the project and, in response, had questions as to why there are the jut outs from the highway (*i.e.,* segments of the line that do not parallel PTH 5.

4.7.2.2 Town of Neepawa

The Town of Neepawa was notified about the project and, in response, shared that they had no questions or concerns about the project. They shared high-level information about potential future subdivisions and developments, noting that the only planned development at this time is a 15-lot addition to the existing Hillcrest Subdivision. There may also be growth around the new hospital and school property. The Town confirmed that Project 320, located north of Highway 16 and west of Highway 5, is the only project they are actively working on.

4.7.2.3 Information sessions and open house

Participants at the in-person and virtual information sessions included landowners, representatives from municipal and provincial government, associations, organizations, and businesses.

Feedback from the virtual information sessions included concerns about biosecurity, weed management, and potential impacts to livestock. Participants asked about construction methods, driveway access, the timing of work and possible conflicts with migratory bird restrictions. Agricultural producers emphasized the need to account for private water lines and pivot irrigation systems during planning. Recreational users raised questions about construction timing and potential impacts on snowmobile routes. Government representatives highlighted environmental considerations, including wetlands along the route, monitoring systems, and mitigation measures.

During the in-person open house, participants asked what the project area would look like after construction and how future subdivision plans or new access roads might be affected. They raised questions about easement restrictions, potential impacts on other infrastructure, and construction methods for driveways. Participants also sought clarity on the project timeline and its purpose, emphasizing interest in how the pipeline will support regional growth and increased natural gas capacity.

4.7.3 Themes from engagement feedback

4.7.3.1 Business and operations

Engaged audiences shared concerns about construction methods, scheduling, and operational impacts. Feedback emphasized avoiding disruption to cattle operations during calving, breeding, haying, and harvest seasons. Questions included contractor selection and laydown areas for staging. Property-related inquiries included visual impacts, easement restrictions, space for new access roads, and potential interference with irrigation systems and pivots. Additional concerns involved assets and facilities, including future water line projects and whether existing pipelines would remain in service.

4.7.3.2 Energy

Engaged audiences sought clarity on pipeline specifications, including length, diameter, right-of-way width, depth near sensitive areas, and materials used. Questions also addressed construction methods and restoration practices, particularly in relation to minimizing land disturbance and ensuring proper reclamation. Interest was expressed in the purpose of the project, future service opportunities, and potential farm tap connections once infrastructure is in place.

4.7.3.3 Environment

Engaged audiences shared concerns about environmental impacts and mitigation measures. Concerns included timing in relation to migratory bird restrictions, construction near wetlands and water crossings, and hydrology of the Brookdale Drain. Additional issues included biosecurity risks such as anthrax and soil-borne pathogens, weed management, and topsoil segregation and restoration. Questions were also raised about monitoring systems for leak detection and minimizing ecological disturbance during construction.

4.7.3.4 Important sites

Engaged audiences shared concerns about cultural heritage considerations, including the likelihood of encountering bison remains and artefacts near Brookdale Drain. Participants also raised questions about contractor responsibilities for heritage work. Participants shared an interest in heritage contracting and participating in heritage work for the project.

4.7.3.5 Planning and process

Engaged audiences shared concerns about route selection and regulatory approvals. Landowners questioned why the pipeline is proposed where is, and not on the east side of the highway. Concerns were also expressed about future land development, particularly restrictions on building over the pipeline and impacts on subdivision plans.

4.7.3.6 Recreation

Engaged audiences emphasized the importance of maintaining access to recreational areas and minimizing disruption to seasonal activities during construction. Feedback highlighted concerns about potential impacts on trail use and outdoor recreation, with participants seeking assurance that construction methods and scheduling would accommodate these activities when possible.

4.7.3.7 Socioeconomic

Workforce development was a key theme, with suggestions for training programs aligned with project requirements prior to construction and interest in local employment opportunities. Economic concerns included compensation for land easements, crop damage, and loss of pasture and forage production, noting that re-establishing forage is a multi-year process. Participants also expressed interest in local employment opportunities.

4.8 How feedback influenced project decisions

In aligning with key engagement principle of accountability (outlined in section 5.2.1) Manitoba Hydro strives to report back on how information from engaged audiences was considered and may have influenced decision-making. Manitoba Hydro has shared meeting minutes and summary notes from the in-person open house and virtual information sessions to participants through e-mail. A summary of what we heard during engagement sessions is published on the project webpage.

Table 4-5 The following table summarizes how feedback received through the engagement process influenced project decisions through the outcomes shared:

Table 4-5: Summary of engagement feedback and associated project outcomes

Feedback	**Outcomes**
Concerns about biosecurity risks, including anthrax and weed management, and requests for engagement with Manitoba Agriculture and adherence to best practices.	Manitoba Hydro will implement the Manitoba Hydro biosecurity policy and procedures to mitigate biosecurity risks.
Requests to minimize disruption to cattle operations and protect agricultural infrastructure (corrals, barns, watering systems, pivots) during construction.	Manitoba Hydro will work with landowners to minimize disruption to farming operations where possible and confirm locations of in-ground infrastructure to prevent damage.

Table 4-5: Summary of engagement feedback and associated project outcomes

Feedback	Outcomes
Questions about pipeline specifications, construction methods, and restoration practices.	Manitoba Hydro will provide detailed project specifications (length, diameter, right-of-way width, depth) and confirm that construction methods will be used appropriately, with topsoil segregation and restoration after construction.
Concerns about land acquisition, compensation for crop damage, and long-term forage loss.	Manitoba Hydro will continue direct discussions with property owners regarding easements and compensation.
Interest in cultural heritage protection and concerns about heritage methodology.	Manitoba Hydro will consider input into heritage fieldwork planning and continue discussions with interested nations.
Requests for workforce development opportunities and early communication of job requirements.	Contract measures will promote opportunities for Indigenous people and businesses including employment and training opportunities.

4.9 Ongoing engagement

After filing this environmental assessment report with Manitoba Environment and Climate Change, we will notify the engaged First Nations, the Manitoba Métis Federation, affected landowners, the RMs, and other interested parties of the submission and provide a link to this report.

Following Manitoba Environment and Climate Change's decision regarding the Neepawa gas transmission project, we will notify the engaged First Nations, the Manitoba Métis Federation, affected landowners, the RM and other interested parties of the outcome of the decision. If we are granted a licence, we will keep our engaged audiences informed of construction schedules and activities.

We also plan to engage in further discussions about culture and heritage monitoring opportunities.

For Indigenous monitoring, Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities and to discuss a ceremony or ceremonies for those interested.

We will remain open and responsive to any questions or concerns that may arise from engaged audiences through the project's construction and operation phases. The project webpage will continue to be updated as the project progresses through the regulatory review process and, if a licence is received, through project construction. Similarly, the toll-free phone number (1-877-343-1631) and project engagement email address (projects@hydro.mb.ca) will remain available. Any feedback about the project engagement process will help support the continual improvement of Manitoba Hydro’s engagement efforts on future projects

5.0 Environmental setting

This chapter provides an overview of primarily desktop-review based existing environmental conditions for the following aspects that are broadly relevant for the assessment and/or relate to more than one valued component (VC):

- Historic and cultural setting
- Climate
- Ecological land classification
- Bedrock and surficial geology
- Soils and terrain
- Groundwater and groundwater wells
- Surface water
- Communities and population
- Land and resource use

Existing conditions directly relevant to a specific VC, including their collection methods, are described in each VC assessment chapter.

5.1 Historic and cultural setting

The Neepawa gas transmission project is located on Treaty 1 and Treaty 2 lands, the original territories of the Anishinaabeg, Anishininewak, Ininewak, Dakota Oyate, and the National Homeland of the Red River Métis. We acknowledge these nations who have occupied and cared for these lands for thousands of years and their longstanding cultural and spiritual connections with the land. Through this, we recognize the importance of learning and considering the unique perspectives each of these nations have and share with us throughout the project.

The project region has changed substantially since colonialism. Past and ongoing projects and activities including the development of electrical and gas transmission and distribution lines, roads, settlements, and agricultural development have drastically altered the landscape and caused disruptions to the ways in which rights-based activities, practiced by First Nations peoples and Red River Métis citizens, occur in the area.

Neepawa has a rich Indigenous history, which is reflected in its name, Neepawa, which is derived from the Ojibwa word for “plenty” or “abundance” also highlighting the region’s fertile agricultural landscape (Government of Manitoba 2000). The area served as a well-known wintering area for Indigenous groups who also gathered there each year in the summer for the buffalo hunt (Manitoba Historical Society 2009).

Indigenous trade and travel routes later became well-known cart trails that were also used by fur traders, hunters, and settlers. The Fort Ellice Trail (also known as the Carlton Trail or Saskatchewan Trail) was a popular travel route that linked the Red River Settlement to Fort Edmonton, about 1,450 km to the northwest (Government of Manitoba 2024). This trail is also described as being the artery of the Métis Buffalo Hunt (Manitoba Historical Society 2009).

The landscape in Neepawa changed with the arrival of settlers in the late 19th century. Many settlers would travel on the Fort Ellice trail, covering as much as 20 kilometres on warm and dry days (Hall 1969). In mid-July 1877, thirty settlers from Listowel, Ontario, arrived in what is now Gladstone, Manitoba. While some people chose to homestead in the vicinity, the Graham family, which included 14 people, continued their travels to what is now the Town of Neepawa. Their decision to remain there was influenced by the presence of the Fort Ellice Trail, which passed directly through the area (Town of Neepawa 2024).

By 1880, two businessmen, J. Hamilton and John A. Davidson had also arrived in Neepawa (Town of Neepawa 2024). They purchased land and established a general store in the town, drawn primarily by the possibility of a railway line in the area. At the time, the Canadian Pacific Railway (CPR) mainline was being developed south of Portage la Prairie (Manitoba Historical Society 2009), and the possibility of a railway connection positioned Neepawa as an attractive settlement site.

Although the CPR route extended to Carberry in 1881, Hamilton and Davidson were determined to safeguard Neepawa as a new town, and so they offered Manitoba and Northwestern Railway (M&NW, later leased by CPR) a land grant and a financial bonus of $16,000 to construct the line within Neepawa limits. The railway was built, and the Town of Neepawa was incorporated in 1883 (Town of Neepawa 2024). Although Neepawa's growth did not keep up to neighbouring places such as Portage la Prairie and Brandon, its early success can be attributed to its role as a railway hub and its thriving wheat economy (Town of Neepawa 2024).

Although the proposed project predominantly traverses land that is now privately owned and used mainly for agriculture as well as residential, commercial, recreational, and other uses, Manitoba Hydro acknowledges that Indigenous Nations have been stewards of these lands since time immemorial. Manitoba Hydro understands that First Nations peoples and Red River Métis citizens have enduring connections to these lands and may continue to visit the area to practice rights-based activities today, including on private land with landowner permission.

Treaty Land Entitlements (TLE) agreements, negotiated between certain First Nations and the federal government, aim to fulfill outstanding land-related treaty obligations.

Engaged First Nations with active TLE agreements and outstanding TLE entitlements include Long Plain First Nation, Peguis First Nation, Rolling River First Nation, and Swan Lake First Nation (Indigenous Services Canada 2017). The project development area (i.e., pipeline and control point footprints and temporary work areas) does not cross Crown lands, reserve lands, a TLE selection, or an Addition to Reserve selection.

During project engagement for this project and other recent projects, Manitoba Hydro has heard about past and ongoing harms and alterations to traditional landscapes resulting from settlement and development, including Manitoba Hydro projects and operations.

Figure 5-1 provides a non-exhaustive summary of major events or periods of change, which Manitoba Hydro understands to have affected the landscape and the relationships First Nations peoples and Red River Métis citizens have with land in the project area.

While many of the events and activities outlined in Figure 5-1 have been immensely harmful and impactful to First Nations peoples, Red River Métis citizens, and their traditional lands, it is important to note that the land upon which the project is proposed is not singularly defined by the inflicted damage. The resilience of First Nations peoples and the Red River Métis in the face of change persists and continues to grow with a renewal and resurgence of Indigenous identities, self-determination, and sovereignty.

Globally and within Canada, there are increasing efforts to protect Indigenous rights, as reflected in the United Nations Declaration on the Rights of Indigenous Peoples. This Declaration calls for reconciliation at a national level, including renewed interest in protecting language, culture, and constitutionally protected rights.

Figure 5-1: Timeline of events contributing to changes to the landscape and to the relationships that First Nations peoples and Métis citizens have with land in the project area

15th Century

The Doctrine of Discovery is a historical legal concept originating from a series of Papal Bulls (formal statements from the Pope) during the 15th and 16th centuries. It provided direction for European explorers and colonizers to claim lands they "discovered" that were not inhabited by Christians, despite Indigenous peoples having lived on these lands since time immemorial. The principles of this doctrine made its way into Canadian law in the 1880s through various legal instruments, including royal charters and proclamations. The Doctrine of Discovery supported colonization and the dispossession of sovereign Indigenous nations to British and Canadian colonial governments.

Past and ongoing colonial and assimilative strategies that have served to disconnect, relocate, and displace First Nation and Métis peoples from the land can be traced back to this early doctrine.

Pope Francis during a visit to Canada where the Vatican apologized for the Church's role in the residential school system, Maskwacis, Alberta, July 2022

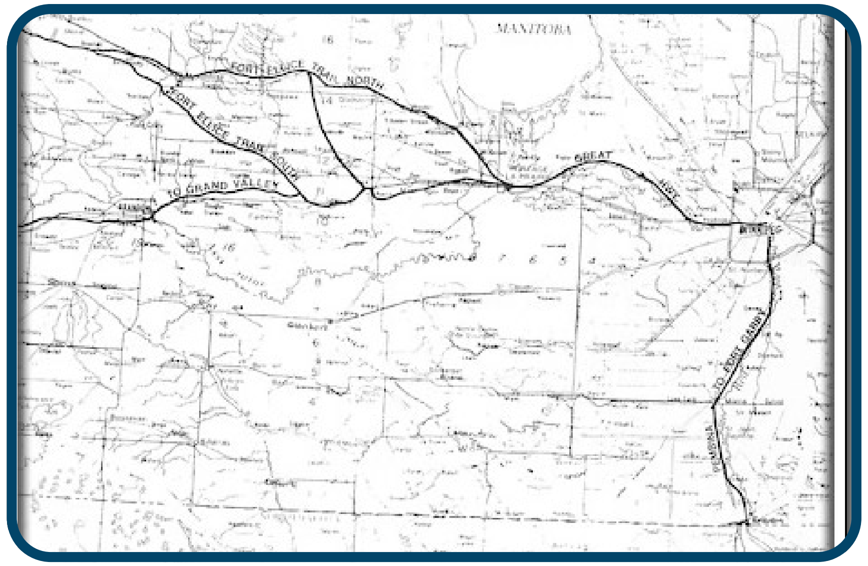
19th Century: Eradication of the buffalo

Prior to settlement, the area was known for its rich buffalo resources. Political views at the time encouraged hunting for safer train passage and it was understood that if the buffalo were decimated, Indigenous peoples on the prairies would be more "submissive without their main source of subsistence." Eradication of the buffalo in the 19th century led to starvation and loss of culture, ultimately having "a profound influence on the lives of Indigenous peoples" (Phillips 2018).

Men standing with pile of buffalo skulls, Michigan Carbon Works, Rougeville MI, 1892.Source: Burton Historical Collection, Detroit Public Library.

17th to mid-19th centuries: The fur trade

Beginning in the 1600s and extending for 250 years, the fur trade brought significant changes to the way of life of many First Nation peoples and communities as people adapted to new tools and a more commercially driven way of life (Glover 2020, Government of Canada 2017).



Fort Ellice Trail Junction. Government of Manitoba. (1963). Fort Ellice Trail Junction [Commemorative plaque]. Historic Resources Branch.from https://www.gov.mb.ca/chc/hrb/plaques/plaq0405.html

The fur trade era marked the earliest contact between Europeans and First Nations peoples in the project region. With the fur trade came small-pox, measles, influenza and other communicable diseases, trade goods, a money-based economy, and other factors that were disruptive to the culture and economies of the region's Indigenous peoples (Heagerty 1928). The intermingling of cultures eventually led to the emergence of a culturally distinct, diverse group of Métis people who later played a large role in the fur trade (Kloos 2016). A number of trails developed by Indigenous peoples criss-crossed the project area, and this network was later used by European explorers and traders.

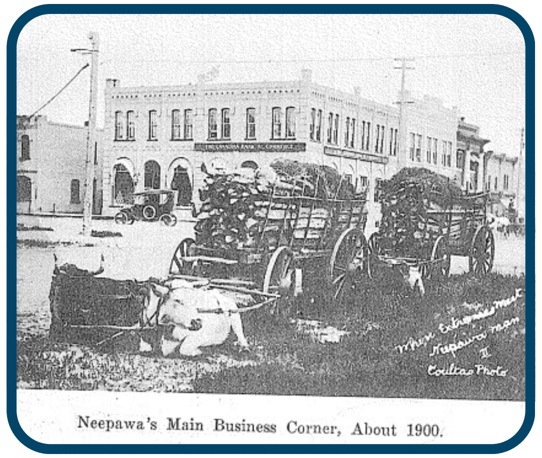
The Fort Ellice Trail, also known as the Carlton Trail or Saskatchewan Trail, was a major travel and trade route. It connected the Red River Settlement to Fort Edmonton, stretching approximately 1,450 kilometers to the northwest (Government of Manitoba, 2024). This trail is also described as being the artery of the Métis Buffalo Hunt (Manitoba Historical Society 2009).

1872: The Dominion Lands Act

In 1872, the *Dominion Lands Act* was signed, which outlined specific policies to encourage homestead settlement throughout the west. This Act allocated "millions of prairie acres for homesteads, railway construction, and colonization companies" (Brglez 2021). As a result, settlers moved into the region. Canada intended to use natural resources and lands in the west to promote Western settlement and railway construction. The Act outlined a standard measure for surveying and subdividing land. The Dominion Land Survey divided the prairie lands into square townships. Each township comprised of 36 sections, where each section contained 640 acres (260 ha), which were further broken down into 160 acre (65 ha) quarter-sections. The Dominion Lands Act led the way for the development of infrastructure along a square grid system, including roads, drains, towns and sometimes, transmission lines. A different survey system was already present along the Red and Assiniboine Rivers, where French Métis and French settlers utilized the River Lot System, a historical subdivision technique used to allocate long narrow lots fronting the rivers. Many river lots across the prairies were eliminated to make way for development. In those areas, the township grid begins where the river lots end (Manitoba Historical Society 2008).

Late 19th Century: Settlement in Neepawa

The Fort Ellice Trail, also known as the Carlton or Saskatchewan Trail, served as a major travel and trade route for Indigenous peoples and was important for the Buffalo Hunt. The trail linked the Red River Settlement to Fort Edmonton and passed directly through the area that became Neepawa, making it a well-known gathering and wintering place (Manitoba Historical Society 2009). In 1877, settlers from Ontario travelled along the trail to Gladstone, with some families continuing on to Neepawa. By 1880, businesses were established in the town, and the arrival of the railway in 1883 marked a significant shift in settlement (Town of Neepawa 2024). These settlement activities marked a period of change in the landscape, as agricultural development and commerce reshaped the region and influenced the relationships that First Nations peoples and Red River Métis citizens maintained with the land.



Mackenzie, A. F. (1958). A brief history of Neepawa – Land of plenty [Photograph]. Town of Neepawa. From https://www.neepawa.ca/history-heritage/

1870s: The Railway and Resource Extraction

In 1881, although the Canadian Pacific Railway (CPR) route extended to Carberry, Hamilton and Davidson worked to secure Neepawa's future by offering the Manitoba and Northwestern Railway (later leased by CPR) a land grant and a financial bonus of $16,000 to bring the line through the town. The railway was completed, and Neepawa was incorporated in 1883. Although Neepawa's growth did not match that of nearby Portage la Prairie or Brandon, its early success was tied to its role as a railway hub and its thriving wheat economy (Town of Neepawa 2024).

19th century to 1996: Residential school system

Residential schools were created by the federal government in the 1800s under the Indian Act as a tool of assimilation. Indigenous children were forcefully sent to institutions, often far from their home communities, where they would "have their hair cut, their language killed, their relationships with family and community severed, their sense of belonging destroyed, and their physical, emotional, mental and spiritual health compromised" (Assembly of First Nations, 2021b). Many of these students never returned. Residential schools were characterized by the Truth and Reconciliation Commission as a cultural genocide and "a systematic, government- sponsored attempt to destroy Aboriginal cultures and languages and to assimilate Aboriginal peoples so that they no longer existed as distinct peoples," (Truth and Reconciliation Commission of Canada 2015).

Among the 14 residential schools across Manitoba, none were located directly in Neepawa. However, the closest residential school was the Brandon Indian Residential School, located southwest of Brandon (National Centre for Truth and Reconciliation 2025).

Postcard view of Brandon Indian Residential School (circa 1908) Source: Rob McInnes, BR0053

1871 - Signing of Treaty One and Treaty Two

The signing of the numbered treaties is when the formal relationship between the Crown and Indigenous nations began, establishing a nation-to-nation relationship. Even though they are formal agreements, the parties to a treaty had different understanding of the meaning of treaties and different intentions when the treaties were negotiated. The Government of Canada has generally adopted a narrow view of treaty terms, originally considering the numbered treaties to be primarily a land conveyance agreement, intended to extinguish Indigenous title and open the region for settlement and development. The First Nation signatories to the numbered treaties, on the other hand, understood the treaties in the context of Indigenous peace and friendship treaties, which had long been used to mediate disputes and regulate external relations. From this perspective, the numbered treaties were an acknowledgement that First Nations peoples would share the land with the newcomers, and in return, would receive material support and assistance, a recognition of their primacy of occupation of the land, and an assurance that Indigenous economies and freedom of movement would not be affected (Daugherty 1983).
The interpretation and implementation of the numbered treaties remain a contested issue, but recent court decisions have supported the view that the honour of the Crown demands a liberal interpretation of the treaties.

The Neepawa Gas Transmission Project is located on Treaty 1 and Treaty 2 lands, the original territories of the Anishinaabeg, Anishininewak, Ininewak, Dakota Oyate, and the National Homeland of the Red River Métis. Treaty One was signed on August 3, 1871 by the federal government and the Anishinabek and Swampy Cree of southern Manitoba. Treaty One was the first of the numbered treaties and covers much of what is presently known as southern Manitoba. Treaty One established a formal relationship between the Crown and Indigenous peoples, and the conditions of Treaty One have had constant legal and socioeconomic effects on the signatory First Nations and Métis peoples.
Treaty 2 was signed on August 21, 1871 at Manitoba House, Rupertsland, with representatives of the Queen of Great Britain and Ireland. The treaty reaffirmed the inherent rights that the Anishinaabe had prior to European contact, located where southwestern Manitoba is today and a small part of southeastern Saskatchewan (Treaty 2, 2025).

1876 to present: The Indian Act

The Indian Act, first introduced in 1876, is a Canadian federal law that governs in matters pertaining to Indian status, bands, and Indian reserves. A new version of the Act was passed in 1951, and since then has been amended several times, with changes mainly focusing on the removal of discriminatory sections. The Indian Act still governs most First Nations today, and is an evolving, paradoxical document that has enabled trauma, human rights violations, and social and cultural disruption for generations of Indigenous people. *The Indian Act* has also enabled the government to determine the land base for nations in the form of reserves and defines who qualifies as 'Indian' in the form of Indian status. The Act outlawed traditional governance systems in favour of Band Chief and Councils with governing authority limited to Indian Reserve land. The Act also restricted Indigenous people from voting in federal elections until 1960, continued to take up and put laws on Indigenous land, and has the ability to enfranchise those First Nations (especially women) who the government deems to no longer have "status" (Assembly of First Nations, 2021a).

1930: Natural Resources Transfer Act

In 1930, the Natural Resources Transfer Act was passed by the federal government, transferring the jurisdiction of natural resources to the Province of Manitoba (Elias et al. 1997; Hall 2006). This provided provincial authority to exploit natural resources within the provincial boundary, including increased management over trapping, fishing, and hunting (Elias et al. 1997).

Sturgeon fishing, 1909. Source: Library and Archives Canada/PA-060742

1982: The Constitution Act

The Constitution Act, 1982 enshrined the Charter of Rights and Freedoms into Canada's Constitution. Section 35 of the Act protects Aboriginal and Treaty rights and requires the Crown to act honourably in all its dealings with Indigenous peoples. Canadian courts, including the Supreme Court of Canada have made judgments clarifying the meaning of Section 35. One element of these judgments is the recognition that the Crown has a legal duty to consult with Aboriginal peoples about any decision or action that might adversely affect the exercise of an Aboriginal or Treaty right, before taking that action or making that decision.

The duty to consult is generally triggered in relation to decisions or actions that have the potential to adversely affect lands and resources used to exercise Aboriginal or Treaty rights such as hunting, fishing and trapping for food.

1988: The Environment Act

With the enactment of The Manitoba Environment Act in 1988, environmental assessment became a legislated requirement for certain types of development in Manitoba. The consideration of cumulative effects is central to environmental assessment as a tool for sustainability, particularly in areas where multiple large-scale projects operate or are planned. It is acknowledged as a best practice, but cumulative effects assessment is methodologically complex and there are challenges to its effective implementation. Manitoba's *Environment Act* and regulations do not include a requirement to include cumulative effects assessment at either the development or strategic level; however, it is not uncommon for proponents to address cumulative effects in their applications, such as this one.

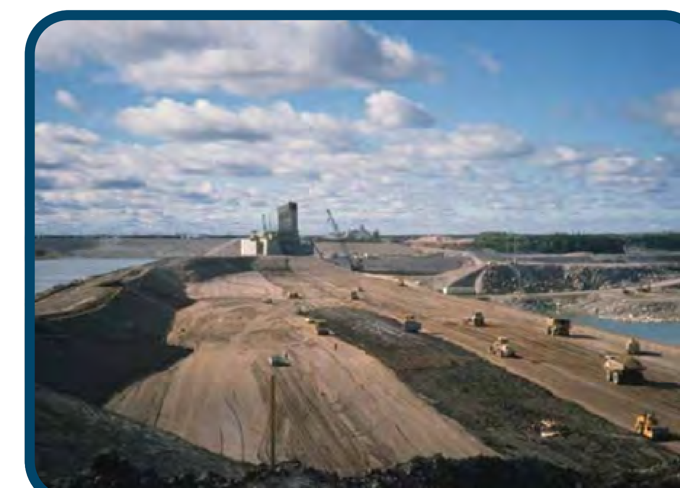
1885: Métis Scrip in Manitoba

Beginning in 1885, as part of the Manitoba Act, the federal government offered Métis families 'scrip' in exchange for their land title (Robinson 2019). Scrip could be issued as land scrip (typically a quarter section of land), or it could also be issued as money scrip, valued at $160 or $240. Métis people were moved to create space for European settlers, and the federal government placed restrictions on which lands Métis people could homestead, with the vision of reaching Canada's 'manifest destiny', as noted in a letter from Sir John A. MacDonald (Auger 2021).

Métis scrip for purchase of dominion lands from 1905. Source: Library and Archives Canada / The Canadian Encyclopedia (https://www.thecanadianencyclopedia.ca/en/article/dominion-lands-policy)

1900s to present: Energy development

Hydroelectricity generation in Manitoba began in the early 1900s with the construction of generating stations along the Winnipeg River. These early generating stations were primarily to serve the growing City of Winnipeg, and industrial and agricultural operations in southern Manitoba. Due to increasing demands for electric power in Manitoba from the mid-1950s, interest grew in the hydroelectric generating capacity of the Nelson and Churchill river systems, with the first major project, the Kelsey Generating Station, completed in 1961. Manitoba Hydro now operates five generating stations on the Lower Nelson River and utilizes a High Voltage Direct Current Transmission System to move power from northern Manitoba to the rest of the province. This system includes the Radisson, Henday, Keewatinohk, Riel and Dorsey converter stations and Bipole transmission lines.



Construction of Limestone Generating Station, 1987. Source: Government of Manitoba and Manitoba Hydro 2015

Natural gas in Manitoba is distributed primarily by Centra Gas Manitoba, a subsidiary wholly owned by Manitoba Hydro. Natural gas has been utilized in the province since the 1870's. As technology developed, natural gas pipelines have become an efficient way of improving access to gas for commercial and residential purposes. While energy development has greatly contributed to urban and rural development and advancements, it has also caused collective trauma and profound changes to ways of life for Indigenous peoples across Manitoba.

2016: The Path to Reconciliation Act

In 2016, the Government of Manitoba passed *The Path to Reconciliation Act*, which sets out the government's commitment to advancing reconciliation and is informed by, but not limited to the Truth and Reconciliation Commission Calls to Action. The Act recognizes that reconciliation of Indigenous and non-Indigenous peoples is to be guided by the principles of respect, engagement, understanding, and action.

The National Centre for Truth and Reconciliation (NCTR) held its grand opening in November, 2015. Photo by Carolyne Kroeker.

2021: MMF-Canada Agreement

On July 6, 2021 the Manitoba Métis Federation (MMF) signed the Manitoba Métis Self-Government Recognition and Implementation Agreement with Canada at Upper Fort Garry. The agreement provided immediate recognition of the MMF as the democratically elected Métis Government for the Red River Métis. Prior to this agreement, Métis citizens had been displaced across their homelands since the passing of the Manitoba Act established the Province of Manitoba in 1870.

2023-2024: First modern Métis treaty

In 2023, members of the MMF voted in favor of developing a modern treaty with the federal government to affirm the MMF-Canada agreement.

On November 30, 2024 the first modern Métis treaty was signed between the MMF and the federal government. The agreement commits Canada to working with the MMF on a government-to-government basis, affirming the MMF's inherent rights to self-government and self- determination.

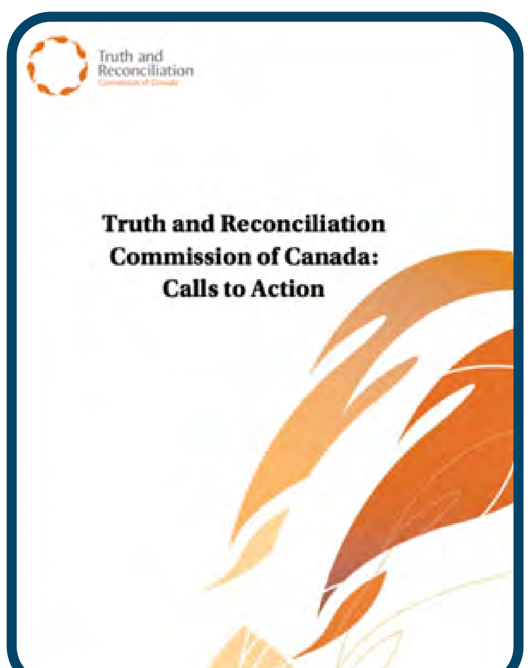

Manitoba Métis Federation President David Chartrand speaks to gathered attendees at the signing of the treaty in November, 2024. Photo by Brooke Jones for the Winnipeg Free Press.

2007 – 2015: Truth and Reconciliation Commission

Between 2007 and 2015, the Truth and Reconciliation Commission provided those directly or indirectly affected by the legacy of the Indian Residential School system with an opportunity to share their stories and experiences.

The Truth and Reconciliation Commission spent 6 years travelling to all parts of Canada and heard from more than 6,500 witnesses.

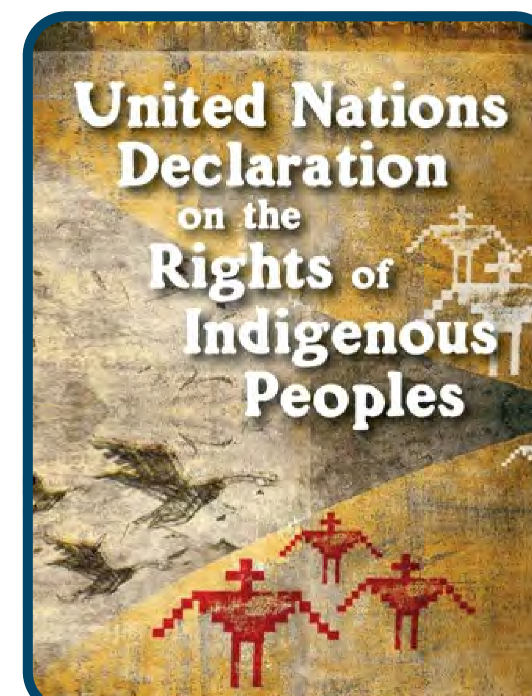
The Truth and Reconciliation Commission developed a guiding set of ten principles for truth and reconciliation and made 94 Calls to Action to advance the process of reconciliation in Canada.



2021: UNDRIP Act

On June 21, 2021, the United Nations Declaration on the Rights of Indigenous Peoples Act received Royal Assent and came into force. This Act provides a roadmap for the Government of Canada and Indigenous peoples to work together to implement the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) based on lasting reconciliation, healing, and cooperative relations.

Through 24 preambular provisions and 46 articles, UNDRIP affirms and sets out a broad range of collective and individual rights that constitute the minimum standards to protect the rights of Indigenous peoples and to contribute to their survival, dignity and well-being. Article 32 (2) of UNDRIP provides that "states shall consult and cooperate in good faith with the Indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources," (United Nations General Assembly, 2007).



5.2 Climate

Based on Smith et al. (1998) terrestrial ecozones, ecoregions, and ecodistricts map of Manitoba, the project falls within the Carberry and Shilo Ecodistricts of the Aspen Parkland Ecoregion, in the Prairies Ecozone. The Shilo Ecodistrict is generally characterized by short, warm summers and long, cold winters, with mean annual precipitation that varies considerably from year-to-year with approximately one-quarter falling as snow (Smith et al., 1998).

Table 5-1 lists eight meteorological stations operated by Environment and Climate Change Canada (ECCC) in the project study area (i.e., defined herein as being within ~50 km from the approximate midpoint of the proposed gas transmission line), as well as three complementary stations operated by Manitoba Agriculture (MB Ag). Most stations show a relatively short temporal coverage which should be recognized when using these records for long term climate studies, such as the calculation of 30-year climate normals. This is demonstrated with a column noting the availability of normals for the stations and their associated quality codes, as well as the availability of Adjusted and Homogenized Canadian Climate Data (AHCCD) at that location.

To develop an understanding of historic climate normals and climate trends in the project area, data was reviewed from 13 stations including:

- 8 stations operated by ECCC
- 3 complementary meteorological stations operated by MB Ag
- 2 hydrometric stations operated by Water Survey of Canada (WSC)

Table 5-1: Meteorological stations of interest for the project study area including stations from ECCC and MB Ag

Station name	**Operated by**	**Normals availability**	**AHCCD (Y/N)**
Neepawa Water	ECCC	1981-2010: Temperature (A Code) Precipitation (A Code)	- [1]
Neepawa Murray 6 Southwest (ECCC)	ECCC	1981-2010: Temperature (D Code) Precipitation (D Code)	Y
Minnedosa	ECCC	1981-2010: Temperature (D Code) Precipitation (D Code)	Y

Gladstone South	ECCC	1971-2000: Temperature (D Code) Precipitation (D Code)	N
Rapid City	ECCC	1971-2000: Temperature (D Code) Precipitation (D Code)	N
Grass River	ECCC	1971-2000: Temperature (A Code) Precipitation (C Code)	N
Brandon A (Climate ID 5010480)	ECCC	1991-2020 Temperature (A Code) Precipitation (C Code)	Y
Brandon A (Climate ID 5010481)	ECCC		
Neepawa	MB Ag	-	-
Minnedosa	MB Ag	-	-
Gladstone	MB Ag	-	-
Whitemud River at Westbourne	WSC	-	-
Whitemud River Near Keyes	WSC	-	-

[1] There is uncertainty as to whether the Neepawa Water station is an AHCCD location given the current information available from Environment and Climate Change Canada.

While Table 5-1 includes two hydrometric stations operated by WSC in the vicinity of project area, there is no gauged data for the Brookdale Drain, which will be crossed by the proposed pipeline. The available two stations are considered representative of the hydrology of the area and have data records of a reasonable duration. The Whitemud River Near Keyes is in the project study area and operates as a seasonal gauge from March to October, with no readings provided during the winter months. The Whitemud River at Westbourne is a station located east of the project study area and represents a larger drainage basin. However, it is included as it may provide meaningful information on more regional hydrologic conditions. For the purposes of quality control and assurance, any year with more than 10% missing data was omitted from the analysis for both sets of station data.

5.2.1 Climate normals

Among the stations reviewed, the following climate normals are reported herein:

- Neepawa
- Minnedosa
- Brandon

Monthly climate normals (ECCC, 2024) are illustrated in Figure 5-2 for temperature, precipitation, and wind speed. Among the stations in the immediate project study area and as noted in Table 5-1, Neepawa and Minnedosa report climate normals in the 1981-2010 period for both temperature and precipitation, and Brandon reports climate normals in the 1991-2020 period for temperature, precipitation, and wind. Additionally, Gladstone, Rapid City, and Grass River report climate normals for the 1971-2000 period for both temperature and precipitation. The available normals for the ECCC stations are classified as Code A for Neepawa temperature and precipitation and Grass River temperature only (no more than 3 consecutive and no more than 5 total missing years of data). The Grass River and Brandon precipitation normals are classified Class C (at least 20 years of data), and the remaining ECCC normals presented herein are classified Class D (at least 15 years of data). Climate normals for the Neepawa station during the 1991-2020 period are most indicative of recent historic climate conditions, although these normals are not currently available from ECCC. Thus, to supplement the climate normals available from ECCC, climate data were obtained from a gridded reanalysis dataset known as the European Reanalysis version 5 (ERA5; Hersbach et al., 2023) and normals were calculated at the grid nearest Neepawa for the 1981-2020 period (40 years) which aligns with methods used to generate future projections. The ERA5 normals from 1981-2020 showed little difference overall compared to ERA5 normals from 1981-2010 (not presented). Comparing with ECCC normals, the Neepawa ERA5 normals show wetter summer months. Figure 5-2 shows ECCC normals for Neepawa, Minnedosa, and Brandon; also shown are period-of-record extremes at each ECCC station. Based on analysis (not presented), conditions and seasonal patterns are similar among the two datasets (ECCC and ERA5).

Monthly averages were also computed from the Manitoba Agriculture (MB Ag) stations but are not presented. Generally, these averages were like ECCC published normals; for Neepawa, the summer months were wetter, and winter months were drier for the MB Ag sites compared to the ECCC normals. For Minnedosa, June was wetter, and the winter months were drier. It should be noted that the Manitoba Agriculture dataset record contains limited time periods and samples different years of data than what is available from ECCC. In particular, the Minnedosa MB Ag and ECCC datasets do not have any overlapping years of data. Additionally, Minnedosa's MB Ag precipitation data for September 2016 appeared erroneous and was therefore, omitted from the analysis.

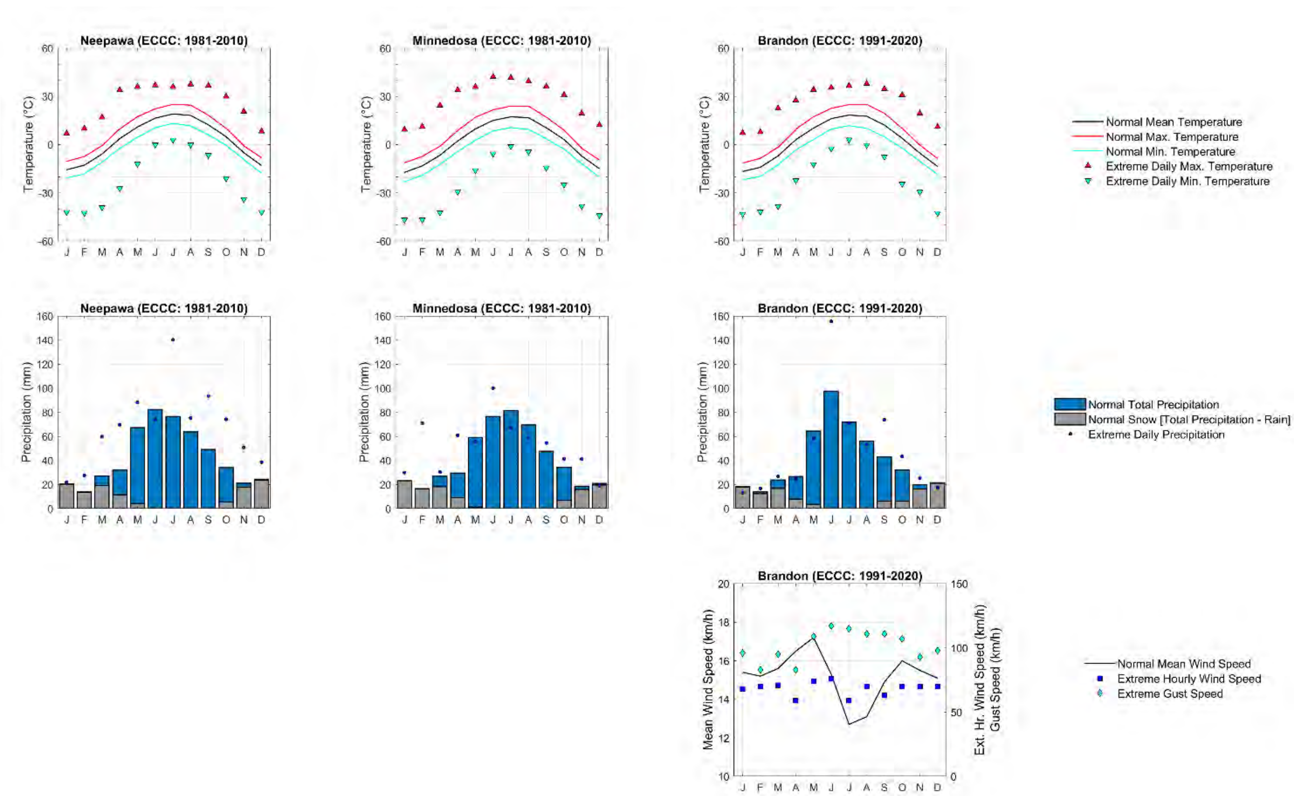


Figure 5-2: Monthly climate normals at Neepawa and Minnedosa (temperature, precipitation) from ECCC during the 1981-2010 period and monthly climate normals (temperature, precipitation, and wind) for Brandon from the 1991-2020 period. Also shown (as points) are period-of-record, sub-monthly, extremes for select variables. Data retrieved from ECCC (2024).

Monthly streamflow averages for the WSC stations were calculated for the 1981-2020 period to represent hydrological normals that complement climate normals and align with future projections. The maximum streamflow shown for each month was based on the maximum of the mean daily streamflow for the entire period-of-record for the gauge. Figure 5-3 shows monthly streamflow averages for the two stations listed in Table 5-1. Note, the Whitemud River near Keyes (Station 05LL005) gauge has been a seasonal gauge for most of the 1981-2020 period of interest and, therefore; only March to October were plotted. Both sites exhibit a snowmelt dominated hydrologic regime, with April showing the highest monthly average flows.

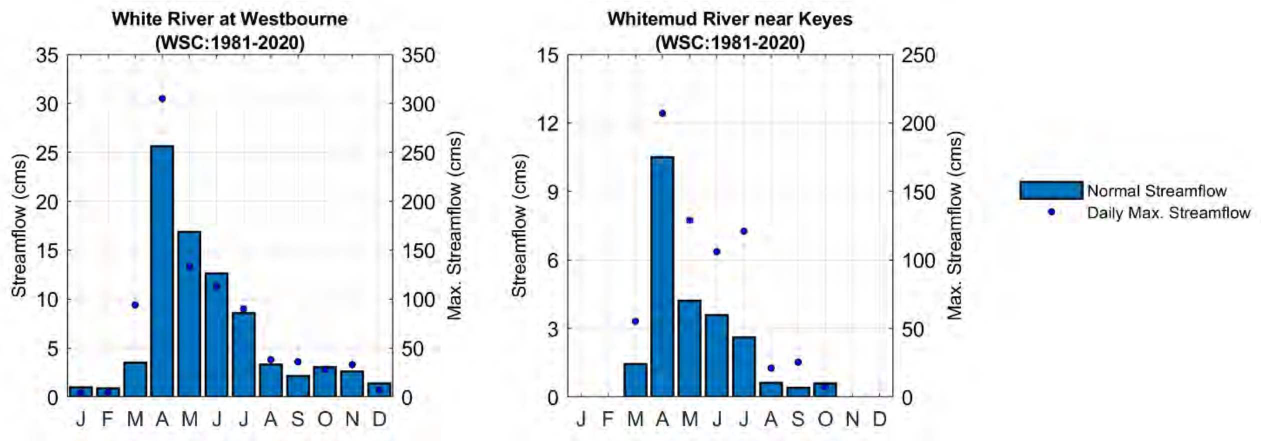


Figure 5-3: *Monthly streamflow normals for Whitemud River at Westbourne and Whitemud River near Keyes for the 1981 –2020 time period, calculated from Water Survey of Canada (WSC; HYDAT) data. Also shown (points) are period-of-record maximum of mean daily streamflow. Note: Whitemud River near Keyes is a seasonal gauge so only months between March and October are presented.*

5.2.2 Trends

Adjusted and Homogenized Canadian Climate Data (AHCCD) from ECCC are developed specifically for purposes of understanding long-term trends in climate (Vincent et al., 2020; Mekis and Vincent, 2011; Wan et al., 2010). AHCCD includes minimum temperature (Tmin; mean of daily minimum temperature), mean temperature (Tmean; mean of daily mean temperature), maximum temperature (Tmax; mean of daily maximum temperature), rain (total of daily rainfall), snow (total of daily snowfall), precipitation (total of daily precipitation), and wind speed (mean of hourly wind speed). Seasonal and annual time series from AHCCD at Minnedosa/Neepawa, and Brandon for temperature and precipitation are plotted in Figure 5-4 and Figure 5-5 respectively. AHCCD wind data at Brandon is presented in Figure 5-6. Since methods involved in generating AHCCD typically include the joining of multiple nearby stations (i.e., to reduce missing data and increase time series length), the sites presented in Figures 5-4, 5-5, and 5-6 may incorporate data from multiple stations (e.g., those listed in Table 5-1); for example, the AHCCD data for temperature is noted at Minnedosa. However, the AHCCD data at the same climate id for precipitation is noted at Neepawa. For streamflow trends, the raw Water Survey of Canada data was used with no adjustments or homogenization applied. However, any year with more than 10% missing data was omitted from the analysis for the purposes to quality control and assurance as described in the normals section.

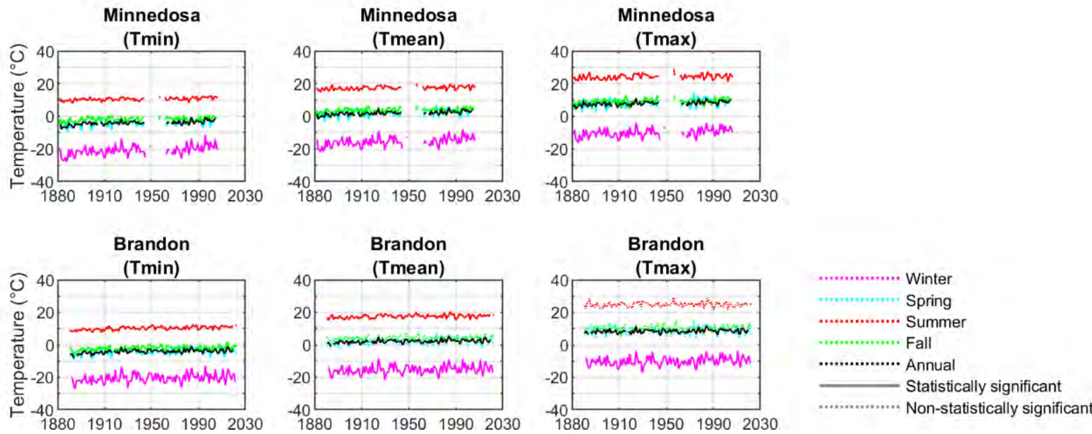


Figure 5-4: *Time series of seasonal and annual temperature trends for Minnedosa and Brandon. Solid lines indicate statistically significant trends and dotted lines indicate time series where no statistically significant trend was detected. Data shown are from the entire period available within ECCC's Adjusted and Homogenized Canadian Climate Data (AHCCD).*

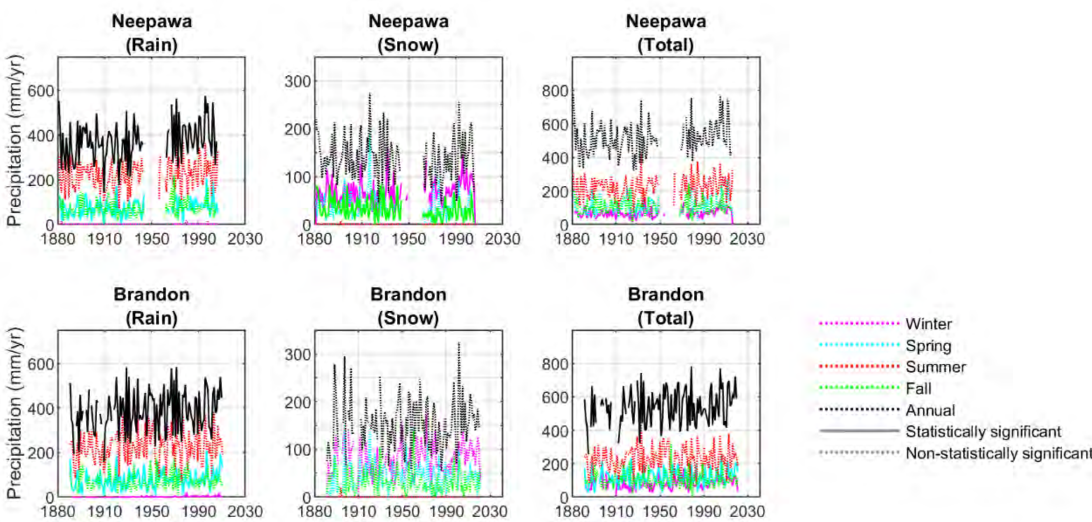


Figure 5-5: *Time series of seasonal and annual precipitation trends for Neepawa and Brandon. Solid lines indicate statistically significant trends and dotted lines indicate time series where no statistically significant trend was detected. Data shown are from the entire period available within ECCC's Adjusted and Homogenized Canadian Climate Data (AHCCD).*

Figure 5-6: *Time series of seasonal and annual wind trends for Brandon. Solid lines indicate statistically significant trends and dotted lines indicate time series where no statistically significant trend was detected. Data shown are from the entire period available within ECCC's Adjusted and Homogenized Canadian Climate Data (AHCCD).*

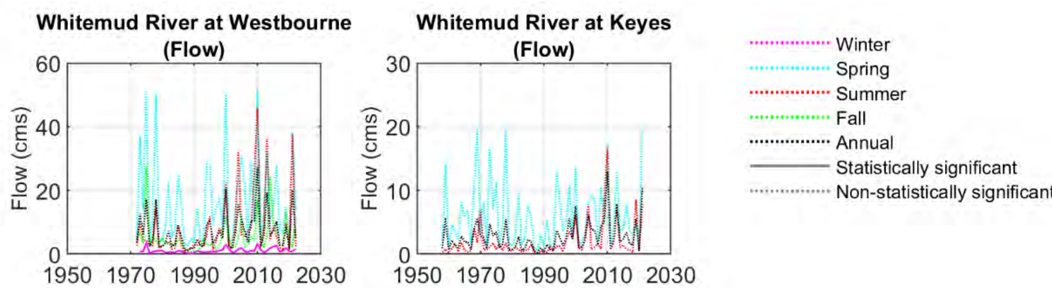


Figure 5-7: *Time series of seasonal and annual flow trends for Whitemud River at Westbourne and Whitemud River at Keyes. Solid lines indicate statistically significant trends and dotted lines indicate time series where no statistically significant trend was detected. The flow data presented is HYDAT data for the entire period of record in common for the two stations which spans from 1958-2022.*

For the flow trend analysis, hydrological years were considered when computing trends. Each hydrological year spans from October 1st of the year to September 30th of the following year. For example, the hydrological year of 1958 spans from Oct 1, 1958 to Sept 30, 1959. Therefore, WSC's data (HYDAT) presented in Figure 5-6 which spans from 1958-2025 includes the hydrological years from 1958-2024 for which data is included from September 1958 to September 2025, with 1 month of data pulled from the hydrological year 1958 to be able to compute the Fall 1959 trend.

Note, the Whitemud River near Keyes is currently a seasonal gauge which is active from March-October. Therefore, only seasonal trends for Spring and Summer were calculated. Additionally, the "annual" value for this station is computed from March-October of each year when the gauge is active. Also, note the hydrometric data was reviewed for quality control and assurance purposes, and for years in which 10% of missing data is exceeded would be discarded from the trend analysis. However, there was no missing data for both these gauges for the period reviewed, and therefore, no years of data were discarded from the trend analysis at that station.

Statistically significant trends are shown in Figure 5-4, Figure 5-5, Figure 5-6, and Figure 5-7 as solid lines, whereas dotted lines represent time series that were not found to be statistically significant.

Statistically significant climate trends of note include:

- For Minnedosa minimum, mean, and maximum temperatures saw increases annually and for all seasons
  - Annual Tmin: 0.15 °C/decade
  - Annual Tmean: 0.21 °C/decade
  - Annual Tmax: 0.19 °C/decade
- For Brandon, minimum temperatures saw increases annually (0.14°C/decade) and for all seasons, mean temperatures saw increases annually (0.11°C/decade) and for winter and summer, and maximum temperatures saw increases annually (0.8°C/decade) and for winter.
- For Neepawa, annual rain saw increases of 5.3 mm/decade, and spring rain also saw increases of 2.4 mm/decade. Total precipitation saw increases for winter of 1.5 mm/decade and snow saw increases for winter and fall.
- For Brandon, rain saw increases annually (5.2 mm/decade), and for winter and spring, while total precipitation saw increases annually (5.9 mm/decade), and for winter and spring.
- For Brandon, wind saw decreases annually (0.56 km/h/decade) and for all seasons.
- For Whitemud River at Westbourne, flows only saw increases for the winter season (Winter: 0.16 m^3/s/decade).
- For Whitemud River at Keyes, no statistically significant trends were detected.

Statistical significance was analyzed using the Mann-Kendall test as in Zhang et al. (2000). The slope of trends was estimated based on Kendall's rank correlation tau statistic (Sen, 1968). Generally, these tests are less sensitive to outliers compared to other commonly used methods (e.g., linear regression to estimate trend slope). Note, the trend slope computation was performed independently on annual and seasonal time series which results in cases where the aggregation of seasonal slopes does not equal the annual slopes.

Historic trends provide an indication of how the climate has changed in the past but may not be an accurate representation of continued longer-term changes in the climatic system (e.g., through extrapolation of trends). Projected changes to the climate system based on future greenhouse gas scenarios, developed using climate models, are presented in Chapter 13.0.

5.3 Ecological land classification

Ecological classification in Canada is a hierarchical designation describing ecologically distinct areas based on interrelationships of geology, landform, soil, water, vegetation, and human factors, with the ecozone at the coarsest level, followed by the ecoregion, and the ecodistrict.

As previously mentioned, the proposed project is located within the Prairies Ecozone, Aspen Parkland Ecoregion, and Carberry and Shilo Ecodistricts (see Map 5-1). Ecological land classification descriptions have been obtained from Smith et al. (1998) and are summarized below.

5.3.1 Prairies Ecozone

The Prairies Ecozone extends north from the Canada-United States border and ranges from the western edge of Alberta to eastern Manitoba. This ecozone comprises the northern extension of the former open grasslands of the Great Plains of North America. The ecozone has a landscape characterized by level to rolling or gently undulating terrain. Agricultural crops represent the dominant vegetation. Groves of trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*) and bur oak (*Quercus macrocarpa*) are also scattered across the prairies. almost of the tall grass and mixed grass prairie have been modified by human activity (Smith et al. 1998).

5.3.2 Aspen Parkland Ecoregion

The Aspen Parkland Ecoregion forms part of the extensive transition zone between the boreal forest to the northeast and the grasslands to the west. The eastern boundary is marked by the Manitoba Escarpment. The terrain ranges from kettled to gently undulating landscapes of till, glaciofluvial and glaciolacustrine surficial deposits. Eolian dunes also occur in the region. Black Chernozemic soils, well-drained and developed over calcareous deposits are dominant in the region. Sandy Regosols and poorly drained Gleysols also occur. The climate is characterized by short, warm summers and long, cold winters. The mean annual precipitation ranges from about 440 to 530 mm. The average growing season varies from 173 to 183 days.

On moist sites, vegetation in the Aspen Parkland consists of trembling aspen and various shrubs, while drier sites typically include bur oak and grassland communities. Common grasses in the ecoregion include fescue (*Festuca* spp.), June grass (*Koeleria* *macrantha*), Kentucky bluegrass (*Poa pratensis*), and wheat grasses (*Elymus* spp.). Slough grasses (*Beckmannia syzigachne*), marsh reed grass (*Calamagrostis canadensis*), sedges (*Carex* spp.), cattails (*Typha* spp.) and willows (*Salix* spp.) are found on poorly drained sites. Numerous other shrubs and herbs also occupy the ecoregion.

5.3.3 Ecodistricts

Table 5-2 below shows the area and percentage of the PDA that falls within each of the two ecodistricts traversed by the proposed project.

Table 5-2: Area and percent coverage of ecodistricts in the PDA

Ecodistrict	PDA	
	Ha	%
Shilo Ecodistrict	29	53
Carberry Ecodistrict	26	47

Approximately 53% of the PDA is situated within the Shilo ecodistrict, while the remaining 47% occurs within the Carberry ecodistrict.

5.3.3.1 Carberry ecodistrict

The Carberry Ecodistrict is a fairly level area, supporting vegetation that has been greatly modified by agriculture since settlement. Well drained soils overlay deposits of the Assiniboine Delta, resulting in soils excellent for cultivation and agriculture. The area previously consisted of tall grass prairie with associated herbs, interspersed with small trembling aspen and willow groves.

5.3.3.2 Shilo ecodistrict

While Shilo ecodistrict has much of its land under cultivation, large tracts of natural vegetation remain in Spruce Woods Provincial Park and the Canadian Forces Base Camp Shilo. Natural grasslands cover the drier sites with occasional trees such as bur oak, white spruce (*Picea glauca*) and trembling aspen, and shrubs such as hazelnut (*Corylus cornuta*), creeping juniper (*Juniperus horizontalis*), and common juniper (*Juniperus communis*). Tree and shrub cover becomes heavier on the north facing slopes. Moister sites support balsam poplar, aspen, and a dense shrub cover of red-osier dogwood and alder (*Alnus spp.*). Wetter sites occupy willow, alder, and red-osier dogwood with a ground cover of grasses and sedges. River bottom lands support green ash and Manitoba maple. A unique feature of this ecodistrict is the mixed prairie grassland occurring with white spruce and shrubs of juniper and common bearberry (*Arctostaphylos uva-ursi*).

5.4 Land cover

Natural Resources Canada uses remote sensing satellite data to spatially differentiate between the land cover classifications that make up Canada's land surface (Natural Resources Canada 2020). The distribution of land cover class types is illustrated in Map 5-6 with the area and percent covers in the PDA shown in Table 5-3. Specific valued component chapters include analysis of land cover classifications relative to their specific spatial boundaries as relevant.

Table 5-3: Land use / land cover class area (ha) and percent (%) coverage in the PDA

Land Use/ Land Cover Class	**PDA**	
	ha	**%**
Agri-Forage Field	11	20
Agricultural Field	28	52
Coniferous Forest	-	-
Cultural Features	-	-
Deciduous Forest	1	3
Mixedwood Forest	-	-
Open Deciduous Forest	1	1
Range and Grassland	10	18
Roads, Trails and Rail Lines	4	7
Sand and Gravel	-	-
Water Body	-	-

Wetland Marsh	-	-
Wetland – Treed Bog	-	-
Total:	54	100
Values might not sum to totals shown because of rounding.		

The dominant land cover class in the PDA is agricultural field, which accounts for greater than 52% (approximately 28 ha) of the PDA (Natural Resources Canada 2020).

5.5 Soils and terrain

The project is in the Upper Assiniboine Delta physiographic subsection of the Assiniboine Plain physiographic section (Haluschak and Podolsky 1999). The landscape is described level to very gently undulating landscape is comprised dominantly of sand deposits to loam, clay loam and silty clay loam textured sediments. Within the region, extensive areas of dominantly fine sand soils have been wind-modified resulting in gently to sharply hummocky sand dunes.

The elevation ranges from approximately 364 m at the northern extent of the project to 390 m in the central portion of the project and 387 m at the southern extent of the project. Regionally, the land slope is generally less than 1%, however, local slopes range from level (0-0.5%) to gently sloping (5-9%).

Soils were previously mapped in the project area at a detail scale (1:20,000) for the RM of North Cypress (Haluschak and Podolsky 1999) and the RM of Langford (unpublished). The dominant soils are characterized as well drained Orthic Black Chernozems, with a minor portion of imperfectly drained Gleyed Rego Black Chernozems. The major soil associations within the project area include:

Stockton Association (Stockton series) – well drained soils developed on coarse textured or sandy (loamy fine sand, sand) lacustrine sediments.

Ramada Association (Ramada series) – well drained soils developed on moderately fine textured or fine loamy (clay loam, silty clay loam) lacustrine sediments.

Wellwood Association (Wellwood series) – well drained soils developed on moderately fine textured or fine loamy (clay loam, silty clay loam) lacustrine sediments overlying coarse to moderately coarse textured or coarse loamy to sandy (fine sand, loamy fine sand, very fine sand, loamy very fine sand) lacustrine sediments.

Hallboro Association (Hallboro series) – well drained soils developed on coarse textured or sandy (fine sand, loamy fine sand, very fine sand) lacustrine sediments overlying moderately fine textured or fine loamy (clay loam, silty clay loam) lacustrine sediments.

Fairland Association (Fairland series) – well drained soils developed on medium textured or coarse loamy (loam, very fine sandy loam) lacustrine sediments.

Glenboro Association (Grover series) – imperfectly drained soils developed on medium textured or coarse loamy (loam, very fine sandy loam) lacustrine sediments overlying coarse to moderately coarse textured or coarse loamy to sandy (fine sand, loamy fine sand, very fine sand, loamy very fine sand) lacustrine sediments.

Soil texture is predominantly moderately fine (clay loam) and coarse (loamy fine sand). Soil drainage is predominantly characterized as well with a minor portion of the project area considered imperfectly drained. Salinity is not indicated to be an important issue in the immediate project area in existing soil resource information.

Soils have a high capability for agriculture and as a result, most of the project area is prime agricultural lands. Some lands with lower capability lands (due to coarse textured soils) are used for high value crop production with supplemental irrigation.

5.6 Geology

The project area is underlain by multiple bedrock types. Bedrock across most of the project area is characterized as the Vermillion River Formation and the Favel Formation (Figure 5-8; Manitoba Geologic Services, 1979). The Vermillion River Formation contains multiple members comprised of various types of shales including carbonaceous, calcareous and bentonitic types. The Favel Formation is comprised of calcareous shale, minor limestone, bentonitic and oil shale.

Bedrock elevation in the project area ranges from approximately 300 m at the south end of the project and 320 m at the north end (Little 1980a). Overlying surficial drift thickness in the project area ranges from 100 m at the south end of the project to 35 m at the north end (Little 1980b).

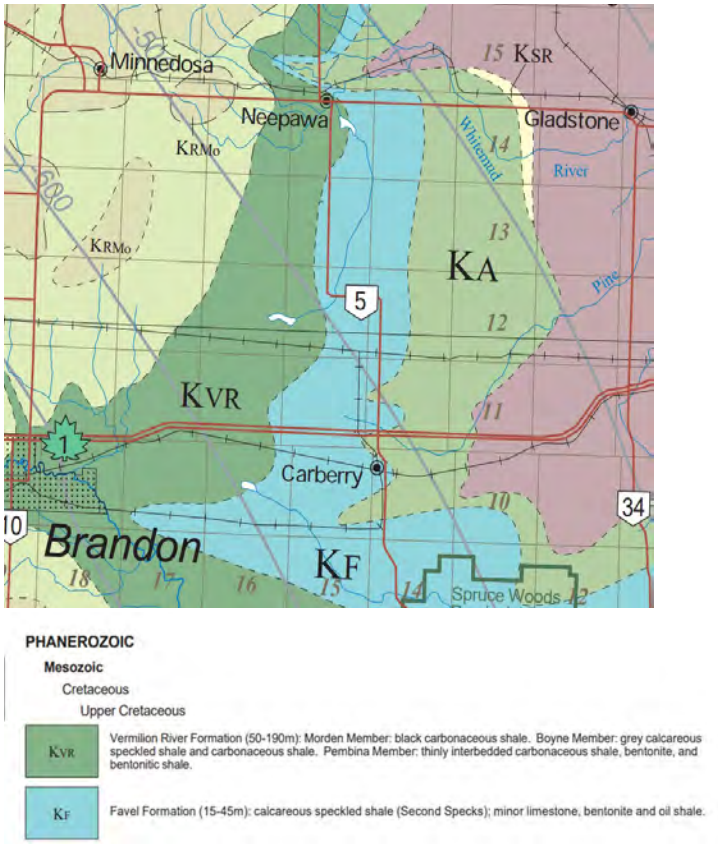


Figure 5-8: Bedrock geology in the project area (Betcher et al. 1995)

The predominant surficial material overlying the bedrock in the project area is characterized as distal glaciofluvial sediments comprised of find sane, minor gravel, thin silt and clay interbeds; 1 to 75 m thick clay, silt and minor sand (Figure 5-9; Little 1980c). A minor portion of the project area I dissected by offshore glaciolacustrine sediments consisting of clay, silt, minor sand; 1 to 20 m thick.

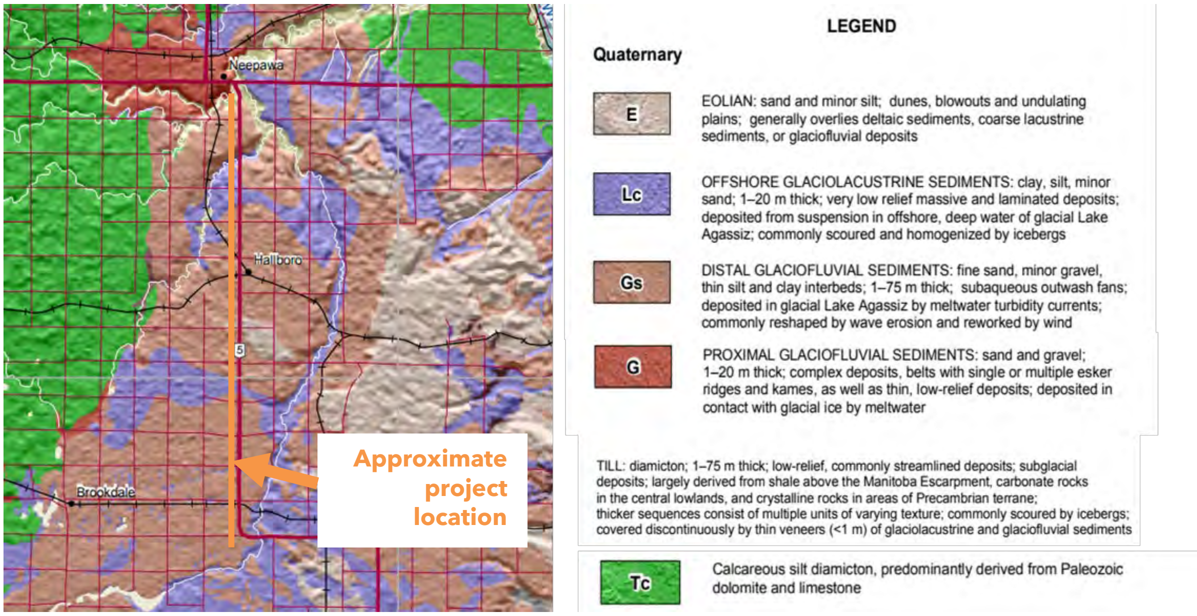


Figure 5-9 Surficial geology in the project area (Matile and Keller, 2004)

5.7 Groundwater

The project area is underlain by the Assiniboine Delta Aquifer (ADA), a water bearing deposit of sand and gravel lying below a 3,900 square km area centered around Carberry (Figure 5-10; ADA 2014). According to regional sand and gravel map data presented by Rutilus (1987a), the southern portion of the project is a thick and extensive portion of the aquifer, while the northern portion extends into a thin portion of the aquifer.

The ADA is a regionally significant groundwater source. The aquifer contains approximately 12,000,000 acre-feet of water. It is supplied or recharged by precipitation.

Water from the ADA is used to irrigate crops, supply the food processing industry, and is a reliable water source for domestic and agricultural uses.

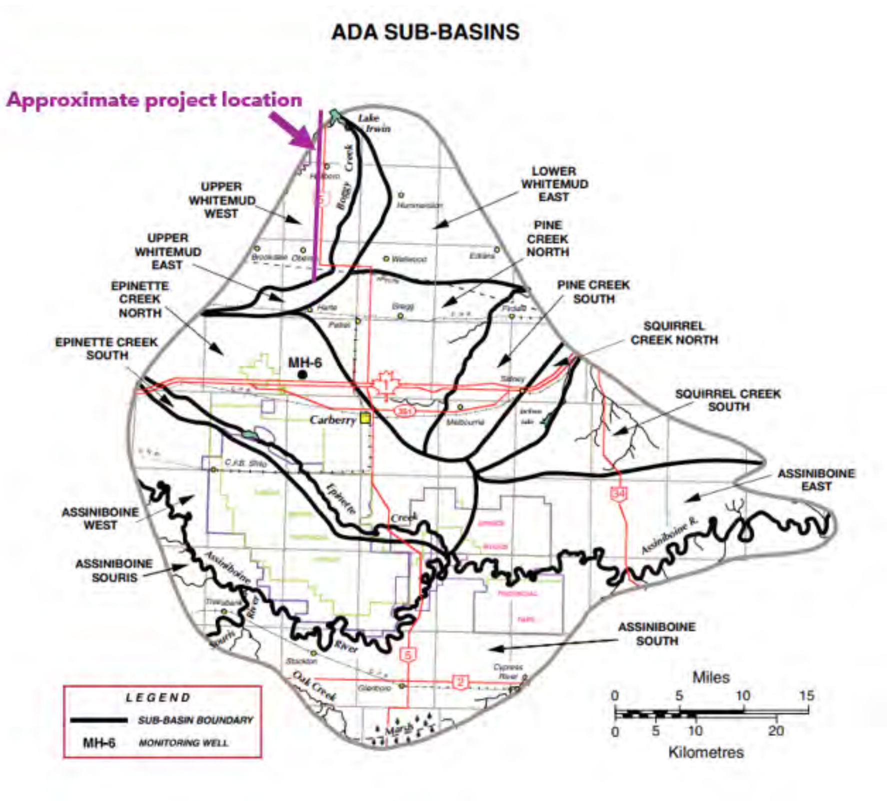


Figure 5-10: Generalized Assiniboine Delta Aquifer (Assiniboine Delta Aquifer Management Plan, 2005)

According to the ADA Management Plan (ADA 2014):

Protecting the aquifer's water quality is of paramount importance. The main concern is leaching of potentially harmful contaminants. Allowing contaminants to be introduced could degrade the quality of water used each year as well as the much larger volume of water in storage. Restoration of such a large aquifer's water quality could be a very long and expensive task and might not even be possible. Based on monitoring and analysis to date, the quality of water within the aquifer is considered, in general, to be good to excellent. However, concern exists where nitrate concentrations are becoming elevated above baseline levels.

Groundwater quality is generally excellent in sand and gravel aquifers in the region, with total dissolved solids concentrations typically in a range from 200 to 450 mg/L in the ADA (Betcher et al. 1995). As the ADA is an unconfined aquifer, there is no natural protection from the ground surface to the surface of the aquifer.

The project is in the Upper Whitemud West sub-watershed sub-basin (Figure 5-10).

There are no bedrock aquifers indicated in the project area (Rutulis 1987b).

Artesian conditions occur when a confined aquifer contains water that is under pressure. When an artesian aquifer is intercepted, for example by a well or other disturbance, aquifer water will rise to a point where hydrostatic equilibrium is reached. There are no flowing wells or artesian conditions indicated in the project area with the closest indicated approximately 10 km northwest of the northern end of the project (Hempe and Iqbal 2016; Figure 5-11). Data provided by Hempe and Iqbal (2016) indicates wells in the project area have highest recorded water levels between the ground and 3 metres below ground surface and more than three metres below ground surface (Figure 5-11).

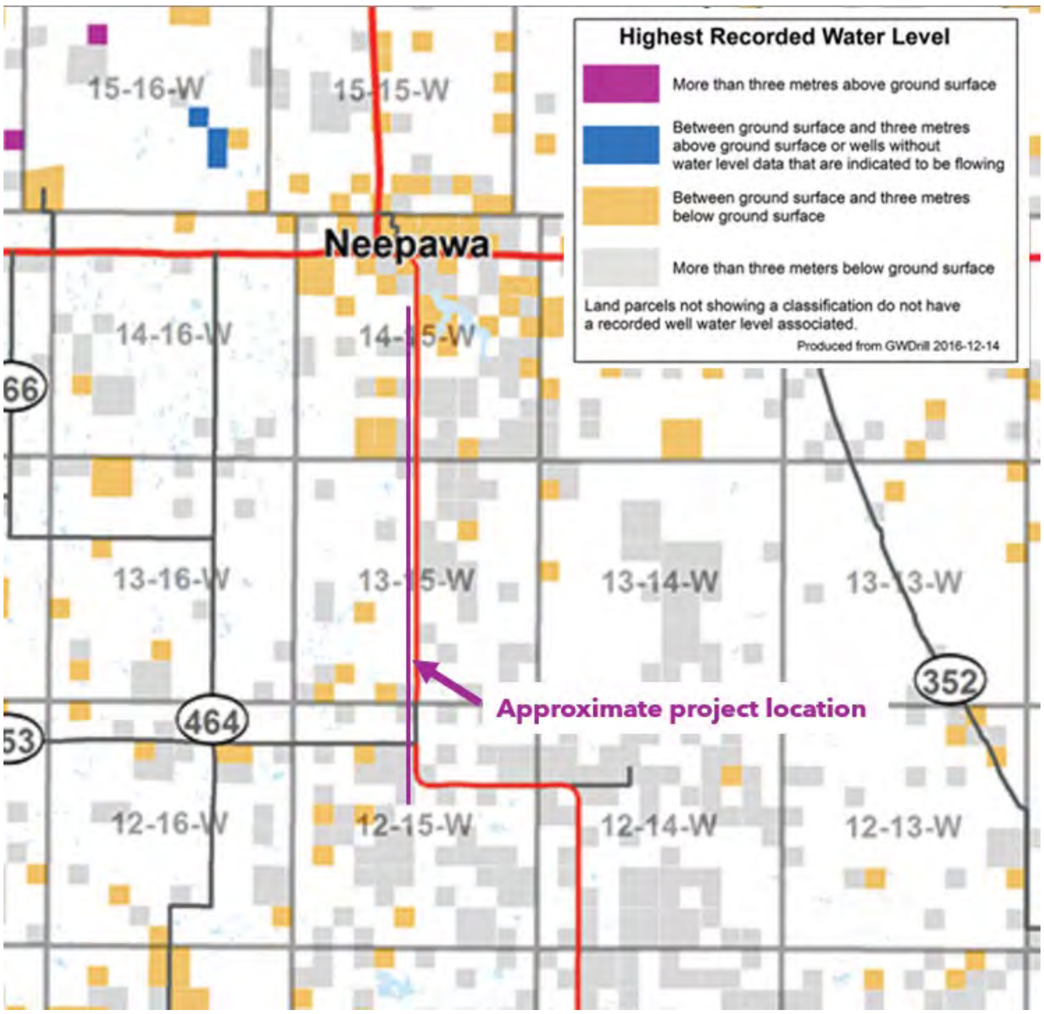


Figure 5-11: Flowing wells in the project area (modified from Hempel and Iqbal 2016)

In Manitoba's GWDrill 2018 groundwater records database, there are 342 groundwater well records within 5 km of the project (Table 5-4). Of these, 41 are indicated as active, while the status of 282 are unknown. Of the remaining wells, 14 are sealed, 1 is indicated as dry, and 4 have no available records.

There are 50 recorded wells located within 1 km of the project, with 8 indicated as active (Table 5-4). Of these, 6 are indicated to be for domestic use, 1 for municipal use and 1 is a test well (data not shown).

Table 5-4: Summary of groundwater wells in the project area

Well Status	**Number of Wells**		
	Within 1 km of project	**Between 1 km and 5 km of project**	**Total**
Active	8	33	41
Dry	0	1	1
Sealed	3	11	14
Unknown	38	244	282
No record	1	3	4
Total	50	292	342

Source: GWDrill Database 2018 © Province of Manitoba

5.8 Surface water

Map 5-7 illustrates watersheds, waterways, and fish habitat classifications (Milani 2013) in the project area. The project falls within the Whitemud river watershed.

5.8.1 Surface water hydrology

Surface water hydrology in the Prairie Ecozone is characterized by large, turbid rivers and streams along with many smaller rivers and creeks that drain the area in a north-easterly direction through the Nelson River drainage system, ultimately draining to Hudson Bay (Smith et al., 1998).

Many of the major watercourses in this ecozone have been modified or developed to some extent by hydropower, irrigation, flood protection, or water management (Smith et. al, 1998). Perennial watercourses within the PDA that will be traversed by the proposed gas transmission project include Brookdale Drain (Map 5-3).

5.8.2 Surface water quality

The Canadian Council for Ministers of the Environment (CCME) developed the water quality index (WQI) in 2001 and organizes long-term water quality data into categories: excellent, good, fair, marginal, and poor.

Broadly, within the Prairies Ecozone, the waterbody average CCME WQI was 79 or fair quality (Manitoba Government 2021).

There are two long-term water quality stations within the Whitemud River Watershed. The nearest station within the assessment area is located at Boggy Creek (Whitemud River) near Neepawa (Manitoba Government 2010). This monitoring station has been operating since 1973 and water samples are collected monthly (including quarterly samples) to be tested for several water quality parameters including water chemistry, nutrients, metals, pesticides, and bacteria. The CCME WQI results for the Whitemud River indicate a classification within the 'Good' range, with values between 80 and 94.

5.8.3 Fish and fish habitat

Milani (2013) sampled several drains in southern Manitoba, one of which, the Brookdale Drain, is traversed by the proposed project. Fish species included white sucker (*Catostomus commersonii*), fathead minnow (*Pimephales promelas*), and finescale dace (*Chrosomus neogaeus*). The riparian vegetation along the Brookdale Drain consisted of a closed treed canopy with occasional tall shrub cover, and a moderately-well developed herb and low shrub layer dominated by graminoids.

5.8.3.1 Aquatic species of conservation concern

Within the Aspen Parkland Ecoregion, eleven species listed by the Manitoba Conservation Data Centre (MB CDC 2025) can be found and include the following:

- Freshwater Mussels: threeridge (*Notropis dorsalis*), wabash pigtoe (*Fuconaia flava*), white heelsplitter (*Lasmigona complanata*), creek heelsplitter (*Lasmigona compressa*), back sandshell (*Ligumia recta*), mapleleaf mussel (Q*uadrula quadrual*), and creeper (*Strophitus undulatus*)
- Lamprey: chesnut lamprey (*Ichthyomyzon castaneus*) and Silver Lamprey (*Ichthymomyzon unicuspis*); and

- Fish: Silver Chub (*Macrhybopsis storeriana*), and bigmouth shiner (*Notropis dorsalis)*.

A request was made to MB CDC to determine if any aquatic SOCC occurs within 5 km of the project boundary. Based on the MB CDC search results, no aquatic SOCC has been recorded within 5 km of the project boundary. Conclusions related to groundwater and the aquatic environment

Since the project is not anticipated to interact with groundwater or groundwater wells, (i.e., no known locations within the PDA), and surface water or aquatic habitat (as pipeline installation for the Brookdale Drain will be via HDD), potential effects on hydrology and aquatics were not identified as areas requiring further assessment for this project.

5.9 Communities and population

The project is within the RM of North Cypress-Langford. An overview of the communities within the RM and nearby towns of Neepawa and Carberry, and the respective populations, are provided below.

Chapters 11.0 and 12.0 discuss economic aspects and infrastructure and community services in the RM.

The RM of North Cypress-Langford was formed because of the amalgamation of the RM of North Cypress and Langford in 2015. The RM has two main trading centres, the Town of Neepawa and the Town of Carberry. The main transportation routes within the RM consists of Trans-Canada Highway 1 at the south end of near Carberry and Provincial Trunk Highway 16 at the north end near Neepawa. Communities within the RM include Brookdale, Edrans, and Wellwood.

The Town of Neepawa and the Town of Carberry are the two largest urban centres near the proposed project. Neepawa is located at the junction of PTH 16 and PR 5, approximately 3.5 km north of the PDA, and Carberry is located near the junction of PTH 1 and PR 5, approximately 17 km south of the PDA.

The 2021 population of the RM of North Cypress-Lanford was 3,011, which represents an approximate 9.7% increase in population when compared to the 2016 population of 2,745. Out of the total 963 private dwellings, 902 were occupied by permanent residents, and there was a population density of 1.7 people per square kilometre (Statistics Canada 2023a).

The Town of Neepawa had a 2021 population of 5,685, which represents an increase of 23.3% when compared to the 2016 population of 4,609. Out of the total 1,946 private dwellings, 1,866 were occupied by permanent residents, and there was a population density of 332.7 people per square kilometre (Statistics Canada 2023b).

The Town of Carberry had a 2021 population of 1,818, which represents an increase of 4.6% when compared to the 2016 population of 1,738. Out of the total 847 private dwellings, 794 were occupied by permanent residents, and there was a population density of 379.1 people per square kilometre (Statistics Canada 2023c).

5.10 Land and resource use

Agriculture is the dominant land use and economic driver in the RM of North Cypress-Langford with agricultural fields representing the dominant land cover (28 ha, 52%), followed by agri-forage field (11 ha, 20%), and range and grassland (10 ha, 18%), within the PDA. Chapter 9 (Commercial agriculture) discusses the agricultural activities and practices occurring in the area and assesses potential project effects on this key type of land use in the area.

This section discusses other types of land and resource use that take place within the spatial boundaries of the assessment, the types of land on which they occur, and the structures in place to manage land and resource use.

5.10.1 Property ownership

Land within the project area is predominantly private land, which accounts for approximately 97% of the PDA. The remaining area of the PDA is comprised of roads, which accounts for approximately 2%.

Table 5-5: Property ownership status of land within the PDA

Land ownership category	PDA	
	Area (ha)	**Percent**
Assumed Private	0.002	<1%
Assumed Road	0.2	<1%
Private	53	97%
Road	1	2%
Total:	54	100

Values might not sum to totals shown because of rounding.

There are limitations in available geospatial data on land ownership. Where there were gaps in land ownership information, ReproMaps were referenced to develop approximations of the ownership status of land overlapped by the PDA.

5.10.2 Designated and protected lands

Map 5-4 illustrates the locations of designated and protected lands in the broad area surrounding the project.

Langford Community Pasture is approximately 3.4 km east of the PDA, at its closest point. The pasture spans approximately 20,000 acres of natural terrain that has never been cultivated by prairie settlers (Manitoba Habitat Conservancy, n.d.). Today, community pastures across western Canada like this one play an important role in conserving diverse habitats, including grasslands, forests, and wetlands.

5.10.2.1 Provincial parks and ecological reserves

There are no provincial parks or ecological reserves within the RM of North Cypress-Langford. The closest provincial park to the project is Spruce Woods Provincial Park, which is approximately 30 km southeast of the project footprint.

5.10.2.2 Provincial wildlife management areas and wildlife refuges

Within the RM of North Cypress-Langford, there is one wildlife management area (WMA), the Whitemud Watershed WMA, located approximately 9 km east of PDA.

The WMA provides habitat for deer, upland game birds, amphibians and other wildlife that require mixed-grass prairie and aspen-oak stands. Game species in the WMA include white-tailed deer (*Odocoileus virginianus*), elk (*Cervus canadensis*), moose (*Alces alces*), black bear (*Ursus americanus*), sharp-tailed grouse (*Tympanuchus phasianellus*), ruffed grouse *(Bonasa umbellus*).

Furbearer species in the WMA include red squirrel (*Tamiasciurus hudsonicus*), badger (*Taxidea taxus*), short-tailed weasel (*Mustela erminea*), long-tailed weasel (*Neogale frenata*), fisher (*Pekania pennanti*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*).

The two closest wildlife refuges to the project are Minnedosa Lake Wildlife Refuge and Spruce Woods Wildlife Refuge. The PDA does not traverse any wildlife refuges. Spruce Woods is located approximately 18 km south of the project.

5.10.3 Land use zoning

The RM of North Cypress-Langford, and the Towns of Neepawa and Carberry have their own municipal by-laws (laws, regulations, or rules of a local government), adopted under provisions of *The Planning Act* (Manitoba) and the Provincial Planning Regulation (M.R. 81/2011), that administer land use planning, zoning, and approvals for lands.

As a Crown corporation, Manitoba Hydro is generally exempt from *The Planning Act* and its regulations in terms of development planning. Manitoba Hydro is therefore not bound by municipal development plans but seeks to engage cooperatively with municipalities to limit conflicts between Manitoba Hydro projects and municipal development plans.

5.10.3.1 Planning district

The proposed project is located within the Cypress Planning District (CPD). The CPD is a partnership between the Town of Carberry, Municipality of North Cypress-Langford, Village of Glenboro, and RM of South Cypress.

5.10.3.2 Municipal zoning

Municipal zoning by-laws and development plans specific to the area directly traversed by the project include:

- Cypress Planning District Development Plan By-Law No. 67
- RM of North Cypress-Langford Zoning By-Law No. 7-2022

Designations under the municipal zoning and planning instruments mentioned above are predominantly Rural/Agriculture area for the area traversed by the project. This designation generally indicates that the land is to be used for agricultural purposes and limits certain non-agricultural uses that could create land use conflicts through interference with agricultural production.

5.10.4 Recreation and tourism

The RM of North Cypress-Langford, along with the Towns of Neepawa and Carberry, support various local parks and recreation areas for residents and visitors.

There are several community/recreation clubs, municipal parks, campgrounds, and community halls located throughout various communities and towns, such as Brookdale/Oberon, Wellwood, Edrans, and Langford. Notable locations and events important to tourism and recreation in the area include:

- Langford Recreational Trail

- Langford-Neepawa Winter Park
- HyLife Back Forty Multi-Use Trail Park
- Neepawa Viewing Towers
- Neepawa Golf & Country Club
- The Lily Nook
- The Great Trail
- Carberry Sandhills Golf and Country Club
- Carberry Museum

Snowmobiling is a popular recreational activity within the spatial boundaries of the assessment. In conjunction with local clubs, Snowmobilers of Manitoba Inc. (Snoman) develop and maintain a network of trails with the goal of promoting safe and environmentally responsible snowmobiling. According to the 2024-25 Snoman map, numerous club and provincial snowmobile trails traverse the project assessment area (Snoman Inc. 2025).

5.10.5 Resource use activities

Other resource use activities that occur in the RM of North Cypress-Langford include woodlot management, hunting, trapping, and domestic resource use.

No commercial forestry management licences exist in the project area. The Government of Manitoba, Agriculture and Resource Development Branch, administers domestic forest utilization through the issuance of timber permits. Some private landowners may manage woodlots on their own properties under the direction of the Manitoba Woodlot Association’s Private Land Resource Planning Initiative (Manitoba Forestry Association 2015).

The area provides hunters with hunting opportunities during specified seasons. Manitoba’s big game hunting is administered by Manitoba Natural Resources and Northern Development within Game Hunting Area (GHA) zones. Most of the project area is in GHA zone 30 and species hunted there would include white-tailed deer, elk, black bear, gray wolf (*Canis lupus*), coyote, upland birds (i.e. grouse, wild turkey, gray partridge) and migratory birds (i.e. ducks, coots, snipes, geese, sandhill crane and woodcock).

Manitoba’s Open Trapping Area Zone 1 where typical furbearer species harvested include beaver, coyote, fox, marten, raccoon, red squirrel, wolf, and weasel, also overlaps the entire assessment area (Manitoba Trapping Guide, 2025-26).

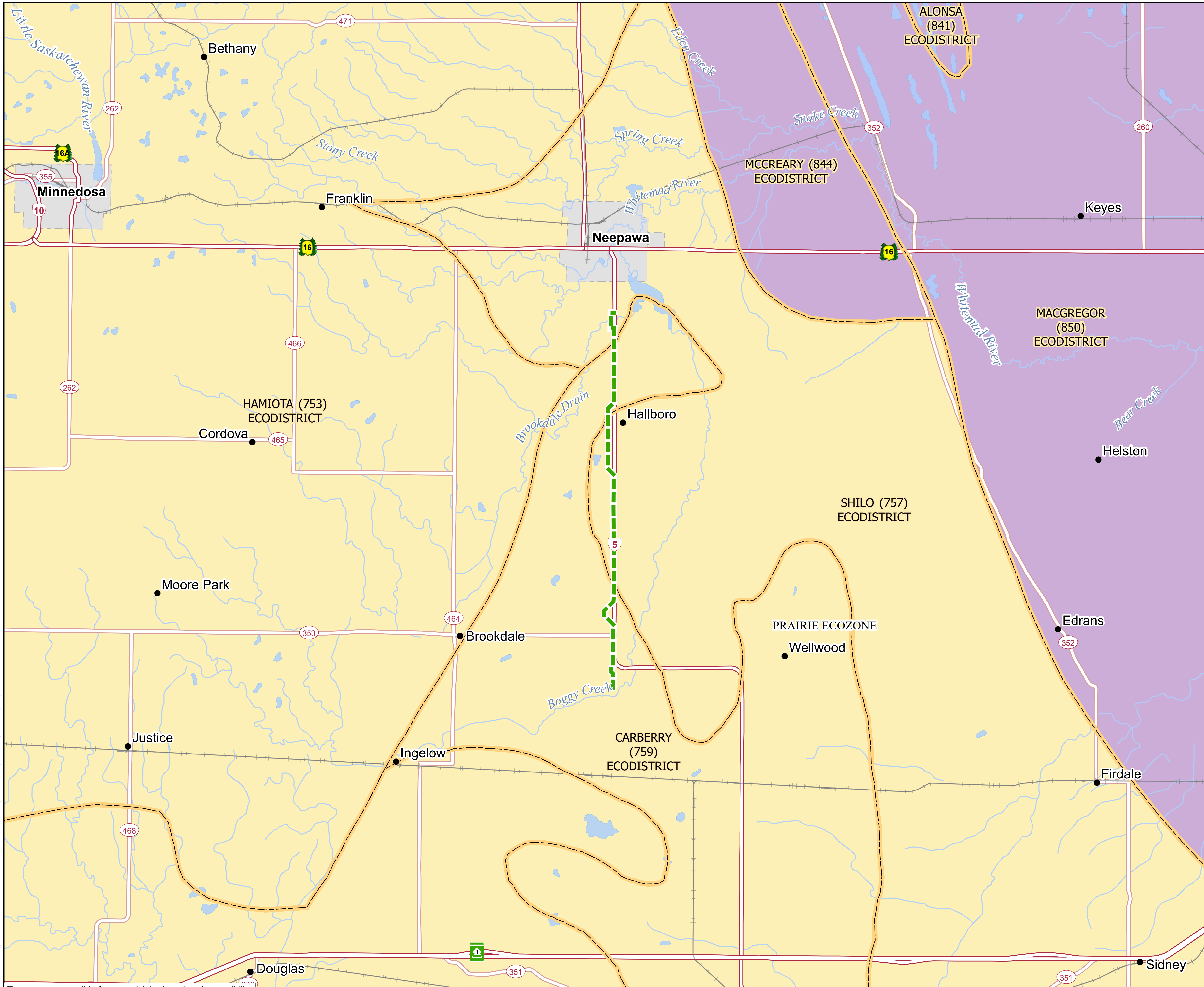
5.10.6 Traditional land and resource use

As illustrated in Figure 5-1, past and ongoing projects and activities including the development of electrical and gas transmission and distribution lines, roads, settlements, and agricultural development have altered the landscape and caused disruptions to the ways in which rights-based activities, including harvesting and other cultural activities, occurs in the area.

Although the project area is now predominantly composed of private land and used mainly for agriculture as well as other residential, commercial, and recreational uses, Manitoba Hydro acknowledges that the land in the area is all Indigenous traditional land and that First Nations people and Red River Métis citizens continue to practice rights-based activities across the landscape today, including on both private land with landowner permission and on the small amount of Crown land that remains.

Chapter 6.0 (Important sites) considers potential project effects to culturally important sites and practices, which has been informed through project engagement (Chapter 4.0) on this project and past Manitoba Hydro projects.

Manitoba Hydro recognises that a lack of information regarding specific cultural activities and locations where they may occur does not necessarily represent a lack of cultural use or importance of the area. Even if not specifically identified through project engagement, Manitoba Hydro assumes that harvesting and other cultural practices are potentially occurring within the regional area of the project.



Neepawa Gas Transmission Project

Project Infrastructure

- Final Preferred Route

Ecoregions and Ecodistricts

- Aspen Parkland
- Lake Manitoba Plain
- Ecodistrict
- Ecozone

Landbase

- Community
- TransCanada Highway
- Yellowhead Route
- Provincial Trunk Highway
- Provincial Road
- Railway
- First Nation Reserve
- City/Town

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

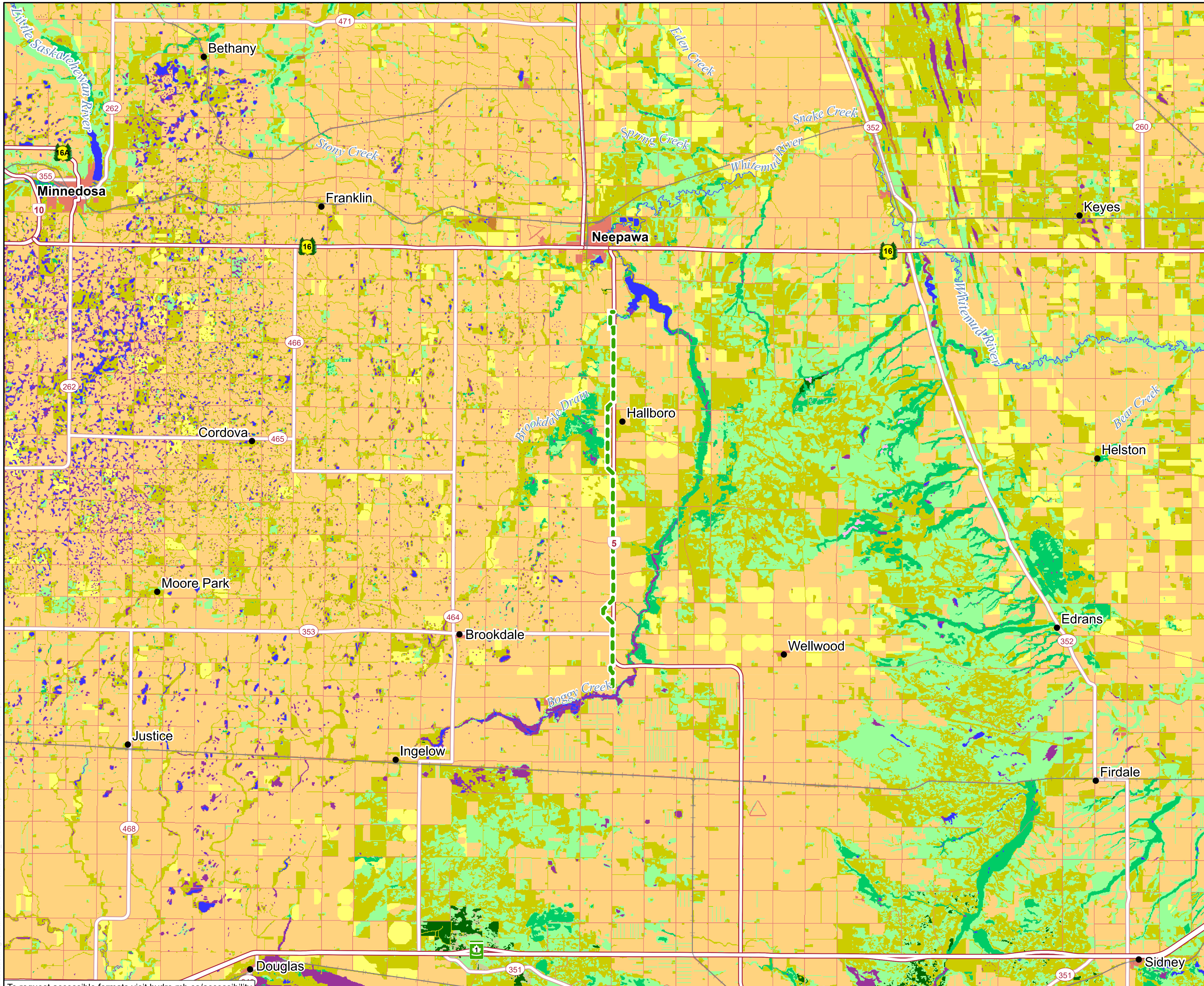
N

0 4 8 Kilometres
0 2.5 5 Miles

1:190,000

Ecozones, Ecoregions, and Ecodistricts

Map 5-1



Neepawa Gas Transmission Project

Project Infrastructure

- Final Preferred Route

Land Cover Classification

- Agricultural Cropland
- Bare Rock, Gravel and Sand
- Coniferous Forest
- Cultural Features
- Deciduous Forest
- Forage Crops
- Forest Cutover
- Marsh and Fens
- Mixedwood Forest
- Open Decidious Forest
- Range and Grassland
- Treed and Open Bogs
- Water

Landbase

- Community
- TransCanada Highway
- Yellowhead Route
- Provincial Trunk Highway
- Provincial Road
- Railway

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

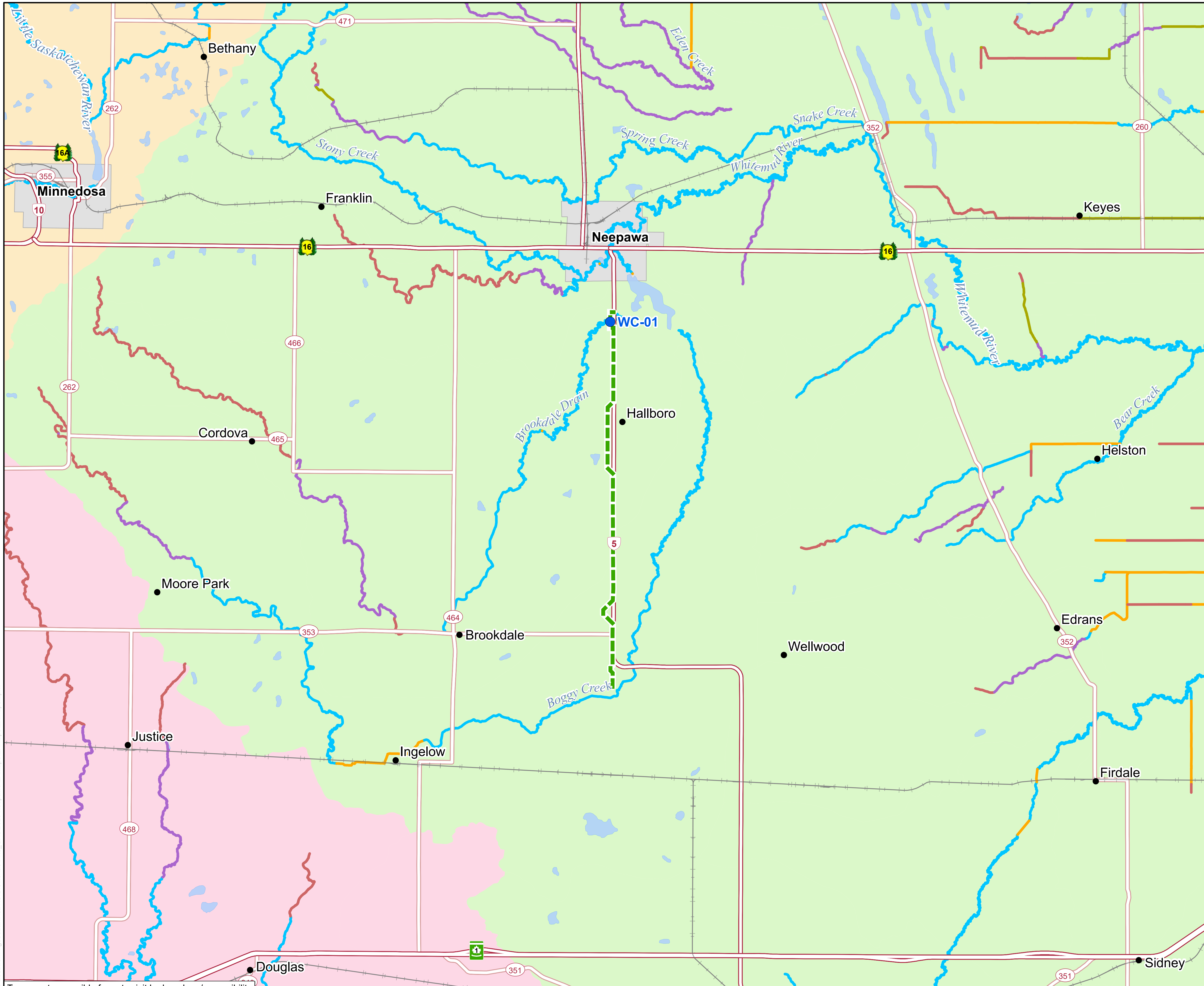
Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

0 4 8 Kilometres
0 2.5 5 Miles

1:190,000

Land Cover Classification

Map 5-2



Neepawa Gas Transmission Project

Project Infrastructure
- Final Preferred Route

Water Crossings
- Water Crossing

Milani Habitat Classification
- Type A
- Type B
- Type C
- Type D
- Type E

Watersheds
- Central Assiniboine
- Whitemud River
- Little Saskatchewan

Landbase
- Community
- TransCanada Highway
- Yellowhead Route
- Provincial Trunk Highway
- Provincial Road
- Railway
- City/Town

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

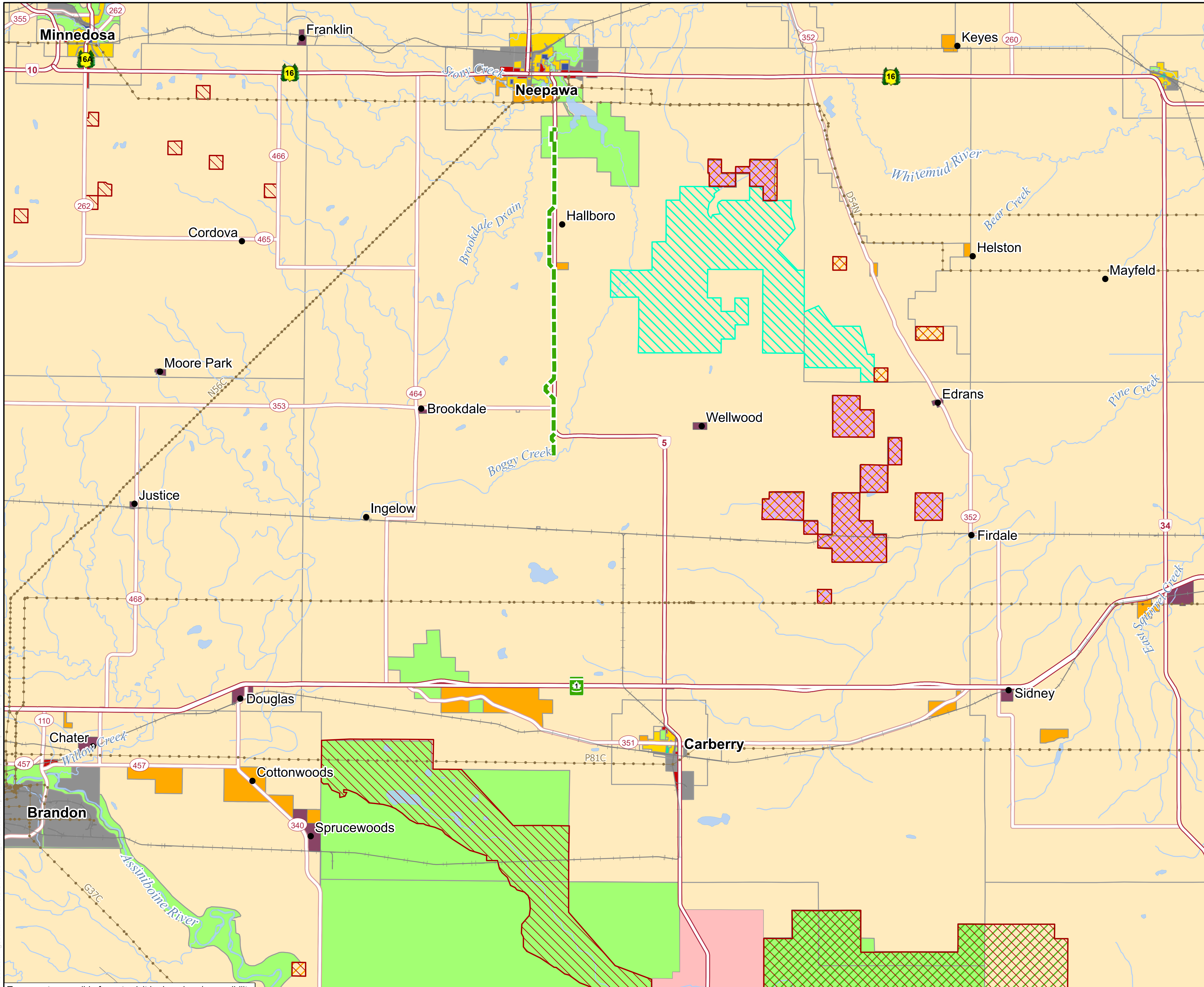
0 4 8 Kilometres
0 2.5 5 Miles

N

1:190,000

Waterways and Watersheds

Map 5-3



Neepawa Gas Transmission Project

Project Infrastructure
- Final Preferred Route

Designated and Protected Lands
- Community Pasture
- Provincial Park
- Area of Special Interest
- Protected Area
- Wildlife Management Area

Land Use Zoning[1]
- Commercial
- Industrial
- Institutional
- Mixed Use
- Parks, Recreation, and Open Space
- Residential
- Reserve Lands
- Rural/Agricultural
- Rural Residential
- Settlement Centre
- Wildlife Management Area
- Other

Existing Infrastructure
- Existing ≤230kV Transmission Line
- Existing 500kV Transmission Line

Landbase
- Community
- TransCanada Highway
- Yellowhead Route
- Provincial Trunk Highway
- Provincial Road
- Railway
- First Nation Reserve

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Source:
1. Manitoba Development Plan Designations, 2024, Province of Manitoba

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

N

0 4.5 9 Kilometres
0 2.5 5 Miles

1:220,000

Designated Lands and Land Use Zoning

Map 5-4

6.0 Important sites

For this assessment, important sites include heritage resources as defined and protected by Manitoba's Heritage Resources Act (1986) as well as a broad range of cultural sites and features understood to be important to First Nations peoples and Red River Métis citizens in the project area.

Manitoba Hydro chose to use important sites as a valued component (VC) because it can broadly capture the diverse ways by which locations and features of the land are of heritage or cultural value and because the project has the potential to interact with important sites.

Heritage resources refer to physical, cultural, and natural elements considered valuable and preserved for their historical, cultural, scientific, or aesthetic significance. Heritage resources include tangible remains of human endeavours that have survived through time and provide evidence of past activity. These are non-renewable resources that may be disturbed or damaged by development activities.

Cultural sites and features important to First Nations peoples and Red River Métis citizens include both tangible sites and intangible cultural heritage.

Tangible important sites include sites or objects of cultural, historical, spiritual, or sacred importance. Certain land types and interests such as unoccupied Crown land and land available for Treaty Land Entitlement opportunities are also considered.

Intangible cultural heritage is defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO) to include traditions and living expressions transmitted from one generation to the next (UNESCO 2023).

This assessment, therefore, also considers the practice of ceremony, the places ceremony may occur, as well as the experiences and cultural knowledge transmission that occur through undertaking cultural practices, including rights-based activities.

Taking a broad approach to assessing project effects on heritage and culture aligns with the Manitoba Clean Environment Commission's comment related to culture and heritage in the Bipole III Transmission Project Report on Public Hearing (2013), which stated the following:

"With regard to heritage resources, it is important to keep in mind that these are by no means limited to those resources, such as archaeological sites, that have already been identified. In many cases, heritage resources are only identified because there has previously been some disturbance, such as building of roads, that has turned up artefacts. It is also important to remember that the landscape itself is a heritage resource, providing visual cues for storytelling and memory. Alteration of the landscape can, by itself, have an impact on heritage." (Manitoba Clean Environment Commission 2013)

6.1 Summary of conclusions

The proposed Neepawa gas transmission project is anticipated to have adverse residual effects for both important sites (including the disturbance of heritage resources and/or the disturbance of cultural sites or features) and cultural experiences. Heritage resources are non-renewable, and disturbing or destroying them may result in irreversible loss of both the resource and its information and cultural context. Cultural experiences are also susceptible to disruption, particularly through changes to the sense of place, aesthetics, noise, and access restrictions.

Residual effects on heritage resources and cultural experiences are expected to be of moderate magnitude during construction and decommissioning, and low during operations. Effects on cultural experiences have the potential to be continuous throughout the life of the project, with potential intermittent localized restrictions during maintenance work.

With mitigation and environmental protection measures, project and cumulative effects on important sites are predicted to be not significant because the project is not anticipated to result in the destruction of a heritage resource or a long-term loss of cultural experiences to a point where cultural experiences are critically reduced or eliminated.

However, it is important to acknowledge that engaged audiences may experience effects to important sites in unique and differing ways. Therefore, effects may be felt to varying magnitudes depending on the individual, and some individuals may deem effects as substantive.

6.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 6.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on important sites.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent Altona to Winkler gas transmission project, Dominion City to Altona gas transmission pipeline, the Northwest Gas Transmission Project, and electrical transmission projects (e.g., the Pointe du Bois to Whiteshell Transmission Project, Dorsey to Wash'ake Mayzoon Transmission Project, and Manitoba-Minnesota Transmission Project (MMTP)). The assessment considers the following:

- Changes to important sites, including disturbance of heritage resources from their *in-situ* context and/or disturbance of tangible cultural sites or features important to First Nations peoples and Red River Métis citizens
- Changes to cultural experience, including changes to intangible culture, cultural practices (*e.g.,* ceremony), knowledge transmission, and access to important sites

6.2.1 The project

The proposed project consists of construction, operation, and decommissioning of a six-inch steel natural gas transmission pipeline and associated above-ground control structures. The new pipeline will be approximately 20 km in length, beginning at a control point located approximately 22.5 km south of Neepawa and terminating at another control point located approximately 3.5 km south of Neepawa. The project components are described in more detail in Chapter 2.0 (Project description).

6.2.2 Regulatory and policy setting

The following provincial laws, and associated regulations, policies, and guidelines, as well as Manitoba Hydro's policies were considered for assessing project effects to important sites.

6.2.2.1 The Heritage Resources Act (1986)

Heritage resources are non-renewable resources that provide a tangible cultural link between the past and present. Heritage resources are protected under Manitoba's The Heritage Resources Act (1986) and are "…a heritage site, a heritage object, and any work or assembly of works of nature or of human endeavor that is of value for its archaeological, palaeontological, pre-historic, historic, cultural, natural scientific or aesthetic features, and may be in the form of sites or objects or a combination thereof". Heritage sites are recorded in a provincial registry and are managed by the Historic Resources Branch (HRB) of the Department of Sport, Culture and Heritage. This registry includes the following categories:

- Archaeological sites
- Palaeontological sites
- Designated Provincial sites
- Designated Municipal sites
- Commemorative plaques
- Cemeteries, including abandoned historical cemeteries and other burial sites

The provincial registry does not specifically recognize cultural sites and therefore does not offer protection for cultural sites understood to be important to First Nations peoples and Red River Métis citizens unless they can be captured and registered as an archaeological site. Examples of cultural sites that may be registered as an archaeological site include culturally modified trees or trees with prayer flags.

If it is in the opinion of the Minister that heritage resources may be affected by development, the Minister can order an archaeological study or other protection measures.

6.2.2.2 *The Constitution Act section 35, Part II* (1982)

Section 35 of The Constitution Act, 1982, recognizes and affirms the existing Aboriginal and treaty rights of the Indigenous peoples of Canada. These affirmed rights include rights relevant to important sites including rights to practice one's culture and spiritual traditions as well as rights to lands, territories, and resources recognized as inherent Aboriginal rights by Canadian courts (Government of Canada 2024).

Traditional activities and practices included within this chapter reflect traditional activities and practices that the courts have expressly recognized would potentially be constitutionally protected under section 35 of the Canadian Constitution Act, 1982. If an activity, practice, or custom was shared with Manitoba Hydro and understood to be important to a potentially affected First Nation or the Manitoba Métis Federation, it was considered relevant to this assessment.

6.2.2.3 Manitoba Hydro's Indigenous Relations Commitment Statement

In 2023, Manitoba Hydro released an Indigenous Relations Commitment Statement. Commitments within the statement that are relevant to the assessment of project effects on important sites include the following:

We will work collaboratively with Indigenous communities to address the adverse impacts of our projects and operations.

We will collaborate with Indigenous communities to understand and be guided by their Indigenous Knowledge as it relates to our projects (Manitoba Hydro 2023).

6.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for engaged audiences to provide feedback about the project. Feedback related to important sites included the following:

- During a site visit for engaged First Nations and the Manitoba Métis Federation on November 27, 2025, a participant shared that there is a strong likelihood of bison remains near the Brookdale Drain as this area was likely used as a bison corral. During the site visit, most of the feedback received was regarding training, employment, and business opportunities and project-specific questions (see Chapter 4.0), while feedback specific to important sites was comparatively limited.

6.2.4 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on important sites:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The PDA is described in detail in Chapter 2.0 (Project description). The total area of the PDA is 54.4 ha.
- **Local assessment area (LAA):** includes all components of the PDA plus a 1 km buffer around the PDA, which is deemed inclusive of important sites that could be encountered during project activities.
- **Regional assessment area (RAA):** includes the PDA and LAA and consists of a 5 km buffer around the PDA. The RAA area is crucial for understanding the broader environmental and socio-economic context of the project and is the area used for assessing cumulative environmental and socio-economic effects.

Map 6-1 displays the spatial boundaries for important sites, which are consistent with the boundaries discussed in the heritage resources technical memo prepared for the project (Appendix B).

6.2.5 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on important sites are based on the timing and duration of project activities as follows:

- Construction – estimated to take approximately 12 months, beginning in the winter of 2027
- Operation and maintenance – estimated to be at least 50 years based on the pipeline’s design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

To understand existing conditions related to important sites, the assessment also considers information from the existing database of previously recorded sites, general cultural chronologies, and the living memories of knowledge holders who have shared feedback about important sites through project engagement and on past projects.

6.2.6 Potential effects, pathways, and measurable parameters

The potential project effects on important sites, along with effects pathways and measurable parameters are outlined in Table 6-1.

Table 6-1: Potential effects, effects pathways, and measurable parameters for important sites

Potential effect	**Effect pathway**	**Measurable parameter(s) and units of measurement**
Changes to important sites, including disturbance of heritage resources from their *in-situ* context and/or disturbance of tangible cultural sites or features important to First Nations peoples and Red River Métis citizens	Project activities involving ground disturbance resulting in physical interaction with known or unknown important sites, including features and objects located beneath or upon the surface	• Number of heritage resources altered/lost because of project activities • Instances of encountering heritage resources and/or cultural sites, features, or objects during pre-construction field work or construction activities • Qualitative assessment of feedback related to potential physical impacts to important sites shared through project engagement
Changes to cultural experience, including changes to intangible culture, cultural practices (*e.g.,* ceremony), knowledge transmission, and access to important sites	Project induced changes to sense of place, aesthetics, and stress resulting in disruption to aspects of intangible cultural heritage and the experience of visiting important sites and/or undertaking cultural practices due to the presence of the pipeline Increased noise or changes in the types of noise as the result of project activities Project activities that restrict access to important sites resulting in loss of opportunities for cultural experiences, practices, and knowledge transfer	• Qualitative assessment of feedback related to potential project impacts to cultural experiences • Qualitative assessment of the project's predicted residual effects on noise and psychological stress presented in Chapter 10.0 (Human health risk) • Qualitative assessment of changes to access

6.2.7 Residual effects characterization

Table 6-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on important sites.

Table 6-2: Characterization of residual effects on important sites

Characterization	Quantitative Measure or Definition of Qualitative Categories
Direction – the long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to important sites relative to baseline. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to important sites relative to baseline. **Neutral –** no net change in measurable parameters for important sites relative to baseline.
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**No measurable change** – no disturbance of important sites is predicted. **Low** – a measurable or perceived change is predicted, but there is no anticipated loss to heritage resources and/or disruption to the ability or preference to visit important sites nor is the ability to undertake cultural activities expected to be diminished. **Moderate** – limited damage to heritage resources and/or cultural sites is predicted. Any encounters with undiscovered sites during construction would have at least a moderate magnitude of effect on the site; an assessment by a professional archaeologist would be required to evaluate the magnitude. A measurable or perceived change is predicted in which there will be short-term implications to the ability to undertake cultural activities **High** – an objectively clear change is predicted, resulting in long-term implications including the loss/damage of heritage resources, and the knowledge they provide and/or long-term diminishment in the ability to undertake cultural activities.

Geographic Extent - the geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration – the time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	Not applicable for heritage resources or other tangible important sites for which impacts cannot be undone. For other effects (*e.g.*, to intangible cultural heritage, cultural experiences): **Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency - identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Reversibility - pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation Irreversible – the residual effect is unlikely to be reversed

6.2.8 Significance definition

For this assessment, adverse residual effects on important sites are considered significant if the proposed project results in:

- the destruction of a heritage resource
- a long-term loss of cultural experiences to a point where cultural experiences are critically reduced or eliminated

The destruction of the object is considered the extreme end of the potential effect. Once a heritage object is destroyed, no further information can be learnt about that heritage resource and the knowledge and historical understanding that could have been gained from the object is lost.

The severity of the project's residual effects on important sites will vary among cultural groups and between individuals in cultural groups. Affected First Nations peoples and Red River Métis citizens may perceive the significance of these effects differently, reflecting their distinct identities, relationships to the land, connections to specific places, and visions for future use of the area. Recognizing these distinct perspectives, significant adverse effects for important sites will be considered as a long-term loss of cultural experiences to a point where cultural experiences are critically reduced or eliminated.

It is important to note that even if effects on individual components of the environment are deemed not significant, there could still be effects to important sites overall because of the presence of the project and due to perceived effects or stress caused by the project.

6.3 Existing conditions

Baseline information for this assessment was gathered through a detailed review of engagement feedback and windshield surveys. Heritage screening was informed by three pieces of information: documented history, known archaeological sites and detailed landscape analysis. LiDAR imagery was overlaid onto the study area to allow for visual examination of relict channels. The current land use primarily consists of agricultural fields.

The existing conditions described in this section focus on:

- The natural environment
- Cultural history
- Registered heritage sites
- Areas of elevated heritage concern (AOCs)
- Cultural sites and features

6.3.1 The natural environment

The physical environment is composed of climate, landscape, soils, hydrology, local and regional topographic relief, and the geological processes that created the landscape. These factors not only assist with contextualizing heritage resources within an area, but also in determining areas within the PDA that have moderate to high heritage potential. For more detailed information on the natural environment, refer to Appendix B.

6.3.2 Cultural history

A cultural chronology is presented in Appendix B and is divided into the Early Indigenous Period (*ca*. 12,000 – 8,000 years ago), the Middle Indigenous Period (*ca.*

8,000 – 2,000 years ago), the Late Indigenous Period (*ca.* 2,000 – 350 years ago), and the Indigenous-European Period. Additional context on the historic and cultural setting of the area is also provided in Chapter 5.0.

6.3.3 Registered heritage sites

The provincial site registry listed 55 registered archaeological sites within the RAA. These sites are listed in Table 6-3. These sites include ancient Indigenous campsites, isolated finds, and uninterpreted occurrences.

Table 6-3: Provincially registered archeological sites located within the RAA

Site	Site Type	Period	Description	Within LAA or RAA
EaLu-001	Workshop	Indigenous Period	Surface collection of Indigenous Period lithics	RAA
EaLu-002	Campsite	Not Available	A poorly recorded site	RAA
EaLu-003	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics	RAA
EaLu-004	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics, including Avonlea and side-notched projectile points and Indigenous Period ceramics, including Laurel and Blackduck	RAA
EaLu-005	Uninterpreted	Late Indigenous Period	Collection of Indigenous Period lithics	LAA
EaLu-006	Isolated Find	Indigenous Period	Isolated find of Indigenous Period lithics	RAA
EaLu-007	Isolated Find	Indigenous Period	Isolated find of Indigenous Period lithics	RAA
EaLu-010	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics, including triangular projectile point	RAA
EaLu-011	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics and ceramics	RAA
EaLu-012	Campsite	Indigenous Period	Surface collection of Indigenous Period lithics, including Avonlea projectile point	RAA
EaLu-014	Isolated Find	Indigenous Period	Isolated find of Indigenous Period lithics	RAA
EaLu-015	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics and ceramics	RAA
EaLu-017	Campsite	Middle Indigenous Period	Surface collection of Indigenous Period lithics, including a McKean projectile point	RAA
EaLu-023	Campsite	Not Available	Surface collection containing “flakes of bone”	RAA
EaLu-024	Campsite	Middle Indigenous Period	Surface collection of Indigenous Period lithics including projectile points and Indigenous	RAA

Table 6-3: Provincially registered archeological sites located within the RAA

Site	Site Type	Period	Description	Within LAA or RAA
		Late Indigenous Period Indigenous-European Period	Period ceramics including Blackduck. Site contains an Indigenous -European component.	
EaLu-025	Campsite	Middle Indigenous Period	Surface collection of Indigenous Period lithics, including Oxbow and corner-notched projectile points	RAA
EaLu-036	Campsite	Middle Indigenous Period Late Indigenous Period	Surface collection of Indigenous Period lithics, including McKean, Oxbow, Sonota, Besant, and Pelican Lake projectile points and Indigenous Period ceramics	RAA
EaLu-039	Isolated Fine	Indigenous Period	Isolated find of Indigenous Period lithics	RAA
EaLu-040	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics, including side-notched projectile points	RAA
EaLu-041	Campsite	Late Indigenous Period Indigenous-European Period	Surface collection of Indigenous Period ceramics, including fabric impressed. Site contains an Indigenous-European component.	RAA
EaLu-042	Campsite	Not available	A poorly recorded site	RAA
EaLu-043	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics	RAA
EaLu-044	Campsite	Not available	A poorly recorded site	RAA
EaLu-045	Campsite	Middle Indigenous Period Late Indigenous Period	Surface collection of Indigenous Period lithics, including corner-notched projectile points and ceramics	RAA

Table 6-3: Provincially registered archeological sites located within the RAA

Site	Site Type	Period	Description	Within LAA or RAA
EaLu-046	Campsite	Not available	A poorly recorded site	RAA
EaLu-047	Campsite	Not available	A poorly recorded site	RAA
EaLu-048	Campsite	Late Indigenous Period Indigenous-European Period	Surface collection of Indigenous-European Period ceramics	RAA
EaLu-051	Campsite	Indigenous Period Late Indigenous Period	A poorly recorded site	LAA
EaLu-053	Campsite	Middle Indigenous Period Late Indigenous Period	A poorly recorded site	RAA
EaLu-054	Campsite	Middle Indigenous Period Late Indigenous Period	Surface collection of Indigenous Period lithics, including Oxbow, McKean, Avonlea, and Prairie projectile points	RAA
EaLu-055	Uninterpreted	Middle Indigenous Period	Surface collection of Indigenous Period lithics, including McKean projectile points	RAA
EaLu-056	Campsite	Middle Indigenous Period Late Indigenous Period	Surface collection of Indigenous Period lithics, including McKean, Besant, and Prairie projectile points	RAA
EaLu-057	Uninterpreted	Middle Indigenous Period Late Indigenous Period	Surface collection of Indigenous Period lithics, including Oxbow and Prairie projectile points	RAA
EaLu-058	Uninterpreted	Late Indigenous Period	Surface collection of Indigenous Period lithics, including Besant, Avonlea, and Prairie projectile points	RAA

Table 6-3: Provincially registered archeological sites located within the RAA

Site	Site Type	Period	Description	Within LAA or RAA
EaLu-059	Other	Late Indigenous-European Period	A World War II era airfield	RAA
EaLv-006	Uninterpreted	Late Indigenous Period	Surface collection of Indigenous Period lithics, including Besant, Avonlea, Pelican Lake, and Prairie projectile points	RAA
EbLu-001	Kill Site	Middle Indigenous Period Late Indigenous Period	Collection of Indigenous Period lithics, including Oxbow, McKean, and Prairie side-notched projectile points	RAA
EbLu-002	Campsite	Middle Indigenous Period Late Indigenous Period	Surface collection of Indigenous Period lithics, including Oxbow, McKean, Duncan, and Pelican Lake projectile points and Indigenous Period ceramics, including Laurel	RAA
EbLu-003	Campsite	Indigenous Period	Surface collection of Indigenous Period lithics	RAA
EbLu-004	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics, including side-notched projectile point	RAA
EbLu-005	Isolated Find	Not Available	A poorly recorded site	RAA
EbLu-006	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics, including Sonota projectile point	RAA
EbLu-007	Isolated Find	Not Available	A poorly recorded site	RAA
EbLu-008	Campsite	Late Indigenous Period	Surface collection of Indigenous Period lithics	RAA
EbLu-009	Isolated Find	Late Indigenous Period	Surface collection of Indigenous Period lithics, including Pelican Lake projectile point	RAA
EbLu-010	Campsite	Indigenous Period	Surface collection of Indigenous Period lithics	RAA

Table 6-3: Provincially registered archeological sites located within the RAA

Site	Site Type	Period	Description	Within LAA or RAA
EbLu-012	Campsite	Indigenous Period	Surface collection of Indigenous Period lithics, including projectile points	RAA
EbLu-014	Isolated Find	Indigenous Period	Isolated find of Indigenous Period lithics	RAA
EbLu-015	Campsite	Not Available	A poorly recorded site	RAA
EbLu-016	Campsite	Not Available	A poorly recorded site	RAA
EbLu-017	Campsite	Indigenous Period	Surface collection of Indigenous Period lithics, including an obsidian scraper	RAA
EbLu-018	Campsite	Early Indigenous Period	Surface collection of Indigenous Period lithics, including projectile points	RAA
EbLu-020	Isolated Find	Middle Indigenous Period	Surface collection of Indigenous Period lithics, including Oxbow projectile points	RAA
EbLu-021	Campsite	Indigenous Period	A poorly recorded site	RAA
EbLu-026	Uninterpreted	Middle Indigenous Period Late Indigenous Period	Surface collection of Indigenous Period lithics, including Hanna, Oxbow, Pelican Lake, and Plains projectile points	RAA

The majority of the archaeological sites in the RAA are predominantly Indigenous Period heritage resources and isolated finds within disturbed contexts. There is a large number of sites found in proximity (within 10 km) to the project area dating from the Early Indigenous Period to World War II. Two archaeological sites are within the LAA.

A review of provincial and municipal designated sites and commemorative plaques indicated a total of two provincial and four municipal sites (see (Table 6-4), and 12 plaques located in the RAA (see Table 6-5). The two municipal designated sites are located just outside the LAA within the RAA, and the four provincial designated sites are also located in the RAA.

Table 6-4: Designated provincial and municipal sites located within the RAA

Name	**Site type**
Davidson House	Municipal
Roxy Theatre	Municipal
Knox Presbyterian Church	Provincial
Beautiful Plains County Court Building	Provincial
Margaret Laurence House	Provincial
Independent Order of Odd Fellows Building	Provincial

Table 6-5: Plaques

1983	Beautiful Plains County Court Building
1987	Beautiful Plains County Court Building
1963	Fort Ellice Trail Junction
1992	Knox Presbyterian Church
1989	Laurence, Margaret, House
1982	Neepawa Agricultural Society Centennial
1995	Independent Order of Odd Fellows Building
2002	Oberon
N/A	Dumfries School
N/A	Osprey School
1967	Lake Irwin Park
2006	Layng's Ford

There are seven centennial farms registered within the RAA, listed in Table 6-6.

Table 6-6: Centennial farms

Name	Legal Description	Original Date
Ras. Family Farm	SE 28-13-15 W	1889
Mo. Family Farm	NE 13-14-16 W	1891
Ti. Family Farm	SW 8-14-15 W	1881
McJ. Family Farm	NW 22-14-15 W	1891
Ol. Family Farm	E 32-12-15 W	1903
Ha. Family Farm	W 4-13-15 W	1905
Ha. Family Farm	SE 7-12-15 W	1904

To summarize:

- In the RAA, there are 55 registered archaeological sites, two municipal sites, four provincial sites, 12 plaques, and seven centennial farms.
- In the LAA, there are two registered archaeological sites and no provincially designated sites, municipally designated sites, or plaques.

6.3.4 Areas of elevated concern

Based on the review of documented history, known archaeological sites, landscape analysis, and professional judgement of the project archaeologist, ten AOCs with elevated archaeological potential were identified (Table 6-7). The ten AOCs are further detailed in Appendix B.

Table 6-7: Areas of elevated heritage concern

AOC	Rationale	Legal Description
AOC 1	Archaeological site within 1,000 m.	NE-16-14-15-W
AOC 2	Archaeological site within 500 m.	SE-16-14-15-W
AOC 3	Archaeological site within 500m.	NE-09-14-15-W
AOC 4	Archaeological site within 1,000 m.	SE-09-14-15-W
AOC 5	Reported Burial. Centennial farm within 1000m. Archaeological site within 2,500 m.	NE-28-13-15-W
AOC 6	Centennial farm within 150 m and archaeological site within 2,500 m.	SE-28-13-15-W
AOC 7	Reported burial in adjacent quarter section.	SE-33-12-15-W
AOC 8	Intersects major trail. Archaeological sites within 700 m.	SE-28-12-15-W

AOC 9	Reported burial in adjacent quarter section. Archaeological site within 800 m.	NE-21-12-15-W
AOC 10	Archaeological site within 800 m.	SE-21-12-15-W

Pedestrian surveys and shovel testing prior to construction will be focused on these areas.

6.3.5 Cultural sites and features

Through engagement on this project and past projects, Manitoba Hydro understands that both Crown and private lands are used for practicing rights-based activities. Crown land is highly valued as it is available for First Nations peoples and Red River Métis citizens to use for rights-based activities without permission.

Although, the PDA does not traverse any Crown land (see Table 5-6), with landowner permission, private lands also provide areas for First Nations peoples and Red River Métis citizens to undertake rights-based activities.

Based on past engagement on projects in southern Manitoba, Manitoba Hydro also understands that both Crown and private land can contribute to the fulfillment of Treaty Land Entitlement (TLE) agreements. TLE agreements have been negotiated between certain First Nations and the federal government to fulfill outstanding land-related treaty obligations (Indigenous Services Canada 2025).

Although there are currently no TLE selections in the RAA, Long Plain First Nation, Peguis First Nation, Rolling River First Nation, and Swan Lake First Nation, who are being engaged about the project, have TLE settlement agreements that are not yet entirely fulfilled. These Nations' TLE agreements include an amount of provincial Crown land to be selected and/or an amount of land to be acquired from private landowners who are willing to sell (Indigenous Services Canada 2025).

Manitoba Hydro recognises that a lack of specific information regarding important sites for this proposed project does not represent a lack of cultural use or importance of the area. Through initial engagement, general knowledge of history, culture, and areas of interest were shared, helping shape a broader understanding of the historical, cultural, and environmental context of the project area. While some important sites may not have been identified during initial engagement, Manitoba Hydro understands that the area is of broad cultural importance to engaged First Nations and the Manitoba Métis Federation who have maintained enduring relationships with the land in the area for generations. Manitoba Hydro remains committed to ongoing engagement and remains open to receiving additional information throughout the lifecycle of the project. Conversations about heritage resources and important sites are continuous and foundational to both understanding and respecting the cultural and historical landscape of the project area.

6.4 Project interactions with important sites

Table 6-8 identifies, for each potential effect, the physical activities that might interact with important sites and result in the identified effect.

Table 6-8: Project interactions with important sites		
Project activities/components	**Changes to important sites, including heritage resources in their in-situ context and tangible cultural sites or features**	**Changes to cultural experience, including intangible culture, cultural practices, knowledge transmission, and access to important sites**
Construction of pipeline and control points		
Mobilization and staff presence	-	✓
Vehicle and equipment use	✓	✓
Access development	✓	✓
Marshalling yards (temporary work or storage areas)	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	-	✓
Pipe installation – trenching and lowering	✓	✓
Horizontal directional drilling	✓	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-
Backfilling and contouring	✓	✓
Control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	✓	✓
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline and control points		
Presence of pipeline and control points	-	✓
Vehicle and equipment use	✓	✓

Table 6-8: Project interactions with important sites

Project activities/components	Changes to important sites, including heritage resources in their in-situ context and tangible cultural sites or features	Changes to cultural experience, including intangible culture, cultural practices, knowledge transmission, and access to important sites
Maintenance activities, including in-line inspections using pipeline inspection gauges (PIGs) and integrity digs	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	-
Valve operation checks (annually)	-	-
Vegetation management	✓	✓
Decommissioning of pipeline and control points		
Mobilization and staff presence	-	✓
Vehicle and equipment use	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	-	-
Removal of above-ground components (dismantling, removal from site, disposal)	✓	✓
Rehabilitation	✓	✓
Clean-up and demobilization	✓	✓

✓= Potential interaction

– = No interaction

6.5 Assessment of project effects

As presented in Section 6.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on important sites. While effects to important sites could occur during construction, operation, and decommissioning, they are anticipated to be most pronounced during construction and include the following:

- Changes to important sites, including disturbance of heritage resources from their *in-situ* context and/or disturbance of tangible cultural sites or features important to First Nations peoples and Red River Métis citizens
- Changes to cultural experience, including changes to intangible culture, cultural practices (*e.g.,* ceremony), knowledge transmission, and access to important sites

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 6-8, proposed mitigation measures, and the characterization of residual project effects.

The assessment draws on information shared by First Nations peoples and Red River Métis citizens during project engagement on this project and past projects.

6.5.1 Changes to important sites

6.5.1.1 Analytical assessment techniques

Changes to important sites are assessed by predicting the project's potential to encounter heritage sites and/or resources and other culturally important sites and features.

In relation to heritage resources, the likelihood of an area to contain heritage resources is known as the archaeological potential. Archaeological potential within the project area was assessed by reviewing archival maps, photos, LiDAR, information gathered during project engagement, input from the HRB, and mapping potential locations (*e.g.*, types of landforms, nearness to documented heritage resources, proximity to water) in relation to the project footprint.

The assessment of possible effects on cultural sites, features, and practices qualitatively draws on information shared through project engagement with engaged First Nations and the Manitoba Métis Federation, and experience in the protection of these sites on past projects with the involvement of the archaeological community and Indigenous nations.

Effects on important sites are assessed using measurable parameters that capture both quantitative and qualitative indicators of change and/or disturbance. Key measurable parameters to assess changes to important sites include:

- The number of heritage resources altered/lost because of project activities
- Instances of encountering heritage resources and/or cultural sites, features, or objects during pre-construction field work or construction activities
- Qualitative assessment of feedback related to potential physical impacts to important sites shared through project engagement

6.5.1.2 Effects pathways

Important sites, including heritage resources and cultural sites or features important to First Nations peoples and Red River Métis citizens, may be changed by the project during construction, operations, and decommissioning. The pathway through which important sites may be affected by the project include:

- project activities involving ground disturbance resulting in physical interaction with known or unknown important sites, including features and objects located beneath or upon the surface.

<u>Construction</u>

Sites, including heritage resources and other tangible cultural sites or features present in the soil or on the landscape in the project area, are primarily vulnerable to project activities involving ground disturbance. Less common, is disturbance of sites or features located on the surface because they are easier to detect prior to project activities. This would include spaces used for ceremony or other cultural purposes, such as trees with prayer flags.

Much of the LAA is cultivated, which indicates that any cultural materials to a depth of approximately 30 cm are likely disturbed. Cultivation can move or damage artifacts, and small features such as hearths. However, there is some residual information in cultivated field sites.

During construction, the primary project activities that may result in disruption of heritage resources and tangible cultural sites or features are those that involve ground disturbance. The primary area of concern is the PDA, and within the PDA, the pipeline trench. During construction, trenching is the project activity involving the largest amount of ground disturbance. Pipeline trenches are narrow linear disturbances, and they are more likely to damage than destroy buried archaeological sites.

Other project activities during construction that may involve ground disturbance include the use of vehicles and equipment, access development, right-of-way preparation (including flagging, clearing of vegetation, and topsoil stripping), horizontal directional drilling, backfilling and contouring, gate station and valve site connections (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application), and clean up and reclamation.

Ten AOCs with elevated heritage potential were identified by the project archaeologist for investigation through pedestrian surveys and shovel tests prior to construction. These AOCs are described in Section 6.3.4 and in greater detail in the technical memo included in Appendix B.

Operations

During operations, the potential for the project to disturb important sites is substantially diminished because ground disturbance is anticipated to be low. Potential effects during operations are generally related to maintenance activities, vehicle and equipment use, and vegetation management. Maintenance activities such as in-line inspections and integrity digs, which involve excavation, would introduce the greatest potential for disturbing important sites.

New information shared about important sites in the area during pre-construction field work or during construction may highlight information relevant to operations (*i.e.,* new locations to be aware of).

Decommissioning

During decommissioning, important sites may be affected through similar pathways as the construction phase. These decommissioning activities include vehicle and equipment use, removal of above-ground components (including dismantling, removal from site, and disposal), and rehabilitation.

Effects would primarily be limited to previously disturbed areas. However, it is possible that new important sites for rights-based activities could be established between the time of construction and decommissioning of the project, which is anticipated to take place in at least 50 years.

6.5.1.3 Mitigation for changes to important sites

The primary methods for protecting archaeological sites are discovery and mitigation. The purpose of undertaking a Heritage Resources Impact Assessment is to identify and assess any heritage resources that may be negatively impacted by development. Within the areas of elevated heritage concern (AOCs), Manitoba Hydro plans to conduct pedestrian surveys by walking the cultivated fields and excavating shovel tests. If archaeological sites are encountered prior to any potential effects from the development, there is potential to move some activities related to the development, as mitigation, which would remove the effect or capture the information contained within the archaeological site before it is damaged or destroyed.

A Heritage Resources Impact Assessment (HRIA) will be conducted prior to construction activities to identify heritage resources within the PDA and mitigate the potential effects. The implementation of the Cultural and Heritage Resources Protection Plan (CHRPP) during the construction phase within areas of high archaeological potential is meant to mitigate any heritage resources disturbed during that phase of the project. These are standard measures applied to other Manitoba Hydro projects.

Project-specific mitigation measures to avoid or reduce the potential effects of the project on important sites are described below.

- A pre-construction survey of areas with heritage potential will be conducted. A total of ten areas of elevated heritage concern have been identified, including three reported burials, a major historic trail, and areas in proximity to known archaeological sites. These features may have the potential for heritage resources on or along their margins. Areas to be surveyed prior to or during construction have been determined by:
    - reviewing archival maps, photos, LiDAR, mapping potential locations (*e.g.,* types of landforms, nearness to documented heritage resources, proximity to water)
    - reviewing information gathered during project engagement
    - examining input from the HRB
    - windshield surveys.
- Mitigation for the protection of heritage sites or objects is outlined in the CHRPP. The CHRPP (Appendix E) will provide clear instructions on how to proceed should Manitoba Hydro, its contractors and/or consultants, discover or disturb a cultural or heritage site or object and will determine the ongoing protection measures for the resources through processes outlined in this document.
- If a heritage site or object is discovered, project work will cease around the discovery and the project archaeologist will be contacted. Work in the area will continue only if approval is received from the archaeologist or the Historic Resources Branch.
- Manitoba Hydro will work to notify engaged First Nations and the Manitoba Métis Federation about archaeological finds.
- Manitoba Hydro remains open to engaged First Nations and the Manitoba Métis Federation identifying sensitive sites, including important sites, to help inform the environmental protection program for the project.
- Identified cultural and heritage sites will be incorporated into environmental protection plans prior to construction.

- Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.
- Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.

6.5.1.4 Residual effect on important sites

Heritage resources and objects are non-renewable and once disturbed or destroyed can never be returned to their original context, losing key information. A potential adverse effect on heritage sites is disturbing them from their in-situ condition. Disturbance may range from displacement from the original context to complete destruction. If a disturbed heritage resource gets displaced from its in-situ context, some to all information about the heritage object can be lost. A heritage resource disturbed to a minor extent can retain information such as typology and association with a complex or culture. However, detailed information such as association with other heritage objects from the area and stratigraphic deposition can be lost. At the extreme, disturbing a heritage object can result in the destruction of the object. When a heritage resource is destroyed, the knowledge and historical understanding that could have been gained from the resource is lost.

For intangible cultural sites and features important to First Nations peoples and Red River Métis citizens, the potential range of adverse effects is aligned with the range identified for heritage resources, from loss of integrity and/or information about the site or object to complete destruction.

Following mitigation, there is still potential for the project to encounter important sites throughout the PDA and potentially decrease the number or quality of heritage resources and other important sites and features. Residual effects for changes to important sites are characterized by the following:

- Direction: Adverse
- Magnitude: Moderate during construction and decommissioning, low during operation
- Geographic extent: PDA
- Duration: Long-term
- Frequency: Multiple irregular events for most effects to important sites, but effects to intangible cultural heritage may be continuous through operations due to the ongoing presence of the project
- Change: Irreversible

6.5.2 Changes to cultural experience

6.5.2.1 Analytical assessment techniques

Changes in cultural experience are assessed through a qualitative review of feedback related to potential project impacts to cultural experiences, residual effects on noise and psychological stress and changes to access. Measurable parameters to assess changes in cultural experience include:

- Qualitative assessment of feedback related to potential project impacts to cultural experiences
- Qualitative assessment of the project's predicted residual effects on noise and psychological stress presented in Chapter 10.0 (Health and well-being)
- Qualitative assessment of changes to access

6.5.2.2 Effects pathways

The project has the potential to affect cultural experience, during construction, operation, and decommissioning. The pathways through which cultural experience may be affected by the project include:

- Project induced changes to sense of place, aesthetics, and stress resulting in disruption to aspects of intangible cultural heritage and the experience of visiting important sites and/or undertaking cultural practices due to the presence of the pipeline
- Increased noise or changes in the types of noise as the result of project activities
- Project activities that restrict access to important sites resulting in loss of opportunities for cultural experiences, practices, and knowledge transfer

<u>Construction</u>

During construction, the primary project activities that may result in changes to cultural experience by affecting the sense of place include the mobilization and staff presence, vehicle and equipment use, access development, marshalling yards (including temporary work or storage areas), right-of-way preparation (including flagging, clearing vegetation, and topsoil stripping), pipe stringing (including welding and coating), pipe installation (including trenching and lowering), horizontal directional drilling, backfilling and contouring, control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application), and clean-up and reclamation. The project may also affect cultural experience through project activities that cause noise and changes to access.

Throughout construction, there will be an increase in noise or change in the types of noise in localized areas under active construction.

For the duration of active construction, access to the PDA (right-of-way) is prohibited. Physical barriers (*i.e.,* gates, fences) may be in place during this time to deter access to the area. These access restrictions are intended to protect health and safety while construction activities are underway. However, the restrictions also prevent access to important sites and access points that may be located along the PDA.

Although there is no Crown land traversed by the PDA for this project, Manitoba Hydro understands, based on engagement feedback shared for past projects, that First Nations peoples and Red River Métis citizens may also use private land to practice cultural activities with landowner permission. The Manitoba Métis Federation has previously shared for other recent projects, including the proposed Dominion City to Altona gas transmission line, that there are interests related to constitutionally protected rights on private lands that may be used for harvesting with landowner permission and that there may be Métis owned private lands in the area on which Red River Métis citizens undertake cultural activities. In areas of private land along the PDA, where landowners may currently grant permission for individuals to use their property to undertake rights-based activities, those areas would be inaccessible during construction.

Limiting access has the potential to affect cultural experiences by affecting cultural continuity and knowledge transfer. A loss or diminishment of experience of important sites, through the pathways described, may have long-term implications on cultural vitality of Indigenous peoples due to diminished opportunity for the intergenerational transmission of cultural and Indigenous Knowledge that occurs through participating in various cultural practices (i.e., intangible cultural heritage).

Operations

During operations, the potential for the project to result in changes to cultural experience include the presence of the pipeline and control points, vehicle and equipment use, maintenance activities, and vegetation management.

Changes to aesthetic conditions resulting from project activities during operations, may affect Indigenous peoples' sense of place, defined as peaceful enjoyment of lands and waters without sensory disturbances, stress, or harassment, and their emotional and spiritual attachment to culturally important places. Effects to sense of place would primarily occur during scheduled inspections and maintenance activities described in Chapter 2.0 (Project description).

During operations, access to the PDA (right-of-way) may be prohibited on occasion to allow for inspections and maintenance activities to proceed in a safe manner. Aside from these localized and isolated periods of access restriction during specific activities, access to the PDA will return to the same state as it exists prior to the project.

Decommissioning

During decommissioning, potential effects are generally related to vehicle and equipment use, the removal of above-ground components (dismantling, removal from site, and disposal), rehabilitation, and clean up and demobilization. The pathways to the effects are similar to those during the construction phase.

6.5.2.3 Mitigation for changes to cultural experience

Through engagement on past projects, Manitoba Hydro has learned about the importance of providing people working on projects, particularly those who are non-local, with Indigenous cultural awareness training prior to work taking place. Several First Nations have also shared perspectives about the importance of incorporating ceremony into projects to proceed in a good way and show respect for the spirits, ancestors, and all beings (including people) that may be affected by a project. These recommendations provide opportunities for cultural continuity and knowledge transfer.

Project-specific mitigation measures to avoid or reduce the potential effects of the project on cultural experience are described below.

- Manitoba Hydro will provide notification to engaged First Nations and the Manitoba Métis Federation and relevant interested parties prior to the start of construction.
- Indigenous Cultural Awareness Training will be required for project workers (i.e., both Manitoba Hydro staff and contractors).
- Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in arranging a ceremony or ceremonies, recognizing that participation will be guided by each nation’s cultural practices, protocols, and preferences.
- Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.
- Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.

6.5.2.4 Residual effect on cultural experience

Following the implementation of mitigation measures, predicted residual effects on cultural experience include:

- Alterations to sense of place, aesthetics, and/or stress, resulting in disruption to aspects of intangible cultural heritage and the experience of visiting important sites and/or undertaking cultural practices
- Increased noise or changes in the type of noise
- Access restrictions to the PDA during construction
- Intermittent localized access restrictions to the PDA during maintenance activities

Although First Nations peoples and Red River Métis citizens may access private land for right-based activities, with permission, project effects to access to important sites will affect only those who are landowners or who specifically obtain permission to use private land within the LAA.

Following the implementation of mitigation measures described above, residual effects for changes in cultural experience are characterized by the following:

- Direction: Adverse
- Magnitude: Moderate during construction and decommissioning, and low during isolated periods of maintenance activities
- Geographic extent: LAA
- Duration: Long-term throughout construction, operation and decommissioning as it relates to the presence of the pipeline, noise and access restrictions
- Frequency: Continuous (during construction, decommissioning, and during operations due to presence of the line) and irregular events when maintenance activities take place
- Change: Irreversible

6.5.3 Summary of residual effects

Table 6-9 characterizes the residual effects on important sites.

Table 6-9: Project residual effects on important sites

Residual effects characterization						
Project Phase	Direction	Magnitude	Geographic extent	Duration	Frequency	Reversibility
Changes to important sites						
Construction	A	M	PDA	LT	IR	I
Operation		L			C	
Decommissioning		M			IR	
Changes in cultural experience						
Construction	A	M	LAA	LT	C	I
Operation		L				
Decommissioning		M				

6.5.4 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the important sites
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

For important sites, both conditions are present.

Past and ongoing project and activities including the development of transmission lines, roads, railway, and resource development in the RAA have drastically altered important sites since European contact first occurred. A more detailed history of activities that have altered the cultural landscape and Indigenous connections to land in the project area is included in Chapter 5.0 (Environmental setting).

6.5.4.1 Project residual effects likely to interact cumulatively

Table 6-10 shows the project and physical activities inclusion list, which identifies other projects and physical activities that might act cumulatively with the project to impact important sites. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 6-10: Potential cumulative effects on important sites

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects	
	Changes to important sites	**Changes to cultural experience**
Existing/ongoing projects and activities		
Domestic resource use (e.g., hunting, trapping, fishing, non-commercial agriculture)	-	-
Recreational activities (e.g., canoeing, snowmobiling, hiking)	✓	✓
Industrial and commercial resource use, including commercial agriculture	✓	✓
Existing infrastructure (non-Manitoba Hydro) such as roads, railways, telecommunication lines, pipelines, water and wastewater treatment facilities	✓	✓
Manitoba Hydro gas and electricity transmission and distribution	✓	✓
Residential and institutional developments	✓	✓
Potential future projects and activities		
Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony	✓	✓
Residential and institutional developments	✓	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.

– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

6.5.4.2 Cumulative effects on important sites

Most of the past and ongoing projects and activities in the RAA have contributed to changes to important sites in the RAA. The project has the potential to interact cumulatively on important sites with the past and ongoing projects as well as the two potential future projects shown in Table 6-10. The pathways for cumulative effects and mitigation measures are discussed in subsequent sections.

Pathways for cumulative effect

Ongoing/existing and future projects and activities in the RAA have the potential to interact cumulatively with the project's residual effects on important sites if they involve activities requiring ground disturbance, clearing of forested areas, or the creation of noise and/or access disruptions.

Ground disturbances have the potential to damage or destroy important sites. Cumulative effects can affect both important sites and the resolution and fidelity of archaeological knowledge. Small impacts may degrade and potentially destroy the integrity of important sites over time, even though the effect of each individual impact is limited. As archaeological sites provide only a small sample of past cultural activity, losing one or more archaeological sites in a region can significantly reduce the archaeological knowledge of a region.

Beyond the physical disturbances that these potential future developments may cause, they may also alter changes to cultural experiences, including altering sense of place, aesthetics, and/or causing stress, resulting in disruption to aspects of intangible cultural heritage and the experience of visiting important sites and/or undertaking cultural practices. Effects related to noise and access will only be additive if the activities causing noise or disruptions in access to important sites occur concurrently and close to one another.

The effects of the proposed Neepawa gas transmission project along with potential future developments in the RAA have the potential to compound impacts to important sites, leading to both tangible damage or loss of important sites and negative impacts on cultural experiences.

Mitigation measures

Project mitigation measures will help reduce project residual effects to important sites. Manitoba Hydro will continue to consider feedback related to mitigation for how the project contributes cumulatively to effects to important sites in the RAA.

Other proponents maintaining existing projects and activities in the project area, and those proposing future projects and activities, are responsible for reporting relevant activities to the Historic Resources Branch and may adopt mitigation measures to mitigate their own potential effects. The regulators can inform Manitoba Hydro if it appears that there are unanticipated adverse cumulative effects occurring. The Historic Resources Branch also reviews land-based developments through the heritage resource impact assessment program as mandated by *The Heritage*

Resources Act. Therefore, additional mitigation for cumulative effects related to heritage resources are addressed by the provincial regulators as they determine whether future projects will require heritage investigations.

Residual cumulative effect

Residual cumulative effects on important sites, and the experience of visiting important sites are predicted to be adverse in direction. Magnitude is predicted to be low based on experience with transmission pipelines, consideration of the identified mitigation measures, and feedback heard during project engagement. The geographic extent of predicted cumulative effects would be the RAA.

Cumulative effects resulting from noise and changes in access are likely to be more temporary in nature and only interact cumulatively during periods of overlapping activity. On the other hand, effects related to the ongoing presence of the project in conjunction with ongoing/existing and future projects and activities, are considered long-term until individual projects no longer contribute effects on important sites (*i.e.,* until the activity stops or the project is decommissioned). While some cumulative effects on important sites may be reversible following decommissioning of the projects contributing to effects, Manitoba Hydro understands that effects resulting in the interruption of opportunities for Indigenous Knowledge transfer and cultural continuity that occurs through visiting important sites are not reversible.

6.5.5 Determination of significance

With proposed mitigation and environmental protection measures, the residual project and cumulative effects on important sites are predicted to be not significant.

Manitoba Hydro acknowledges that engaged audiences may experience effects to important sites in unique ways. Therefore, effects may be felt to varying magnitudes depending on the individual, and some individuals may deem effects as substantive. With this variation in mind, the project is not anticipated to result in the destruction of a heritage resource or a long-term cultural experiences are critically reduced or eliminated based on qualitative assessments of indicators of the potential effects, literature review, engagement feedback, and professional judgment.

6.5.6 Prediction confidence

Prediction confidence in the assessment of effects on important sites is moderate.

This prediction confidence assignment reflects the available information regarding heritage sites mentioned during engagement with First Nations peoples and Red River Métis citizens, a review of publicly available literature on important sites in the project area, and experience with applying and monitoring mitigation measures on past Manitoba Hydro projects.

In relation to heritage resources, this prediction confidence reflects the limited number of land-based features of interest and low potential terrain but also recognizes the limited number of archaeological studies in the area. The prediction confidence of smaller, ephemeral sites and burials is lower. The location decisions for these heritage resources are more specific and thus harder to predict. Chance find policies, as described in the CHRPP, are built around this understanding and outline reporting procedures if heritage resources are encountered in the study area.

Manitoba Hydro is aware that there may be important cultural sites and features present in the RAA that we are not aware of and have considered this assumption in this assessment. Given the qualitative and subjective nature of assessing potential effects to important sites, specifically to the experience of visiting important sites and enjoyment of place, the views of First Nations peoples and Red River Métis citizens may differ from the findings of this assessment.

6.5.7 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a VC monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (see Chapter 16.0).

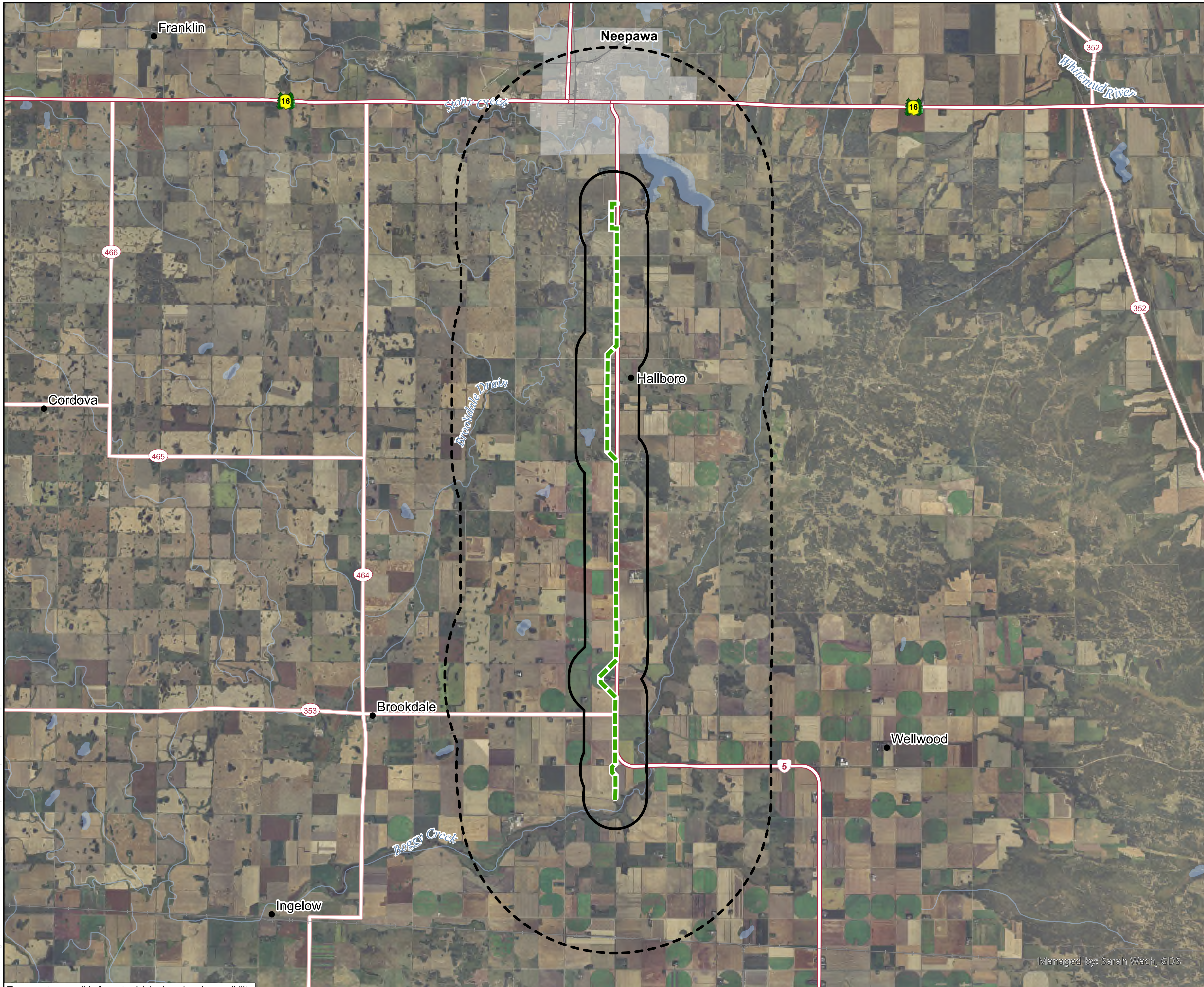
The environmental protection program (EPP) is a framework for implementation, management, monitoring and evaluation of protection activities in keeping with environmental effects identified in environmental assessments, regulatory requirements, and public expectations. The EPP prescribes measures and practices to avoid and reduce adverse environmental effects (*e.g.,* wildlife reduced risk timing windows, setbacks, and buffers for sensitive habitat).

To provide opportunity for Indigenous monitoring during construction, Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.

6.5.8 Sensitivity to future climate change scenarios

Effects of climate change on important sites are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (*e.g.,* flooding).

If heritage resources or cultural sites and features are located on the surface, the major risk associated with climate change is forest fires. Hotter and drier spring and summer weather will contribute to this. Subsurface heritage resources are less affected by fires. However, since charcoal from fires can diffuse into the soil, fires may contaminate soil and make dating of subsurface heritage resources difficult. Droughts could also expose previously underwater heritage resources, cultural sites, or features, while flooding could result in the disappearance of previously exposed heritage resources, cultural sites, or features.



Neepawa Gas Transmission Project

Project Infrastructure

- Final Preferred Route

Assessment Area

- Local Assessment Area (1 km buffer around PDA)
- Regional Assessment Area (5 km buffer around PDA)

Landbase

- Community
- TransCanada Highway
- Yellowhead Highway
- Provincial Highway
- Provincial Road
- Railway
- First Nation Reserve
- City/Town

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

N

0 2.5 5 Kilometres
0 1.5 3 Miles

1:120,000

Spatial Boundaries for Important Sites

Map 6-1

7.0 Vegetation

In this environmental assessment, vegetation refers to the diversity and characteristics of an area's plant cover. Vegetation provides ecological, aesthetic, recreational, and economic value, supports wildlife, and is important to traditional and cultural practices of Indigenous nations. Vegetation was chosen as a valued component for the following reasons:

- There is potential for the project to interact with species of conservation concern (SOCC).
- There is potential for the project to contribute to an increase in non-native, invasive, or noxious weeds.
- Knowledge shared through project engagement included the concerns for weed management in the project area.

7.1 Summary of conclusions

The Neepawa gas transmission project is anticipated to have adverse residual project effects on vegetation including the following:

- Potential loss of plant SOCC due to right-of-way preparation, topsoil stripping, and salvage during construction
- Potential loss of plant SOCC from vegetation management or other maintenance activities during operations
- No anticipated change to the abundance and distribution of invasive and non-native species
- No direct alteration of wetlands

The residual project effects on vegetation are anticipated to be the most pronounced during the construction phase when project activities involving ground disturbance and vegetation clearing or disturbance will most occur.

Adverse residual project and cumulative effects to vegetation are anticipated to be not significant because the project is not anticipated to threaten the long-term persistence or viability of native vegetation communities or SOCC in the RAA.

7.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 7.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on vegetation.

This assessment has been influenced by engagement feedback, information provided from field reconnaissance surveys, and Manitoba Hydro's experience with other transmission projects (both gas and hydroelectric) in southern Manitoba (e.g., Altona to Winkler Gas Transmission Project, Dominion City to Altona Gas Transmission Project, Northwest Gas Transmission Project, the Pointe du Bois to Whiteshell Transmission Project, Dorsey to Wash'ake Mayzoon Transmission Project, St. Vital Transmission Complex and Manitoba-Minnesota Transmission Project).

7.2.1 The project

The proposed project consists of construction, operation, and decommissioning of a six-inch steel natural gas transmission pipeline and associated above-ground control structures. The new pipeline will be approximately 20 km in length, beginning at a control point located approximately 22.5 km south of Neepawa and terminating at another control point located approximately 3.5 km south of Neepawa. The project components are described in more detail in Chapter 2.0 (Project description).

7.2.2 Regulatory and policy setting

Effects to vegetation are provincially and federally regulated. The following laws, and associated regulations, policies, and guidelines were considered for assessing project effects to vegetation.

7.2.2.1 Federal guidance

Species at Risk Act (SARA)

The federal *Species at Risk Act* (2002) protects species at risk (SAR) and their critical habitat in Canada. The legislation provides a framework to facilitate recovery of species listed as threatened, endangered, or extirpated, and to prevent species listed as special concern from becoming threatened or endangered. SARA prohibits the following:

- The killing, harming, or harassing of endangered or threatened species at risk (Sections 32 and 26)
- The destruction of critical habitat of endangered or threatened species at risk (Sections 58, 60, and 61)

Under SARA, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the status of species at risk. COSEWIC designates species at risk by listing them under Schedule 1 of SARA under the following classifications:

- Extirpated – a species that no longer exists in the wild in Canada, but exists elsewhere in the wild

- Endangered – a species that is facing imminent extirpation or extinction
- Threatened – a species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
- Special Concern – a species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats (Government of Canada 2024)

7.2.2.2 Provincial guidance

The Endangered Species and Ecosystems Act

Provincially, at risk plant and animal species native to Manitoba are designated as endangered, threatened, extinct, extirpated (no longer present in Manitoba), or special concern and are protected under *The Endangered Species and Ecosystems Act* (2018) and its regulations (Province of Manitoba n.d.). In addition to designating the status of a species at the provincial level, the purposes of *The Endangered Species and Ecosystems Act* (ESEA) are to ensure protection and enhance the survival of endangered and threatened species in the province and to enable the reintroduction of extirpated species into the province.

Activities that would kill, disturb, or interfere with any listed species, or damage, destroy, or remove habitat and natural resources on which a listed species depends, are prohibited by Manitoba's ESEA.

At risk ecosystems can also be designated as threatened or endangered and be protected under the MESEA. Two ecosystems are currently designated as endangered: alvars and native tall grass prairie (Province of Manitoba 2023).

Manitoba Conservation Data Centre

The Manitoba Conservation Data Centre (MB CDC) assigns conservation status ranks to plant and animal species in Manitoba based on their rarity along a five-point scale (Manitoba Natural Resources and Indigenous Futures 2025a). MB CDC ranks range from S1 to S5 as defined below:

- S1: Critically imperiled – at a very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors
- S2: Imperiled – at a high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors

- S3: Vulnerable – at moderate risk of extirpation in the jurisdiction due to a restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors
- S4: Apparently secure – at a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors
- S5: Secure – at very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations, or occurrences, with little to no concern from declines or threats (NaturServe Explorer 2025)

The Noxious Weed Act

The Noxious Weeds Act of Manitoba requires municipalities to inspect, monitor and control (or destroy) noxious weeds within their borders. Noxious weeds pose a threat to the economy (*i.e.*, agriculture), the environment (*e.g.*, invasive species) and human and animal health (*e.g.*, poisonous weeds) (Government of Manitoba 2025).

Non-native and invasive plants regulated by *The Noxious Weed Act*, are categorized into three tiers as follows:

- Tier 1: Species considered to have the most potential for negative effects though they may not yet be present in Manitoba
- Tier 2: Species that already have already established in Manitoba and are observed to spread easily
- Tier 3: All other designated species

7.2.2.3 Other legislation

Other pieces of legislation that may be relevant to the project's interactions with vegetation include:

- *The Environment Act* (Manitoba) as it relates to the requirement for a pesticide use permit prior to the use of herbicides for vegetation management.

7.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide feedback about the project.

Feedback related to vegetation included concerns about noxious weeds and the need for the development of weed management plans. Leafy spurge (Tier 2) and water hemlock (Tier 3) were identified as noxious weeds of particular concern.

Through experience engaging on past gas transmission projects, Manitoba Hydro understands that general concerns related to the potential effects of gas transmission lines on vegetation include the potential loss or disruption to shelterbelts, the potential change or loss of SOCC, loss or disturbance of existing wooded areas, development through wetlands, loss or disturbance of plants, and the spread of invasive plants.

7.2.4 Potential effects, pathways, and measurable parameters

The potential project effects on vegetation, along with effects pathways and measurable parameters are outlined in Table 7-1.

Table 7-1: Potential effects, effects pathways, and measurable parameters for vegetation

Potential effect	**Effect pathway**	**Measurable parameter(s) and units of measurement**
Change in SOCC abundance and distribution.	Vegetation clearing and ground disturbance resulting in direct loss of plant SOCC. Ground disturbance resulting in indirect loss of SOCC from the establishment of invasive and non-native plants.	Number, abundance, and spatial distribution of plant SOCC. Qualitative assessment of potential for invasive and non-native plants to alter the abundance and distribution of SOCC.
Change in invasive and non-native species abundance and distribution.	Introduction and spread of invasive and non-native plant species from ground disturbance and project materials and equipment	Number, abundance, and spatial distribution of invasive and non-native plants.

7.2.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on vegetation:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The PDA is described in detail in Chapter 2.0 (Project Description). The total area of the PDA is 54.4 ha.

- **Local assessment area (LAA):** includes all components of the PDA plus a 1 km buffer around the PDA which is used to evaluate measurable effects on vegetation. The total area of the LAA is 4,347 ha.
- **Regional assessment area (RAA):** includes the PDA and LAA and consists of a 15 km buffer around the final preferred route (Map 7-1). This area is where there is the potential for cumulative and socio-economic effects, and that will be relevant to the assessment of any wider-spread effects of the project. The total area of the RAA is 128,970 ha.

The LAA and RAA used for the assessment of project effects on vegetation are consistent with the LAA and RAA boundaries being used to assess effects on wildlife and wildlife habitat (Chapter 8.0). The LAA and RAA boundaries are also consistent with those that have been used to assess effects on vegetation on recent transmission projects in Manitoba.

Map 7-1 illustrates the spatial boundaries for the assessment of project effects on vegetation.

7.2.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on vegetation are based on the timing and duration of project activities as follows:

- Construction – estimated to take approximately 12 months, beginning in the winter of 2027
- Operation and maintenance – estimated to be at least 50 years based on the pipeline’s design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

7.2.7 Residual effects characterization

Table 7-2 provides the definitions used to characterize the residual effects on vegetation.

Table 7-2: Characterization of residual effects on vegetation

Characterization	Description	Quantitative measure or definition of qualitative categories
Direction	The long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to vegetation relative to baseline **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to vegetation relative to baseline **Neutral –** no net change in measurable parameters for vegetation relative to baseline
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	**No measurable change –** no measurable change is predicted **Low** – A measurable change in SOCC is predicted but it is unlikely to affect sustainability in the LAA and there is no predicted effects **Moderate –** a measurable change affecting the sustainability of SOCC in the LAA is predicted but is not predicted to extend to the RAA **High –** a measurable change affecting the sustainability of SOCC in the RAA is predicted
Geographic extent	The geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA

Table 7-2: Characterization of residual effects on vegetation

Characterization	Description	Quantitative measure or definition of qualitative categories
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency	Identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** **Multiple irregular event –** occurs at no set schedule **Multiple regular event –** occurs at regular intervals **Continuous –** occurs continuously
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation **Irreversible –** the residual effect is unlikely to be reversed

7.2.8 Significance definition

For this assessment, adverse residual effects on vegetation are considered significant if, following the application of mitigation measures, the proposed project:

- threatens the long-term persistence or viability of native vegetation communities or SOCC in the RAA.

7.3 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data, including pertinent reports, published literature, provincial and federal databases, and other data sources. Information was also gathered during the reconnaissance survey conducted for vegetation in June and July 2025 (Appendix C).

The existing conditions described in this section focus on:

- Ecological land classification
- Land cover classification
- Botanical resources including SOCC, non-native species, and invasive or noxious weeds

7.3.1 Ecological land classification

The proposed project's PDA is within the Prairies Ecozone, Aspen Parkland Ecoregion, and Carberry and Shilo Ecodistricts. Descriptions of these ecozone, ecoregion, and ecodistricts can be found in Chapter 5.0.

Map 7-1 and Table 7-3 illustrate how the PDA, LAA and RAA intersect the Canada land classification ecozones, ecoregions and ecodistricts.

Table 7-3: Ecodistrict area (ha) and percent (%) coverage in the PDA, LAA and RAA

Ecodistrict	**RAA**		**LAA**		**PDA**	
	ha	**%**	**ha**	**%**	**ha**	**%**
Aspen Parkland Ecoregion						
Carberry	34,987	27	2,235	51	26	47
Hamiota[1]	32,574	25	0	0	0	0
Shilo	51,333	40	2,113	49	29	53
Lake Manitoba Plain Ecoregion						
MacGregor[1]	231	0	0	0	0	0
McCreary[1]	9,845	8	0	0	0	0
Total	128,970	100	4,347	100	54	100

Values might not sum to totals shown because of rounding.

[1] See Smith et al. 1998 for descriptions of Hamiota, MacGregor, and McCreary ecodistricts.

7.3.2 Land cover classification

Natural Resources Canada uses remote sensing satellite data to spatially differentiate between the land cover classifications that make up Canada's land surface (Natural Resources Canada 2020). Native vegetation classes include range and grassland, deciduous forest, mixed wood forest, and marsh wetland. The water class includes rivers and streams. Agriculture includes forage crops and fields. Cultural features, roads, and rail lines are also identified.

The distribution of land cover class types is illustrated in Map 7-2 with the area and percent covers in the PDA, LAA, and RAA shown below in Table 7-4.

Table 7-4: Land use / land cover class area (ha) and percent (%) coverage in the PDA, LAA and RAA

Land Use/ Land Cover Class	RAA		LAA		PDA	
	ha	%	ha	%	ha	%
Agri – Forage Field	6,153	5	345	8	11	20
Agricultural Field	73,815	57	2,578	59	28	52
Coniferous Forest	231	0.2	0.36	<0.01	-	-
Cultural Features	426	0.3	-	-	-	-
Deciduous Forest	16,018	12	304	7	1	3
Mixedwood Forest	128	0.1	1	0.03	-	-
Open Deciduous Forest	3,154	2	181	4	1	<1
Range and Grassland	23,377	18	698	16	10	18
Roads, Trails and Rail Lines	3,659	3	132	3	4	7
Sand and Gravel	55	<0.1	-	-	-	-
Water Body	572	0.4	21	<1	-	-

Wetland Marsh	1,333	1	85	2	-	-
Wetland Treed Bog	50	<0.1	-	-	-	-
Total	128,970	100	4,347	100	54	100
Values might not sum to totals shown because of rounding.						

The dominant land cover throughout the assessment area for vegetation is agricultural land, which accounts for 80% of land cover in the RAA, approximately 83% of the LAA, and approximately 90% of the PDA.

The remaining land cover in the PDA occurs as forested areas, accounting for approximately 15% of the RAA, 11% of the LAA, and 4% of the PDA. Forests within the RAA are predominately deciduous. In the LAA and PDA, forested areas occur mainly as small, wooded patches or shelterbelts located on private lands or along natural waterways, such as the Brookdale Drain. Wetlands and waterbodies make up less than 2% of the RAA and 3% of the LAA. The waterbody class in the LAA includes Boggy Creek and Brookdale Drain.

7.3.3 Botanical resources

A vegetation survey was conducted in June and July 2025 to qualitatively document the vegetation near creeks, drains, and several road crossings in the PDA and LAA.

Within the PDA, cultivated agricultural fields represent the greatest land cover. Wetlands and waterbodies occupy >2% of the RAA and approximately 3% of the LAA. Although the PDA does not traverse wetlands or waterbodies, Boggy Creek and Brookdale Drain are the primary hydrological features in the LAA, providing localized aquatic and riparian habitats that support wetland vegetation. Two distinct riparian community types were observed along Brookdale Drain. The first is a hardwood–graminoid community, characterized by a closed tree canopy with occasional tall shrubs, a moderately well-developed herb and low shrub layer, and graminoids as the dominant species. The second is a cattail marsh community, which features dense emergent vegetation primarily composed of cattails, interspersed with tall shrubs such as willow and dogwood. The understory in this marsh community includes a variety of herbaceous species, grasses, and sedges. Together, these communities contribute to habitat diversity and provide important ecological functions within the riparian zone.

7.3.3.1 Roadside vegetation

The roadside vegetation in the project area is dominated by grasses such as smooth brome (*Bromus inermis*) and Kentucky bluegrass *(Poa pratensis)* with occasional patches of tall shrubs. The ditch supported a variety of herbaceous plants including native and non-native species.

7.3.3.2 Drain and riparian vegetation

Brookdale Drain and Boggy Creek support a mixture of graminoids with a mixture of deciduous trees and tall shrubs or are dominated by common cattail (*Typha latifolia*) as marsh wetland vegetation. The northern edge of Lake Irwin supported a variety of tall shrubs.

According to Smith et al. (1998), typical riparian species that occur in this area include American elm *(Ulmus americana*), green ash (*Fraxinus pennsylvanica*), Manitoba maple (*Acer negundo*), and bur oak (*Quercus macrocarpa*) with associated shrubs such as hazel (*Corylus sp.*) and Saskatoon (*Amelanchier alnifolia*).

7.3.3.3 Rangeland and grassland vegetation

Rangeland and grassland vegetation are critical for biodiversity conservation, particularly as these ecosystems have suffered substantive declines. The vegetation within the project area consisted of mixed grasses and herbaceous vegetation, with aspen tree and shrub cover bordering the grasslands.

7.3.3.4 Shelterbelt vegetation

Shelterbelts are aesthetically important as noise, wind, and visual barriers. In addition to aesthetic benefits, shelterbelts also have the potential to reduce soil erosion from wind and water as well as provide important wildlife habitat for areas used for nesting, feeding, and breeding by many bird species, other wildlife, and species at risk. Common shelterbelt tree species in the area were mainly hardwoods including trembling aspen (*Populus tremuloides*), hybrid poplar (*Populus spp*), bur oak, willows (*Salix sp.*), as well as jack pine (*Pinus banksiana*).

7.3.4 Species of conservation concern

Species of conservation concern already exist in low numbers and are listed either by the Manitoba Conservation Data Centre (MBCDC) or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or are protected provincially or federally through *The Endangered Species and Ecosystem Act* (MBESEA) and/or the *Species at Risk Act* (SARA).

Plant SOCC include all provincially (MBESEA) and federally (SARA) listed species, as well as species ranked as Critically Imperiled to Vulnerable, by the (MB CDC) (i.e., those ranked S1 through S3). Species of conservation concern ranked S1, S2, or S3 (or any combination) by the MB CDC but not listed under the MBESEA are not protected by legislation, but they are important contributors to biodiversity in Manitoba and considered rare or uncommon in the province.

According to the MB CDC there are 148 plant SOCC that can be expected to range within the Aspen Parkland Ecoregion and 129 plant SOCC that can be expected to range within the Lake Manitoba Plain Ecoregion. Currently, there are 15 species listed at risk in the ecoregion, with either ESEA, SARA or COSEWIC, nine in the Aspen Parkland and 11 in the Lake Manitoba Plain (see Table 7-5).

Table 7-5 - Plant species listed at risk in the Lake Manitoba Plain Ecoregion

Scientific name	Common name	ESEA	SARA	COSEWIC
Agalinis aspera	Rough Agalinis	Endangered	Endangered	Endangered
Agalinis gattingeri	Gattinger's Agalinis	Endangered	Endangered	Endangered
Bouteloua dactyloides	Buffalograss	Threatened	-	-
Celtis occidentalis	Hackberry	Threatened	-	-
Chenopodium subglabrum	Smooth Goosefoot	Endangered	Threatened	Threatened
Cypripedium candidum	Small White Lady's-slipper	Endangered	Threatened	Threatened
Dalea villosa	Hairy Prairie-clover	Threatened	Special Concern	Special Concern
Fraxinus nigra	Black Ash	-	-	Threatened
Solidago riddellii	Riddell's Goldenrod	Threatened	Special Concern	Special Concern
Spiranthes magnicamporum	Great Plains Ladies'-tresses	Endangered	-	-
Symphyotrichum sericeum	Western Silvery Aster	Threatened	Threatened	Threatened

Teloschistes chrysophthalmus	Golden-eyed Lichen	-	Special Concern	Special Concern
Tradescantia occidentalis var. occidentalis	Western Spiderwort	Threatened	Threatened	Threatened
Vernonia fasciculata	Fascicled Ironweed	Endangered	Endangered	Endangered
Veronicastrum virginicum	Culver's-root	Threatened	-	-

Based on MB CDC records, only one listed plant species, Bloodroot (*Sanguinaria canadensis*), was known to occur within the LAA. The plant is ranked as S2 (imperilled) and is not designated under MESEA, SARA or COSEWIC.

Four SOCC were recorded during the June and July 2025 surveys. Among them, late yellow locoweed (*Oxytropis campestris*) is ranked Critically Imperilled (S1?) by the MB CDC. Late yellow locoweed was observed in the RAA but not along the PDA.

Three additional species observed in the study area are ranked as Vulnerable (S3 to S3S5). These species included narrow-leaved puccoon (*Lithospermum incisum*), narrow-leaved cattail and cottonwood (*Populus deltoides*), and were observed along roadsides, wetlands, and forest vegetation. Of these, only cottonwood was recorded along the PDA.

7.3.5 Non-native, invasive species or noxious species

Invasive plant species are a subset of weedy plant species that require control or eradication based on provincial or federal legislation. These species are of concern because they can cause economic losses, damage to native plant communities, or human illness or injury (Royer and Dickinson 1999).

Several non-native and invasive species were abundant and widespread in the study area. 32 non-native species were recorded during surveys in June and July 2025 (Appendix C). Of the plants detected, 13 species were considered invasive plants with the Canadian Food Inspection Agency (2008), while four species were listed with the Invasive Species Council of Manitoba (2025). These classifications are due to their tendency to outcompete native species and dominate habitats once introduced.

7.4 Project interactions with vegetation

Table 7-6 identifies, for each potential effect, the physical activities that might interact with the vegetation and result in the identified effect.

Table 7-6: Project interactions with vegetation

Project activities/components	Change in SOCC abundance and distribution	Change in abundance and distribution of invasive and non-native species
Construction of pipeline and control points		
Mobilization and staff presence	-	-
Vehicle and equipment use	✓	✓
Access development	✓	✓
Marshalling yards (temporary work or storage areas)	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	-	-
Pipe installation – trenching and lowering	-	-
Horizontal directional drilling	-	-
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-
Backfilling and contouring	-	-
Control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	-	-
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline and control points		
Presence of pipeline and control points	-	-
Vehicle and equipment use	✓	✓
Maintenance activities	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	✓
Valve operation checks (annually)	-	✓
Vegetation management	✓	✓
Decommissioning of pipeline and control points		
Mobilization and staff presence	-	-
Vehicle and equipment use	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	-	-
Removal of above-ground components (dismantling, removal from site, disposal)	-	-
Rehabilitation	✓	✓
Clean-up and demobilization	✓	✓

✓= Potential interaction
– = No interaction

7.5 Assessment of project effects

As presented in Section 7.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on vegetation. These effects are anticipated to be more pronounced during the construction phase of the project for each of the potential effects assessed:

- Change in SOCC abundance and distribution
- Change in the abundance and distribution of invasive and non-native species

As illustrated in the project interactions table (Table 7-6), no effects to vegetation are anticipated to result from certain project activities including mobilization and staff presence, pipe stringing, pipe installation testing, backfilling and contouring control point connections, presence of the pipeline, ground pipeline patrols, valve operation, and pipeline disconnections as these project activities will be contained on the proposed pipeline right-of-way.

Horizontal directional drilling will be used to install the pipeline across waterbodies (*e.g.*, drains), shelterbelts, and road allowances. Equipment (work area) for drilling under shelterbelts, drains and road allowances will be set up on agricultural land in PDA. As a result, vegetation will not be impacted by horizontal directional drilling.

Depth cover surveys, cathodic protection monitoring tests, and leak surveys will be confined to the PDA (both work and access) and as a result there will be no impacts to vegetation.

Finally, the operation of the control points as well as the future abandonment of the pipeline and any control point dismantling will not affect vegetation as these areas occur within existing developed footprints.

All other project activities have potential pathways of effect that may result in changes in vegetation diversity including the potential changes in the abundance of SOCC and the change in distribution of invasive and non-native species.

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 7-6, proposed mitigation measures, and the characterization of residual project effects.

7.5.1 Change in species of conservation concern

Even though the dominant land use in the PDA is agriculture, the project has potential to alter or disturb vegetation.

7.5.1.1 Effects pathways

The effect pathways through which the project has the potential to change SOCC abundance includes:

- Vegetation clearing and ground disturbance resulting in direct loss of plant SOCC.
- Ground disturbance resulting in indirect loss of SOCC from the establishment of invasive and non-native plants.

Construction

During construction, plant species diversity can be affected through vehicle and equipment use, right-of way and control point site preparation on non-agricultural lands (i.e., along road allowances), topsoil stripping and salvage (along road allowances), temporary workspace and access development (if required), and the installation of above-ground components.

Right-of way and control point site preparation in non-agricultural areas (i.e., road allowances) can result in the removal or disturbance to existing vegetation that can alter or result in the loss of SOCC present within the PDA. Heavy equipment and vehicle use on temporary workspaces could remove or crush SOCC or affect them through soil compaction and rutting. However, since the PDA mostly traverses previously developed lands, the potential for adverse effects to SOCC is limited.

One SOCC, cottonwood, was observed in the PDA during the field surveys in June and July 2025. Cottonwood trees primarily occur in shelterbelts traversed by the PDA.

Three SOCC were observed in the RAA during the field surveys conducted in June and July 2025. Species recorded include late yellow locoweed (*Oxytropis campestris*), narrow-leaved cattail, and narrow-leaved puccoon (*Lithospermum incisum*). These species were observed along roadsides, drains, and as treed vegetation. Late yellow locoweed and narrow-leaved puccoon occurs in range grassland. Narrow-leaved cattail occurs in drains and roadside ditches.

No protected species, listed under MESEA, SARA or COSEWIC were encountered during the field reconnaissance survey. However, one listed plant species, bloodroot was known to occur within the LAA (Manitoba Conservation Data Centre 2025).

Species of conservation concern in the PDA as well as other SOCC in the surrounding LAA and RAA could experience indirect effects from construction if there is an introduction or establishment of regulated weeds and non-native invasive species.

Ground disturbance because of right-of-way and control point site preparation, vehicle and equipment use, and topsoil stripping and salvage has the potential to increase opportunities for weed and non-native invasive species to establish and spread in the PDA and LAA. Competition from weeds and non-native invasive species may change the abundance and distribution of plant SOCC effects extending up to 1 km from the area of disturbance (Manitoba Hydro 2023).

Operations, maintenance, and decommissioning

Right-of-way maintenance has the potential to impact SOCC through using vehicle equipment and vegetation management. Vegetation management activities such as herbicide application or mowing could kill or remove SOCC while using heavy equipment and vehicles during clean-up and reclamation can impact SOCC through crushing and soil disturbance.

The use of vehicles and equipment for inspection, maintenance, and vegetation management through operations and decommissioning will continue to introduce potential pathways for indirect effects on species diversity through the potential introduction and spread of regulated weeds and non-native invasive species.

7.5.1.2 Mitigation measures related to change in SOCC abundance and distribution

In addition to the pipeline being routed primarily on agricultural land, mitigation measures to reduce project-related changes to include:

- SAR will be protected in accordance with provincial and federal legislation and provincial and federal guidelines.
- A 30 m setback distance will be applied to known SAR.
- Setbacks and buffers along the right-of-way will be clearly identified by signage or flagging prior to construction, and signage or flagging will be maintained during construction to alert crews to the presence of the setback.
- If previously unidentified plant SAR are found on the right-of-way prior to or during construction, the occurrences will be flagged for avoidance, where possible.
- If avoidance of listed SAR is not possible, the regulators will be contacted to determine the most appropriate mitigation action. This could include harvesting seed from the PDA, salvaging and transplanting portions of sod, collecting cuttings or transplanting whole plants.
- Access shall be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.

7.5.1.3 Residual effect on change in SOCC abundance and distribution

This section describes the residual project effects to vegetation predicted to remain after the application of mitigation measures. Table 7-2 describes the factors used to characterize the residual effects on vegetation.

After mitigation, predicted residual effects on change in SOCC abundance and distribution include:

- Potential loss of plant SOCC from right-of-way preparation, topsoil stripping, and salvage
- Potential loss of plant SOCC on right-of-way from vegetation management or other maintenance activities during operations

No species at risk listed with either the MBESEA or SARA were observed during the field surveys and as such, the project is not anticipated to effect protected species. However, one SOCC has been identified in the PDA and has the potential to interact with project.

Additional undocumented SOCC may also be present in the PDA and may be impacted by the proposed project. No land cover categories will be lost or changed because of the project (i.e., agriculture, deciduous forest, range and grassland).

Following the implementation of mitigation measures described above, residual effects for change in SOCC abundance and distribution are characterized as follows:

- Direction: adverse
- Magnitude: low, project effects are not predicted to affect sustainability in the PDA or LAA and there are no predicted effects on listed species.
- Geographic extent: PDA; if temporary workspaces cannot be entirely confined to pre-developed area, residual effects may extend to the LAA
- Duration: long-term
- Frequency: single event during construction and decommissioning and irregular events throughout operations
- Reversibility: reversible

7.5.2 Change in the abundance and distribution of invasive and non-native species

The effect pathway through which the project has the potential to change the distribution of invasive and non-native species is:

- Introduction and spread of invasive and non-native plant species from ground disturbance and materials and equipment used during construction, maintenance and decommissioning

7.5.2.1 Effects pathways

Construction

During construction, the use of materials and equipment has the potential to spread non-native and invasive plants within the PDA. Right-of-way and control point site preparation as well as development of temporary work areas onto undisturbed land can create soil disturbance, which can lead to colonization of areas by invasive or non-native weedy species that can outcompete native plant species and cause changes in vegetation distribution.

Heavy equipment used during right-of way and control point site preparation can result in the introduction and/or spread of invasive and non-native species in the PDA and beyond.

In addition, construction materials (i.e., gravel and fill) used for the preparation of sites or for temporary work areas also creates a pathway for the introduction and spread of invasive and non-native species if contaminated with seed or fragments of invasive plants (Nature Conservancy, n.d.).

Operations, maintenance, and decommissioning

The use of vehicles and equipment for inspection, maintenance, and abandonment of the pipeline through operations, maintenance and decommissioning will continue to create a potential pathway for the introduction and spread of regulated weeds and non-native invasive species in the PDA. Ongoing weed management along the portions of the right-of-way under agricultural production is expected to continue throughout operations.

7.5.2.2 Mitigation measures related to change in abundance and distribution of invasive and non-native species

The following outlines the proposed mitigation measures to reduce the changes in abundance and distribution of invasive and non-native species:

- All equipment must arrive at the right-of-way or project site clean and free of soil or vegetation debris.
- Weed control along access roads and trails will be conducted in accordance with the Rehabilitation and Invasive Species Management Plan.

- Equipment will be cleaned before moving from locations with identified invasive weed infestation.

7.5.2.3 Residual effect on change in abundance and distribution of invasive and non-native species

This section describes the residual project effects to vegetation predicted to remain after the application of mitigation measures. Table 7-7 describes the factors used to characterize the residual effects on vegetation.

As discussed in Section 7.3.2, more than 89% of the project occurs on agricultural land, forested areas accounted for approximately 4%, with a portion of the proposed right-of-way paralleling road allowances. Even though invasive and non-native species were observed in the PDA during the field reconnaissance conducted in June and July 2025, it is anticipated that following implementation of the mitigation identified above for the change in abundance and distribution of invasive and non-native species that the project will result in no residual effects.

7.5.3 Summary of residual effects on vegetation

Table 7-7 characterizes the residual effects on vegetation.

Table 7-7:Project residual effects on vegetation

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Residual effect on change in SOCC abundance and distribution						
Construction	Adverse	Low	PDA	Long-term	Single event	Reversible
Operation					Irregular	
Decommissioning					Single event	
Residual effect on change in abundance and distribution of invasive and non-native species						
Construction	No residual effects anticipated					
Operation						
Decommissioning						

7.5.4 Cumulative effects on vegetation

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

Both conditions have been met with respect to the change to SOCC abundance and distribution. The project is anticipated to have adverse residual effects on the change in SOCC abundance and distribution and each residual effect could interact with residual effects of other past, present or foreseeable future physical activities.

Both conditions were not met for change to abundance and distribution of invasive and non-native species and is therefore not considered in the cumulative effects assessment below.

7.5.4.1 Project residual effects likely to interact cumulatively

Table 7-8 shows the project and physical activities inclusion list, which identifies other projects and physical activities that might act cumulatively with the project to impact vegetation. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 7-8: Potential cumulative effects on vegetation

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects Change in SOCC abundance and distribution
Existing/ongoing projects and activities	
Agriculture (cropping, livestock operations, irrigation)	✓
Residential and Institutional developments	✓
Domestic resource use (e.g., hunting, trapping, fishing)	✓
Recreational activities (e.g., canoeing, snowmobiling, hiking)	✓
Industrial resource use (e.g. potato processing)	✓
Infrastructure (includes rail lines, provincial trunk highways, provincial roads, third party pipelines, water treatment facilities, wastewater treatment facilities)	✓
Manitoba Hydro gas and electricity transmission and distribution	✓
Potential future projects and activities	
Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony	✓
Residential and institutional developments	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.
– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

7.5.4.2 Cumulative effect for change in SOCC abundance and distribution

The assessment of the cumulative effects to vegetation, specifically the change in SOCC abundance and distribution, likely to result from the project in combination with other projects and physical activities, including the pathways to effect and mitigations, are discussed in subsequent sections.

7.5.4.3 Pathways for cumulative effect

Ongoing and future projects and activities in the RAA (Table 7-8) have the potential to interact cumulatively with the project if their plans include development or activities in areas of SOCC occurrences as these activities would contribute to changes in SOCC abundance and distribution.

The ongoing and future activities identified as likely to interact with the residual effects of the project on vegetation have similar effects pathways as those identified for this project. Physical activities that involve ground disturbance and the use of vehicles and equipment are likely to cause residual effects resulting in the direct and indirect loss of vegetation SOCC.

Based on the proposed future Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewoods Colony Environment Act Proposal, the quarter section where the project will be located, NE 17-12-15W, contains a combination of wetland and deciduous forest. Based on the proposal, the project footprint will be located on an area of the property that is agricultural/developed (south-Man Design Group Ltd. 2023), therefore it is not anticipated that forest and wetlands is likely to be altered.

The future proposed residential and institutional developments in and around the Town of Neepawa are not anticipated to contribute to cumulative effects to vegetation. Based on feedback, is that the developments will be located within pre-disturbed/developed areas, therefore it is not anticipated that forest and wetlands is likely to be altered.

Since all projects identified are anticipated to involve these types of physical activities (*i.e.*, effects pathways), the project is anticipated to interact cumulatively with all projects in relation to effects to vegetation, specifically, the change in SOCC abundance and distribution.

7.5.4.4 Mitigation measures

Project mitigation measures, including restricting access to roads and trails and cleared construction areas in accordance with the Access Management Plan will help reduce project residual effects to SOCC. Future projects are expected to implement similar standard mitigation measures and avoid or minimize effects on vegetation as appropriate.

7.5.4.5 Residual cumulative effect

Many of the ongoing and future projects that may interact cumulatively with residual project effects on vegetation are in or alongside previously disturbed, modified habitats. The RAA is developed primarily for agriculture, which currently covers approximately 103,346 ha or more than 80%. A smaller area of 19,531 ha (approximately 15%) is covered by deciduous forest. Within the PDA, as per the land cover classification, approximately 2.1 ha (approximately 4%) is forested. Some of the existing projects, specifically infrastructure projects, which are permanent structures, have potentially caused a loss or alteration of SOCC in the RAA.

With the implementation of mitigation measures identified for vegetation, this project, in combination with other ongoing and future projects, is predicted to have small contributions to cumulative effects on SOCC.

While the project will have a cumulative environmental effect, with the implementation of mitigation measures, cumulative effects are anticipated to be of low magnitude. Cumulative effects are anticipated to potentially occur throughout the RAA, will be long-term (during the project's lifespan), and occur on a continuous basis but reversible after decommissioning.

7.5.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on vegetation are predicted to be not significant.

The project is not anticipated to threaten the long-term persistence or viability of SOCC in the PDA, LAA, or RAA.

7.5.6 Prediction confidence

Prediction confidence in the assessment of effects on vegetation is moderate-high.

Provincial land cover classification data was used to predetermine percentages of cover classes, revealing that most of the land traversed by the proposed project PDA is used for agriculture (90%), which was consistent with the land use documented during vegetation surveys. The percent of native vegetation class (i.e., forests) in the PDA is minimal and suggests a smaller potential for SOCC to be present in the PDA.

Areas that have the potential to support SOCC in the PDA include shelterbelts, drains, and road allowance ditches. The potential for interactions between the project and SOCC is higher in areas where the PDA parallels road allowances than where the pipeline will cross beneath shelterbelts and drains using horizontal directional drilling, reducing the likelihood of interaction with SOCC.

Although minimal and not anticipated to result in a change in the characterization of vegetation effects, some potential limitations for the effects on vegetation include the imperfect detection of SOCC, and seasonal changes experienced by different species. There is also some uncertainty related to un-surveyed areas (i.e., drains, shelterbelts etc.) where additional SOCC may be present.

Additionally, other projects with similar disturbance to vegetation, monitored effects of those projects were observed to be aligned with the predicted effects anticipated in the environmental assessment.

7.5.7 Follow-up and monitoring

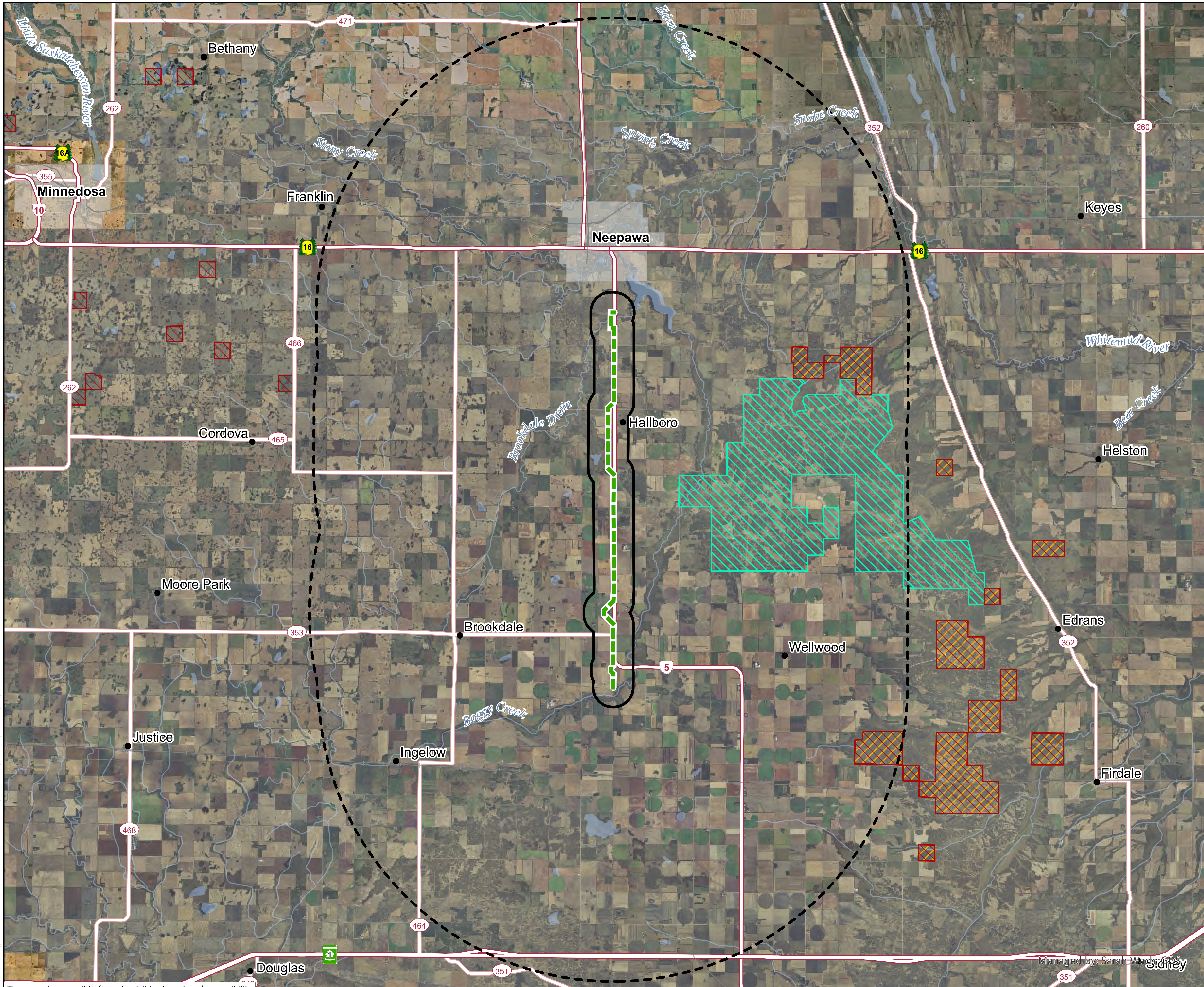
Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a valued component monitoring plan for vegetation has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the environmental protection plan (see Chapter 16).

7.5.8 Sensitivity to future climate change scenarios

Effects of climate change on vegetation are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding).

As a result of climate change, there is the potential for continued floods because of increased precipitation in both winter and spring and rapid spring melt (Government of Manitoba 2011). An increase in flooding from climate change will impact native vegetation including SOCC.

As part of government planning, flood and erosion prone area policies have been drafted and implemented to reduce impacts to future developments. These protection measures along with implementation of mitigation for proposed projects will help to mitigate the potential effects of increased flooding on native vegetation, including SOCC.



Neepawa Gas Transmission Project

Project Infrastructure
- Final Preferred Route

Assessment Areas for Vegetation and Wildlife
- Local Assessment Area (1 km buffer around PDA)
- Regional Assessment Area (15 km buffer around PDA)

Designated and Protected Lands
- Protected Area
- Area of Special Interest
- Provincial Park
- Community Pasture
- Wildlife Management Area

Landbase
- Community
- TransCanada Highway
- Yellowhead Highway
- Provincial Highway
- Provincial Road
- Railway
- City/Town

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

0 4 8 Kilometres
0 2.5 5 Miles

1:190,000

Spatial Boundaries for Vegetation, and Wildlife and Wildlife Habitat

Map 7-1

8.0 Wildlife and wildlife habitat

In this environmental assessment, wildlife includes birds, mammals, terrestrial invertebrates, amphibians, and reptiles. Wildlife are components of natural ecological cycles, provide economic benefits from viewing, hunting, guiding, and trapping, and provide a source of food and materials.

Wildlife and wildlife habitat was selected as a valued component as they provide ecological, aesthetic, recreational, economic, and cultural value to Indigenous communities, interested parties, the public, local businesses, and government agencies. In addition, wildlife and wildlife habitat was selected as a VC for the following reasons:

- There is potential for the project to interact with species of conservation concern (SOCC) that may be found in the assessment areas. Species of conservation concern already exist in low numbers and are listed either by the Manitoba Conservation Data Centre (MB CDC) or Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and/or are protected provincially or federally through *The Endangered Species and Ecosystem Act* (Manitoba) (MBESEA) and/or the *Species at Risk Act* (SARA).
- Wildlife habitat is present along waterways/drains, in shelterbelts, and patches of forest within the assessment area.

8.1 Summary of conclusions

The Neepawa gas transmission project is anticipated to have adverse residual project effects on wildlife and wildlife habitat. The residual project effects include the following:

- Direct alteration of less than 2.1 ha of forest habitat
- No direct alteration of wetlands
- Temporarily reduced effectiveness of wildlife habitat (*i.e.,* displacement of wildlife species) due to project-related sensory disturbance
- Increase to wildlife mortality risks associated with potential vehicle collisions, entrapment in trenched areas, or behavioural changes due to temporary displacement from the project development area associated with sensory disturbances (*e.g.,* noise)

The residual project effects on wildlife and wildlife habitat are anticipated to be the most pronounced during the construction phase when the majority of ground disturbance, vegetation clearing, peak traffic volumes, and other project activities that may directly or indirectly affect wildlife habitat and/or mortality risk will occur. The magnitude of residual project effects on wildlife and wildlife habitat are anticipated to range from low (during construction and decommissioning) to negligible (during operations and maintenance).

Adverse residual project and cumulative effects to wildlife and wildlife habitat are anticipated to be not significant because the project is not anticipated to result in a threat to the long-term persistence or viability of a wildlife species in the RAA.

8.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 8.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on wildlife and wildlife habitat.

An assessment of cumulative effects on wildlife and wildlife habitat is also presented.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent Dominion City to Altona gas transmission pipeline, and electrical transmission projects (*e.g.,* the Pointe du Bois to Whiteshell Transmission Project, Dorsey to Wash'ake Mayzoon Transmission Project, St. Vital Transmission Complex and Manitoba-Minnesota Transmission Project).

8.2.1 The project

The proposed project consists of construction, operation, and decommissioning of a six-inch steel natural gas transmission pipeline and associated above-ground control structures. The new pipeline will be approximately 20 km in length, beginning at a valve site located approximately 22.5 km south of Neepawa and terminating at another control structure located approximately 3.5 km south of Neepawa. The project components are described in more detail in Chapter 2.0 (Project description).

8.2.2 Regulatory and policy setting

The following provincial laws, and associated regulations, policies, and guidelines, as well as Manitoba Hydro's policies were considered for assessing project effects to wildlife and wildlife habitat.

8.2.2.1 Federal guidance

Species at Risk Act (SARA)

The federal *Species at Risk Act* (2002) protects species at risk and their critical habitat in Canada. The legislation provides a framework to facilitate recovery of species listed as threatened, endangered, or extirpated, and to prevent species listed as special concern from becoming threatened or endangered. SARA prohibits the following:

- The killing, harming or harassing of endangered or threatened species at risk (Sections 32 and 26)
- The destruction of critical habitat of endangered or threatened species at risk (Sections 58, 60, and 61)

Under SARA, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the status of species at risk. COSEWIC designates species at risk by listing them under Schedule 1 of SARA under the following classifications:

- Extirpated – a species that no longer exists in the wild in Canada, but exists elsewhere in the wild
- Endangered – a species that is facing imminent extirpation or extinction
- Threatened – a species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
- Special concern – a species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats (Government of Canada 2024)

Migratory Birds Convention Act (MBCA)

The *Migratory Birds Convention Act* (1994) and associated regulations (Migratory Birds Regulations (2022)) provide for the protection of migratory birds, their eggs, and their nests. It applies to most native migratory bird species.

8.2.2.2 Provincial guidance

The Endangered Species and Ecosystems Act

Provincially, at risk plant and animal species native to Manitoba are designated as endangered, threatened, extinct, extirpated (no longer present in Manitoba), or special concern and are protected under *The Endangered Species and Ecosystems Act* (2018) and its regulations (Province of Manitoba 2023). In addition to designating the status of a species at the provincial level, the purposes of *The Endangered Species and Ecosystems Act* (ESEA) are to ensure protection and enhance the survival of endangered and threatened species in the province and to enable the reintroduction of extirpated species into the province.

Activities that would kill, disturb, or interfere with any listed species, or damage, destroy, or remove habitat and natural resources on which a listed species depends, are prohibited by Manitoba's ESEA.

At risk ecosystems can also be designated as threatened or endangered and be protected under the ESEA. Two ecosystems are currently designated as endangered: alvars and tall grass prairie (Province of Manitoba n.d.).

The Wildlife Act

The Wildlife Act provides general provisions for regulating activities relating to the take and trade of wild animals in Manitoba. A "wild animal" is defined as "an animal or bird of a species or type listed in Schedule A or declared by the regulations to be a wild animal", and includes select amphibian, reptile and mammal species and most bird species (including those not protected under the MBCA) known to exist in Manitoba.

Manitoba Conservation Data Centre

The Manitoba Conservation Data Centre (MB CDC) assigns conservation status ranks to plant and animal species in Manitoba based on their rarity along a five-point scale (Manitoba Natural Resources and Indigenous Futures 2025a). MB CDC ranks range from S1 to S5 as defined below:

- S1: Critically imperilled – at a very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors
- S2: Imperilled – at a high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors
- S3: Vulnerable – at moderate risk of extirpation in the jurisdiction due to a restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors
- S4: Apparently secure – at a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors

- S5: Secure – at very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations, or occurrences, with little to no concern from declines or threats (NaturServe Explorer 2025)

8.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide feedback about the project. Feedback related to wildlife and wildlife habitat included concern for migratory bird restrictions and their relevance to scheduling construction activities.

Through experience engaging on past gas transmission projects, Manitoba Hydro understands that general concerns related to the potential effects on wildlife and wildlife habitat include the potential loss or disruption to shelterbelts, the potential change or loss of species of conservation concern, and the loss or disturbance of existing wooded areas or wetlands that provide wildlife habitat.

8.2.4 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on wildlife and wildlife habitat (Map 7-1):

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The PDA is described in detail in Chapter 2.0 (Project description). The total area of the PDA is 54.4 ha.
- **Local assessment area (LAA):** includes all components of the PDA plus a 1 km buffer around the PDA which is used to evaluate measurable effects on vegetation. The total area of the LAA is 4,347 ha.
- **Regional assessment area (RAA):** includes the PDA and LAA and consists of a 15 km buffer around the PDA. This area is where there is the potential for cumulative and socio-economic effects, and that will be relevant to the assessment of any wider-spread effects of the project. The total area of the RAA is 128,970 ha.

The LAA and RAA used for the assessment of project effects on wildlife and wildlife habitat are consistent with the LAA and RAA boundaries being used to assess effects on vegetation (Chapter 7.0). The LAA and RAA boundaries are also consistent with those that have been used to assess effects on wildlife and wildlife habitat on other recent transmission projects in Manitoba.

Map 7-1 illustrates the spatial boundaries for the assessment of project effects on wildlife and wildlife habitat.

8.2.5 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on wildlife and wildlife habitat are based on the timing and duration of project activities as follows:

- Construction – estimated to take approximately 12 months, beginning in the winter of 2027
- Operation and maintenance – estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

8.2.6 Potential effects, pathways, and measurable parameters

The potential project effects on wildlife and wildlife habitat, along with effects pathways and measurable parameters are outlined in Table 8-1.

Table 8-1: Potential effects, effects pathways, and measurable parameters for wildlife and wildlife habitat

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in wildlife habitat	Direct temporary disturbance and displacement of SOCC due to ground disturbance. Indirect effects to wildlife from sensory disturbance.	Amount of wildlife habitat in the PDA (ha) that may be directly altered by project activities.
Change in mortality risk	Direct change in mortality risk due to project activities such as vehicle collisions or entrapment in an open trench.	Total duration and timing of construction activities Amount of wildlife habitat in the PDA (ha)

8.2.7 Residual effects characterization

Table 8-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on wildlife and wildlife habitat.

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat

Characterization	Quantitative Measure or Definition of Qualitative Categories
Direction – the long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to wildlife and wildlife habitat relative to baseline. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to wildlife and wildlife habitat relative to baseline. **Neutral –** no net change in measurable parameters for wildlife and wildlife habitat relative to baseline.
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**Change in habitat:** **Negligible –** no measurable change in wildlife SOCC is predicted **Low –** a measurable change in SOCC is predicted but it is unlikely to affect sustainability in the LAA and there are no predicted effects on listed species **Moderate –** a measurable change affecting the sustainability of SOCC in the LAA is predicted but is not predicted to extend to the RAA **High –** a measurable change affecting the sustainability of SOCC in the RAA is predicted **Change in mortality risk:** **Negligible –** a measurable change in the abundance of wildlife in the LAA is not anticipated **Low –** a measurable change in the abundance of wildlife in the LAA is not anticipated, although temporary local shifts in distributions in the LAA might occur **Moderate –** a measurable change in the abundance and/or distribution of wildlife in the LAA might occur, but a measurable change on the abundance of wildlife in the RAA is not anticipated

Table 8-2: Characterization of residual effects on wildlife and wildlife habitat	
Characterization	**Quantitative Measure or Definition of Qualitative Categories**
	High – a measurable change in the abundance and/or distribution of wildlife in the RAA might occur
Geographic Extent - the geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration – the time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency - identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Reversibility - pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation Irreversible – the residual effect is unlikely to be reversed

8.2.8 Significance definition

For this assessment, adverse residual effects on wildlife and wildlife habitat are considered significant if the proposed project:

- results in a threat to the long-term persistence or viability of a wildlife species in the RAA

8.3 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data, including pertinent reports, published literature, provincial and federal databases, and other data sources.

The existing conditions described in this section focus on the following:

- Overview of wildlife habitat
- Occurrence and distribution of wildlife
- Species of conservation concern

8.3.1 Overview of wildlife habitat

The RAA is located entirely within the Prairies Ecozone with approximately 92% of the RAA being in the Aspen Parkland Ecoregion. Much of the native vegetation and wildlife habitat that the RAA historically provided has been developed for agriculture (Smith et al. 1998).

Although agricultural land accounts for more than 80% of land cover in the RAA, approximately 83% of the LAA, and approximately 90% of the PDA (Table 7-4), forested areas, shelterbelts, and wetlands are interspersed amongst the agricultural land in the RAA, providing habitat for wildlife species including a variety of birds, mammals, amphibians, reptiles, and terrestrial invertebrates.

According to provincial land cover data, forested areas account for approximately 15% of the RAA, 11% of the LAA, and 3.9% (2.1 ha) of the PDA. The forests within the RAA are predominantly deciduous (approximately 98%). The forested lands found in the LAA and PDA are found mainly as small, wooded areas or shelterbelts on private land or along natural waterways such as the Brookdale Drain.

Wetlands occupy approximately 1% of the RAA and 2% of the LAA. The PDA does not traverse wetlands or waterbodies based on published provincial land cover data.

Portions of the Whitemud Watershed Wildlife Management Area (WMA) are in the RAA with the closest being approximately 9 km east of the northern end of the PDA. The Whitemud Watershed WMA provides habitat for deer, upland game birds, amphibians and other wildlife that require mixed-grass prairie and aspen-oak stands (Manitoba Natural Resources and Indigenous Futures 2025b).

The Langford Community Pasture is also partly located in both the LAA and RAA, approximately 3.4 km east of the PDA at its closest point. This 20,000-acre parcel of undeveloped natural land, in addition to other uncultivated agricultural lands in the

RAA, also provide habitat that support a variety of wildlife species (Manitoba Habitat Conservancy 2012).

Descriptions of the ecozone, ecoregions, and ecodistricts can be found in Chapter 5.0 and a detailed breakdown of land cover classes and the ecozone, ecoregions, and ecodistricts within the project assessment areas can be found in Chapter 7.0 (Section 7.3).

8.3.2 Occurrence and distribution of wildlife

The RAA supports a variety of bird, mammal, amphibian, reptile, and terrestrial invertebrate species, including SOCC.

8.3.2.1 Birds

Over 100 breeding bird species potentially occur in the RAA, which overlaps the Southwestern, Parkland, and South Central regions of Manitoba's Breeding Bird Atlas (Bird Studies Canada 2025).

Bird species found throughout the Aspen Parkland Ecoregion (92% of the RAA) include merlin *(Falco columbarius*), raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), black-billed magpie (*Pica hudsonia*), red-winged blackbird (*Agelaius phoeniceus*), killdeer (*Charadrius vociferus*), meadowlark (*Sturnella neglecta*), and various species of ducks in wetland areas (Smith et al. 1998).

Suitable habitat for many bird species, including several of the SOCC can be found within the project study area. Forests, riparian edges, and shelterbelts within the RAA, provide suitable habitat for many bird species, including olive-sided flycatcher (*Contopus cooperi*), red-headed woodpecker (*Melanerpes erythrocephalus*), eastern wood pewee (*Contopus virens*), and whip-poor will (*Antrostomus vociferus*). In addition to forested areas that provide habitat, pastures, hay lands, and uncultivated agricultural lands can support some grassland bird species, including SOCC (Manitoba Hydro 2022, Manitoba Hydro 2015, Canadian Wildlife Federation 2024).

8.3.2.2 Mammals

The Prairies Ecozone supports a wide variety of mammals including rodents, furbearers, and ungulates. Most mammal species in the RAA are common and widespread across southern Manitoba, particularly in natural habitats such as forests, grasslands, or wetlands.

Within the RAA, common mammals include white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), eastern grey squirrel

(*Sciurus carolinensis*), ground squirrel (*Spermophilus* spp.), eastern cottontail (*Sylvilagus floridanus*), snowshoe hare (*Lepus americanus*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), woodchuck (*Marmota monax*), boreal redback vole (*Clethrionomys gapperi*), and deer mice (*Peromyscus maniculatus)* (Smith et al. 1998, Manitoba Hydro 2022, Manitoba Hydro 2014, Tetratech 2012).

8.3.2.3 Amphibians and reptiles

Amphibians and reptiles are not typically found in intensively developed agricultural areas, and generally prefer natural habitats such wetlands, forests, and grasslands. With natural habitat (forests and wetlands) accounting for 4% (2.1 ha) of the PDA, 13% of the LAA, and 16% of the RAA, the assessment area provides marginal habitat for amphibians and reptiles in areas such as the crossing of the Brookdale Drain in 16-14-15 WPM and ditches adjacent to municipal roads (Manitoba Hydro 2022).

Amphibians with a reported distribution area which overlaps with the RAA include Canadian toad (*Anaxyrus hemiophrys*), wood frog (*Lithobates sylvaticus*), northern leopard frog (*Lithobates pipiens*), and barred tiger salamander (*Ambystoma mavortium*).

Reptiles with a reported distribution area which overlaps the RAA include northern red-bellied snake (*Storeria occipitomaculata*), plains garter snake (*Thamnophis radix*), red-sided garter snake (*Thamnophis sirtalis parietalis*), smooth green snake (*Opheodrys vernalis*), northern prairie skink (*Plestiodon septentrionalis septentrionalis*), and potentially the western hognose snake (*Heterodon nasicus*) at the southern extent of the RAA (Preston, 1982; Manitoba Herp Atlas, 2024).

8.3.2.4 Terrestrial invertebrates

Terrestrial invertebrates include species living in the soil (e.g., nematodes, earthworms), on the ground (i.e., beetles, spiders), in the air (i.e., butterflies, moths, flies, bees), and within the vegetation canopy (i.e., 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) (Manitoba Hydro 2012). Terrestrial invertebrate species are understood to occur throughout the RAA.

8.3.3 Species of conservation concern

Based on a review of provincial and federal databases and existing literature (MB CDC 2025), a list of SOCC that may be found within 5 km of the PDA are presented in Appendix D.

8.3.3.1 Birds

Six bird SOCC have the potential to occur within 5 km of the PDA (MB CDC 2025). They include:

- Burrowing owl (*Athene cunicularia*), which is ranked S1B (critically imperiled) and is designated as endangered under ESEA, SARA, and COSEWIC
- Common nighthawk (*Chordeiles minor*), which is ranked S2S3B (imperiled – vulnerable) and is designated as threatened under ESEA, and as special concern under SARA and COSEWIC
- Bobolink (*Dolichonyx oryzivorus*), which is ranked S3S4B (vulnerable – apparently secure) and is designated as threatened by SARA and as special concern under COSEWIC
- Bank swallow (*Riparia riparia*), which is ranked S4B (apparently secure) and is also designated as threatened by SARA and COSEWIC
- Barn swallow (*Hirundo rustica*), which is ranked S4B (apparently secure) and is designated as threatened by SARA and as special concern under COSEWIC
- Sharp-tailed grouse (*Tympanuchus phasianellus*), which is ranked S5 (secure)

8.3.3.2 Mammals

Two mammal SOCC have the potential to occur within 5 km of the PDA (MB CDC 2025). They include:

- Mule or black-tailed deer (*Odocoileus hemionus*), which is ranked S3 (vulnerable) and is designated as threatened under ESEA
- American badger (*Taxidea taxus taxus*), which is ranked S4 (apparently secure) and is designated as special concern under SARA and COSEWIC

Riparian areas along the Brookdale Drain and other natural areas have the potential to support these SOCC, however, suitable habitat for these mammals is limited due to the predominance of crop land in the project study area.

8.3.3.3 Amphibians and reptiles

Based on MB CDC records, there is one reptile SOCC and one amphibian SOCC that have potential to occur within 5 km of the PDA (MB CDC 2025). They are:

- Northern prairie skink (*Plestiodon septentrionalis septentrionalis*), which is ranked S1 (critically imperiled) and is designated as endangered under ESEA and as special concern under SARA and COSEWIC
- Northern leopard frog (*Lithobates pipiens*), which is ranked S4 (apparently secure) and is designated as special concern under SARA and COSEWIC

8.3.3.4 Terrestrial invertebrates

Based on MB CDC records, one terrestrial invertebrate SOCC is known to occur within 5 km of the PDA. The yellow-banded bumble bee (*Bombus terricola*) is ranked S3S5 (vulnerable to secure) and is designated as special concern under SARA and COSEWIC (MB CDC 2025).

8.4 Project interactions with wildlife and wildlife habitat

Table 8-3 identifies, for each potential effect, the physical activities that might interact with wildlife and wildlife habitat and result in the identified effect.

Table 8-3: Project interactions with wildlife and wildlife habitat		
Project activities/components	Change in wildlife habitat	Change in mortality risk
Construction of pipeline and control points		
Mobilization and staff presence	✓	✓
Vehicle and equipment use	✓	✓
Access development	✓	✓
Temporary work areas, e.g., marshalling yards	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	✓	✓
Pipe installation – trenching and lowering	✓	✓
Horizontal directional drilling	✓	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	✓	✓
Backfilling and contouring	✓	✓
Control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	✓	✓
Clean-up and reclamation	✓	✓
Operation and maintenance of pipeline and control points		
Presence of pipeline, gate station, and valve sites	-	-
Vehicle and equipment use	✓	✓
Maintenance activities	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	✓	✓

Table 8-3: Project interactions with wildlife and wildlife habitat		
Project activities/components	Change in wildlife habitat	Change in mortality risk
Valve operation checks (annually)	✓	✓
Vegetation management	✓	✓
Decommissioning of pipeline and control points		
Mobilization and staff presence	✓	✓
Vehicle and equipment use	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	✓	✓
Removal of above-ground components (dismantling, removal from site, disposal)	✓	✓
Rehabilitation	✓	✓
Clean-up and demobilization	✓	✓

✓= Potential interaction

– = No interaction

No effects to wildlife and wildlife habitat are anticipated to result from the presence of the pipeline, gate station, or valve site. All other project activities have potential pathways of effect that may result in changes to wildlife habitat and/or mortality risk as identified in Table 8-3 and assessed in the following Section 8.5.

8.5 Assessment of project effects

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 8-3, proposed mitigation measures, and the characterization of residual project effects.

As presented in Section 8.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on wildlife and wildlife habitat. These residual effects are anticipated to be negligible to low in magnitude and most pronounced during the construction phase of the project for each of the potential effects assessed:

- Change in wildlife habitat
- Change in mortality risk

8.5.1 Change in wildlife habitat

Although the dominant land use in the PDA is agriculture, there is potential for project activities to interact with wildlife habitat.

8.5.1.1 Analytical assessment techniques

Project-related change in wildlife habitat is assessed through considering the amount of wildlife habitat in the PDA (ha) that may be directly altered as a result of the project. Wildlife habitat, for the purposes of this assessment, is considered to be forested area and wetland area per provincial land cover classification data.

8.5.1.2 Effects pathways

The effect pathways through which the project has the potential to result in change in wildlife habitat include:

- Direct temporary disturbance and displacement of SOCC due to project activities involving ground disturbance and changes to vegetation
- Indirect effects to wildlife from sensory disturbance resulting from project activities occurring within areas that provide wildlife habitat

Past environmental assessments on other pipeline projects have found that construction and maintenance activities can result in potential effects on SOCC through the loss of habitat, disruption of breeding activity, and temporary displacement due to noise within areas providing habitat (Kelly WM Scott & Associates 2011; Energy East Project Consolidated Application 2016).

Construction

During construction, wildlife habitat can be affected directly through project activities involving ground disturbance and changes to vegetation including access development, right-of-way preparation (*i.e.,* the clearing of vegetation and stripping of topsoil), trenching during pipeline installation, horizontal directional drilling, and installation of above-ground components where ground disturbance is involved (*i.e.,* compaction of subsoil). These construction activities have the potential to directly alter wildlife habitat, particularly if forested areas, wetlands, or road allowance ditches are disturbed by the activities.

The PDA represents the area within which wildlife habitat could be directly affected/altered by project activities. Based on provincial land cover classification data, the PDA traverses no wetlands and contains approximately 2.1 ha of deciduous forest, representing the maximum amount of vegetation clearing and direct wildlife habitat alteration that could result from the project if mitigation measures were not implemented.

Direct effects to wildlife habitat will not occur in areas along the PDA where the pipeline will be installed by horizontal directional drilling (HDD), which avoids surface disturbance.

Indirect effects on wildlife habitat are those that reduce the effectiveness of existing or remaining habitat for wildlife. Indirect effects may result from project activities that generate sensory disturbances (*e.g.,* noise, visual) that may displace wildlife. All construction activities have the potential to generate noise and alter the sensory experience for wildlife in the area from mobilization and staff presence, vehicle and machinery use, activities involved in preparing the right-of-way and installation of the pipeline via trenching and horizontal directional drilling, through to clean-up and remediation. As such, the activities that occur throughout construction have the potential to result in the temporary displacement of wildlife within the LAA due to altered sensory experience.

Operations

During operations, wildlife habitat may be directly altered periodically during vegetation management and maintenance activities that may involve ground disturbance. For example, if an inspection reveals a deficiency in the pipeline and the repair/maintenance work requires that an area be excavated/trenched, there may be direct disturbance to wildlife habitat in a localized area.

Similar to construction, project activities that create noise may result in indirect effects to wildlife habitat that may alter the sensory experience and cause temporary displacement. In addition to vegetation management and maintenance activities, vehicle and equipment use, ground pipeline patrols, and valve operation checks may cause these sensory disturbances.

The presence of the pipeline and above-ground components are not anticipated to affect wildlife habitat on an ongoing basis.

Decommissioning

During decommissioning, the removal of above-ground components and rehabilitation may directly alter wildlife habitat through ground disturbance. Similar to construction, indirect effects to wildlife habitat may result from all project decommissioning activities. In addition to the removal of above-ground components and rehabilitation, mobilization and staff presence, vehicle and equipment use, pipeline disconnection (isolate, purge, and cap off below grade), and clean-up and demobilization have the potential to cause sensory disturbances and displacement of wildlife, specifically birds and mammals.

8.5.1.3 Mitigation for change in wildlife habitat

Potential direct effects of the project on wildlife habitat have been reduced through routing the pipeline predominantly on developed agricultural land and making use of horizontal directional drilling to allow the pipeline to cross beneath certain features along the project route including areas providing wildlife habitat such as the Brookdale Drain and a wet deciduous forest area located between SE 33-13-15 WPM and NE 28-13-15 WPM.

In addition to pipeline routing and design, mitigation measures to reduce project-related changes to wildlife habitat include the following:

- Wildlife features (*e.g.*, stick nests) will be identified in the Construction Environmental Protection Plan (CEnvPP), and mitigation, such as buffers, will be applied.
- Environmentally sensitive sites, features, and areas will be identified and mapped before construction.
- Construction activities will not take place outside of the reduced risk timing windows for wildlife species without additional mitigation measures such as pre-construction nest searches.

- Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.

8.5.1.4 Characterization of residual effects on wildlife habitat

The PDA traverses and therefore has the potential to directly alter a maximum of 2.1 ha of wildlife habitat, comprised entirely of deciduous forest. The PDA does not traverse any wetland per provincial land cover classification data. However, the actual area of wildlife habitat directly altered by the project is anticipated to be less than 2.1 ha. The crossing locations where the pipeline will be installed by horizontal directional drilling, avoiding the need to clear vegetation or disturb the ground, include the Brookdale Drain and the wet deciduous forest area located between SE 33-13-15 WPM and NE 28-13-15 WPM, which both contain deciduous forest. The precise area of wildlife habitat that will be retained because of the use of horizontal direction drilling will not be known until the drill design at each location is finalized. Therefore, this assessment only concludes that the area of wildlife habitat that will be directly altered will be less than 2.1 ha.

Mitigation measures including identifying wildlife features for inclusion in the CEnvPP, mapping out environmentally sensitive sites prior to construction, and developing and following an Access Management Plan are anticipated to further mitigate the potential for direct alteration of wildlife habitat. Working within reduced risk timing windows for wildlife species, where possible, or implementing additional mitigation measures where not possible, is anticipated to mitigate some indirect effects to wildlife habitat effectiveness through minimizing sensory disturbances from project activities during sensitive time periods for wildlife.

Following the implementation of mitigation measures described above, predicted residual effects on the change in wildlife habitat include:

- Potential reduced effectiveness of wildlife habitat and displacement of wildlife species due to project-related sensory disturbance
- Direct alteration of less than 2.1 ha of forest habitat resulting from clearing vegetation along the project right-of-way

Residual effects for change in wildlife habitat, after mitigation, are characterized as follows:

- Direction: adverse
- Magnitude: low during construction and decommissioning (*i.e.,* anticipated change in SOCC is unlikely to affect sustainability in the LAA and there are no predicted effects on listed species); negligible during operations and maintenance (*i.e.,* no measurable change in wildlife SOCC is predicted)

- Geographic extent: PDA for direct effects to wildlife habitat, LAA for indirect effects resulting from sensory disturbance
- Duration: long-term (*i.e.,* the residual effect extends for the life of the project)
- Frequency: continuous during construction and decommissioning, multiple irregular events during operations
- Reversibility: reversible

8.5.2 Change in mortality risk

8.5.2.1 Analytical assessment techniques

Project-related change in wildlife mortality risk is assessed through considering the amount of wildlife habitat in the PDA (ha of forests and wetlands) that may be directly altered as a result of the project, estimated project related traffic volumes, as well as qualitative assessment of the total duration and timing of project activities in relation to reduced risk timing windows for wildlife species.

8.5.2.2 Effects pathways

The effect pathways through which the project has the potential to result in change in wildlife mortality risk is through project activities that may result in harm or risk the survival or wildlife species through direct interactions or behavioural changes in wildlife that may result from increased activity.

Construction

Wildlife mortality could increase due to collisions of mammals, birds, or amphibians, including SOCC, with construction vehicles. During construction, some roads will experience increased volumes, particularly during peak periods of workforce movement (*e.g.*, between shifts) and during peak periods of materials delivery. At the peak of construction, it is anticipated that there will be approximately 50 project-related vehicles travelling to, from, and within the PDA.

Clearing vegetation and stripping topsoil to prepare the right-of-way also has the potential introduce greater mortality risk for birds, amphibians, reptiles, and small mammals that may unknowingly be present (or have nests) within the PDA.

The establishment and presence of the trench before the pipeline is lowered into place and backfilling of the trench after pipeline installation introduce risk for wildlife species to become entrapped within the trench.

Increased activity and the associated sensory changes (*e.g.,* noise, nighttime illumination) from construction may also cause an indirect increase in mortality risk by causing behavioural changes such as movement into new areas that increase chances of predation or human interaction. Small mammals or birds may move from cover because of disturbance from noise and vibration, putting them at greater risk of predation and mortality from exposure (Habib, Bayne and Boutin 2007). All construction activities have the potential to generate noise and alter the sensory experience for wildlife in the area in ways that may alter behaviour and increase mortality risk.

Operations

Similar to construction, the influx of project-related traffic (*i.e.,* vehicles and equipment) travelling to, from, and within the PDA during periodic maintenance activities, inspections, and vegetation management increases mortality risk associated with vehicle collisions. Similarly, maintenance activities that involve trenching/excavation introduced the risk of wildlife entrapment and sensory disturbance resulting from project activities may indirectly affect mortality risk through behavioural changes of wildlife species such as temporary displacement from habitat in the PDA.

Decommissioning

Similar to construction and operations, the influx of project-related traffic (*i.e.,* vehicles and equipment) travelling to, from, and within the PDA during decommissioning increases mortality risk associated with vehicle collisions. Excavation required to cap off the pipeline below grade and to remove above-ground components introduced increased risk of entrapment. Indirect affects to mortality risk may result during activities throughout decommissioning because the associated sensory disturbances may cause behavioural changes of wildlife species such as temporary displacement from habitat in the PDA.

8.5.2.3 Mitigation for change in mortality risk

Potential direct effects of the project on wildlife mortality have been reduced through making use of horizontal directional drilling, which reduces the risk of entrapment by eliminating the need for a trench in certain locations (Section 2.6.4, Crossings) and reduces the area of wildlife habitat (*i.e.,* deciduous forest) that will need to be cleared. In addition to pipeline design (*i.e.,* horizontal directional drilling at certain locations), mitigation measures to reduce project-related changes to wildlife mortality include the following:

- Hunting and harvesting of wildlife, or possession of firearms by project staff, will not be permitted while working on project sites.
- Construction activities will be restricted to roads, trails and cleared construction areas in accordance with the Access Management Plan.
- Project-related vehicles will comply with all traffic rules, including speed limits and provincial and federal highway regulations.
- Construction activities will not take place outside of the reduced risk timing windows for wildlife species without additional mitigation.
- The trench will be inspected before backfilling to prevent amphibians or other wildlife from being inadvertently buried.

8.5.2.4 Characterization of residual effects on wildlife mortality risk

As stated in 8.5.1.4 (Characterization of residual effects on wildlife habitat), the project is anticipated to directly alter less than 2.1 ha of wildlife habitat, specifically deciduous forest.

The project is anticipated to result in up to 50 additional vehicles travelling to, from, and along the PDA at the peak of construction. The PDA generally parallels PTH 5, on which annual average daily traffic volumes range between 700 and 990 vehicles per day. Therefore, the project is estimated to increase daily traffic volumes up by up to 7%. During operations, project-related traffic is not anticipated to be discernable from normal daily traffic volumes.

Developing and following an Access Management Plan and project-related vehicles and equipment following relevant traffic rules are anticipated to mitigate the risk of wildlife collisions with vehicles, and the associated mortality risk. Working within reduced risk timing windows for wildlife species, where possible, or implementing additional mitigation measures where not possible, is anticipated to mitigate some direct and effect to mortality risk. It is not anticipated to be possible to work within all reduced risk timing windows for all wildlife species for all project activities. For example, pipeline installation (*i.e.,* trenching, HDD) are anticipated to take place under non-frozen ground conditions in the spring and summer months. Amphibians are particularly vulnerable to disturbance due to their life history requirements requiring access to water, upland habitats, and minimal ground disturbance during spring and summer. Therefore, additional mitigation may be required in the CEnvPP in environmentally sensitive sites that may provide habitat for amphibians.

Following the implementation of mitigation measures described above, predicted residual effects on wildlife mortality risk include:

- Potential increase in wildlife collisions with vehicles or entrapment in trenched areas
- Indirect increases in wildlife mortality risk resulting from project-related sensory disturbances and associated behaviour changes in wildlife species (*e.g.,* displacement from PDA)

Residual effects for change in wildlife mortality risk, after mitigation, are characterized as follows:

- Direction: adverse
- Magnitude: low during construction and operations, negligible in operations
- Geographic extent: PDA except for residual effects to wildlife mortality risk resulting from the potential for vehicle and equipment collisions, which extends to the RAA on access routes that will be travelled by project vehicles and machinery travelling to and from the PDA
- Duration: long-term (*i.e.,* the residual effect extends for the life of the project)
- Frequency: continuous during construction and decommissioning, irregular events during operations
- Reversibility: reversible

8.5.3 Summary of residual effects characterizations

Table 8-4 characterizes the residual effects on wildlife and wildlife habitat.

Table 8-4: Project residual effects on wildlife and wildlife habitat

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Change in wildlife habitat						
Construction	A	L	PDA/LAA	LT	C	R
Operation		NC			IR	
Decommissioning		L			C	

Change in mortality risk						
Construction	A	L	PDA-RAA		C	
Operation	N	NC	PDA-RAA	LT	IR	R
Decommissioning	A	L	PDA-RAA		C	

8.5.4 Cumulative effects

Where residual adverse effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out. Therefore, the assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has adverse residual effects on the VC; and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

For the assessment of project effects on wildlife and wildlife habitat both of above conditions exist and a cumulative effects assessment is therefore presented in this section.

8.5.4.1 Project residual effects likely to interact cumulatively

Table 8-5 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project to impact wildlife and wildlife habitat.

Table 8-5: Potential cumulative effects on wildlife and wildlife habitat		
Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects	
	Change in wildlife habitat	Change in mortality risk
Past and ongoing projects and activities		
Domestic resource use (e.g., hunting, trapping, fishing, non-commercial agriculture)	-	✓
Recreational activities (e.g., canoeing, snowmobiling, hiking)	✓	✓
Industrial and commercial resource use, including commercial agriculture	✓	✓
Existing infrastructure (non-Manitoba Hydro) such as roads, railways, telecommunication lines, pipelines, water and wastewater treatment facilities	✓	✓
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	✓	✓
Residential and institutional developments	✓	✓
Future projects and activities		
Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony	✓	✓
Residential and institutional developments	-	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.
– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

8.5.4.2 Cumulative effects on wildlife habitat

8.5.4.3 Pathways for cumulative effects on wildlife habitat

Existing and ongoing projects and activities in Table 8-5, with the exception of domestic resource use, have contributed to a change in wildlife habitat, both direct and indirect. The primary pathways of these effects are through land clearing (*i.e.,* loss of wildlife habitat) and/or sensory disturbances (*e.g.,* noise) altering the effectiveness of wildlife habitat.

Within the RAA, industrial and commercial resource use, specifically commercial agriculture, has contributed notably to the modification and/or loss of wildlife habitat. The RAA is extensively developed for agriculture with agricultural land currently covering approximately 80% of the RAA. Existing infrastructure (Manitoba Hydro and non-Manitoba Hydro), residential and institutional developments, and recreational activities have contributed to the loss of native habitat in the RAA over time and continue to have the potential to affect remaining wildlife habitat through sensory pathways that may alter the effectiveness of wildlife habitat for certain species.

The proposed future Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony is anticipated to contribute to cumulative effect to wildlife habitat. The quarter section within which it will be located, NE 17-12-15W, is approximately 2 km west of the project's southern control point and contains a combination of wetland and deciduous forest, land cover types that provide wildlife habitat. Based on the project's Environment Act Proposal, the project footprint will be located on an area of the property that is agricultural/developed land (South-Man Design Group Ltd. 2023). Therefore, the project is not anticipated to directly result in the loss or disruption of wildlife habitat, but sensory disturbances from project activities may interact cumulatively with those of the Neepawa gas transmission project affecting the effectiveness of wildlife habitat in the RAA if construction activities on the two projects overlap temporally.

The future proposed residential and institutional developments in and around the Town of Neepawa are not anticipated to contribute to cumulative effects to wildlife habitat as the assumption, based on feedback, is that the developments will be located within pre-disturbed/developed areas, therefore it is not anticipated that wildlife habitat (forest and wetland) is likely to be altered.

8.5.4.4 Mitigation measures

The implementation of the mitigation measures identified above in Section 8.5.1.3 will reduce the proposed project's adverse effects on wildlife and wildlife habitat.

Application of similar mitigation for existing projects/activities by other proponents would help to mitigate similar project effects that may result, lessening the potential for cumulative effects.

8.5.4.5 Residual cumulative effect

With the implementation of mitigation measures identified for change in wildlife habitat, this project, in combination with other ongoing and future projects and activities, is predicted to have a small contribution to cumulative effects on wildlife habitat with temporary wildlife displacement due to sensory effects like noise bring the potential residual cumulative effect anticipated.

While the project will have a cumulative effect, with the implementation of mitigation measures, cumulative effects are anticipated to be limited to the LAA and are anticipated to be of low magnitude. Cumulative effects will be short-term occurring on an irregular basis when the activities of ongoing and future projects occur at the same time as the activities involved in the Neepawa gas transmission project. Residual cumulative effects on wildlife habitat are anticipated to be most pronounced during the construction phases of the projects/activities and are anticipated to be reversible after decommissioning of the activities and projects with a cumulative interaction.

8.5.4.6 Cumulative effects on wildlife mortality risk

8.5.4.7 Pathways for cumulative effect on wildlife mortality risk

All ongoing and future projects and activities in Table 8-5 have the potential to interact cumulatively with the project's residual effects on wildlife mortality risk.

The primary pathways through which an ongoing or future project or activity may interact cumulatively with the project's effects on wildlife mortality risk are through the introduction of additional traffic (*i.e.,* vehicle and equipment use), vegetation clearing, ground disturbance, and sensory disturbances occurring in the RAA at the same time as the project.

In addition to wildlife mortality risks related to potential collisions between wildlife species and vehicles, certain existing infrastructure types introduce unique ongoing wildlife mortality risk such as bird-wire collision risks associated with electrical transmission lines. Domestic resource use poses a direct wildlife mortality risk based on the nature of the activities (*e.g.,* hunting, trapping fishing).

Both the proposed future Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony and proposed residential and institutional developments are anticipated to have the potential to contribute to cumulative effects to wildlife mortality risk if they bring additional traffic to the RAA, involve ground disturbance, vegetation clearing, or generate sensory disturbances that may alter wildlife behaviour at times that overlap with the Neepawa gas transmission project.

8.5.4.8 Mitigation measures

The implementation of the mitigation measures identified above in Section 8.5.2.3 will reduce the proposed project's adverse effects on wildlife and wildlife habitat. Application of similar mitigation for existing projects/activities by other proponents would help to mitigate similar project effects that may result, lessening the potential for cumulative effects.

8.5.4.9 Residual cumulative effect

With the implementation of mitigation measures identified for change in wildlife mortality risk, this project, in combination with other ongoing and future projects and activities, is predicted to have a small contribution to cumulative effects on wildlife mortality risk. The anticipated potential residual cumulative effects on wildlife mortality risk are a potential increase in wildlife collisions with vehicles or other project activities with direct mortality risks and potential indirect increases in wildlife mortality risk due to sensory disturbances that may affect behavioural changes in wildlife species.

While the project will have a cumulative effect, with the implementation of mitigation measures, cumulative effects are anticipated to be of low magnitude (*i.e.,* a measurable change in the abundance of wildlife in the LAA is not anticipated, although temporary local shifts in distributions in the LAA might occur). Residual cumulative effects will extend into the RAA as it relates to the risk for wildlife-vehicle collisions as traffic related to ongoing and future projects and activities are likely to use the same travel routes. Cumulative effects will be short-term occurring on an irregular basis when the activities of ongoing and future projects occur at the same time as the activities involved in the Neepawa gas transmission project. Residual cumulative effects on wildlife mortality risk are anticipated to be most pronounced during the construction phases of the projects/activities and are anticipated to be reversible after decommissioning of the activities and projects with a cumulative interaction.

8.5.5 Determination of significance

With mitigation and environmental protection measures, the project and cumulative effects on wildlife and wildlife habitat are predicted to be not significant.

The project is not anticipated to result in a threat to the long-term persistence or viability of a wildlife species in the RAA.

8.5.6 Prediction confidence

Prediction confidence in the assessment of effects on wildlife is medium. The level of confidence is based on the quantity and quality of data available, professional judgement and experience with similar projects, and the anticipated effectiveness of mitigation measures, which reflect best industry practices. Mitigation measures during construction and operation will be implemented to reduce adverse effects on wildlife. The level of confidence in the effectiveness of the mitigation measures is high based on past project experience.

8.5.7 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a valued component monitoring plan for wildlife and wildlife habitat has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (Chapter 16).

8.5.8 Sensitivity to future climate change scenarios

Effects of climate change on wildlife and wildlife habitat are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding).

Future climate for the project area is forecasted to be warmer with more precipitation, on average, during winter and spring seasons, and such changes could impact wildlife through a change in habitat availability and conditions, as well as mortality risk.

9.0 Commercial agriculture

Commercial agriculture refers to the for-profit production of crops and livestock. Given the location of the project in a prime agricultural region, project components and activities have the potential to affect commercial agriculture.

Concerns were raised about the potential for effects on commercial agriculture due to the project during project engagement (*e.g.*, during discussions with landowners and through feedback provided by provincial government staff and producer representative organizations).

Commercial agriculture was selected as a valued component because unmitigated effects from project activities during construction and from the presence of the project and maintenance activities, could reduce the amount of land available for agriculture, degrade the quality of land used to support agriculture, and interfere with agricultural activities.

Commercial agriculture is a key driver of productivity and prosperity in Manitoba and plays an important role in maintaining economic strength and generating socio-economic stability within the region of the project. Within the project area commercial agriculture includes:

- Production of annual and perennial crops (*i.e.*, row crops, other specialty crops, grains, oil seeds, hay, and forages), including field operations such as seeding, the application of inputs (*e.g.*, fertilizers, manure, soil amendments and pesticides) and harvesting.
- Raising of livestock and livestock grazing.
- Buildings and other structures used in support agricultural operations and activities.

9.1 Summary of conclusions

The Neepawa gas transmission project is anticipated to have adverse residual project effects on commercial agriculture. The residual project effects include the following:

- A total of 49 ha (121 ac) of land will be temporarily lost from agricultural production during project construction. This includes 41 ha (101 ac) of annual cropland (row crops and cereal/oilseed) and 8 ha (20 ac) of seeded hayland (forages) and natural hayland (grassland). However, compensation will be provided to affected agricultural producers to offset the effects of this temporary land loss.

- The presence of above-ground assemblies at control points throughout the lifetime of the project will result in the permanent loss of an estimated 0.80 ha (1.98 ac) of land from agricultural use. However, compensation will be provided to offset the effects of this permanent land loss to agricultural producers.
- With topsoil stripping and other construction mitigation measures, land capability classes along the pipeline route are anticipated to return to pre-disturbance levels. However, reductions in crop yield within the project development area may persist into the operations and maintenance phase.
- While the potential for conflict with agricultural activities may remain following mitigation, the magnitude of these effects and the extent over which they are experienced will be reduced. Manitoba Hydro understands that even though overall project effects will affect a small proportion of the RAA, local effects (*i.e.*, field scale) can have a meaningful impact on individual operations. Communications with landowners prior to land access for project activities may result in additional site-specific mitigation, further reducing potential for conflict with agricultural activities. Compensation will be provided to address the residual potential conflict with agricultural activities and damages that may be caused by project activities.
- Portions of the project have been routed to parallel existing gas pipeline easement, which is intended to reduce overall project conflicts with agricultural activities.
- Adverse residual project and cumulative effects to commercial agriculture are anticipated to be not significant because the project is not anticipated to impair the capacity for agricultural productivity in the RAA.

9.2 Scope of the assessment

This chapter presents baseline or existing conditions for commercial agriculture and includes the assessment of potential effects of project construction, operations and maintenance, and decommissioning activities on commercial agriculture. An assessment of cumulative effects, considering the effects of other projects in conjunction with the current project, on commercial agriculture is also presented.

This assessment has been influenced by engagement feedback and Manitoba Hydro’s experience with other projects in southern Manitoba, including the recent Dominion City to Altona gas transmission pipeline and electrical transmission projects (*e.g.,* Pointe du Bois to Whiteshell Transmission Project, Dorsey to Wash’ake Mayzoon Transmission Project, and Manitoba-Minnesota Transmission Project).

9.2.1 The project

The proposed Neepawa Gas Transmission Project (the project) is an approximate 20-kilometre, 6-inch steel natural gas pipeline. The line will extend from a control point located approximately 22.5 kilometres south of Neepawa and run north to another control point located 3.5 kilometres south of Neepawa.

The project components are described in more detail in Chapter 2 (Project description).

9.2.2 Regulatory and policy setting

The following provincial laws, and associated regulations, policies, and guidelines, as well as Manitoba Hydro's policies were considered for assessing project effects to commercial agriculture.

9.2.2.1 Provincial regulation and policy

The Noxious Weeds Act

The Noxious Weeds Act defines noxious weeds in Manitoba and outlines responsibilities to control and destroy noxious weeds. The Act defines a noxious weed as a plant that is designated as a tier 1, tier 2 or tier 3 noxious weed in the regulations, and the definition includes the seed of a noxious weed, whether it is still attached to the noxious weed or separated from it. Specific noxious weeds are designated within the Noxious Weeds Regulation 42/2007 into one of the three tiers based on prevalence, distribution, and invasiveness:

- Tier 1 species are those that are considered to have the most potential for negative effects though they may not yet be present in Manitoba. Under the Act, all Tier 1 species must be destroyed on land that a person owns or occupies.
- Tier 2 includes those species that are already established in Manitoba and have been observed to spread easily. Tier 2 species infestations less than 20 acres must be destroyed on land that a person owns or occupies, while infestations occupying 20 acres or more must be controlled and kept from spreading on land that a person owns or occupies.
- Tier 3 species on land a person owns or occupies must be controlled if the weed's uncontrolled spread is likely to negatively affect an aspect of Manitoba's economy or environment, or the well-being of residents in proximity to the land.

The Act is relevant to this assessment of project effects because noxious weeds could be introduced to previously unaffected agricultural lands because of project activities. Section 5(1) of the Act requires the cleaning of equipment following the use of that equipment in an area where a noxious weed is present.

Beyond *The Noxious Weeds Act*, there is no legislation directly governing biosecurity on agricultural land or with respect to agricultural operations. For example, there is no legislation directly addressing the potential spread of soil-borne pathogens (*e.g.,* clubroot, soybean cyst nematode) or livestock diseases.

Biosecurity Protocols

In pursuit of reducing the spread of diseases and weeds in agricultural production areas, Manitoba Agriculture has developed biosecurity protocols for different end users, including landowners, agricultural service providers, utility companies, and researchers (Manitoba Agriculture 2024[a]). Biosecurity Management on Agricultural Land for the Energy and Transportation Industries is the protocol that applies to pipeline projects. This protocol's objective is to prevent the spread of soil-borne pests such as weeds, protists, and nematodes in agricultural soils by limiting soil movement between fields and across right of ways (Manitoba Agriculture 2024[b]).

The biosecurity protocols are relevant to this assessment of project effects because they show the importance of biosecurity for agricultural operations and provide strategies for maintaining and enhancing biosecurity.

9.2.2.2 Municipal guidance

Land use planning in the rural municipality traversed by the project (*i.e.*, the RM of North Cypress-Langford) is guided by provincial land use policies and governed under *The Planning Act*. Under *The Planning Act's* Provincial Planning Regulation (81/2011), the project is within an agriculture policy area with a rural/agriculture designation. The goals stated for the agricultural policy area include:

- Protecting agricultural land for present and future food production and agricultural diversification opportunities
- Protecting agricultural operations from encroachment by other land uses
- Maintaining the ability of a producer to efficiently manage, expand or diversify an operation

The RM of North Cypress-Langford is a member of The Cypress Planning District for coordination and cooperation in land use and land development issues with other, neighbouring municipalities. The land use plan for the area traversed by the project indicates the land is almost completely designated as Rural / Agricultural Area, except for the northern portion of the project which is in a Rural Conservation Area. The zoning by-laws allow for non-agricultural developments in the Rural / Agricultural

Area, including pipelines. With respect to the development of utilities, the district's development policies indicate:

> *The planning and installation of major utility corridors shall be coordinated with the responsible Council(s) and affected landowners and conflicts with existing uses shall be minimized.*

Non-agricultural land uses are addressed in the land and resource use section of the assessment (see Section 5-10).

9.2.2.3 Manitoba Hydro policies

<u>Manitoba Hydro's agricultural biosecurity policy and procedure</u>

Manitoba Hydro understands that biosecurity is of concern to agricultural producers across the province and recognizes that Manitoba Hydro staff and contractors have the potential to affect agricultural biosecurity through construction and maintenance activities that require access to agricultural land. Manitoba Hydro's agricultural biosecurity policy addresses the need to prevent the introduction and spread of diseases, pests and invasive plant species on agricultural land and livestock operations (Manitoba Hydro 2023a).

Manitoba Hydro's agricultural biosecurity standard operating procedure (SOP) (Manitoba Hydro 2023b) includes the following:

- Guidance for working in livestock settings and crop settings including assessing biosecurity risks, where a landowner or producer does not have an established protocol
- The requirement for all employees, subsidiaries and contractors who are required to perform work in livestock and agricultural settings to be trained in Manitoba Hydro's agricultural biosecurity policy and the biosecurity SOP every three years

Like the provincial Biosecurity Management on Agricultural Land for the Energy and Transportation Industries protocol (Manitoba Agriculture 2024[b]), Manitoba Hydro's agricultural biosecurity SOP seeks to prevent the spread of soil-borne pests in agricultural soils by limiting soil movement between fields and across rights of way, and provides mitigation measures focused on cleaning techniques and reducing exposure to biosecurity risks (*e.g.,* not working under very wet conditions).

While the provincial protocol (Manitoba Agriculture 2024[b]) presents multisector biosecurity guidance, the Manitoba Hydro SOP is specifically developed to address biosecurity concerns and issues related to how Manitoba Hydro project activities may interact with agricultural lands and operations.

Landowner compensation

Where property easements need to be acquired, Manitoba Hydro seeks to identify, contact, and communicate with landowners in a timely manner. Manitoba Hydro will mitigate project effects on agriculture to the extent practical. However, residual project effects may result from construction and operation activities. Effects may include temporary and permanent loss of land due to the presence of above-ground structures, damage to crops and property, ongoing nuisance to farmers and their operations, and direct and indirect effects on property use. Landowners and producers are compensated for these residual effects.

Four types of compensation are available to affected landowners:

1. Land compensation

Land compensation is a one-time payment to landowners who grant an easement for a transmission pipeline right-of-way. It is based on the following:

- total land area (acres) of easement required
- current market value of the land (per acre)

For underground gas transmission lines, Manitoba Hydro's compensates directly affected landowners by a factor of 100% of the current market value of the easement area.

2. Construction damage compensation

Construction damage compensation is provided to landowners who experience damage to their property due to construction, operation, and maintenance of a Manitoba Hydro project. A one-time payment for construction damage is negotiated on a case-by-case basis. Manitoba Hydro will:

- compensate or be responsible for repairing, to the satisfaction of the landowner, any damage to a landowner's property related to the construction and operation and maintenance of the gas transmission line, and
- compensate a landowner for damages such as the reapplication of topsoil or rejuvenation of compacted topsoil where the remedial work requires farm machinery and the landowner's expertise.

If crops are in place prior to construction, the crop owner is compensated for financial loss due to damage of crops. This compensation generally considers the most recent average value of the harvested crop reported by Manitoba Agricultural Services Corporation.

3. Structure impact compensation

Structure impact compensation is a one-time payment to landowners if an above-ground structure (*e.g.*, valve site) is constructed on land classified as agricultural. Structure impact compensation considers the following:

- lands permanently removed from production, determined by the type of structure constructed on the land
- reduced productivity in an area of overlap around each above-ground structure
- additional time required to manoeuvre farm machinery around each above-ground structure
- double application of seed, fertilizer and weed control in the area of overlap around each above-ground structure

4. Ancillary damage compensation

Ancillary damage compensation is a one-time payment that applies where Manitoba Hydro's use of the right-of-way directly or indirectly affects property use. Ancillary damage compensation is negotiated. Landowners may be compensated for:

- agricultural effects (*e.g.,* effects on irrigation and aerial spraying activities)
- constraint effects, such as restricted access to adjacent lands

9.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide project feedback related to commercial agriculture. This included direct emails to the following agricultural producer groups and other potentially interested parties:

- Manitoba Agriculture (various sections/representatives)
- Keystone Agricultural Producers
- Manitoba Beef Producers
- Dairy Farmers of Manitoba
- Manitoba Pork
- Manitoba Chicken Producers
- Manitoba Egg Farmers
- Manitoba Forage and Grassland Association
- Manitoba Organics
- Manitoba Sheep Association
- Manitoba Beekeepers Association

A summary of engagement outcomes is as follows:

- Manitoba Pork indicated there are two registered operations along the route

- Manitoba Egg indicated that a communal agricultural operation in the vicinity of the project may provide some feedback on the project
- Manitoba Chicken Producers confirmed no registered producers in the vicinity of the project

In a letter to Manitoba Hydro, Manitoba Beef Producers provided some comments on the beef industry and few concerns related to potential effects from the project. A summary of their concerns is as follows:

- Biosecurity – Manitoba Beef Producers shared the importance of Manitoba Hydro and its contractors adhering to strict biosecurity protocols to help reduce the risk of disease transmission to livestock, or the transfer of noxious weeds, soil-borne pathogens and other soil-borne pests to lands used by beef producers. A critical case in point would be if soil disturbance resulted in anthrax spores being dug up during construction. This would pose a serious health threat to cattle as anthrax generally results in swift death for the affected animals. The presence of anthrax has led to cattle losses in several areas of Manitoba in the past, including in southeastern Manitoba.
- Weed management - Manitoba Beef Producers strongly stated the importance of plans to manage weeds throughout all stages of the project to reduce the adverse consequences for livestock, people, and livestock-related activities such as haying, grazing and cropping. They specifically noted concerns about invasive species including leafy spurge, water hemlock and water hemp.
- Impacts to land – Manitoba Beef Producers shared importance of reducing the amount of land that may be impacted by project construction, including lands being taken out of production for a period of time.
- Disruption to livestock operations – Manitoba Beef Producers shared concerns with disruption to livestock operations and suggested avoiding calving seasons, breeding seasons, and active livestock grazing areas. Similarly, there should be efforts to avoid activities that would interfere with planting or harvest activities, including hay production.

A letter was provided the Sustainable Agriculture Branch of Manitoba Agriculture providing summary comments on agricultural considerations for the development of gas pipelines in agro-Manitoba. A summary of key points is provided below:

- Only ~14% of Manitoba’s land has agricultural potential; pipeline footprints including risers and meter stations permanently remove productive farmland and may impact production economics, especially in areas of high value production.
- Pipelines can restrict normal farm operations, including deep tillage, equipment access, manure application, and field traffic (*e.g.*, limits for pipeline crossing).

- Biosecurity risks are highest during construction, with potential spread of soil-borne pathogens (*e.g.*, clubroot, bacterial ring rot [potatoes], nematodes, verticillium wilt, blackleg), noxious weeds and other pests via equipment and personnel.
- Livestock operations face added risks, including disease transmission and disturbance of soils that may contain anthrax spores.
- Pipeline corridors may cause long-term soil compaction, mixing, drainage disruption, and yield loss, requiring compensation.
- Mitigation measure considerations include early landowner engagement, off-season construction, strict sanitation, soil segregation, low-impact equipment, and protection of tile drainage and irrigation systems.
- Coordination with landowners is essential to plan reroutes or repairs where conflicts cannot be avoided.

A virtual engagement session was also hosted by Manitoba Hydro on November 19, 2025, with the organizations listed above receiving direct invitations. During the virtual engagement session:

- A producer noted the presence of irrigation pivots and the potential for tile drainage in the project area, however, confirmation of existing tile drainage systems or locations was not provided.
- A participant inquired about the pipeline's route in relation to the Langford Community Pasture, specifically whether the pipeline passes through or bypasses the area.
  - Most of the community pasture is within the RM of Langford-North Cypress, with a small southern portion in the neighbouring RM of Glenella-Lansdowne, to the east.
  - At its closest point, the community pasture is approximately 3.4 km east of the proposed project footprint, and no interaction is anticipated between project activities/ presence and the community pasture.
- While no other correspondence or comments were received from other producer groups or individual producers, the concerns forwarded by the Manitoba Beef Producers reasonably capture some of the primary concerns from agricultural producers and organizations raised on similar projects in the past, namely land loss, damage to land, interference and/or disruption to operations and biosecurity.

While no other correspondence or comments were received from other producer groups or individual producers, the concerns forwarded by the Manitoba Beef Producers reasonably capture some of the primary concerns from agricultural producers and organizations raised on similar projects in the past, namely land loss, damage to land, interference and/or disruption to operations and biosecurity.

9.2.4 Potential effects, pathways, and measurable parameters

The identification of effects included in the assessment of project effects on commercial agriculture was based on regulatory guidance, namely Manitoba Environment and Climate Change's Information Bulletin – Environment Act Proposal Report Guidelines, key issues and concerns identified during engagement, and Manitoba Hydro experience and learnings from past assessments.

The potential project effects on commercial agriculture, along with effects pathways and measurable parameters are outlined in Table 9-1.

Table 9-1: Potential effects, effects pathways, and measurable parameters for commercial agriculture

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Loss and/or degradation of agricultural land	Clearing of the right-of-way, creation of access routes, and set-up of temporary work areas (*e.g.*, marshalling yards) may result in **temporary** agricultural land loss.	Extent of temporary agricultural land loss (ha)
	The presence of above-ground structures remaining through operation (*e.g.,* valve sites) will result in **permanent** agricultural land loss.	Extent of permanent agricultural land loss (ha)
	Construction activities may result in agricultural production losses due to degradation of soil capability through soil disturbance, compaction, and alteration of drainage paths. Traffic movement during project maintenance activities might cause soil degradation through compaction.	Land capability class for agriculture

Conflict with agricultural activities	Construction and operation and maintenance activities might cause conflict with agricultural activities (*e.g.*, disrupted field operations or access, tile drainage installation) and increased potential for crop and livestock biosecurity risk.	Interference with agricultural activities (*e.g.*, increased field access distances, relocation of agricultural buildings or structures, modified tile drainage installation requirements)

9.2.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on commercial agriculture:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project.
- **Local assessment area (LAA):** includes all components of the PDA and consists of quarter sections of land traversed by the PDA. The quarter section was selected to define the LAA as these land survey/ownership units generally encompass the basic field management unit most commonly used in the project region. The LAA represents the area where direct and indirect effects on agriculture are likely to be most pronounced or identifiable and encompasses the locally affected agricultural land uses or activities. Therefore, project effects that are experienced across the entire field management unit will generally be considered within the boundary of the LAA.
- **Regional assessment area (RAA):** includes the PDA and LAA and is defined by the administrative boundaries of the RMs that are traversed by the PDA, which consists of the RM of North Cypress-Langford. The RAA area is crucial for understanding the broader environmental and socio-economic context of the project and is the area used for assessing cumulative environmental and socio-economic effects.

Map 9-1 illustrates the spatial boundaries for the assessment of project effects on commercial agriculture.

9.2.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on commercial agriculture are based on the timing and duration of project activities as follows:

- Construction – estimated to take approximately 12 months, beginning in the winter of 2027
- Operation and maintenance – estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

9.2.7 Residual effects characterization

Table 9-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on commercial agriculture.

Table 9-2: Characterization of residual effects on commercial agriculture

Characterization	Quantitative Measure or Definition of Qualitative Categories
Direction – the long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to commercial agriculture relative to baseline. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to commercial agriculture relative to baseline. **Neutral –** no net change in measurable parameters for commercial agriculture relative to baseline.
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**No Measurable Change –** no measurable change in the capacity for agriculture **Low –** a small but measurable change in the capacity for agriculture. Land loss, land degradation or conflict with activities has a measurable effect on production levels, however production can continue at or near pre-disturbance levels. **Moderate –** a change that is greater than low but will not result in an impairment of agricultural capacity. Land loss, land degradation or conflict with activities has a measurable effect on production levels that

Table 9-2: Characterization of residual effects on commercial agriculture

Characterization	Quantitative Measure or Definition of Qualitative Categories
	may influence production at the field management unit level. **High –** a change that can result in an impairment of agricultural capacity. Land loss, land degradation or conflict with activities influences production such that production cannot continue at or near predisturbance levels.
Geographic Extent - the geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration – the time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through construction to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency - identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** – occurs one time **Multiple irregular event –** occurs at no set schedule **Multiple regular event –** occurs at regular intervals **Continuous –** occurs continuously
Reversibility - pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation **Irreversible –** the residual effect is unlikely to be reversed

9.2.8 Significance definition

A determination of significance is made for the project residual effects on commercial agriculture after the implementation of mitigation measures has been considered. There are no specific provincial regulations or guidelines that set thresholds for determining the significance of environmental effects on commercial agriculture. As such, the study team developed thresholds to evaluate the capacity for agriculture to continue for extended periods of time following construction of the project.

It is acknowledged that effects on commercial agriculture may differ depending on the scale at which, and the perspective from which, they are evaluated. The significance of project effects from the perspective of an individual landowner or producer, considered at the local scale of an individual agricultural operation or agricultural field, may differ from the perspective of the agricultural industry considered at a broader, regional scale.

For this assessment, adverse residual effects on commercial agriculture are considered significant if the proposed project results in either of the following:

- A loss of commercial agricultural land or degradation of soil quality such that existing agricultural production cannot continue at current levels for extended periods of time (*i.e.,* beyond the post-construction reclamation phase, or beyond 3 years post-construction) or cannot be adequately compensated
- Interference or disruption that restricts agricultural operations and activities such that existing agricultural operations and activities cannot continue at current levels for extended periods of time (beyond construction phase) or cannot be adequately compensated

9.3 Existing conditions

Baseline information for this assessment was gathered through a detailed review of the following information sources:

- Available desktop information (e.g., existing soil resource information, land cover, crop types, landowner maps, Statistics Canada)
- Orthoimagery (i.e., corrected aerial/satellite imagery) review
- A windshield survey completed within the LAA on (August 7, 2025)
- Feedback from project engagement

The existing conditions described in this section focus on:

- Agricultural land cover and land use
- Existing commercial agriculture operation types and farm sizes
- Agricultural capability

- Soil compaction risk
- Agricultural cropping, including risk to crop biosecurity
- Livestock operations, including risk to livestock biosecurity

9.3.1 Agricultural land cover and land use

The RAA is comprised largely of land under agricultural land use, with approximately 43.4% under annual crop production and 3.4% as forage crops (Table 9-3; Map 5-2). Approximately 21.8% of the RAA is characterized as range and grassland, most of which in some cases may be used for grazing livestock or cut for hay for livestock feed (e.g., road rights-of-way, drainage channel side slopes).

Within the LAA and PDA, land use is more weighted to agriculture with 59.0% and 52.1%, respectively, under annual production. Forage crops occupy a sizeable portion of the LAA (11.4%) and PDA (19.7%). Similarly, range and grasslands occupy a notable portion of the LAA (15.9%) and the PDA (17.7%). Within the LAA and PDA the range and grassland is considered to be under agricultural land use.

Table 9-3: Land cover types in the RAA, LAA and PDA

Cover Type	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
Agriculture – annual cropping	76,842	43.4	1,106	59.0	28.3	52.1
Agriculture – forage crops	6,014	3.4	215	11.4	10.7	19.7
Range and Grassland	38,632	21.8	298	15.9	9.6	17.7
Conifer Forest	2,209	1.2	0	0.0	0	0.0
Cultural	424	0.2	0	0.0	0	0.0
Deciduous Forest	30,584	17.3	146	7.8	1.4	2.6
Marsh/Fens	4,957	2.8	14	0.8	0	0.0
Mixedwood Forest	5,996	3.4	1	0.1	0	0.0
Open Deciduous Forest	5,984	3.4	39	2.1	0.7	1.3
Roads/Trails/Rail Lines	4,405	2.5	45	2.4	3.6	6.7
Sand and Gravel	41	<0.1	0	0.0	0	0.0
Water	1,014	0.6	11	0.6	0	0.0
Urban	0	0.0	0	0.0	0	0.0
Totals	177,101	100	1,875	100	54.4	100

NOTES:

9.3.2 Existing commercial agriculture operation types and farm sizes

Farm types within the RAA predominantly reported as being some type of crop operation, including oilseed and grain farming (40% of farms), vegetable and melon farming (11% of farms) and other crop farming (8%), including hay production and other miscellaneous crop farming (Table 9-4; Statistics Canada 2021[a]). Cattle ranching and farming comprised 33% of farms, with fewer farms reporting as other animal production (5%), hog and pig farming, sheep and goat farming, and poultry and egg farming, all of which represented less than 1% of farms.

When compared to Manitoba overall, vegetable farming is more prominent in the RAA, as it is within an important potato production region. More information on agricultural cropping and livestock within the LAA and PDA is presented in Section 9.2.5 and Section 9.2.6, respectively.

One farm in the RAA reported as having organic products for sale and having certified organic products for sale in 2021 (Statistics Canada, 2021[b]). It is unknown if any of the farming operations within the LAA are considered organic production systems.

Table 9-4: Farm types reported in the RMs of the RAA

Farm Type	RMs of the RAA		Manitoba	
	Number of farms	%	Number of farms	%
Oilseed and grain farming	101	39.8	6,749	46.4
Cattle ranching and farming	84	33.1	3,812	26.2
Vegetable and melon farming	28	11.0	184	1.3
Other crop farming	20	7.9	1,898	13.1
Other animal production	13	5.1	1,015	7.0
Hog and pig farming	2	0.8	245	1.7
Sheep and goat farming	2	0.8	174	1.2
Poultry and egg production	2	0.8	263	1.8
Greenhouse, nursery and floriculture production	1	0.4	137	0.9
Fruit and tree nut farming	1	0.4	66	0.5
Total number of farms	254	100	14,543	100

Source: Statistics Canada. 2021. Table 32-10-0231-01 Farms classified by farm type, Census of Agriculture, 2021.

The RAA is the RM of North Cypress-Langford.

With respect to manure management, manure was reported to be applied by 87 farms within the RAA, with 85 farms reporting solid or composted manure application and 5 reporting liquid manure application (Statistics Canada, 2021[c]). Manure application is an important practice in the region, with approximately 34% of farms across the RAA reporting manure application as an activity. Manure management within the LAA is discussed further in Section 9.2.6.

Nine farms within the RAA report having irrigation as a practice; however, no acres were included in this reporting due to data being deemed too unreliable to be published (Statistics Canada, 2021[c]). Irrigation was confirmed to be a practice within the LAA based on an Orthoimagery review and observations from the August 2025 windshield survey.

With respect to farm size, farms under 180 acres in size were the most reported, accounting for 26% of farms in the RAA (Table 9-5; Statistics Canada, 2021[d]). These farms are likely comprised of a combination of "hobby farms" and/or landowners with relatively small land holdings, potentially leasing or renting out land to agricultural operators.

The next most commonly reported farm sizes in the RAA are the 1,120 to 3,519 acres class, accounting for 24% of reported farms, and the 180 to 560 acres and 560 to 1,120 acres classes, with 21% and 18% of reported farms, respectively. Farms in these size classes likely best represent the typical commercial annual crop production operation in the region. Farm size classes in the RAA are similar to those reported for Manitoba overall.

Table 9-5: Farms sizes reported in the RMs of the RAA

Farm Size	RMs of the RAA		Manitoba	
	Number of farms	%	Number of farms	%
Under 180.00 acres	65	25.6	3,996	27.5
180.00 to 559.99 acres	52	20.5	3,315	22.8
560.00 to 1,119.99 acres	46	18.1	2,485	17.1
1,120.00 to 3,519.99 acres	61	24.0	3,675	25.3
3,520.00 acres and over	30	11.8	1,072	7.4
Total number of farms	252	100	14,543	100

Source: Statistics Canada. 2021. Table 32-10-0232-01 Farms classified by total farm area, Census of Agriculture, 2021.
RMs of the RAA include North Cypress-Langford.

There are seven registered centennial farms in the area within a 5-km buffer of the PDA but none are traversed by the project footprint (see Section 6.3.3).

9.3.3 Agricultural capability

Agricultural land capability is a function of climatic, topographic, and soil conditions for a given parcel of land. Agricultural capability classes provide insight into the ability of the soils to support cropping and describe the degree of limitation in use for cropping. Where specific limitations exist, subclasses are assigned and describe the type of limitation.

The agricultural capability classification system is a seven-class system, with Class 1 having no significant limitations in use for crops and Class 7 having no capability for arable culture or permanent pasture. The definitions of agricultural capability classes are given in Table 9-6.

Table 9-6: Agricultural capability classification

Agricultural Capability Class	Degree of Limitation
1	Soils in this class have no significant limitations in use for crops
2	Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices
3	Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices
4	Soils in this class have severe limitations that restrict the range of crops or require special conservation practices or both
5	Soils in this class have very severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible
6	Soils in this class are capable only of producing perennial forage crops, and improvement practices are not feasible
7	Soils in this class have no capability for arable culture or permanent pasture
O	Organic soils, which are not rated for agricultural capability

Source: Canada Land Inventory 1969

The agricultural capability classes within the RAA are predominantly (49%) considered prime agricultural land for the purposes of land use planning in Manitoba (Manitoba Agriculture 2008; Manitoba Government n.d.) including Class 1 (19%), Class 2 (20%) and Class 3 (10%) (Table 9-7). Class 1, 2 and 3 lands are considered to have no significant limitations, moderate, and moderately severe limitations for dryland crop production, respectively, and typically consist of grain, oilseed, specialty and row crop production. Approximately, 22% of land within the RAA is found in Class 4 (15%) and Class 5 (7%), which are generally considered marginal for annual crop production. Approximately, 23% of the RAA is rated as Class 6, which is generally considered only capable of producing perennial forage crops. However, it is likely that some of the sandy, Class 6 soils within the region are used for high-value, irrigated potato production. The distribution of agricultural capability classes across the RAA is shown on Map 9-2.

Within the LAA, 68% of the land is characterized as Class 1, 2 and 3 with Class 1 (43%) being the most common (Table 9-7). The PDA has similar characterization with 67% of the area within Class 1, 2 and 3 (Table 9-7). The main limitation to agricultural capability in the PDA is moisture limitation/droughtiness (subclass M, 44%) due to low water holding capacity in the coarse textured soils. Minor portions of the PDA are limited due to excess water (subclass W, 8%) and topography (subclass T, 8%).

Table 9-7: Agricultural capability in the RAA, LAA and PDA

Agricultural Capability	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
1	33,698	19.0	801	42.7	22.6	41.5
2	35,337	19.8	174	9.3	6.4	11.8
3	18,259	10.3	300	16.0	7.6	14.0
4	26,505	15.0	457	24.4	16.5	30.3
5	12,117	6.8	15	0.8	0.2	0.4
6	40,373	22.8	104	5.5	1.1	2.0
7	1,683	1.0	12	0.6	0.0	0.0
Organic	8,698	4.9	0	0.0	0.0	0.0
Urban, Modified or Unclassified[1] and Open Water[2]	528	0.3	0	0.0	0.0	0.0
Total[3]	177,101	100	1,875	100	54.4	100

[1] Urban, modified or unclassed lands are not assigned an agricultural capability class.

[2] Open water = surface water features such as rivers, lakes and smaller open water bodies.

[3] Values might not sum to totals shown because of rounding.

9.3.4 Soil compaction risk

Soil compaction can result in degradation of soil capability and productivity. Compaction can reduce the rate of infiltration of water into the soil, soil water holding capacity, soil air movement, seedling emergence, crop growth and crop yield. Soil compaction by be caused by vehicle and heavy equipment traffic.

Soils have degrees of risk of soil compaction which vary based on factors including soil texture and moisture status. A generalized compaction risk rating system was developed using professional judgment and review of two compaction systems that had been designed for forestry applications; specifically, the Soil Compaction and Puddling Hazard Key (British Columbia Ministry of Forests 1999) and the table of Compaction and Rutting Hazard for Soils in Ontario (Archibald *et al.* 1997).

The compaction risk rating matrix based on the combination soil texture and drainage properties is provided in Table 9-8. Resultant compaction risk ratings within the RAA, LAA and PDA are presented in Table 9-9.

The analysis is mostly pertinent to the PDA as this is the area subject to disturbance through project activities. Within the PDA, just over half of the soils are rated as having a low compaction risk, owing to the relatively coarse soil textures. Approximately 40% of the PDA and 6% of the PDA are rated as Moderate to High due to finer textured soils and imperfect to poor to very poor drainage.

Compaction risk ratings are presented in Map 9-3.

Table 9-8: Compaction risk matrix

Drainage	Textural Class					
	Very Coarse (S, LS, LFS)	Moderately Coarse (SL, FSL)	Medium (VFSL, L, SiL)	Moderately Fine (SCL, CL, SiCL, Si)	Fine/Very Fine (SC, SiC, C, HC)	Organic
Rapid	Low	Low	-	-	-	-
Well	Low	Low	Low	Moderate	Moderate	-
Imperfect	Low	Low	Moderate	High	High	-
Poor	Moderate	Moderate	High	High	High	-
Very Poor	-	-	-	-	-	High

NOTES:
S = sand LS = loamy sand LFS = loamy fine sand
SL = sandy loamy FSL = fine sandy loam VFSL = very fine sandy loam
L = loam SiL = silt loam SCL = sandy clay loam
CL = clay loam SiCL = silty clay loam Si = silt
SC = sandy clay SiC = silty clay C = clay
HC = heavy clay
Source: Matrix developed using professional judgment and review of two compaction systems (Archibald *et al.* 1997; British Columbia Ministry of Forests 1999)

Table 9-9: Compaction risk in the RAA, LAA and PDA

Compaction risk	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
Low	82,280	46.5	139	7.4	28.8	52.9
Moderate	63,832	36.0	1,469	78.3	21.9	40.3
High	23,642	13.3	110	5.9	3.5	6.4
Unclassified	7,144	4.0	145	7.7	0.1	0.2
Open water	203	0.1	12	0.6	N/A	N/A
Total[3]	177,101	100	1,875	100	54.4	100

NOTES:
1 Developed lands (disturbed, urban, etc.) are not assigned an agricultural capability class.
2 Open water = surface water features such as rivers and lakes.
3 Values might not sum to totals shown because of rounding.

9.3.5 Agricultural cropping

Agricultural cropping within the RAA is dominated by cereal, oilseed, and row crop production. The following breakdown of cropping within the RAA is from spatial distribution of crop type data for 2023 based on Agriculture and Agri-Food Canada's annual crop inventory (Government of Canada 2024) (Table 9-10):

- Cereal/oilseed cropland covers 36% of the area under agriculture
- Row cropland covers 14% of the area under agriculture
- Natural hayland (grassland) covers 17% of the area under agriculture
- Seeded hayland (pasture and forages) covers 1% of the area under agriculture

Within the LAA, cropping agriculture is even more dominant (Table 9-10):

- Cereal/oilseed cropland covers 50% of the area under agriculture
- Row cropland covers 24% of the area under agriculture
- Natural hayland covers 10% of the area under agriculture

The relatively high portion of the agricultural area being used for annual crops (row crops, cereals, and oilseeds) reflects the high agricultural capability in the LAA.

Within the PDA, cereal/oilseed cropland is predominantly under canola and spring wheat production, while row cropland is predominantly soybeans, corn and potato (Figure 9-1).

Table 9-10: Crop Types Grown (2023) in the RAA, LAA and PDA

Crop Type	RAA		LAA		PDA	
	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)	Extent (ha)	Proportional Extent (%)
Row Crops[1]	24,743	14.0	453	24.2	14.8	27.2
Cereal/ Oilseed Crops[2]	63,777	36.0	938	50.0	25.8	47.4
Other Crop Types[3]	2,066	1.2	0	0.0	0.0	0.0
Seeded Hayland[4]	1,903	1.1	20	1.1	0.5	0.9
Natural Hayland[5]	29,833	16.8	186	9.9	7.2	13.2
Non-agricultural	48,217	27.2	255	13.6	6.0	11.0
Water	6,563	3.7	23	1.2	0.0	0.0
Totals	17,101	100	1,875	100	54.4	100.0

NOTES:
1 Row crop – includes corn, potatoes, soybeans, sunflower
2 Cereal/oilseeds – include cereals, canola, flaxseed, peas, fallow buckwheat, canary seed, millet
3 Other crop types – include beans, hemp, lentils, mustard, safflower and vegetables, and are included in this category due to low reported acreages
4 Seeded hayland – includes forage crops and greenfeed
5 Natural hayland – includes grasslands

Source: Government of Canada. 2024. Annual Crop Inventory. Agriculture Canada. Accessed July 2024 at: https://open.canada.ca/data/en/dataset/ba2645d5-4458-414d-b196-6303ac06c1c9

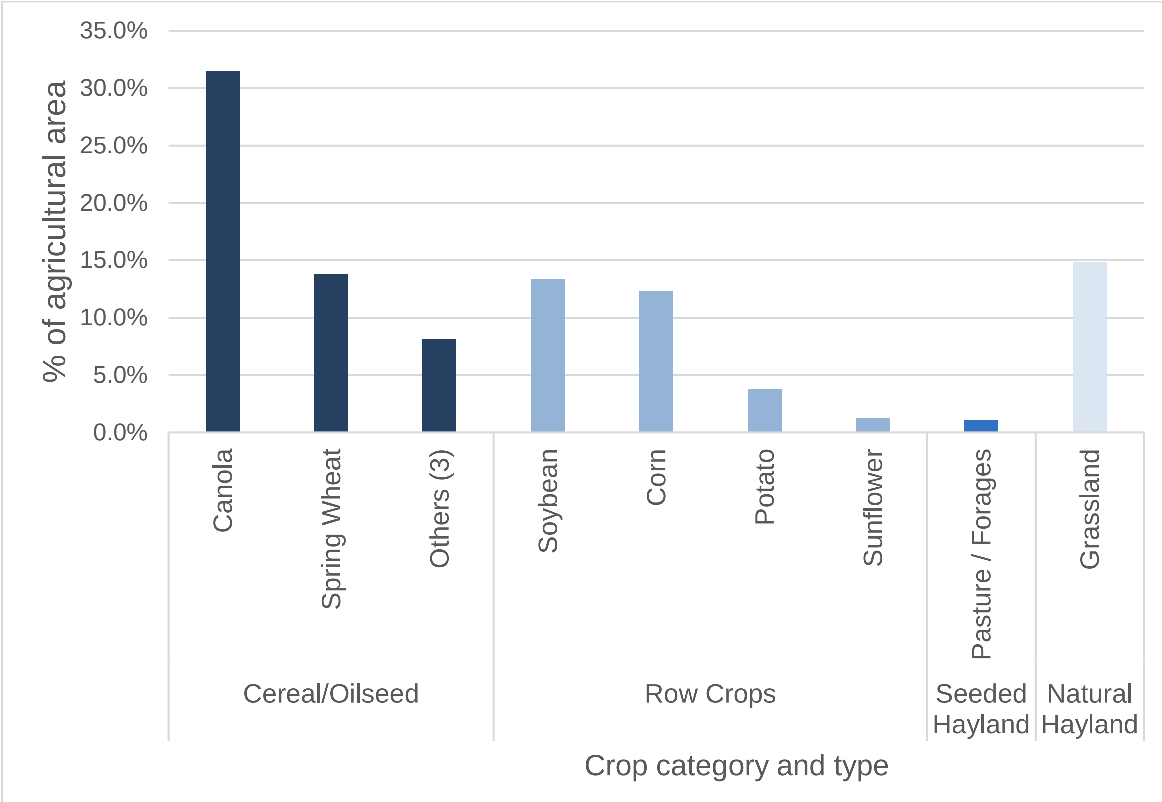


Figure 9-1 Crop types within the PDA (Source: modified from Government of Canada 2024.)

9.3.5.1 Irrigation

The project traverses a potato-producing region of Manitoba where some of the agricultural production is dependent on irrigation. There was active irrigation (*i.e.*, irrigation unit in place) observed in three quarter section within the LAA (*i.e.*, NE-21-13-15W1, SE-21-13-15W1, NE-28-12-15W1) and irrigation unit supply points were observed in other fields within the LAA (*i.e.*, SE-16-13-15W1, SE-33-12-15W1, NE-21-12-15W1, SE-21-12-15W1) during the August 2025 windshield survey. Irrigation systems in the project LAA consist of overhead pivot irrigation units with underground pipelines and electrical service. The location of underground pipelines and electrical service were not inventoried as part of this assessment.

9.3.5.2 Drainage

Surface drainage is fairly-well developed naturally in the variable topography in the region of the project. While surface drainage improvements have been made in the project area, it is not generally a prominent practice due to the relatively coarse textured soils with generally good internal drainage.

Tile drainage has emerged in recent years as a prominent practice in southern Manitoba as a means for producers to manage excess water for annual crop production. Tile drainage consists of perforated plastic pipes buried below the crop rooting zone, typically at 0.9 to 1.2 m (3 to 4 ft) below ground surface and oriented in parallel lines with a typical spacing of 15 m (50 ft) between each drain line. These pipes convey excess water to the field edge, typically into a ditch.

Tile drainage was not visually confirmed during the windshield survey.

The installation of tile drainage following the project would still be an option. However, the presence of the project, and other buried utilities within fields traversed by the project, may influence tile drainage system design (*e.g.*, tile depth, layout) and would require a safety watch during installation.

9.3.5.3 Cropland biosecurity

Cropland biosecurity refers to the management practices that can help minimize and/or control the introduction, transfer, or multiplication of pests in crops. Crop pests such as weeds, insects, diseases, and nematodes, can do irreversible damage to cropland productivity and can cause economic harm to crop producers' operations.

Diseases of concern for prominent crops in the project area include clubroot and verticillium wilt, both of which impact canola, and soybean cyst nematode. These are considered soil-borne pathogens, so biosecurity practices which minimize, control, or prevent soil movement to and from other regions and the project area, and between fields affected by the project, can help mitigate the spread of these diseases related to project activities.

The disease of primary concern for field crops within the RAA is clubroot, which affects canola and is caused by *Plasmodiophora brassicae,* a soil-borne pathogen (Manitoba Agriculture 2024[d]). Resting spore numbers will decline over time when non-host crops are grown, but some of the spores can survive in the soil for up to 20 years. Clubroot was confirmed at very low levels in soil samples in Manitoba in 2011 and 2012, and the pathogen has been detected in more fields including symptomatic plants since then (Canola Council of Canada 2024).

Currently, there are no economic control measures that can remove the disease from a canola field once it has been infested. However, it is possible to curtail the spread and reduce the incidence and severity of infection (Canola Council of Canada 2024).

The RM of North Cypress-Langford have reported *Plasmodiophora brassicae* spores per gram of soil of >80,000 or reported symptoms of clubroot (*i.e.*, swollen tissues or galls on canola roots) from clubroot (Table 9-11; Figure 9-2; Manitoba Agriculture 2024[c]).

Table 9-11: Clubroot Distribution in the RAA

Rural Municipality	Spores per gram of Soil
North Cypress-Langford	>80,000 or symptoms observed

NOTES:
Clubroot symptoms are typically observed in canola growing in soil with >80,000 spores per gram of soil.
The tabulated data are based on soil and canola plant tissue analysis from 2009 to 2014.
SOURCE: Manitoba Agriculture. 2024. Clubroot Distribution in Manitoba, 2022. Accessed May 2024 at: https://www.gov.mb.ca/agriculture/crops/plant-diseases/clubroot-distribution-in-manitoba.html

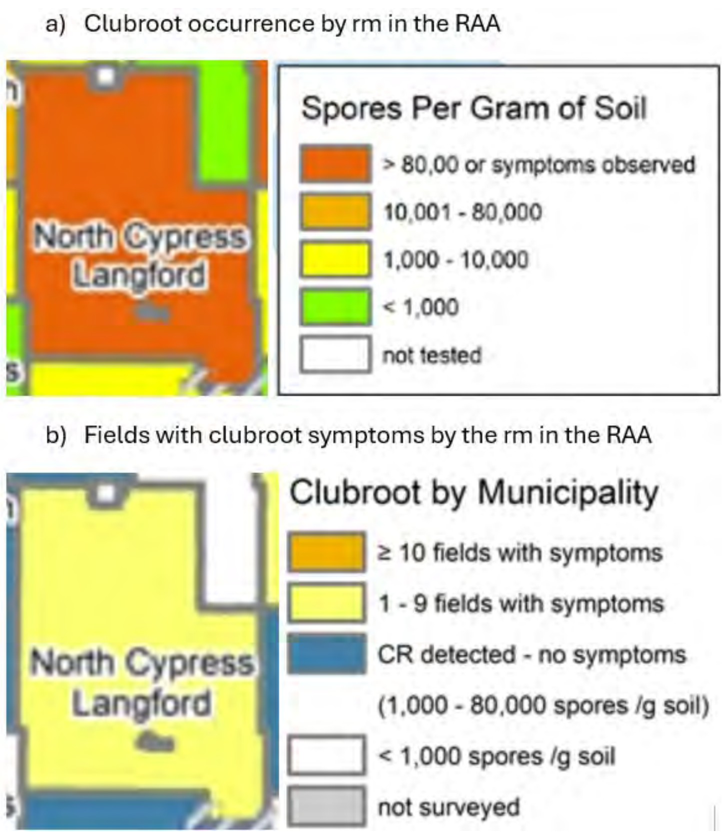


Figure 9-2: Clubroot occurrence within the RAA (modified from Manitoba Agriculture 2024[c])

In 2014, Verticillium wilt in canola caused by *Verticillium longisporum* was detected in Manitoba. This was the first case of this disease on an oilseed crop in North America

(Manitoba Agriculture 2024[d]). The complete host range of *Verticillium longisporum* is still unknown, but many other brassica crops like broccoli, cabbage, mustard, and cauliflower are also hosts (Manitoba Agriculture 2024[d]).).

Soybean cyst nematode (SCN) is a parasitic roundworm harmful to soybean crops. Preventative action, early detection and timely management are key to avoiding substantive yield loss from SCN (Manitoba Pulse & Soybean Growers 2021). The RM of North Cypress Langford had not been surveyed as of 2021 (Figure 9-3).

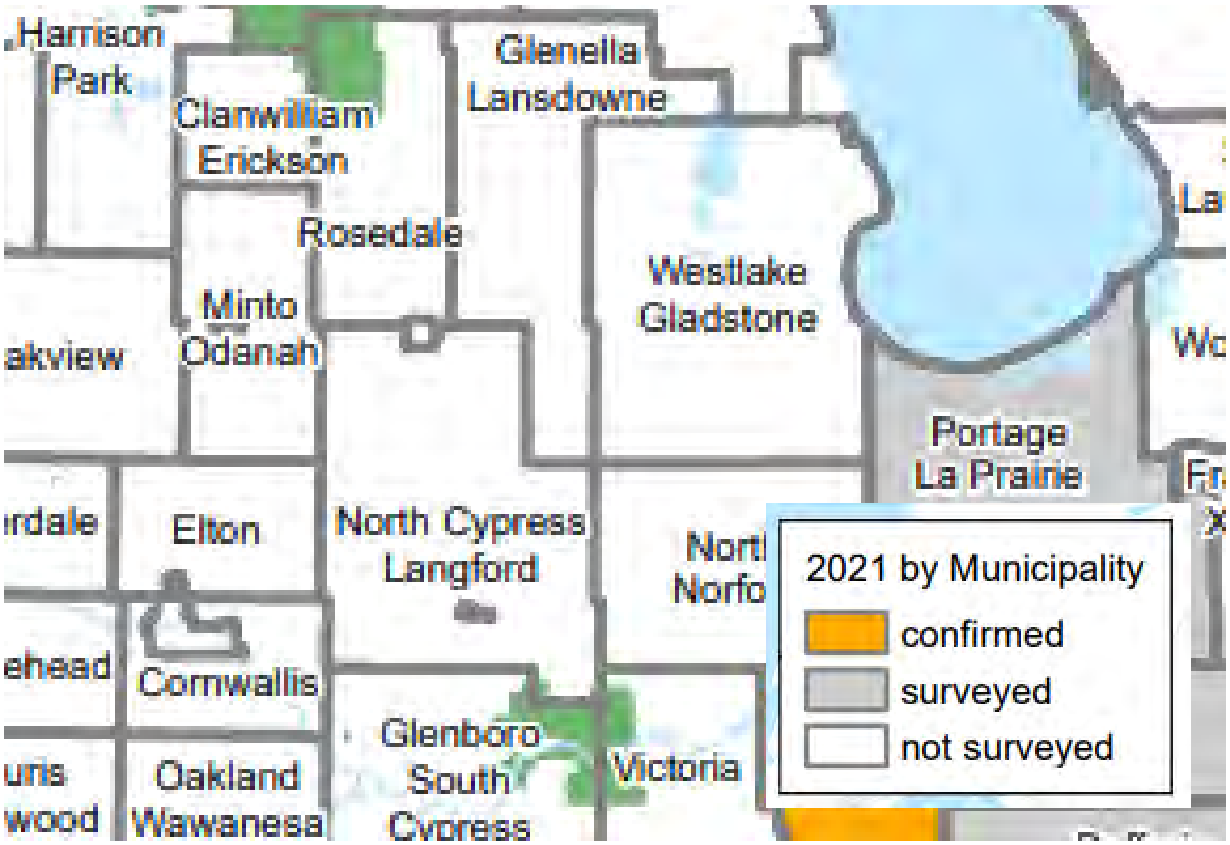


Figure 9-3 Soybean cyst nematode (modified from Manitoba Pulse & Soybean Growers 2021)

9.3.6 Livestock and other value-added operations

The windshield survey conducted in August 2025 and orthoimagery review confirmed the presence of livestock operations within the LAA, although livestock is considered a minor practice relative to cropping within the LAA.

Livestock related activities and other value-added agricultural operations within the LAA were confirmed through the windshield survey completed. Livestock and grain operations with an apparent active yard site being used for agricultural production activities within the LAA are summarized in Table 9-12. One active livestock operation was observed at NE-9-14-15-W1, with cattle and pens observed. An active market garden (The Lily Nook) was noted at SE-4-14-15-W1. A yard site with a few horses was noted at NE-33-13-15-W1. Pastures were noted at a few locations and conservation signage was note at two locations (Table 9-12).

Table 9-12: Livestock, grain and other value-added operations within the LAA

Legal Location	Type of Operation	Comment
NE-16-14-15-W1	Market garden (former)	Former The Lily Nook market garden
NE-9-14-15-W1	Beef	Livestock operation, lots of bales and pen areas, beef cattle in field
SE-4-14-15-W1	Market garden Beef	The Lily Nook market garden Pasture
NE-33-13-15-W1	Horses	Yard with a few horses
SE-33-13-15-W1	Beef, other	Pasture, conservation area sign
NE-28-13-15-W1	Mixed	Oats/pasture
SE-28-13-15-W1	Beef	Pasture
NE-21-13-15-W1	Other	Conservation area sign
NE-16-13-15-W1	Mixed	Oats/pasture

9.3.6.1 Livestock biosecurity

The introduction or spread of diseases can be very devastating for livestock operations. This is especially the case for livestock operations with large numbers of animals contained within common spaces (*e.g.*, cattle feedlots, dairy operations, intensive hog operations). Livestock disease can be spread via close contact with livestock, contaminated feed and through soil.

Anthrax is a disease that quickly kills cattle, sheep, and other grazing livestock (Canadian Food Inspection Agency 2024). It appears regularly in Manitoba, and it is important to vaccinate for the disease every year (Manitoba Agriculture 2024[e]).

Conditions such as flooding, drought and recent digging can bring anthrax spores into close contact with grazing animals (Manitoba Agriculture 2024[e]). Therefore, activities resulting in soil disturbance, such as soil stripping and excavation, have the potential to disturb anthrax spores. Anthrax is a concern specifically raised by raised by Manitoba Beef Producers through project engagement.

9.4 Project interactions with commercial agriculture

Table 9-13 identifies, for each potential effect, the physical activities that might interact with commercial agriculture and result in the identified effect.

Table 9-13: Project interactions with commercial agriculture

Project activities/components	Loss and/or degradation of agricultural land	Conflict with agricultural activities
Construction of pipeline and control points		
Mobilization and staff presence	–	–
Vehicle and equipment use	✓	✓
Access development	✓	✓
Temporary work areas, *e.g.*, marshalling yards)	✓	✓
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	✓	✓
Pipe stringing (including welding, coating)	–	✓
Pipe installation – trenching and lowering	–	✓
Horizontal directional drilling	–	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	–	✓
Backfilling and contouring	✓	✓
Control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	–	✓
Clean-up and reclamation	✓	✓
Operations and maintenance of pipeline and control points		
Presence of pipeline and control points	✓	–
Vehicle and equipment use	✓	✓
Maintenance activities	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	✓	✓
Valve operation checks (annually)	–	–
Vegetation management	–	–
Decommissioning of pipeline and control points		
Mobilization and staff presence	–	–
Vehicle and equipment use	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	✓	✓
Removal of above-ground components (dismantling, removal from site, disposal)	✓	✓
Rehabilitation	✓	✓
Clean-up and demobilization	✓	✓

9.5 Assessment of project effects

Although effects to commercial agriculture could occur during construction, operation, and decommissioning, they are anticipated to be most pronounced during construction primarily due to the potential for construction activities to prevent access for field operations (*i.e.*, temporary land loss) and the potential for construction equipment operations to cause damage to soils, crops and livestock.

No effects to commercial agriculture are anticipated to result from certain project activities including mobilization and staff presence (construction and operation phases), annual valve operation checks and vegetation management.

All other project activities have potential pathways of effect that may result in changes to commercial agriculture including the following potential effects as previously identified.

- Loss and/or degradation of agricultural land due to disturbance to land during construction, operation and decommissioning, and the presence of project structures through operation.
- Conflict with agricultural activities, which can take various forms including inconvenience and nuisance associated with carrying out farming operations, and increased biosecurity risk to cropping and livestock operations.

This section presents the assessment of residual project and cumulative effects for commercial agriculture. A sub-section covering the following topics is included for each of the potential effects on commercial agriculture:

- Analytical assessment techniques
- Effects pathways for construction, operations, and decommissioning phases
- Mitigation
- Characterization of residual effects

9.5.1 Loss and/or degradation of agricultural land

There are two types of land loss associated with the project:

- Temporary land loss is associated with the construction phase of the project. Temporary land loss refers to lands currently under agricultural production, which will not be available for production activities for all or a portion of a growing/production season during construction (*i.e.*, generally during May to October each year).
- Permanent land loss pertains to the operational phase of the project. Permanent land loss refers to lands currently under agricultural production which will no

longer be available for production activities following construction through to decommissioning of the project.

Degradation of land may include decreased land capability for agriculture and/or reduced soil productivity. Examples of when degradation may result in decreased land capability include loss of topsoil (*e.g.*, under-stripping, erosion loss, stockpile and handling mismanagement), mixing of topsoil with subsoil (*i.e.*, over-stripping) or mixing poor quality lower subsoil with better quality upper subsoil. Poor quality subsoils may consist of those with high concentrations of salts (*i.e.*, saline) or carbonates (*i.e.*, highly alkaline), highly contrasting textures (*e.g.*, clay underlying sand or sand underlying clay), high coarse fragment content (*e.g.*, gravelly, stony), or subsoils which are structureless and highly compacted. Reductions in soil productivity are generally characterised as shorter-term effects than decreased land capability and may include compaction from construction equipment or a change in nutrient or moisture status, typically due to dilution or change in soil texture due to admixing.

9.5.1.1 Analytical assessment techniques

The following analytical assessment techniques are used for temporary land loss, permanent land loss and degradation of agricultural land:

<u>Temporary land loss estimation</u>

Estimates for areas of temporary land loss during the construction phase assume that the entire portion of the PDA under agricultural land use will be unavailable for agricultural use and activities during the construction period.

<u>Permanent land loss estimation</u>

Permanent land loss refers to the area that will be occupied by project structures or permanently disturbed footprints (*e.g.,* control point footprints) and that will be unavailable for continued agricultural land use through the operation and maintenance phase of the project. Permanent land loss is estimated by determining the sum of the area occupied by above-ground project structures and permanently disturbed footprints, as provided in the project description (Chapter 2), which will not allow for existing agricultural production to continue.

<u>Degradation of agricultural land</u>

Analytical assessment techniques for degradation of agricultural land include the guidelines presented in Soil Capability Classification for Agriculture (Canada Land Inventory 1969) for determining agricultural capability class and utilizing Manitoba soil series names and correlations to establish agricultural (soil) capability ratings, and site-specific assessments following construction as/if required based on issues or concerns raised by producers.

9.5.1.2 Effects pathways

Construction

During construction of the pipeline and control points, activities such as vehicle and equipment use, access development, establishment of marshalling yards, right-of-way preparation, backfilling and contouring, and clean-up and reclamation activities can result in the loss and or degradation of agricultural land.

It is assumed that temporary loss of commercial agricultural land will affect the entire agricultural portion of the PDA for the duration of construction. Of the whole PDA area of 54 ha, 49 ha (approximately 90%) is under annual crop production (row crops and cereal/oilseed crops; Table 9-10). As shown in Table 9-7, most of the PDA, which will be temporarily unavailable to producers during construction, is considered prime agricultural land (*i.e.*, lands with Class 1, Class 2, and Class 3 agricultural capability).

Potential effects from construction activities that could result in the degradation of agricultural land would be primarily limited to the PDA and include soil compaction, rutting, admixing (mixing of topsoil with subsoil), and erosion. These effects can result in changes to land capability and soil productivity, and, in turn, decreased crop growth and reduced crop yields (Manitoba Agriculture, Food and Rural Initiatives 2008).

The potential for soil compaction is greatest in project areas consisting of imperfectly to poorly drained and moderately fine textured (*e.g.*, clay loam) soils and when soils are under high moisture conditions. Wheel use from heavy equipment on saturated soils increases the potential for compaction (Wolkowyski and Lowry, 2008). Soil that becomes exposed due construction activities can be susceptible to erosion by water and wind, leading to a change in soil thickness and crop productivity.

Alteration to existing natural or improved surface drainage could result if existing surface drains are temporarily impaired or blocked. In the event of alteration to local *(i.e.,* in-field) drainage paths, effect would be anticipated to land areas beyond the PDA and up to the extent of the LAA boundaries within an affected field.

Operation and maintenance

As most of the project will be underground with agricultural land being returned to agricultural land use following construction, the presence of project structures is anticipated to have a minimal effect on land loss. Easements will be required at the

South Control Point and North Control Point for above-grade valve structures. While actual structure assemblies will occupy very small areas, likely only 3 to 4 m^2, the assessment for potential agricultural land loss assumes the entire easement area around these control points will a permanent land loss. This is a conservative approach as some of the land within the easement area could still be available for agricultural use as the gravel surrounding the valve structures does not typically extend to the boundaries of the easement area. A typical installation is provided in Figure 9-4.

Figure 9-4 Typical above-ground control point showing limited area of gravel pad around the exposed facility

The project will result in approximately 0.20 ha (2,000 m^2) of agricultural land being lost at the control point at the south end of the pipeline in SE 21-12-15 W1 and approximately 0.60 ha (6,000 m^2) at the control point at the north end of the pipeline in SE 21-14-15 W1.

This land loss is considered permanent because the expanded structure footprint will exist through the operational life of the project and will be unavailable for agricultural use. The area of agricultural land lost due to aboveground structure presence comprises approximately 0.01% (0.80 ha) of the PDA.

There is also the potential for soil disturbance / degradation to occur during operations and maintenance, albeit to a lesser degree and extent than during the construction phase. Degradation may occur during vehicle and equipment use, maintenance activities and ground pipeline patrols.

Decommissioning

Decommissioning will be required at the end of the project life, which is anticipated to be at least 50 years in the future. Decommissioning is estimated to occur within a one-year period once the project has reached the end of its serviceable life. While full details of project decommissioning are not yet developed, it is anticipated that above-ground structures will be removed and land occupied by those structures is anticipated to be returned to pre-project land use. In other words, agricultural land considered to be a permanent land loss because of the project could be returned to agricultural land use following project decommissioning. It is anticipated that the buried pipeline will be left in place, and additional disturbance during decommissioning along the pipeline route, except for in areas of above-ground structures, will be negligible.

9.5.1.3 Mitigation for loss and/or degradation of agricultural land

Mitigation for permanent loss of agricultural land primarily involves compensation paid to producers for land permanently removed from agricultural use due to the presence of above-ground infrastructure. Manitoba Hydro's compensation policy (*i.e.*, the structure impact portion) takes into consideration agricultural land permanently removed from production for directly affected landowners.

Mitigation for temporary loss of agricultural land includes the following:

- Manitoba Hydro will pay compensation for damage to infrastructure/crops from construction or maintenance activities. Where possible, construction schedules will take into consideration the timing of agricultural activities.
- Compensation will be provided to landowners for:
  - damage to property, any relocation of incompatible agricultural buildings
  - temporary loss of agricultural land
- Areas of temporary soil disturbance on agricultural lands will be rehabilitated in accordance with the Rehabilitation and Invasive Species Management Plan. This

plan will be developed before construction and would be part of the overall Environmental Protection Program, as described in Chapter 16.0.
- Manitoba Hydro will contact directly affected landowners to discuss how to reduce effects on their agriculture activities.

Mitigation for degradation of agricultural land includes the following:

- A pre-construction soil survey will be undertaken along the pipeline route to facilitate development of project-specific topsoil stripping depth and soil handling recommendations.
- Effects of soil compaction and rutting will be mitigated by managing equipment traffic routes and activities for access development, temporary work area setup, right-of-way preparation, pipeline stringing and installation, and control point preparation. Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.
- The pipeline will be constructed in agricultural areas when soils are not saturated to limit compaction, rutting, and admixing. If this is not possible, other mitigation or rehabilitation measures will be conducted to reverse effects of compaction (*e.g.,* deep ripping or tillage)
- If working on saturated soils during non-frozen ground conditions, equipment and techniques that distribute ground pressure (*e.g.,* construction mats, geofabric and padding and corduroy) will be used to avoid compaction and admixing
- Manitoba Hydro will develop an erosion protection and sediment control framework to guide each contractor in preparing of erosion protection and sediment control plans. The objective of these will be to limit adverse environmental effects of sediment releases on the aquatic environment. These will be developed in accordance with provincial and federal legislation and guidelines, and corporate environment policies and guidelines.

9.5.1.4 Characterization of residual effects on loss and/or degradation of agricultural land

After mitigation, predicted residual effects on the loss and/or degradation of agricultural land include:

- Temporary land loss during the construction period in the amount of 49 ha (121 ac). However, compensation will be provided to offset the effects of this temporary land loss to agricultural producers.
- Permanent land loss through the operation and maintenance phase of the project is conservatively estimated at 0.80 ha (1.98 ac). However, compensation will be provided to offset the effects of this permanent land loss to agricultural producers.

With mitigation, the project is not anticipated to result in a loss in land capability. With topsoil stripping and other construction mitigations, land capability classes along the pipeline route are anticipated to return to pre-disturbance levels. However, reductions in crop yield within the PDA may persist into the operations and maintenance phase.

Following the implementation of mitigation measures described above, residual effects for loss and/or degradation of agricultural land are characterized as follows:

- Direction: Adverse to Neutral
- Magnitude: Low to Moderate
- Geographic extent: PDA
- Duration: Medium-term
- Frequency: Single event to Irregular
- Reversibility: Reversible

9.5.2 Conflict with agricultural activities

The project has the potential to result in conflict with agricultural activities during both construction and operation and decommissioning phases. During project engagement, landowners, representative producer/commodity organizations, and provincial staff provided comments and raised concerns on how the project could cause conflict with commercial agriculture operations.

Conflict with agricultural activities could occur due to:

- interference with or damage to agricultural infrastructure (*e.g.,* buildings, barns, grain bins, manure application and water-supply systems)
- interference with the use of field equipment including reduced ability to conduct operations within the right-of-way or over the pipeline (*e.g.,* crossing, deep tillage)
- disruption to livestock operations including interference with haying, calving, breeding, grazing and manure application activities
- increased biosecurity risk for crops and livestock including the spread of disease (crop and livestock) and noxious weeds
- increased management effort due to:
    - additional operational costs and inconveniences associated with increased management effort due to presence of project structures, including:
        - overlap of farm input applications (*e.g.,* seed, fertilizer, pesticides) in proximity to project structures resulting in inefficiencies and excess input usage
        - inefficiencies of field operations due to working around project structures resulting in excess fuel usage and equipment depreciation

- o changes in access routes to farm properties and to areas of agricultural activities (*e.g.*, rotational paddocks, watering facilities, wintering sites, cropping fields)

Most interactions between the project and commercial agriculture are similar between construction and operation and maintenance phases. However, the nature, degree and extent of interactions differ between the phases in some cases.

9.5.2.1 Analytical assessment techniques

The potential for conflict with agricultural activities applies to both project construction and operations. The employment of standardized analytical assessment techniques is a challenge for assessing the potential for conflict with agricultural activities due to the numerous potential pathways and specific operational conditions at an individual farm and field level. Therefore, the assessment of potential for conflict with agricultural activities is inherently more qualitative in nature.

9.5.2.2 Effects pathways

<u>Construction</u>

During construction, any project activities that involve workers, equipment, or materials within agricultural fields could interfere with agricultural operations and activities. For example, project activities such as vehicle and equipment use, access development and right-of-way preparation, and the presence of marshalling yards or other temporary obstructions, within fields that are in use for agricultural production, have the potential to disrupt or interfere with commercial agriculture activities. Such disruption or interference might result in inconvenience, increased time and increased monetary costs to farming.

The degree and extent of construction interactions will depend highly on timing of construction, with less interaction resulting if work occurs outside of the growing season (typically May through October), particularly if construction takes place during the winter, than would result during the growing season. Construction activities may be a concern in terms of biosecurity of crop and livestock operations, and may result in interference with, or damage to, infrastructure.

<u>Interference with or damage to agricultural infrastructure</u>

Right-of-way preparation, including clearing for the project, has the potential to affect agricultural buildings and structures (*e.g.,* grain bins, fencing, storage sheds, barns, and livestock corrals). However, no agricultural buildings are located within the PDA.

In fields with irrigation systems and associated infrastructure (*e.g.,* buried pipelines, buried electrical service lines) in place, specific construction mitigation plans are required to avoid damage to infrastructure and provide assurance that systems will remain functional following construction of the project.

Locations of tile drainage systems were not identified during the windshield survey or the engagement program. If fields are identified as having tile drainage installed, plans for project construction and maintenance activities would consider maintenance of functional operation of tile drains. This may include locating, cutting and capping tile lines at the construction trench during construction and reconnection of tile drain lines following construction. Alternate approaches may be suitable.

<u>Interference with the use of field equipment</u>

Construction activities, if being undertaken during the growing season (*i.e.*, typically May through October), have the potential to interfere with the use of field equipment including reduced ability to conduct field operations within the right-of-way during the construction phase. Numerous field operations are completed throughout the growing season in the undertaking of crop production within the LAA. This includes seedbed preparation, fertilization, seeding/planting, pesticide application, harvesting and tillage.

<u>Disruption to livestock operations</u>

Construction activities might also interfere with livestock operations within the LAA. While livestock production is not a prominent practice in the LAA, the PDA traverses through and near lands that are potentially used for livestock grazing, manure application, and hay production. Such livestock related activities can be disturbed by the establishment of the right-of-way and any construction activities taking place within the agricultural portions of the PDA and coinciding with agricultural operations. While not anticipated based on the available information about existing agricultural land use within the LAA, temporary infrastructure associated with livestock production (*e.g.*, watering stations) may be present within the PDA. If construction activities are determined to potentially interfere with temporary infrastructure associated with livestock production, this infrastructure may have to be re-located.

<u>Increased biosecurity risk</u>

During project engagement, a producer representative organization (Manitoba Beef Producers) and Manitoba Agriculture raised concerns regarding how the proposed pipeline may affect biosecurity risk for commercial agricultural lands in the project area. Concerns raised were primarily related to the transfer of noxious weeds and spread of disease (*i.e.,* soil-borne pathogens).

Soil transport is an important mechanism for the spread of weeds and soil-borne diseases from one field or region to another. There is potential for soil to be transferred from field to field or from another region to the project site during construction through the use of vehicles and equipment, and through project crews moving between fields. Increased biosecurity risk would be more pronounced during construction than operations.

The introduction of pests to previously non-affected agricultural lands can have lasting reductions in crop yields and increased input and management costs.

Operation and maintenance

Effects associated with the operation and maintenance phase of the project are related to vehicle and equipment use, maintenance activities and ground patrols. These activities can primarily cause nuisance and inconvenience, but may also result in increased production costs, if timing overlaps with production operations and activities. In addition, there will be increased risk to biosecurity primarily due to vehicles and equipment traversing fields.

Interference with agricultural operations and activities

Farmers will face challenges related to nuisance and inconvenience if the timing of operation and maintenance activities overlaps the growing season (*i.e.,* typically May to October). The presence of vehicles and equipment and project staff working within agricultural portions of the PDA at the same time as agricultural operations being undertaken may prevent portions of the field from being accessed. This interference could require additional visits to the field by the producer, which could also incur additional costs to the producer. In addition, there are risks inherent in completing field operations while other machinery and workers are in the field.

While the presence of new above-ground infrastructure is limited, these above-ground structures in cropping fields may create extra management effort for producers to work around structures. In addition, there are risks inherent with operating farm machinery in proximity to the structures. It is the responsibility of farmers and operators to avoid structures while operating wide equipment and working around structures requires more attention.

Regarding the potential for future sub-surface or tile drainage improvements, there is potential for conflict with the proposed gas pipeline. The proposed pipe trench depth is approximately 1.3 meters, with 1 meter depth of cover above the pipe. The typical depth of tile drainage lateral pipes (*i.e.,* those installed throughout the field that convey excess soil water) is 0.9 to 1.2 m. Therefore, the depth of the gas pipeline and the likely depth of potential, future tile drainage pipes are in conflict. The installation of tile drains following the project would still be an option to producers. However, the presence of the project may influence tile drainage system design.

Tile drainage design would have to consider the buried gas pipeline and the optimal tile depth and a layout that may have been appropriate in absence of the pipeline may have to be altered to accommodate the gas pipeline. For example, the depth of tile drainage lateral pipes and associated header pipes (*i.e.,* collector pipes at the end of lateral pipe runs and typically at the edge of the field) may need to be adjusted to shallower or deeper depths to avoid the gas pipeline. The drainage tile depth would have to adhere to a minimum clearance or separation distance from the gas pipeline – this clearance or separation distance would have to be confirmed with Manitoba Hydro prior to installation of the tile drainage system. Similarly, the optimal tile drainage layout may need to be altered to avoid the gas pipeline if the tile drainage design cannot feasibly or reasonably accommodate the presence of a gas pipeline. Alterations to tile drainage layouts may require additional header pipes. Finally, if the presence of the gas pipeline necessitates a deeper tile drainage pipe depth, the increased depth may require the addition of a pump station to the drainage system. A combination of change in layout, drainage pipe depth and a pump station may be required. These changes may increase the cost of the tile drainage system. In addition to changes in drainage system design, the presence of the gas pipeline would require a safety watch during installation.

<u>Increased biosecurity risk</u>

During the operation and maintenance phase of the project, there will be potential for soil to be transferred from field to field when maintenance vehicles and people are moving between fields. Through these situations, pests could be introduced and spread in previously non-affected areas.

The introduction and spread of pests would largely be of concern during spring, summer, and fall, which are associated with the growing season and cropping activities. However, because routine pipeline maintenance in agricultural areas is typically completed during winter periods and under frozen soil conditions the potential for compromised biosecurity will be reduced.

The growth of weeds around structures is a concern to agricultural producers. Weeds may grow around structure perimeters that are not accessible for weed control by producers, allowing weed seeds to disperse into adjacent field areas and create a nuisance for producers.

For livestock operations, especially on pasture/grazing lands, there is potential for the introduction of disease during operation and maintenance activities. Pests and diseases have lasting adverse production value (reductions in yield and livestock health) and production cost (increased input and management costs) effects. Disease transfer may occur through disturbance and/or movement of soil or close contact with animals. However, the likelihood of the former is low due to the dominance of annual cropping in the LAA. The potential for biosecurity risk to livestock would be greater where pipeline maintenance activities intersect areas of multiple operations with different livestock types. Again, this scenario has a low likelihood as there is a lack of intensity and diversity in livestock production within the LAA.

Decommissioning

Decommissioning will be required at the end of the project life, which is anticipated to be at least 50 years in the future. Decommissioning is estimated to occur within a one-year period once the project has reached the end of its serviceable life. While full details of project decommissioning are not yet developed, it is anticipated that above-ground structures will be removed and that the buried pipeline will be left in place. Any decommissioning activity that overlaps with the crop growing season (i.e., typically May to October) has the potential to interfere or cause conflict with agricultural activities. Scheduling decommissioning activities occurring in areas beyond the aboveground structures outside of the growing season would be preferable to reduce the potential for conflict with agricultural activities.

9.5.2.3 Mitigation for conflict with agricultural activities

Mitigation for conflict/interference with agricultural activities includes the following:

- Prior to construction, if producers indicate a specific activity or practice that will be affected by the project, Manitoba Hydro will make reasonable efforts to implement specific mitigation, where possible, to reduce local effects.
- Where conflict and/or interference can't be avoided including where timing of project activities overlaps with producer activities during the growing season, Manitoba Hydro will pay compensation pursuant to the Landowner Compensation Program, as detailed below.
- Construction damage compensation is offered to landowners who experience damage to their property due to the construction, operation and maintenance of the pipeline. It will be provided to compensate a landowner for damages such as the reapplication or rejuvenation of compacted topsoil where the remedial work requires farm machinery and the expertise of the landowner.

    - This will include damage to existing irrigation or drainage infrastructure, in the event this occurs.
- Structure Impact Compensation is a one-time payment to landowners for each structure placed on land classed as agricultural. Structure Impact Compensation will cover:
    - reduced productivity in an area of overlap around each structure.
    - additional time required to maneuver farm machinery around each structure.
    - double application of seed, fertilizer and weed control in the area of overlap around each structure.
- Ancillary damage compensation is a one-time payment when Manitoba Hydro's use of the right-of-way directly or indirectly affects the use of the property. It will be provided for:
    - constraint effects such as restricted access to adjacent lands.
    - traditional effects such as highest and best use of land.

Mitigation for increased biosecurity risk includes the following:

- Manitoba Hydro staff and contractors will be trained on Manitoba Hydro's corporate policy on biosecurity (Manitoba Hydro 2023a) and agricultural biosecurity SOP (Manitoba Hydro 2023b) and will follow this SOP during construction and operation and maintenance activities. Measures to be implemented in line with general considerations of the agricultural biosecurity SOP include:
    - completion of a risk assessment to identify the perceived risk to agricultural land from maintenance and construction activities using frequency of activities and consequence levels (field conditions such as wet or frozen)
    - if existing farm level biosecurity measures exist, Manitoba Hydro staff and contractors will strive to meet the requirements of the agricultural operation when access is required
    - regular operation and maintenance activities (including patrols) on agricultural lands will typically be scheduled after crops have been harvested and conducted primarily after freeze-up
    - avoiding access through areas that may contain manure.
- Per the agricultural biosecurity SOP (Manitoba Hydro 2023b), Manitoba Hydro staff and contractors will complete the following requirements (detailed, scenario-based procedures will be followed by staff and contractors, as presented in the agricultural biosecurity SOP):
    - While working in livestock settings (*i.e.*, a property or portion of a property where livestock are kept):

        - Visually inspect, clean, and disinfect tools and footwear before entering and leaving fields or identified controlled access zones (*e.g.*, a zone defined by a livestock producer to control entry onto their property).
        - Visually inspect and mechanically clean vehicles, if vehicles used in fields or identified controlled access zones. Pressure washing vehicles may be necessary if heavily soiled.
        - Record all actions and procedures followed.
        - Boot covers may be required in livestock settings in certain instances.
    - While working in crop settings (*i.e.*, a property or portion of a property where crops such as corn, wheat or canola are grown):
        - Vehicles, equipment, tools and footwear should enter and exit fields in a clean condition.
        - Mechanically clean vehicles, equipment, tools and footwear.
        - If mechanical cleaning is not sufficient, one or both of the following is required: 1) disinfection of vehicles, equipment, footwear and tools for footwear is required, 2) washing (pressure or mobile) at the field approach or off site.
        - Record all actions and procedures followed.
- In addition, Manitoba Hydro will:
    - Discuss with landowners and/or producers, ways to minimize effects to agricultural operations where construction or maintenance activities have the potential to interfere with field activities.
    - Ask producers or landowners to avoid spreading manure or pasturing livestock, if applicable, in the pipeline right-of-way prior to construction.
    - Require all equipment to arrive at the right-of-way or project site clean and free of soil or vegetative debris (including weed seeds).

9.5.2.4 Characterization of residual effects on conflict with agricultural activities

Following the application of mitigation, while the potential for conflict with agricultural activities remains, the magnitude of these effects and the extent over which they are experienced will be reduced. Manitoba Hydro understands that even though overall project effects will affect a small proportion of the RAA, local effects (*i.e.*, field scale) can have a meaningful effect on individual operations. Communications with landowners prior to land access for project activities may result in additional site-specific mitigation, further reducing potential for conflict with agricultural activities. Compensation will be provided to address the residual potential conflict with agricultural activities and damages that may be caused by project activities.

With mitigation, the magnitude of the residual effects related to conflict with agricultural activities is anticipated to be low, with the exception of residual effects on future potential tile drainage installations, and the extent over which they will be experienced is anticipated to be limited to the LAA. Residual project effects on future tile drainage installations could be characterized as having a moderate magnitude, as the project may influence the design and layout of tile drainage systems at the field management unit level.

Residual effects due to conflicts with agricultural activities will be highly sensitive to timing for those conflicts that are associated with crop growing season activities (*e.g.*, tillage, harvesting).

Following the implementation of mitigation measures described above, residual effects for conflict with agricultural activities are characterized as follows:

- Direction: Adverse
- Magnitude: Low to Moderate
- Geographic extent: LAA
- Duration: Short-term
- Frequency: Single event to Irregular
- Reversibility: Reversible

9.5.3 Summary of residual effects characterizations

Table 9-14 characterizes the residual effects on commercial agriculture.

Table 9-14: Project residual effects on commercial agriculture

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Loss and/or degradation of agricultural land						
Construction	Adverse	Low-Moderate	PDA	Medium-term	Single event	Reversible
Operation	Adverse	Low	PDA	Medium-term	Irregular	Reversible
Decommissioning	Adverse / Neutral	Low	PDA	Medium-term	Single event	Reversible

Conflict with agricultural activities						
Construction	Adverse	Low	LAA	Short-term	Single event	Reversible
Operation	Adverse	Low-Moderate	LAA	Short-term	Irregular	Reversible
Decommissioning	Adverse	Low	LAA	Short-term	Single event	Reversible

9.5.4 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the commercial agriculture, and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

Adverse residual effects from the project on commercial agriculture are anticipated to be of low to moderate magnitude and reversible on project decommissioning. There is the potential for residual effects from the project to act cumulatively with residual effects of other past, present, or reasonably foreseeable future physical activities. As both of the above-stated conditions are met a cumulative effects assessment for commercial agriculture was completed and is presented below.

9.5.4.1 Project residual effects likely to interact cumulatively

Table 9-15 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project to impact commercial agriculture.

Table 9-15: Potential cumulative effects on commercial agriculture

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects	
	Loss and/or degradation of agricultural land	Conflict with agricultural activities
Existing/ongoing projects and activities		
Domestic resource use (*e.g.*, hunting, trapping, fishing, non-commercial agriculture)	–	–
Recreational activities (*e.g.*, canoeing, snowmobiling, hiking)	–	–
Industrial and commercial resource use, including commercial agriculture	✓	–
Existing infrastructure (non-Manitoba Hydro) such as roads, railways, telecommunication lines, pipelines, water and wastewater treatment facilities	✓	✓
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	✓	✓
Residential and institutional developments	✓	–
Potential future projects and activities		
Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony	–	–
Residential and institutional developments	–	–

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.
– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

9.5.4.2 Cumulative effect on loss and/or degradation of agricultural land

9.5.4.2.1 Pathways for cumulative effect

Past and present projects that were identified as having potential cumulative effects on commercial agriculture with the effects of this project include developments which have contributed to agricultural land loss throughout the RAA. These are primarily residential developments, non-Manitoba Hydro infrastructure such as roads, railways, water and wastewater facilities, and industrial and commercial resource use. These types of projects generally have a permanent land use change across the entire footprint of the project. If land use under these projects was commercial agriculture prior to development, these footprint areas constitute a permanent loss of land for commercial agriculture.

Other infrastructure projects including Manitoba Hydro hydroelectric transmission and natural gas projects, other pipelines, telecommunication lines generally have relatively small areas of permanent land loss, as most areas disturbed by these projects are returned to prior land use following project development, including to commercial agriculture (see Table 9-15).

An aspect for consideration with respect to cumulative effects to commercial agriculture is at least some of the existing/ongoing projects and activities have been developed to support the commercial agriculture sector in the RAA. For example, some of the existing development used at least partially to support commercial agriculture are the municipal roads, provincial roads and highways, and rail lines. In other words, much of the built-up area within the RAA was necessary to support the development of commercial agriculture itself.

9.5.4.2.2 Mitigation measures

The implementation of mitigation measures described in Section 9.4.1.3 will reduce the effects on agriculture from the project and the project's contribution to cumulative effects on agriculture.

Additional mitigation measures proposed to reduce the cumulative environmental effects on loss or degradation of agricultural land include the following:

- Manitoba Hydro will continue to work with agricultural producers affected by the project and representative producer/commodity organizations to determine site and operation-specific mitigation to lessen the potential for cumulative effects to commercial agriculture.

9.5.4.2.3 Residual cumulative effect

A portion of land capable of supporting commercial agriculture in the RAA has already been disturbed due to previously constructed and operational projects. This includes numerous linear projects, such as the TransCanada Highway 1, Yellowhead Highway 16, Provincial Trunk Highway 5 and Provincial Road 353, Canadian Pacific Railway, Canadian National Railway, and other non-linear infrastructure. However, these existing projects have not substantially reduced the land available for commercial agriculture, which is the dominant land use in the RAA.

With the addition of the proposed project's effects and those of other projects, cumulative effects on loss of agricultural land are anticipated to be low in magnitude. The project will result in minimal land loss that is considered permanent, and this land loss will be reversible upon the decommissioning of the project at some future date. The project's contribution to land loss will be small relative to losses from past projects and is not expected to measurably affect the capacity for commercial agriculture in the RAA.

Similarly, while the project will contribute to degradation of land capability for agriculture, these effects will be small relative to degradation from past projects, and these effects are anticipated to be reversible and not to persist over the long-term. With the addition of the proposed project's effects and those of other projects, cumulative effects on degradation of land are anticipated to be low in magnitude.

The combined cumulative environmental effect on loss and/or degradation of land will be measurable but is not anticipated to result in an impairment to the capacity of agriculture in the RAA and agriculture is anticipated to continue at or near pre-disturbance levels.

9.5.4.3 Cumulative conflict with agricultural activities

9.5.4.4 Pathways for cumulative effect

Past and present projects that were identified as having potential cumulative effects with the effects of this project on commercial agriculture are primarily existing infrastructure projects including Manitoba Hydro hydroelectric and natural gas infrastructure, and other infrastructure such as telecommunications and pipelines (see Table 9-15). These developments have contributed to conflict with agricultural activities throughout the RAA, due to the presence of above-ground infrastructure and facilities.

9.5.4.5 Mitigation measures

The implementation of mitigation measures described in Section 9.4.2.3 will reduce the effects on agriculture from the project and the project's contribution to cumulative effects on commercial agriculture.

Additional mitigation measures proposed to reduce the cumulative environmental effects on conflict with agricultural activities include the following:

- Manitoba Hydro will continue to work with agricultural producers affected by the project and representative producer/commodity organizations to determine site and operation-specific mitigation to lessen the potential for cumulative effects to commercial agriculture.
- Manitoba Hydro will continue to support studies to understand the effects of its projects on commercial agricultural land use and use study outcomes to reduce effects of existing and future projects on conflict with agricultural activities.

9.5.4.6 Residual cumulative effect

With the addition of project effects and those of other projects, cumulative effects on conflict with agricultural activities will be moderate in magnitude and will not result in an impairment of the capacity of agriculture in the RAA. Agricultural production within the RAA is anticipated to continue at near pre-disturbance levels.

It is anticipated that much of the project's contribution to this cumulative effect will be short term in nature (*i.e.*, during construction and operation and maintenance activities which overlap with agricultural field operations), and reversible upon the decommissioning of the project at some future date. Agriculture is considered to have a moderate capacity to accommodate or recover from changes anticipated from the cumulative effects of past and current projects. While these projects will act cumulatively and increase the level of conflict with agricultural activities, agricultural production is anticipated to return and continue near pre-disturbance levels. The project's contribution to cumulative environmental effects is not expected to measurably affect the capacity for commercial agriculture within the RAA.

Within the LAA and at the individual field scale, the project's presence will affect but generally not preclude the potential for future sub-surface or tile drainage improvements, an effect that will act cumulatively with other existing buried facilities. This cumulative effect may be most impactful in fields where the proposed project parallels existing gas pipelines or in fields where existing pipelines cross. This cumulative effect is anticipated to increase the tile drainage design (depth and layout) complexity and may result in increased tile drainage system costs to producers. Specific design elements which may be influenced by consideration of existing pipelines are discussed in Section 9.4.2.2.

While this cumulative effect is not anticipated to impair the capacity of commercial agriculture at the scale of the RAA, the effect to an individual producer at the scale of an agricultural field management unit (*i.e.*, quarter section field) would be measurable and meaningful.

9.5.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on commercial agriculture are predicted to be not significant. Adverse residual effects are expected to be low to moderate (for the potential degradation of land capability for agriculture within the PDA) in magnitude, are reversible and are not anticipated to persist beyond the medium term (*i.e.*, 3 years post-construction).

9.5.6 Prediction confidence

Prediction confidence in the assessment of effects on commercial agriculture is moderate to high.

The prediction confidence is based on the information compiled during desktop-based data compilation, data analyses, understanding project activities, location, and schedule, as well as information gathered from project engagement. A windshield survey was conducted to provide additional information on agricultural land use and buildings within the LAA. While some of the available desktop data are limited in scale (*e.g.*, reliability (*e.g.*, AAFC crop inventory data are based on remote sensing and are not field validated), and completeness (*e.g.*, agricultural operation type and location information was not provided by most industry association groups), the environmental effects mechanisms are well understood.

The mitigation measures identified in Section 9.5.1.3 and Section 9.5.2.3 are standard practice and have been implemented on previously completed transmission projects. Finally, the significance conclusion is based upon a well-founded understanding of commercial agriculture context within the project RAA.

The prediction confidence with respect to cumulative effects is moderate given the lack of spatial context available for the assessment of cumulative effects.

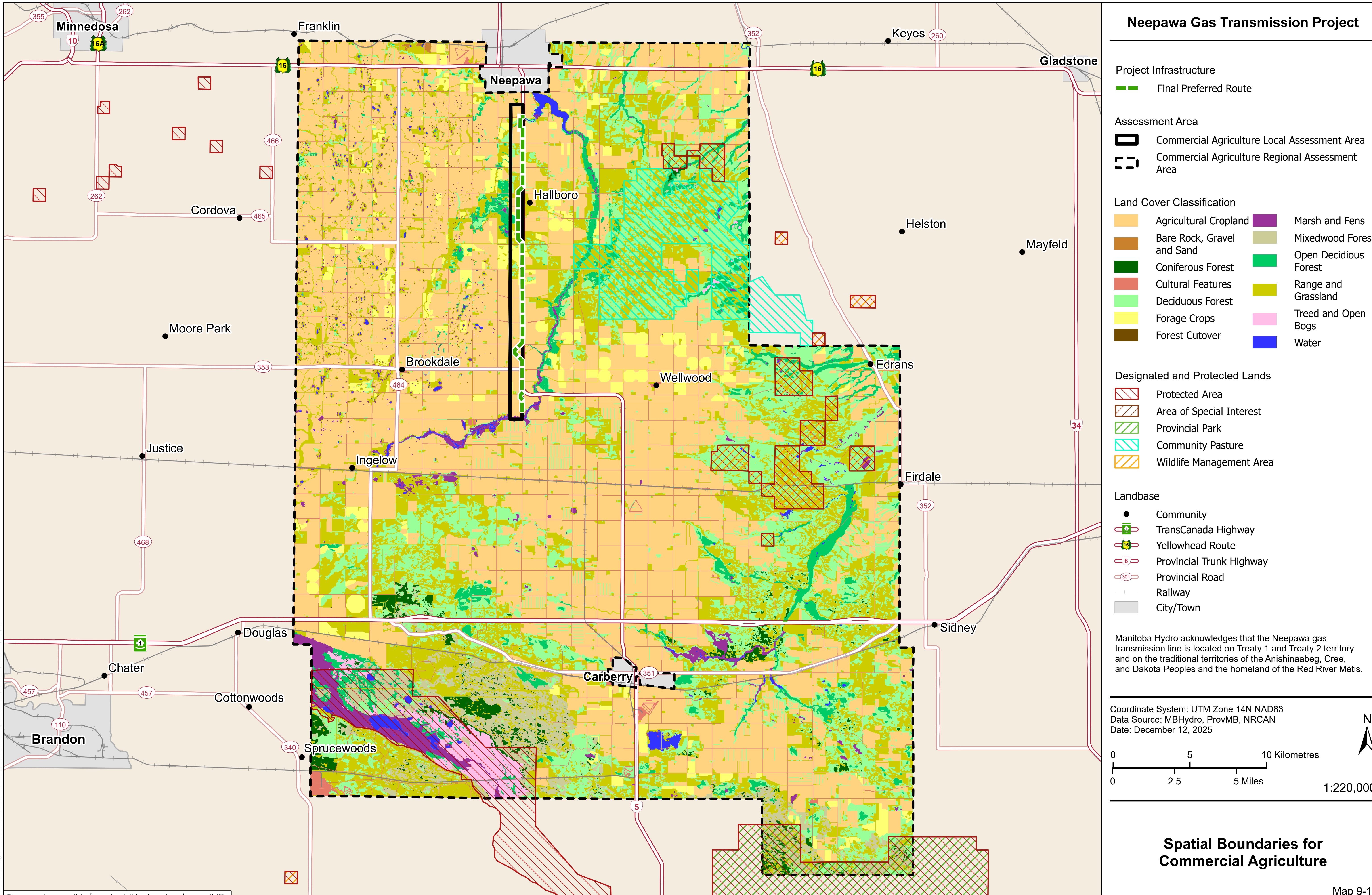
9.5.7 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a valued component monitoring plan for commercial agriculture has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (see Chapter 16). Additionally, if producer concerns are raised during construction or operation and maintenance phases of the project, Manitoba Hydro is committed to follow-up as appropriate.

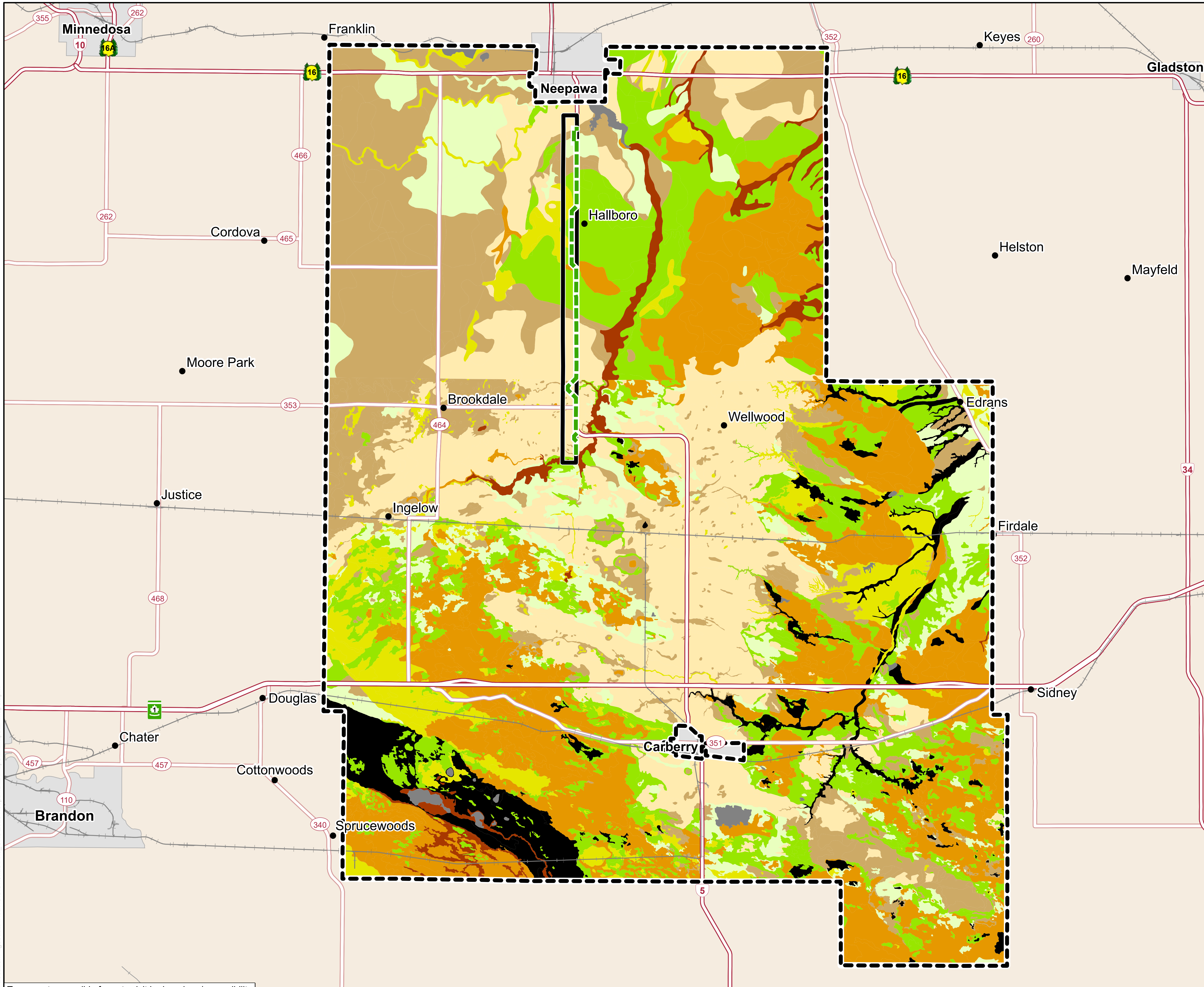
A planned follow-up activity is the completion of a soil survey along the pipeline route to inform soil stripping and handling recommendations to minimize the effects to agricultural land capability and soil productivity from project construction. It is anticipated this follow-up activity will be completed in 2026, prior to construction.

9.5.8 Sensitivity to future climate change scenarios

Effects of climate change on commercial agriculture are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding). These changes could affect commercial agriculture activities such as crop types grown and intensity of drainage practices, but specifics on these changes (i.e., nature, degree, timing, location) are difficult to predict with certainty.



Neepawa Gas Transmission Project
Project Infrastructure
Final Preferred Route
Assessment Area
Commercial Agriculture Local Assessment Area
Commercial Agriculture Regional Assessment Area
Land Cover Classification
Agricultural Cropland
Bare Rock, Gravel and Sand
Coniferous Forest
Cultural Features
Deciduous Forest
Forage Crops
Forest Cutover
Marsh and Fens
Mixedwood Forest
Open Decidious Forest
Range and Grassland
Treed and Open Bogs
Water
Designated and Protected Lands
Protected Area
Area of Special Interest
Provincial Park
Community Pasture
Wildlife Management Area
Landbase
Community
TransCanada Highway
Yellowhead Route
Provincial Trunk Highway
Provincial Road
Railway
City/Town
Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.
Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025
N
0 5 10 Kilometres
0 2.5 5 Miles
1:220,000
Spatial Boundaries for Commercial Agriculture
Map 9-1
Minnedosa
Franklin
Neepawa
Keyes
Gladstone
Hallboro
Cordova
Helston
Mayfeld
Moore Park
Brookdale
Wellwood
Edrans
Justice
Ingelow
Firdale
Douglas
Sidney
Chater
Carberry
Cottonwoods
Brandon
Sprucewoods
To request accessible formats visit hydro.mb.ca/accessibility



Neepawa Gas Transmission Project

Project Infrastructure
- Final Preferred Route

Assessment Area
- Commercial Agriculture Local Assessment Area
- Commercial Agriculture Regional Assessment Area

Agricultural Capability
- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6
- Class 7
- Organic
- Unclassified

Landbase
- Community
- TransCanada Highway
- Yellowhead Route
- Provincial Trunk Highway
- Provincial Road
- Railway
- City/Town

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

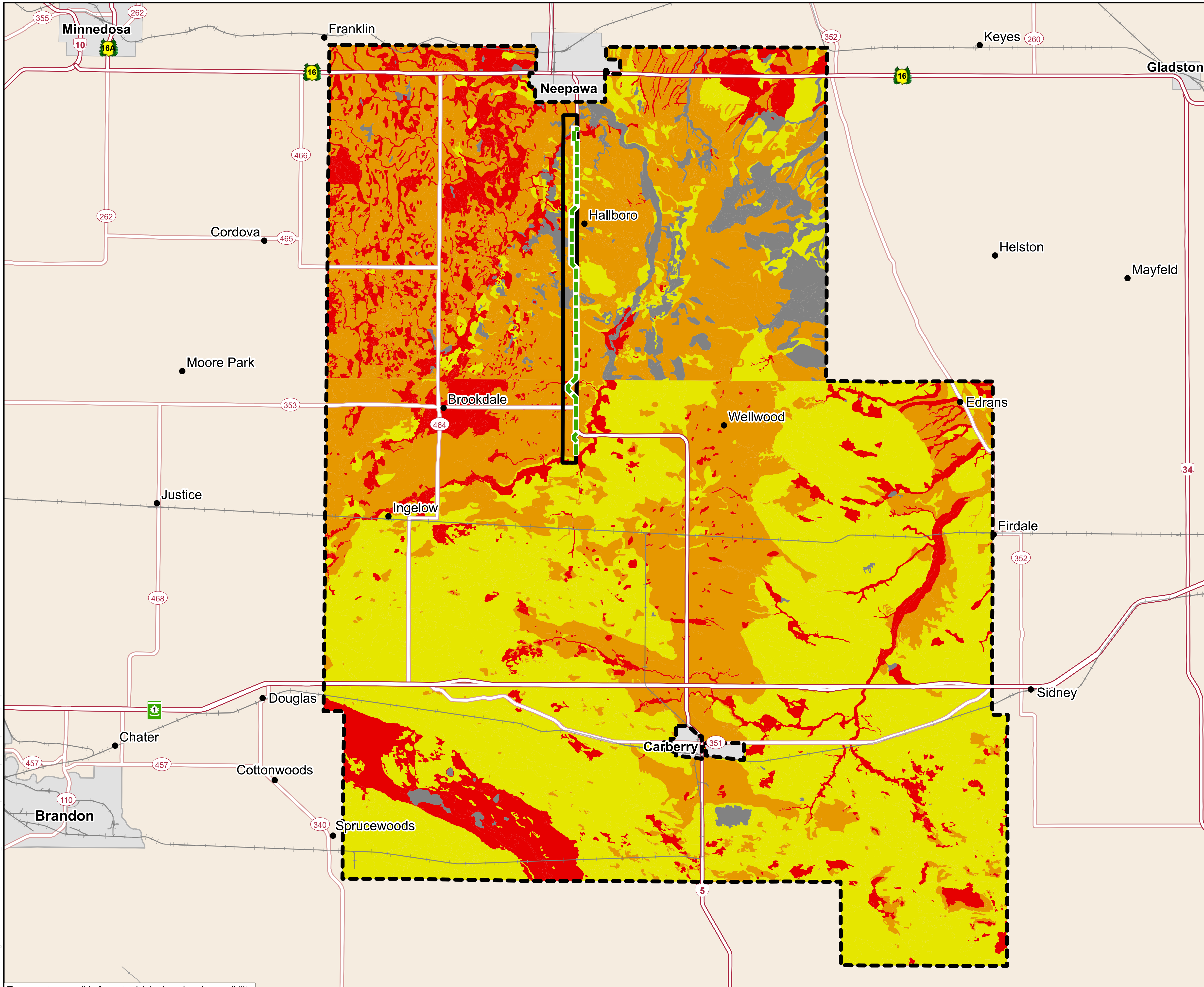
N

0 5 10 Kilometres
0 2.5 5 Miles

1:220,000

Agricultural Capability in the Commercial Agriculture Assessment Areas

Map 9-2



Neepawa Gas Transmission Project

Project Infrastructure

- Final Preferred Route

Assessment Area

- Commercial Agriculture Local Assessment Area
- Commercial Agriculture Regional Assessment Area

Soil Compaction Risk Ratings

- H - High
- L - Low
- M - Moderate
- Unclassified

Landbase

- Community
- TransCanada Highway
- Yellowhead Route
- Provincial Trunk Highway
- Provincial Road
- Railway
- City/Town

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

N

0 5 10 Kilometres

0 2.5 5 Miles

1:220,000

Soil Compaction Risk Ratings

Map 9-3

10.0Human health risk

For the purposes of this assessment, human health risk refers to the potential for harm or adverse effects to the health of individuals and communities and considers potential changes to environmental conditions attributable to the project that can influence human health.

Human health risk was included as a valued component (VC) because it has been assessed as part of other effects assessments for similar projects and has been a concern shared through project engagement on other Manitoba Hydro projects.

10.1 Summary of conclusions

The Neepawa gas transmission project is anticipated to have adverse residual project effects on human health risk. The residual project effects include the following:

- A decrease in air quality resulting from vehicles and heavy machinery generating fugitive dust, particulate matter, and combustion products.
- An increase in noise levels resulting from the presence of staff, vehicles and equipment

The residual project effects on human health risk are anticipated to be the most pronounced during the construction phase because of the heaviest use of heavy equipment, machinery and vehicles, all of which can contribute to adverse effects on air quality and noise levels.

Adverse residual project and cumulative effects to human health risk are anticipated to be not significant because the project is not anticipated to contribute to an increase in fine particulate matter ($PM_{2.5}$) or ozone emissions that exceed the Canadian Ambient Air Quality Standards (CAAQS) red management level nor is it anticipated that project-related noise will exceed Manitoba's provincial noise guidelines for residential and commercial areas for daytime conditions and result in greater than five noise complaints to the province.

10.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 10.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on human health risk.

This assessment has been influenced by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent

Dominion City to Altona gas transmission pipeline, and electrical transmission projects (*e.g.,* the Pointe du Bois to Whiteshell Transmission Project, Dorsey to Wash'ake Mayzoon Transmission Project, St. Vital Transmission Complex and Manitoba-Minnesota Transmission Project).

10.2.1 The project

The proposed project consists of construction, operation, and decommissioning of a six-inch steel natural gas transmission pipeline and associated above-ground control structures. The new pipeline will be approximately 20 km in length, beginning at a control point located approximately 22.5 km south of Neepawa and terminating at another control structure located approximately 3.5 km south of Neepawa. The project components are described in more detail in Chapter 2.0 (Project description).

10.2.2 Regulatory and policy setting

The following provincial laws, and associated regulations, policies, and guidelines, as well as Manitoba Hydro's policies were considered for assessing project effects to human health risk.

- **Canadian Ambient Air Quality Standards:** Developed by the Canadian Council for Ministers of the Environment, the Canadian Ambient Air Quality Standards (CAAQS) set management levels for fine particulate matters, ozone, nitrogen dioxide and sulfur dioxide. The CAAQS also include recommended management actions to control pollutant levels (Canadian Council of Ministers of the Environment 2019). These standards are intended to protect both human health and the environment.
- **Manitoba Ambient Air Quality Standards and Objectives**: Regulatory requirements are in place for assessing potential project-related change to air quality by Manitoba Environment and Climate Change based on the Manitoba Ambient Air Quality Guidelines and Objectives (Government of Manitoba 2005).
- **Health Canada noise guidance**: Noise-induced outcomes are considered health effects by Health Canada, and include noise-induced hearing loss, sleep disturbance, interference with speech comprehension, complaints, and change in the percentage of the population at a specific receptor location who become highly annoyed (Health Canada 2017). Health Canada advises different assessment approaches depending on the project phase, duration of noise-producing activities, and range of noise levels, and provides a guidance document for evaluating human health impacts of noise through the environmental assessment process (Health Canada 2017).

- **Manitoba guidelines for sound pollution**: Manitoba's guidelines for sound pollution specify outdoor environmental sound level objectives for residential, commercial, and industrial areas and include maximum acceptable noise levels for the protection of human health (Province of Manitoba 1992). These guidelines are not used for enforcement but provide a reference document for noise monitoring when handling noise complaints.
- **Municipal bylaws:** the Town of Neepawa By-Law No. 2439 outlines restrictions related to noise control. The by-law states that "In a residential zone or within 500 feet of an inhabited building, no person shall operate or allow to be operated between 10:00 p.m. and 7:00 a.m. Monday to Saturday or 10:00 p.m. and 9:00 a.m. Sundays and holidays, any device, including any tool or item of machinery or equipment which is powered by an electric motor or an internal combustion engine." The by-law also states that no other noise producing activities are permitted between 10:00 p.m. and 7:00 a.m. that annoy or disturb the quiet, comfort or repose of people in the vicinity. The Municipality of North Cypress-Langford does not have any by-laws related to noise.

10.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide project-related feedback. To date, no concerns related to human health risk were raised during project engagement.

Through experience engaging on past gas transmission projects, Manitoba Hydro understands that general concerns related to the potential effects on human health risk have been based mostly around safety, specifically, increased traffic during construction, and safety procedures in place in the event of a pipeline leak or explosion.

10.2.4 Potential effects, pathways, and measurable parameters

The potential project effects on human health risk along with effects pathways and measurable parameters are outlined in Table 10-1.

Table 10-1: Potential effects, effects pathways, and measurable parameters for human health risk

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Decrease in air quality	Emission of dust and exhaust from vehicles and equipment, posing a potential increase in human health risk via inhalation of criteria air contaminants.	CAAQS levels for criteria air contaminants Qualitative assessment of whether exposure to criteria air contaminants represents potential human health risk
Increase in noise levels	Increased noise or change in the type of noise resulting from project activities.	Assessment of noise risk based on project activities, provincial guidelines and municipal by-laws

10.2.5 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on human health risk:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The PDA is described in detail in Chapter 2.0 (Project description).
- **Local assessment area (LAA):** includes all components of the PDA and consists of a 1.5 km buffer around the PDA. This area represents properties that will be traversed and immediately adjacent to the project and are most likely to experience direct human health risks from the project.
- **Regional assessment area (RAA):** includes the PDA and LAA and includes the administrative boundaries of the Municipality of North Cypress-Langford and the Town of Neepawa. The RAA area is crucial for understanding the broader environmental and socio-economic context of the project and is the area used for assessing cumulative environmental and socio-economic effects.

Map 10-1 illustrates the spatial boundaries for the assessment of project effects on human health risk.

10.2.6 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on human health risk are based on the timing and duration of project activities as follows:

- Construction – estimated to take approximately 12 months, beginning in the winter of 2027
- Operation and maintenance – estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

10.2.7 Residual effects characterization

Table 10-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on human health risk.

Table 10-2: Characterization of residual effects on human health risk

Characterization	Quantitative Measure or Definition of Qualitative Categories
Direction – the long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to human health risk relative to baseline. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to human health risk name relative to baseline. **Neutral –** no net change in measurable parameters for human health risk relative to baseline.
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**No Measurable Change –** no discernable change to human health risk. **Low –** a change in human health risks or outcomes that can be measured, that is below regulatory benchmarks and not affecting daily activities. **Moderate** –a measurable change in human health risks or outcomes that is at or around regulatory benchmarks and may moderately affect an individual's daily life and activities. **High –**a measurable change in human health risks or outcomes above regulatory benchmarks that has a severe effect on an individual's daily life or activities or could result in hospitalization or death.

Table 10-2: Characterization of residual effects on human health risk	
Characterization	Quantitative Measure or Definition of Qualitative Categories
Geographic Extent - the geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration – the time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency - identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** **Multiple irregular event –** occurs at no set schedule **Multiple regular event –** occurs at regular intervals **Continuous –** occurs continuously
Reversibility - pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation **Irreversible –** the residual effect is unlikely to be reversed

10.2.8 Significance definition

For this assessment:

- For changes in air quality, adverse residual effects are considered significant if the project contributes to an increase in fine particulate matter ($PM_{2.5}$) or ozone emissions (from vehicles, equipment, or project activities) that exceed the CAAQS red management level.
- For changes in noise level, adverse residual effects are considered significant when estimated audible noise exceeds Manitoba's provincial noise guidelines for residential and commercial areas for daytime conditions and results in greater than five noise complaints to the province. Manitoba Environment and Climate Change does not enforce specific noise limits for regulation of ambient daytime

and nighttime noise levels but instead will review nuisance noise if residents have reported five complaints.

10.3 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data.

The existing conditions described in this section focus on:

- Air quality
- Noise
- Regional population health
- Self-rated health and well-being

10.3.1 Air quality

Manitoba generally has good air quality, with poorer air quality being attributable to aspects such as wildfire smoke and transboundary pollutants form the United States or other Canadian provinces. Air quality in the province in more recent years has also been affected by smoke from forest fires and 2025 has been documented as the smokiest year on record in both Winnipeg and Thompson since Environment and Climate Change Canada began tracking in 1953 (CBC News 2025). Historically, air quality in northern Manitoba has been more impacted by wildfire smoke than in southern Manitoba (Manitoba Environment and Climate Change 2023). Transboundary flow of pollutants only impacts air quality in southern Manitoba.

As the RAA is primarily in an agricultural setting, air quality may also be affected by dust and other particulate matter emanating from agricultural activities like aerial spraying of pesticides, application of fertilizers and manure, harvesting, and smoke generated by local crop burning programs (Government of Manitoba n.d.).

The primary human health risk from crop burning and forest fire smoke is particulate matter of less than 2.5 µm or 2.5 parts per million ($PM_{2.5}$) (Health Canada 2024).

In 2012, the Canadian Council of Ministers of the Environment committed to implementing a national Air Quality Management System (AQMS) to help protect the health of the public and the environment. Comparison of $PM_{2.5}$ (fine particulate matter) and ozone for the three-year period from 2013 to 2015 indicated that these parameters complied with the CAAQS at the five air monitoring stations located across the province of Manitoba (Manitoba Environment and Climate Change n.d.).

$PM_{2.5}$ levels from the most recent publicly available air quality report for Manitoba (2017-2019 period) indicated that although $PM_{2.5}$ levels were impacted by the severity of wildfires from year to year, the $PM_{2.5}$ levels in Brandon did not exceed the CAAQS and were within the orange management level (Manitoba Environment and Climate Change 2023). This level indicates that air quality should be improved through active air management to prevent exceedance of the CAAQS (Manitoba Environment and Climate Change 2023). Ozone levels in Brandon also achieved the CAAQS ozone standard during the same reference period (Manitoba Environment and Climate Change 2023).

10.3.2 Noise

Existing noise levels in the assessment areas will be typical of urban and rural settings. Noise levels in the urban areas around the Town of Neepawa may be higher than noise levels in the surrounding rural areas. Elevated noise levels in rural areas may be due to highway traffic, agricultural activities, airplanes, and recreational activities. Based on a noise assessment conducted for the Selkirk Generating Station, typical baseline noise levels for an urban-rural mixed setting are between 40.4 and 44.5 dBA in the daytime (Stantec Consulting Ltd. 2015). Health Canada (2017) considers day-night noise levels to vary from less than 45 dBA for a typical quiet rural area to 53 to 57 dBA for a typical suburban residential area.

10.3.3 Regional population health

The project falls within the Whitemud district of the Prairie Mountain Health region in Manitoba. Prairie Mountain Health extends east-west from the Manitoba-Saskatchewan border to nearly the western shore of Lake Manitoba, and north-south from the Canada-United States border to the 53rd parallel. The region is approximately 67,000 square kilometres, with 14 First Nation communities, two Manitoba Métis Federation regions, 58 municipalities and 15 Northern Community Councils (Prairie Mountain Health 2023). A new hospital is currently being built in Neepawa, with anticipated completion of construction being in 2026 (Prairie Mountain Health 2024).

The Whitemud region has the lowest prevalence of total respiratory morbidity, residents living with a substance use disorder, and childhood asthma in the Prairie Mountain Health region. The district has a higher-than-average life expectancy and median household income than the region, and a lower unemployment rate (Prairie Mountain Health 2019).

10.3.4 Self-rated health and well-being

Although the intent of this environmental assessment is to quantify the effects of the project on the environment and communities, we recognize that individuals and different communities may perceive the impacts of our projects differently. Perceived environmental conditions can be a strong predictor of mental health, and in some cases may be more useful for predicting mental health than objective environmental conditions (Gomm and Bernauer 2023).

In some cases, even environmental conditions that do not cause adverse biophysical human health effects may contribute to negative mental health outcomes, since the perception of the severity of impacts is often subjective (Gomm and Bernauer 2023). Moreover, subjective exposure and concern about environmental hazards may be at least as important a predictor of poor health outcomes as objective exposure to hazards (Peek et al. 2009).

On previous Manitoba Hydro projects, engaged audiences have shared concerns related to potential and/or perceived effects from projects, and have noted that these concerns lead to an increase in stress. Stress from perceived risk and environmental annoyance are key determinants for mental health and well-being in the context of development projects (Baldwin and Rawstorne 2019). Both stress and annoyance are factors that can erode mental well-being and affect physical health. The links between stress, mental health and physical health are well-documented. Research shows that:

- Unmanaged stress has physical health consequences that include weakened immune systems, weakened functioning of the circulatory and metabolic systems, and increased incidence of cardiovascular disease and Type 2 diabetes (Brunner and Marmot 2006).
- Stress can lead to the adoption of health-threatening coping behaviours such as tobacco use and alcohol consumption (Mikkonen and Raphael 2010).
- Impaired mental health has been found to be linked to a greater risk of developing chronic physical conditions, including diabetes, heart disease and stroke, respiratory conditions, and cancers (Canadian Mental Health Association, Ontario 2025).

During project engagement on the Dominion City to Altona gas transmission project (2024), participants shared concerns related to potential effects of the proposed transmission pipeline on health and well-being and the associated stress related to anticipating or potentially experiencing such effects. The concerns were based mostly around safety, specifically increased traffic during construction and safety procedures in place in the event of a pipeline leak or explosion. Accidents and malfunctions are covered in Chapter 15.0 of this report, but engagement feedback on previous projects has warranted that the stress caused by potential effects was assessed in its own effects pathway. Although this feedback did not come up through project engagement on the Neepawa gas transmission project and the pathway is therefore not carried forward for further assessment in this chapter, understanding the current perceived health status of individuals and communities in the RAA is helpful when considering potential project impacts on human health risk.

Self-rated health, also known as perceived health, is a metric collected by Statistics Canada as an indicator of overall health status. Self-rated health includes components of mental, physical, and social well-being. Statistics Canada uses multiple surveys to measure self-rated health in Canada, one of which being the Canadian Community Health Survey. The Canadian Community Health Survey is an annual survey to track and monitor the health status and health determinants for the Canadian population at the national, provincial, and health region levels.

Table 10-3 displays the health characteristics for self-rated health from Prairie Mountain Health alongside provincial and national rates for both males and females from the most recently available two-year data set (2021-2022). As summarized in the table, the self-rated health and self-rated mental health for people in Prairie Mountain Health was generally comparable to the national averages. Both males and females living in the region reported having an overall greater sense of belonging to local community in comparison to the national average. For women in Prairie Mountain Health, perceived life stress is slightly higher in comparison to the provincial average but lower than the national average. Men in Prairie Mountain Health have perceived life stress that is higher than both the national and provincial average, but neither of these rates are statistically significant.

Table 10-3: Indicators for community well-being for Prairie Mountain Health and provincial and national rates, 2021-2022

Geography	Canada		Manitoba				Prairie Mountain Health, Manitoba					
Sex	Males	Females	Males		Females		Males			Females		
Characteristics	Percent	Percent	Percent	Significantly different from the Canada rate	Percent	Significantly different from the Canada rate	Percent	Significantly different from the Canada rate	Significantly different from the provincial rate	Percent	Significantly different from the Canada rate	Significantly different from the provincial rate
Perceived health, very good or excellent	58.8	56.2	56.6	0	56.3	0	55.0	0	–	57.5	0	–
Perceived health, fair or poor	12.0	13.2	11.1	0	12.1	0	12.6	0	–	10.5	-1	–
Perceived mental health, very good or excellent	61.2	52.8	59.7	0	51.0	0	62.5	0	–	51.6	0	–
Perceived mental health, fair or poor	11.3	14.9	11.0	0	15.4	0	9.2	0	–	14.0	0	–
Perceived life stress, most days quite a bit or extremely stressful	18.9	23.2	19.9	0	19.0	-1	23.2	0	–	21.6	0	–
Sense of belonging to local community somewhat strong or very strong	66.8	67.20	69.3	1	69.0	0	74.5	1	–	73.7	1	–

All data is total population 12 years and older, for the 2021-2022 reference period (most recent available data) from the Canadian Community Health Survey

–: not available for the specific reference period

Source: Statistics Canada 2025.

10.4 Project interactions with human health risk

Table 10-4 identifies, for each potential effect, the physical activities that might interact with human health risk and result in the identified effect.

Table 10-4: Project interactions with human health risk

Project activities/components	Decrease in air quality	Increase in noise levels
Construction of pipeline and control points		
Mobilization and staff presence	-	✓
Vehicle and equipment use	✓	✓
Access development	-	-
Temporary work areas, e.g., marshalling yards	-	-
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	-	-
Pipe stringing (including welding, coating)	-	-
Pipe installation – trenching and lowering	✓	-
Horizontal directional drilling		✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-
Backfilling and contouring	✓	-
Control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	-	-
Clean-up and reclamation	-	-
Operation and maintenance of pipeline and control points		
Presence of pipeline and control points	-	-
Vehicle and equipment use	✓	✓
Maintenance activities, including inline inspections using pipeline inspection gauges (PIGs) and integrity digs	✓	-
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	-
Valve operation checks (annually)	-	-
Vegetation management	✓	-
Decommissioning of pipeline and control points		
Mobilization and staff presence	-	✓
Vehicle and equipment use	✓	✓

Table 10-4: Project interactions with human health risk		
Project activities/components	Decrease in air quality	Increase in noise levels
Pipeline disconnection (Isolate, purge, and cap off below grade)	✓	-
Removal of above-ground components (dismantling, removal from site, disposal)	-	-
Rehabilitation	-	-
Clean-up and demobilization	-	-
✓= Potential interaction – = No interaction		

10.5 Assessment of project effects

As presented in Section 10.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on human health risk. These effects are anticipated to be most pronounced during the construction phase of the project for each of the potential effects assessed:

- Decrease in air quality
- Increase in noise levels

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 10-4, proposed mitigation measures, and the characterization of residual project effects.

10.5.1 Decrease in air quality

10.5.1.1 Analytical assessment techniques

The assessment of potential effects on air quality from criteria air contaminants is based on the change in exposure experienced by an individual that is predicted to occur between baseline (existing) conditions and project conditions, and whether project activities will generate criteria air contaminants that exceed CAAQS levels.

Air quality is determined by the levels of gases and particulate matter in the air. Gases commonly emitted by passenger vehicles and other machinery include nitrogen dioxide (NO_2), sulphur dioxide (SO_2), and carbon monoxide (CO), all of which can have harmful health effects above certain concentrations.

Human health risks associated with air quality under both existing and future project related conditions are typically estimated by comparing measured or calculated chemical concentrations in air to regulatory benchmarks for the protection of human health. The concentrations of criteria air contaminants were not measured or modeled for this project. Instead, a qualitative assessment of human health risk from exposure to criteria air contaminants from the project is based on comparisons with other Manitoba Hydro gas transmission projects.

10.5.1.2 Effects pathways

Construction

During construction, the activities that are anticipated to contribute to a decrease in air quality include vehicle and equipment use, right-of-way preparation, pipe installation (as the result of trenching), and backfilling and contouring.

Vehicle and equipment use are anticipated to be the main pathway related to a decrease in air quality through the emission of exhaust and the generation of dust from operation vehicles and equipment.

Project-related change to air quality poses a potential human health risk if levels of gases and particulates exceed health-based air quality objectives. Change in air quality is of particular importance to sensitive individuals, e.g., children, the elderly, and people with existing cardio-respiratory health problems such as asthma and chronic obstructive pulmonary disease (Health Canada 2021).

Exhaust and dust emissions are anticipated to be highest during the construction phase which will involve right-of-way preparation, creation of temporary work areas, topsoil stripping, trenching, stringing, bending, joining and lowering of pipeline and horizontal directional drilling. During the construction phase, heavy equipment and vehicles will emit combustion by-products (*e.g.,* NO_2, SO_2, CO and particulate matter). Construction activities may also emit fugitive dust (dust from disturbed soils becoming airborne) during the operation of heavy machinery.

Operations

During operations, vehicle and equipment use and vegetation management are the two main pathways that are anticipated to contribute to a decrease in air quality. Vehicle and equipment use will affect air quality to a lesser extent than during the construction phase due to the smaller workforce size and work activities being shorter-term and more isolated.

Spraying herbicides, if required for vegetation management will alter air quality in a very localized area for short periods of time during their application. Operators will be wearing proper protective equipment.

Where in-line inspection or integrity excavations and repairs may be required during operations, purging of the pipeline would take place, which will alter air quality for a short duration in a very localized area.

Decommissioning

Vehicle and equipment use associated with project decommissioning activities are anticipated to contribute to a decrease in air quality, similar to construction and operation. The effects would be to a lesser extent than those during construction due to the smaller size crew required for decommissioning.

Purging during decommissioning will also alter air quality, but in a very localized area and the effects will be short term.

10.5.1.3 Mitigation for decrease in air quality

Mitigation for decrease in air quality involves the following:

- Dust and vehicle emissions will be managed in a manner that considers the safe and continuous public activities near construction sites, where applicable.
- Construction staff will be encouraged to carpool to reduce the amount of traffic in the area.

10.5.1.4 Characterization of residual effects on decrease in air quality

After mitigation, predicted residual effects on the decrease in air quality include temporary, short-term reductions in localized air quality at and immediately around work sites during construction, operations, and decommissioning. This is the result of vehicles and heavy machinery generating fugitive dust, particulate matter, and combustion products.

The magnitude of change in health risk from this decrease in air quality is expected to be negligible. The construction phase is anticipated to have the relative highest magnitude of impact given the larger workforce size, but the change in air quality is not anticipated to result in emissions exceeding Manitoba's Ambient Air Quality Guidelines.

Following the implementation of mitigation measures described above, residual effects for decrease in air quality are characterized as follows:

- Direction: Adverse

- Magnitude: Negligible
- Geographic extent: PDA
- Duration: Short-term
- Frequency: Multiple irregular events
- Reversibility: Reversible

10.5.2 Increase in noise levels

10.5.2.1 Analytical assessment techniques

Manitoba's provincial guidelines for maximum desirable 1-hour equivalent noise levels for residential and commercial areas are 45 dBA for nighttime and 55 dBA for daytime. These guidelines represent acceptable levels to prevent public annoyance and to protect public health and welfare with an adequate margin of safety and were used to assess predicted noise levels associated with project activities.

Health Canada does not have noise guidelines or enforceable noise thresholds or standards and recommends the use of standards or regulations specified for project-specific districts. Health Canada provides recommendations for the evaluation of projects where construction noise at a given receptor location lasts for more than one year, for operational noise, and where noise levels are in the range of 45-75 dB (Health Canada 2010; Health Canada 2017). As the project is not anticipated to produce noise levels above baseline conditions for a period of more than one year, and provincial noise regulations are available, Health Canada guidance was not used in this assessment.

Municipal by-laws outline restricted hours for noise from 10:00p.m. to 7:00a.m. on weekdays and 10:00 p.m. to 9:00a.m. on Sunday and holidays. Since project construction activities are not anticipated to take place between these hours, municipal by-laws were not used to evaluate the magnitude of impacts for this assessment.

10.5.2.2 Effects pathways

<u>Construction</u>

The effects pathway for an increase in noise during construction is the presence of staff, vehicles and equipment, which have the potential to generate noise.

Research on maximum noise levels generated during the construction phase of a project from combined construction equipment sources is suggested to be 89 dBA at a 15-metre distance from noise sources (Stantec Consulting Ltd. 2015). At 480 metres from noise sources, construction activities on a past electrical transmission project were expected to generate 59 dBA of noise, which is comparable to the noise level of indoor conversation (Stantec Consulting Ltd. 2015). During project construction, noise would generally be localized at pipeline installation sites and, due to the staging of construction activities, would occur over a limited duration at a given site.

There are approximately 32 homes within 500 m of the PDA. These homes and residences are the most likely to experience elevated noise levels during construction activities.

Operations

The noise generated from the operation phase of the project is expected to be notably less than during the construction phase. The main source of noise during the operation phase of the project will be from the use of vehicles and equipment during maintenance activities, including inspections, and vegetation management. The noise resulting from these activities will be temporary and localized, contained mostly within the PDA.

Decommissioning

The noise generated from the decommissioning phase of the project is expected to be associated with staff presence and vehicle and equipment use but is anticipated to be less than during the construction phase given the smaller anticipated workforce.

10.5.2.3 Mitigation for increase in noise levels

Mitigation for an increase in noise levels includes the following:

- Construction activities will be conducted per applicable noise bylaws.
    - As specified by the municipal by-laws identified in Section 10.2.2, no construction activities that generate excessive noise will occur between 10:00 p.m. and 7:00 a.m.
- Passive or active techniques to minimize noise, such as the construction of barriers or noise cancellation, will be used in areas of prolonged noise generation to the extent feasible.

10.5.2.4 Characterization of residual effects on increase in noise levels

After mitigation, predicted residual effects on the increase in noise levels are anticipated to be the most pronounced during the construction phase of the project as there will be the most noise-generating activities taking place during construction. The frequency of these activities will be multiple regular events along the right-of-way and not a continuous frequency. During the construction phase, residual effects for human health risk associated with noise levels are adverse. However, the magnitude of change in noise level will be low and anticipated to be similar to ongoing ambient noise levels, which includes noise generated by ongoing agricultural activities throughout the assessment area.

Similar adverse effects are anticipated during the operations and decommissioning phases of the project but at a lesser magnitude. Noise generated by vehicles and equipment during routine maintenance activities may be noticeable but infrequent and of short duration and are therefore deemed negligible.

Following the implementation of mitigation measures described above, residual effects for an increase in noise levels are characterized as follows:

- Direction: Adverse
- Magnitude: Low during construction and decommissioning, negligible during operations
- Geographic extent: LAA during construction and decommissioning, PDA during operation
- Duration: Long-term
- Frequency: Multiple regular events
- Reversibility: Reversible

10.5.3 Summary of residual effects characterizations

Table 10-5 characterizes the residual effects on human health risk.

Table 10-5: Project residual effects on human health risk

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Decrease in air quality						
Construction	A	NC	PDA	ST	IR	R
Operation						
Decommissioning						
Increase in noise levels						
Construction	A	L	LAA	LT	R	R
Operation		NC	PDA			
Decommissioning		L	LAA			

10.5.4 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities. For human health risk, both conditions are present. The project is anticipated to have adverse effects on air quality and noise. Each of the residual effects could interact with other past, present, or reasonably near future physical activities.

10.5.4.1 Project residual effects likely to interact cumulatively

Table 10-6 shows the project and physical activities inclusion list which identifies other projects and physical activities that might act cumulatively with the project to impact human health risk. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 10-6: Potential cumulative effects on human health risk

Other Projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects	
	Decrease in air quality	Increase in noise levels
Existing/ongoing projects and activities		
Domestic resource use (e.g., hunting, trapping, fishing, non-commercial agriculture)	-	-
Recreational activities (e.g., canoeing, snowmobiling, hiking)	-	-
Commercial resource use (includes commercial agriculture, gravel/quarry, fishery, forestry)	✓	✓
Existing infrastructure (non-Manitoba Hydro) such as roads, railways, telecommunication lines, pipelines, water and wastewater treatment)	✓	✓
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	✓	✓
Manitoba Hydro gas and electricity transmission and distribution	✓	✓
Potential future projects and activities		
Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony	-	-
Residential and institutional developments	✓	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.
– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

10.5.4.2 Cumulative effect on decrease in air quality

10.5.4.3 Pathways for cumulative effect

The current projects and activities that may interact cumulatively to affect air quality are commercial resource use and infrastructure, including other Manitoba Hydro gas and electricity lines. These activities have the potential to generate fugitive dust, particulate matter and other air pollutants that lead to a potential change in ambient air quality. However, based on existing baseline data for southern Manitoba measured out of Winnipeg and Brandon, ambient air quality in the region meets the CAAQS for PM2.5 and ozone (Manitoba Environment and Climate Change 2023).

Given that air emissions associated with the project will occur primarily during the construction phase, these effects will be experienced primarily close to active construction areas, and they will be short-term and continuous until the end of construction. Landowners and residents living near both the project and the other projects and activities identified in Table 10-6 may experience cumulative health risk from project-related changes in air quality. However, effects will only be cumulative if activities that generate air pollutants occur concurrently and in physical proximity to one another.

It is not anticipated that the project will interact cumulatively to affect air quality with the Sprucewood Colony expansion because residual project effects on air quality are characterized as negligible and confined to the PDA, and because the development is 2km away from the PDA. Other future residential and institutional developments may cumulatively interact with air quality if they are occurring at the same time within the PDA.

10.5.4.4 Mitigation measures

Implementation of the mitigation measures described in Section 10.5.1.3 will reduce the effects of the project on air quality. Manitoba Hydro will collaborate with proponents and government agencies managing the existing ongoing projects and activities in the area, where appropriate, to address cumulative effects.

10.5.4.5 Residual cumulative effect

The projects and activities listed in Table 10-6 may contribute to a change in air quality and related human health risk. Landowners and residents living near the project near other existing and future projects are most likely to experience cumulative health risk from project-related change to air quality. However, these effects are expected to be negligible in magnitude, short-term in duration and reversible once construction activities subside.

10.5.4.6 Cumulative effect on increase in noise levels

10.5.4.7 Pathways for cumulative effect

Noise generated by current activities in the LAA and RAA have the potential to interact cumulatively with the project and could increase the overall exposure to noise experienced by people living and working in the RAA. Any activities involving the use of vehicles and equipment will contribute to noise levels. However, effects will only be cumulative if noise-generating activities occur concurrently and in physical proximity to one another.

It is not anticipated that the project will interact cumulatively to increase noise with the Sprucewood Colony development activities because it is located outside the LAA. Other future residential and institutional developments may cumulatively interact with air quality if they are occurring at the same time as construction of the project within the LAA.

10.5.4.8 Mitigation measures

Implementation of mitigation measures described in Section 10.5.2.3 will reduce project effects on noise levels. Manitoba Hydro will collaborate with proponents and government agencies managing the existing and ongoing projects and activities in the area, where appropriate, to address cumulative effects.

10.5.4.9 Residual cumulative effect

Cumulative effects on noise will be experienced primarily close to construction areas and are anticipated to be short-term and continuous until the completion of construction. The residual potential cumulative effects due to noise will be negligible to low in magnitude, short-term in duration, and reversible once construction activities are complete.

10.5.5 Determination of significance

With mitigation and environmental protection measures, the residual effects on human health risk related to air quality and noise are predicted to be not significant. The project is not anticipated to contribute to an increase in fine particulate matter ($PM_{2.5}$) or ozone emissions that exceed the CAAQS red management level nor is it anticipated that project-related noise will exceed Manitoba's provincial noise guidelines for residential and commercial areas for daytime conditions and result in greater than five noise complaints to the province.

10.5.6 Prediction confidence

Prediction confidence in the assessment of effects on human health risk is based on desktop-based data compilation, engagement feedback from this project and previous projects, and an understanding of the project activities, location and schedule.

The prediction confidence is high for impacts on human health risk, since the environmental effects mechanisms are well understood, and Manitoba Hydro has experience on assessing the impacts of construction activities on air quality and noise from previous projects in southern Manitoba in agricultural and urban areas.

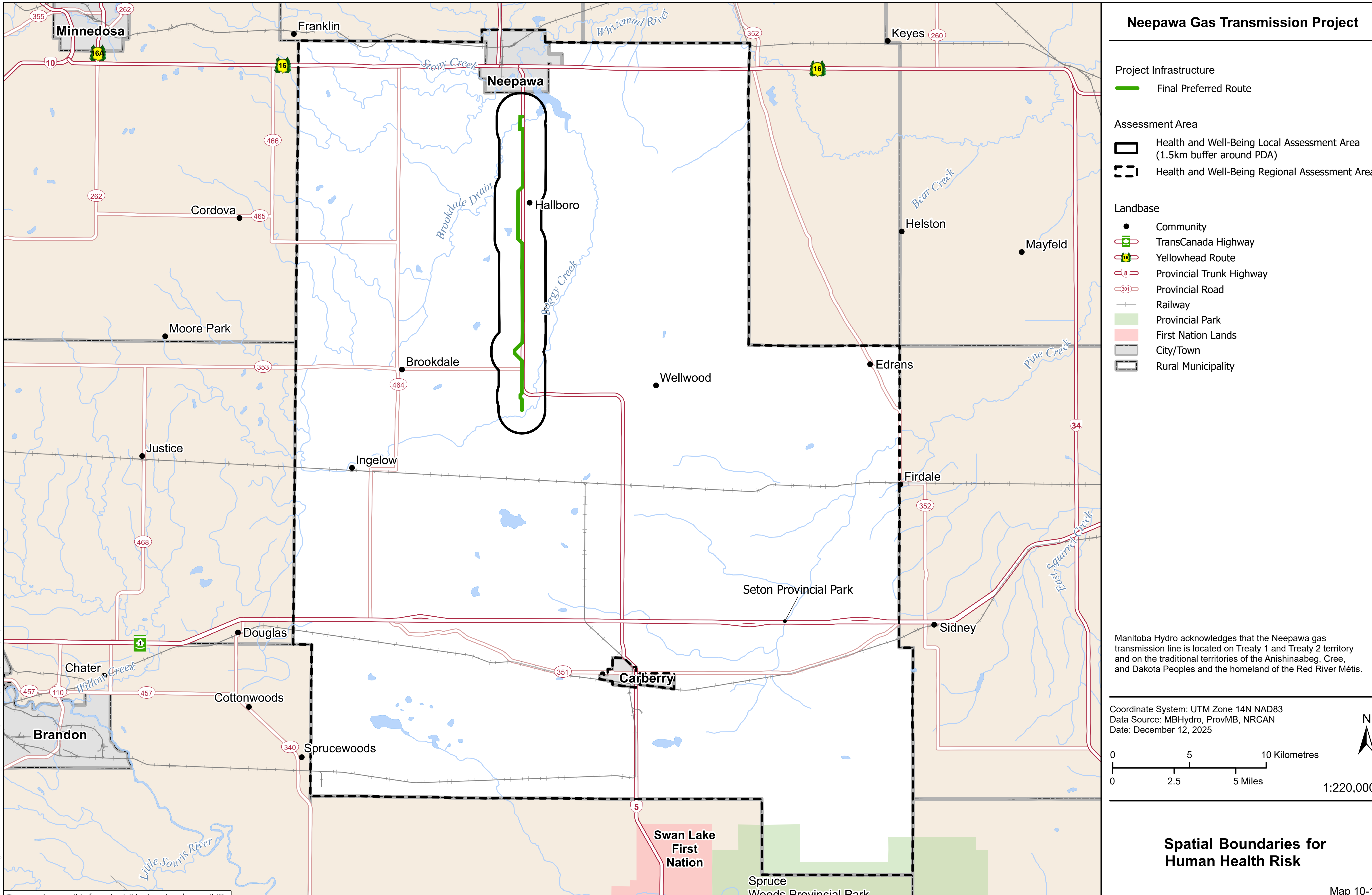
10.5.7 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (see Chapter 16.0).

10.5.8 Sensitivity to future climate change scenarios

Effects of climate change on human health risk are expected to relate to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding).

There is a growing body of literature surrounding the impacts of climate change on mental health and increased anxiety, often referred to as climate anxiety (Clayton 2020). Emotional responses to climate change can be both the result of physical changes to the landscape (such as an increase in severe weather patterns) and the perception of climate change, including the dread associated with negative environmental information or feelings that environmental challenges are intractable (Clayton 2020). Any climate anxiety generated has the potential to negatively impact human health risk.



Spatial Boundaries for Human Health Risk

Map 10-1

11.0Economic opportunities

Economic opportunities refer to unique training, employment or business opportunities that enhance the economic status of individuals, communities, Indigenous Nations and/or regions by providing a stimulus to the growth and/or retention of commerce and industry.

Economic opportunities were selected as a valued component (VC) because of their importance to local and provincial residents, business owners, communities, First Nations, the Manitoba Métis Federation, and governments. Additionally, project-related employment and business opportunities are identified as themes of common interest during the project engagement process.

This chapter presents a detailed assessment of the potential project effects on economic opportunities, including the scope/methods, baseline conditions, effect pathways, mitigation measures, and the analysis and characterization of residual project effects.

11.1 Summary of conclusions

The project is expected to have positive effects on economic opportunities. The project effects include the following:

- Increased direct and indirect/induced regional employment through hiring and training of project workers and increased demand for goods and services to support project-related activities and the influx of the project workforce.
- Increased regional business in the form of increased revenue resulting from the purchase of project-related goods and services from regional businesses and household spending by project workers at regional businesses.
- Contributions to the regional economy through increased income taxes paid by project workers and consumption taxes resulting from project-related spending on goods and services, although effects on regional government revenue and the provincial or federal GDP are not anticipated to be measurable.
- The project's effects on economic opportunities are anticipated to be the most pronounced during the construction phase, when the size of the workforce and project-related spending will be greater than during the operations, maintenance and decommissioning phases.

With no adverse effects to economic opportunities anticipated, a significance determination is not required for this VC.

11.2 Scope of the assessment

For the purpose of this assessment, economic opportunities include the following:

- Regional employment – employment opportunities for local and regional labour forces through construction, operation and maintenance, and decommissioning
- Regional business – contracting opportunities and increased demand for goods and services from local and regional businesses.
- Regional economy – estimates of government tax revenue and contributions to gross domestic product (GDP) in the regional, provincial, and federal economies.

This assessment has been informed by engagement feedback and Manitoba Hydro's experience with other projects in southern Manitoba, including the recent Altona to Winkler gas transmission project, the Dominion City to Altona Gas Transmission Pipeline, the Northwest Gas Transmission Project, and electrical transmission projects (e.g., the Silver to Rosser tap transmission project).

11.2.1 The project

The proposed Neepawa Gas Transmission Project (the project) is an approximate 19-kilometre, 6-inch steel natural gas pipeline. The line will extend from a control point located approximately 22.5 kilometres south of Neepawa and run north to another control structure located 3.5 kilometres south of Neepawa.

11.2.2 Regulatory and policy setting

There are no laws, regulations, policies, or guidelines deemed relevant for assessing the project's effects on economic opportunities.

11.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide economic opportunities related feedback about the project.

The following questions and interests about the project regarding economic opportunities were raised during project engagement:

- Questions about the process for acquiring land when the gas pipeline crosses private property.
- Interest in training opportunities emphasizing workforce planning and training to meet future job requirements.
- Interest in potential business contracting and/or employment opportunities.

11.2.4 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on economic opportunities:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project.
- **Local assessment area (LAA):** includes all components of the PDA and consists of the area of the administrative boundaries of the Municipality of North Cypress-Langford and the Town of Neepawa. The LAA is intended to encompass the communities with which the project may interact on economic opportunities.
- **Regional assessment area (RAA):** the RAA is the same as the LAA for the assessment of project effects on economic opportunities because the area is deemed to encompass a sufficiently broad area for assessing cumulative effects.
- The RAA area is crucial for understanding the broader environmental and socio-economic context of the project and is the area used for assessing cumulative environmental and socio-economic effects.

11.2.5 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on economic opportunities are based on the timing and duration of project activities as follows:

- Construction – estimated to take approximately 12 months, beginning in the winter of 2027
- Operation and maintenance – estimated to be at least 50 years based on the pipeline’s design life.
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life.

11.2.6 Potential effects, pathways, and measurable parameters

The potential project effects on economic opportunities, along with effects pathways and measurable parameters, are outlined in Table 11-1.

Table 11-1: Potential effects, effect pathways, and measurable parameters for economic opportunities

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in regional employment	Project activities requiring labour and creating job opportunities	Direct, indirect, and induced employment Labour force availability
Change in regional business	The purchase of project-related goods and services from regional businesses	Procurement of goods and services ($)
Change in regional economy	Tax revenue generated through spending related to project activities	Estimated government revenue ($) Estimated GDP ($)

For the purposes of this assessment, the term ‘regional’ relates to the LAA/RAA.

11.2.7 Residual effects characterization

Table 11-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on economic opportunities.

Table 11-2: Characterization of residual effects on economic opportunities

Characterization	**Quantitative Measure or Definition of Qualitative Categories**
Direction – the long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to economic opportunities relative to baseline (*i.e.,* an increase in regional employment or economic activity). **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to economic opportunities relative to baseline (*i.e.,* a decrease in regional employment or economic activity). **Neutral –** no net change in measurable parameters for economic opportunities relative to baseline (*i.e.,* no change to regional employment or economic activity).

Table 11-2: Characterization of residual effects on economic opportunities

Characterization	Quantitative Measure or Definition of Qualitative Categories
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**No Measurable Change –** no perceptible change to economic opportunities is anticipated. **Low –** a measurable change to economic opportunities that is not substantial compared to other existing economic contributors. **Moderate –** a measurable change to economic opportunities that is not substantial compared to other existing economic contributors. **High –** a measurable change to economic opportunities that is substantial compared to other existing economic contributors.
Geographic Extent - the geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA/RAA –** residual effects extend into the LAA/RAA
Duration – the time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to the completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency - identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Reversibility - pertains to whether a measurable parameter or the VC can return to its existing	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation

Table 11-2: Characterization of residual effects on economic opportunities

Characterization	Quantitative Measure or Definition of Qualitative Categories
condition after the project activity ceases	Irreversible – the residual effect is unlikely to be reversed

11.2.8 Significance definition

For this assessment, adverse effects on economic opportunities are considered significant if the proposed project results in adverse residual effects that are distinguishable from current economic conditions and trends for the region and cannot be managed or mitigated through adjustments to programs, policies, plans, or other mitigation measures.

The assessment considers both the positive and adverse effects that occur after mitigation and other management measures are implemented. However, a significance determination is provided only for adverse residual effects.

11.3 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data (official reports by the municipal jurisdictions and regional statistics). The existing conditions described in this section focus on:

- Regional economy
- Regional employment

Information is presented for the RM of North Cypress-Langford and the Town of Neepawa (the municipal jurisdictions included in the LAA/RAA).

11.3.1 Regional economy

Agriculture is the dominant industry in the region, with many residents engaged in farming. A wide variety of crops are grown locally in the LAA/RAA, including canola, cereal grains such as wheat and oats, corn, sunflowers, dry peas, mustard, soybeans, potatoes and others (Town of Neepawa, 2025; Manitoba Agricultural Services Corporation, 2025).

The LAA/RAA also hosts a diverse range of other industries and businesses, including sectors such as livestock, manufacturing, logistics, forestry, fishing, hunting, construction, and real estate and housing market (Town of Neepawa, 2025a).

Livestock activities, including pig farming, cattle ranching, and egg production, are also present in the region. Since 2008, Neepawa has been home to HyLife Foods, one of the largest pork producers in Manitoba and Canada, which has national and international operations in premium pork production (HyLife, 2025). Additionally, the manufacturing sector is represented by Neepawa-Gladstone Co-op, Stella-Jones, and This N' That, all have facilities located in Neepawa. The former specializes in the production and delivery of agricultural products, while the latter two specialize in pressure-treated wood products such as furniture and cabinets (Town of Neepawa, 2025b).

11.3.2 Regional employment

The data used to describe the existing conditions of regional employment in the LAA/RAA comes from the 2021 Canadian Census of Population.

Table 11-3 shows the labour force characterization for the municipal jurisdictions in the LAA/RAA (Statistics Canada 2023).

Table 11-3: Labour force characterization for communities in the LAA/RAA for 2021

Labour force status	Town of Neepawa	RM of North Cypress-Langford	LAA/RAA Totals	Manitoba
Total population aged 15 years and over	4,580	2,345	6,925	1,058,415
In the labour force	3,110	1,340	4,450	681,505
Employed	3,015	1,265	4,280	625,115
Unemployed	90	75	165	56,390
Not in the labour force	1,340	540	1,880	376,905
Participation rate (%)	70	71.7	70.85*	64.4
Employment rate (%)	67.8	67.6	67.7*	59.1
Unemployment rate (%)	2.9	5.6	4.25*	8.3

Source: Statistics Canada 2023

*Average percentage between the Town of Neepawa and the RM of North Cypress-Langford

According to the 2021 census, the total labour force in the LAA/RAA is 4,450 across all sectors. The overall participation rate (*i.e.,* the percentage of individuals aged 15 and above who are participating in the labour force) is 70.85%, which is higher than the provincial participation rate of 64.4%. The Town of Neepawa has the highest labour force participation rate in the LAA/RAA at 67.8%. Employment rates in the RM of North Cypress-Langford and the Town of Neepawa were 67.6% and 67.8%, respectively, both of which are higher than the provincial employment rate of 59.1% (Statistics Canada, 2023).

The industries that provide employment for the greatest portion of the labour force in the LAA/RAA are presented in the following table.

Table 11-4: Main industries in the LAA/RAA for 2021

Industry	**Town of Neepawa**		**RM of North Cypress-Langford**	
	Count	**%**	**Count**	**%**
Agriculture, forestry, fishing and hunting	110	3.5	375	28.1
Construction	140	4.5	125	9.4
Health care and social assistance	295	9.5	135	10.1
Manufacturing	1415	45.6	70	5.2
Retail trade	335	10.8	105	7.9

Source: Statistics Canada 2023

Cumulatively, these five industries employ around 70% of the labour force in the LAA/RAA. For the RM of North Cypress-Langford, Agriculture, forestry, fishing, and hunting are the most representative industries, accounting for 28.1% of employment. For the Town of Neepawa, Manufacturing represents 45.6% of employment in the jurisdiction. Table 11-5 provides a detailed breakdown of the industries that employ the labour force in each of the municipal jurisdictions included in the LAA/RAA, as well as totals for the LAA/RAA.

Table 11-5: Industry and workforce in the Town of Neepawa and RM of North Cypress-Langford, North American Industry Classification System

Industry	Town of Neepawa		RM of North Cypress-Langford	
	Count	**%**	**Count**	**%**
Total population aged 15 years and over	4580	100	2345	100
Agriculture, forestry, fishing and hunting	110	3.5	375	28.1
Mining, quarrying, and oil and gas extraction	10	0.3	0	0
Utilities	20	0.6	0	0
Construction	140	4.5	125	9.4
Manufacturing	1415	45.6	70	5.2
Wholesale trade	30	1	60	4.5
Retail trade	335	10.8	105	7.9
Transportation and warehousing	40	1.3	50	3.7
Information and cultural industries	10	0.3	0	0
Finance and insurance	25	0.8	30	2.2
Real estate and rental and leasing	15	0.5	0	0
Professional, scientific and technical services	65	2.1	15	1.1
Management of companies and enterprises	0	0	0	0
Administrative and support, waste management and remediation services	70	2.3	15	1.1
Educational services	160	5.2	115	8.6
Health care and social assistance	295	9.5	135	10.1

Arts, entertainment and recreation	25	0.8	15	1.1
Accommodation and food services	145	4.7	40	3
Other services (except public administration)	90	2.9	75	5.6
Public administration	90	2.9	80	6
Source: Statistics Canada 2023				

11.4 Project interactions with economic opportunities

Table 11-6 identifies, for each potential effect, the physical activities that might interact with economic opportunities and result in the identified effect.

Table 11-6: Project interactions with economic opportunities			
Project activities/components	**Change in regional employment**	**Change in regional business**	**Change in regional economy**
Construction of pipeline and control points			
Mobilization and staff presence	✓	✓	✓
Vehicle and equipment use	✓	✓	✓
Access development	-	-	-
Temporary work areas, e.g., marshalling yards	-	-	-
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	-	-	-
Pipe stringing (including welding, coating)	-	-	-
Pipe installation – trenching and lowering	-	-	-
Horizontal directional drilling	-	-	-
Testing (hydrostatic pressure testing of pipeline, x-ray)	-	-	-
Backfilling and contouring	-	-	-
Control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	-	-	-
Clean-up and reclamation	-	-	-
Operation and maintenance of pipeline and control points			
Presence of pipeline and control points	-	-	-
Vehicle and equipment use	✓	✓	✓
Maintenance activities	✓	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	-	-	-

Table 11-6: Project interactions with economic opportunities			
Project activities/components	**Change in regional employment**	**Change in regional business**	**Change in regional economy**
Valve operation checks (annually)	-	-	-
Vegetation management	-	-	-
Decommissioning of pipeline and control points			
Mobilization and staff presence	✓	✓	✓
Vehicle and equipment use	✓	✓	✓
Pipeline disconnection (Isolate, purge, and cap off below grade)	-	-	-
Removal of above-ground components (dismantling, removal from site, disposal)	-	-	-
Rehabilitation	-	-	-
Clean-up and demobilization	-	-	-

✓= Potential interaction

– = No interaction

All project activities involve labour. For the purposes of this assessment, labour for all project activities during construction and decommissioning is considered under mobilization and staff presence, which includes general employment, the presence of the workforce, and their associated spending in the region. In the operations phase, these effect pathways are considered under maintenance activities, which also involve mobilization and the presence of workers in the region. Aside from vehicle and equipment use, other project activities are not expected to have any effects on economic opportunities.

11.5 Assessment of project effects

As presented in Section 11.1 (Summary of Conclusions), the project is expected to result in positive effects on economic opportunities. These effects are anticipated to be most pronounced during the construction phase for each of the potential effects assessed:

- Change in regional employment
- Change in regional business
- Change in regional economy

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 11-6, proposed mitigation measures, and the characterization of residual project effects.

11.5.1 Change in regional employment

11.5.1.1 Analytical assessment techniques

The assessment of project-related effects on regional employment considers direct, indirect, and induced employment opportunities resulting from the project in relation to regional labour force availability.

11.5.1.2 Effects pathways

The primary pathway through which the project may lead to a change in regional employment is through project activities that require labour and create job opportunities.

<u>Construction</u>

Construction of the project has the potential to generate both direct and indirect employment opportunities for the regional labour force.

Direct employment opportunities during construction may be generated through the hiring of residents of the LAA/RAA by Manitoba Hydro or its contractors to fill project-related positions (*i.e.,* mobilization and staff presence).

Construction activities for the project typically require skilled and unskilled labour for short-term employment. Construction employment will require education or trades certification, or applicable construction experience for some positions. Based on the planned construction schedule, up to 100 workers are anticipated to work on the project during peak construction, with an average of around 50. Potentially, additional work opportunities for the construction of other pipeline projects proposed by Manitoba Hydro can extend the job term of local employees if the projects' timelines coincide.

Direct employment opportunities on the project may include:

- Management and supervisory personnel (e.g., supervisor, foreperson)
- Pipeline inspection services (for signs of damage and potential risks to the pipeline)
- Equipment operators (e.g., heavy equipment, bulldozers, horizontal directional drills)
- Trades and apprentices (e.g., mechanics, technicians, welders)
- Semi-skilled and unskilled labour (e.g., labourer, mechanic's helper)
- Health and safety (e.g., health and safety coordinator)

Indirect and induced employment opportunities may result from the influx of the workforce into the LAA/RAA and project-related needs for goods (*i.e.,* materials) and services, which may place additional demands on existing businesses and potentially lead to increased hiring in response to those demands. Indirect employment may be generated within industries that supply intermediate components, such as raw materials. Induced employment, on the other hand, may be caused by an increase in household spending by direct and indirect workers coming from outside the LAA/RAA (e.g., on consumer products or restaurant services).

Operations

The project's operation and maintenance phase will also generate a demand for labour, as workforces will be mobilized whenever maintenance activities take place. Employment opportunities will include staff positions, operators, mechanical technicians, maintenance workers, patrollers, and equipment operators, depending on the tasks. The anticipated demand for labour during the operations and maintenance phase is anticipated to be smaller than during construction and decommissioning.

Decommissioning

The decommissioning phase of the project will also generate a demand for labour, with direct employment opportunities similar in nature to those generated during construction, such as management and supervisory roles, inspection services, equipment operators, health and safety, trades, and semi-skilled and unskilled labour.

11.5.1.3 Mitigation for change in regional employment

Given that the project has the potential to affect regional employment in a positive manner based on the pathways described above, Manitoba Hydro has identified the following mitigation measures, which focus on enhancing the potential benefits where possible:

- Manitoba Hydro will contact local municipal authorities, First Nations and the Manitoba Métis Federation representatives, prior to project start-up, to provide details about the upcoming project and associated employment and/or business opportunities for the region.
- Manitoba Hydro will continue to engage with First Nations and the Manitoba Métis Federation to understand contextual considerations related to training, employment and business opportunities on the project.
- Manitoba Hydro will continue to meet with First Nations and the Manitoba Métis Federation to discuss multiple projects in the region to support longer-term employment and business opportunities.
- Manitoba Hydro will continue to provide information to communities in the LAA/RAA on training, employment and business opportunities associated with project construction, operation and decommissioning.

11.5.1.4 Characterization of residual effects on regional employment

At the peak of construction, there will be approximately 200 workers performing project activities within the LAA/RAA. The source of the labour force, including the proportion that may be drawn from the regional labour force, remains uncertain until the procurement of construction contracting services has been completed. It is assumed that some of the skilled workforce required for the project will be filled by locals in the LAA/RAA, while another portion of the project's workforce will be comprised of non-local workers, particularly for specialized labour. Other factors, including contractor(s) use of preferred labour and the degree to which workers choose to seek employment with the project, will also affect the final composition of the project workforce. It is likely that employment benefits related to the project will be highly skewed toward the existing skilled trades workforce, with most construction positions comprised of skilled trades positions. As pipeline construction is likely to occur during unfrozen ground conditions, the number of people directly employed on the project is anticipated to be the largest in the late spring/summer.

The main intermediate component/material for the construction of the project is the 6-inch steel pipeline. It is anticipated that steel required for the pipeline will be purchased, manufactured into pipeline, and shipped in from outside the province, thereby not resulting in indirect employment within the LAA/RAA.

Induced employment related to the demand for services by the project workforce is most likely to cause increased demand for the retail trade and accommodation and food services industries, which account for 9.35% and 3.85% of the labour force in the LAA/RAA, respectively. The anticipated increase in demand for regional goods and services, along with the resulting benefits to employment, is expected to be greatest during construction, when the workforce and project spending are at their peak, and to occur to a lesser extent during operations and decommissioning.

The average workforce requirement during operations and maintenance activities is anticipated to be small. Depending on the nature of maintenance activities required, the number of workers may vary. Manitoba Hydro staff and contractors will be used, as required.

The effects are characterized as follows:

- Direction: Positive
- Magnitude:
  - Low to moderate during construction.
  - No measurable change during operations.
  - Low during decommissioning
- Geographic extent: LAA/RAA
- Duration:
  - Long-term during construction and decommissioning.
  - Short-term during operations and maintenance.
- Frequency:
  - Continuous during construction and decommissioning
  - Regular or irregular events during operations and maintenance, depending on the nature of the activities generating employment opportunities.
- Reversibility: Reversible

11.5.2 Change in regional business

11.5.2.1 Analytical assessment techniques

Project-related effects on regional business are assessed by considering the types and values of goods and services that project activities will require, as well as the availability and opportunity for those goods and services to be procured from businesses within the LAA/RAA.

11.5.2.2 Effects pathways

The main pathway through which the project may lead to a change in regional business is through the purchase of project-related goods and services from regional businesses.

<u>Construction</u>

During the construction phase, potential opportunities for businesses in the LAA/RAA may include subcontracting and providing goods and services required for project activities or by the project workforce. Examples include the provision of accommodations, parts supplies, fuel, meals, and vehicle and equipment repair and/or rental. These business opportunities directly relate to mobilization and staff presence as well as vehicle and equipment use (e.g., fuel, repairs).

Increased business revenue resulting from project spending in the LAA/RAA may support capital investment and hiring, thereby increasing capabilities and capacity within the region. Regional spending of wages by project workers will contribute to positive effects on regional business, primarily within the service sector, resulting in indirect economic benefits to businesses in the region.

<u>Operations</u>

On a smaller scale, there will also be the purchase of goods and services to support project operations. These business opportunities will occur periodically during routine inspections and maintenance activities through the same effect pathways as described for the construction phase (i.e., procurement of goods and services for the project and spending by project workers at regional businesses).

<u>Decommissioning</u>

Similar to construction, project decommissioning may generate regional business opportunities through subcontracting and spending on goods and services from regional businesses, including accommodations, parts supply, and vehicle and equipment repair and/or rental for project activities. This will have a positive effect on regional businesses, primarily within the service sector, resulting in indirect economic benefits to businesses in the LAA/RAA.

11.5.2.3 Mitigation for change in regional business

The mitigation measures identified in Section 11.5.1.3 to enhance positive effects on regional employment are also expected to enhance the anticipated positive effects on regional business.

11.5.2.4 Characterization of residual effects on regional business

The project is expected to have a positive effect on regional businesses as a result of project expenditures in the LAA/RAA.

During construction, contracting, or subcontracting opportunities related to right-of-way preparation and pipeline construction, as well as horizontal directional drilling, could result in short-term opportunities for businesses in the LAA/RAA. Although it is anticipated that the main material components required for the project, such as the steel for the pipeline, will be purchased and transported to the PDA from outside the region, service sector businesses operating in the LAA/RAA will experience induced economic benefits from the purchase of meals, fuel, and accommodation by workers. Incidental purchases of repairs and parts for construction vehicles and equipment, as well as the purchase of some materials required for construction, will also result in economic benefits for nearby businesses.

The industries anticipated to experience construction-related increases in business activity include retail trade, transportation and warehousing, accommodations and food services, and real estate, rental and leasing. According to Table 11-5, these four industries collectively employ approximately 15.6% of the regional workforce.

During the operations and maintenance phase and the decommissioning phase, increases in regional business are expected to continue, but at smaller magnitudes than during the construction phase, due to less extensive project activities, material needs, and workforce sizes. During operations, maintenance activities could include short-term contracts for activities such as vegetation management, valve operation checks, or ground pipeline patrols.

The effects are characterized as follows:

- Direction: Positive
- Magnitude:
    - Low during construction and decommissioning

    - No measurable change during operations and maintenance
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency:
    - Continuous during construction and decommissioning
    - Regular or irregular events during operations and maintenance
- Reversibility: Reversible

11.5.3 Change in regional economy

11.5.3.1 Analytical assessment techniques

Tax revenue is based on estimates of government tax revenue and contributions to the GDP resulting from the project.

11.5.3.2 Effects pathways

The main pathway through which the project may lead to a change in the regional economy is through the generation of government tax revenue.

<u>Construction</u>

Project expenditures during construction will lead to increased economic activity, including employment and procurement, as described in previous sections. The project's contribution to provincial and federal economies is measured by GDP (i.e., the value added after deducting the cost of intermediate goods and services). In addition to contributing to GDP, the project and its workers will be subject to varying levels of taxation, including income tax, provincial sales tax (PST), general sales tax (GST), and property tax, which collectively contribute to government revenues.

<u>Operations</u>

Any project-related spending during the operational phase will also have a positive effect on tax revenue for regional, provincial, and national economies.

<u>Decommissioning</u>

Similar to the construction phase, but on a smaller scale, decommissioning-related expenditures will result in increased economic activity, primarily through employment and procurement. In addition to contributing to GDP, the project and its workers will be subject to varying levels of taxation, including income tax, PST, and GST, which contribute to government revenues.

11.5.3.3 Mitigation for change in regional economy

The mitigation measures identified in Section 11.5.1.3 to enhance positive effects on regional employment are also expected to enhance the anticipated positive effects on the regional economy.

11.5.3.4 Characterization of residual effects on regional economy

Quantitative estimates of the project's contribution to GDP are not available. However, considering the low magnitude of characterizations of the project's effect regarding employment and business, its contribution to regional GDP is deemed to be low. At the provincial and federal levels, the project's contribution to GDP is considered to have no measurable change.

It is anticipated that the project will not have a measurable effect on regional government revenue. Indirectly, changes to property taxes are the pathway through which regional (i.e., municipal) government revenues could have an impact. Property tax revenues would only be affected if the project resulted in changes (i.e., increases) in the assessed value of lands traversed by the project. The presence of the right-of-way on the land will not change the taxation status of traversed properties (i.e., landowners will still own the land and be responsible for paying municipal property taxes), and it is not anticipated to affect assessed land values on which property tax amounts are based.

Benefits to provincial and federal tax revenues would occur when the taxable income of project workers increases, resulting in increased income tax revenue, as well as through the collection of PST and GST on goods and services purchased during the project's activities. Given the workforce size and work duration, the project's effects on provincial and federal tax revenues are expected to have no measurable change.

The effects are characterized as follows:

- Direction: Positive
- Magnitude: No measurable change
- Geographic Extent: LAA/RAA
- Duration: Long-term
- Frequency: Continuous
- Reversibility: Reversible

11.5.4 Summary of residual effects characterizations

Table 11-7 characterizes the residual effects on economic opportunities.

Table 11-77: Project residual effects on economic opportunities

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Change in regional employment						
Construction	P	L-M	LAA/RAA	LT	C	R
Operation		NC		ST	IR/R	
Decommissioning		L		LT	C	
Change in regional business						
Construction	P	L	LAA/RAA	LT	C	R
Operation		NC			IR/R	
Decommissioning		L			C	
Change in regional economy						
Construction	P	NC	LAA/RAA	LT	C	R
Operation						
Decommissioning						

11.5.5 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- The project has residual effects on the VC.
- A residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

The project is only expected to have positive or neutral residual effects on regional employment, business, or economy. Since no adverse residual effects are anticipated, further assessment of cumulative effects is not warranted.

11.6 Determination of significance

As discussed in Section 11.1.8, a significance determination is only made if the project is anticipated to have adverse residual effects. As summarized in Table 11-6, after the application of mitigation measures, no adverse residual effects are predicted for economic opportunities; therefore, a determination of significance is not required.

11.7 Prediction confidence

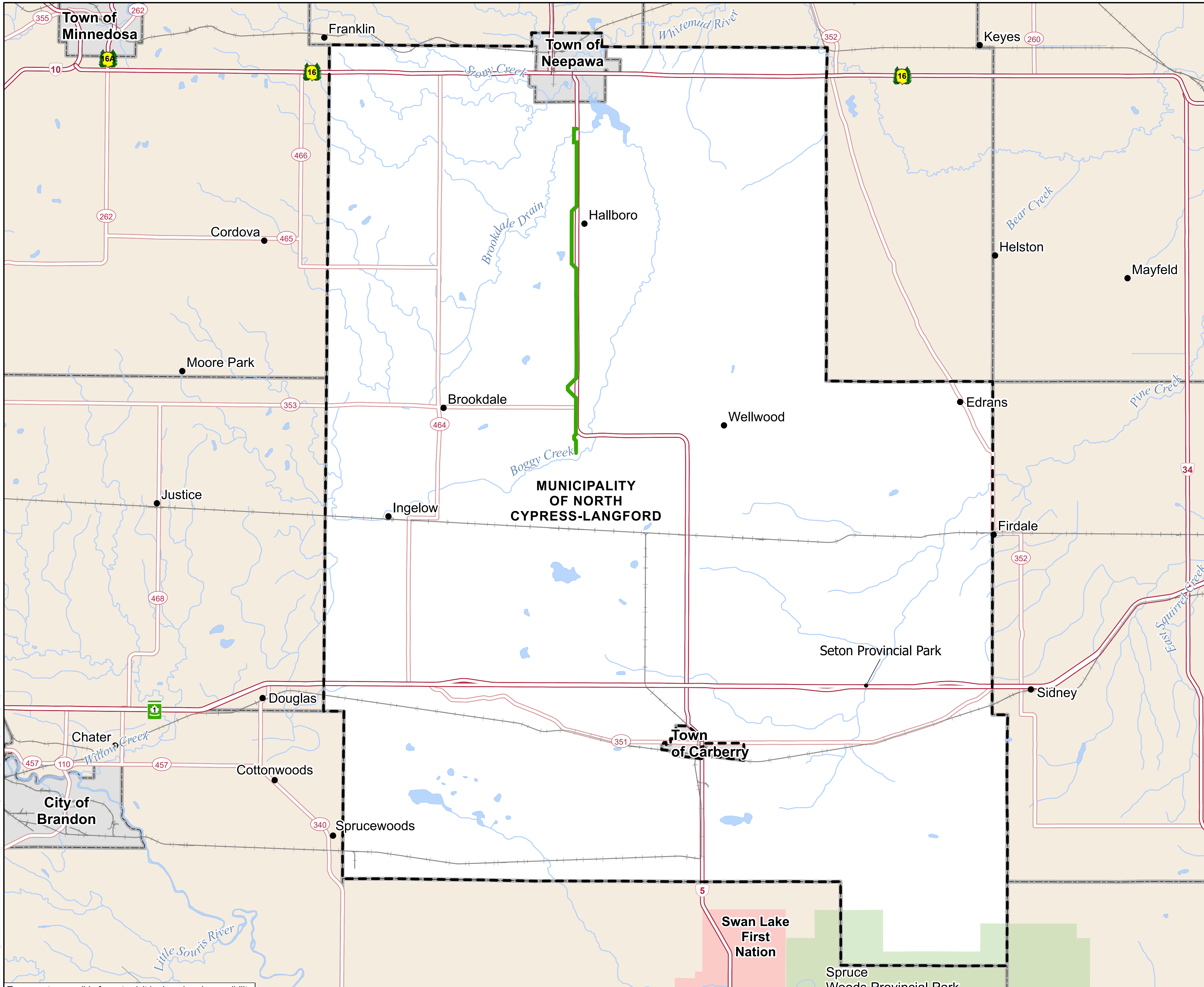
The prediction confidence in the assessment of effects on economic opportunities is moderate to high, based on professional judgment, the quality of publicly available data, and the past effectiveness of proposed mitigation measures. Limitations applicable to the assessment include the limited availability of detailed project costs and the expected source and composition of the labour force.

11.8 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up would be undertaken in pursuit of appropriate rehabilitation per the EPP (see Chapter 16).

Sensitivity to future climate change scenarios

The effects of climate change on economic opportunities are expected to be related to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding), which may result in more frequent infrastructure damage. This may result in the need for more frequent repair and maintenance work on the pipeline and associated components, leading to increased regional economic opportunities through project employment and procurement opportunities for local businesses.



Neepawa Gas Transmission Project

Project Infrastructure
- Final Preferred Route

Assessment Area
- Economic Opportunities and Infrastructure and Community Services Local and Regional Assessment Area

Landbase
- Community
- TransCanada Highway
- Yellowhead Highway
- Provincial Highway
- Provincial Road
- Railway
- Provincial Park
- First Nation Lands

Manitoba Hydro acknowledges that the Neepawa gas transmission line is located on Treaty 1 and Treaty 2 territory and on the traditional territories of the Anishinaabeg, Cree, and Dakota Peoples and the homeland of the Red River Métis.

Coordinate System: UTM Zone 14N NAD83
Data Source: MBHydro, ProvMB, NRCAN
Date: December 12, 2025

0 5 10 Kilometres
0 2.5 5 Miles
1:220,000

Spatial Boundaries for Economic Opportunities and Infrastructure and Community Services

Map 11-1

12.0Infrastructure and community services

Infrastructure and community services refer to the physical structures and facilities (e.g., highways, railways, water, and wastewater systems) as well as the services (e.g., emergency response and healthcare) that are essential for the operation of communities.

Infrastructure and community services was selected as a valued component (VC) because the project has the potential to increase the demand for, or interfere with, local and regional infrastructure and services.

12.1 Summary of conclusions

The Neepawa gas transmission project is anticipated to have adverse residual project effects on infrastructure and community services. The residual project effects include the following:

- Reduced availability of accommodations through project workers who may require temporary accommodations in the LAA/RAA.
- Increased traffic and strain on transportation infrastructure resulting from the transportation of workers, equipment and materials to the PDA.
- Strain on health and emergency response services due to the presence of temporary workers in the LAA/RAA who may need to access these services.
- Strain on waste management facilities through the generation of waste resulting from project activities and the influx of project workers.

The residual project effects on infrastructure and community services are anticipated to be most pronounced during the construction phase, as the workforce and intensity of project activities will be greater than in other phases.

Potential cumulative effects include increased traffic and strain on transportation infrastructure, as well as strain on waste management facilities should the timelines for project activities overlap with those of other projects in the regional area.

Adverse residual project and cumulative effects on infrastructure and community services are anticipated to be not significant. The project is not anticipated to disrupt, restrict, or degrade present infrastructure and community services to a point where activities cannot continue at or near baseline levels and for a period of time that continues beyond the construction phase. Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 12.1), including the scope/methods, baseline conditions, effects pathways, mitigation measures, and the analysis and characterization of residual project effects on infrastructure and community services.

This assessment has been influenced by engagement feedback and Manitoba Hydro’s experience with other projects in southern Manitoba, including the recent Dominion City to Altona gas transmission pipeline, and electrical transmission projects (*e.g.,* the Pointe du Bois to Whiteshell Transmission Project, and Dorsey to Wash’ake Mayzoon Transmission Project).

The assessment considers the following:

- Short-term accommodations
- Traffic and transportation
- Health and emergency response services
- Waste management facilities

12.2 Scope of the assessment

12.2.1 The project

The proposed project consists of the construction, operation, and decommissioning of a six-inch steel natural gas transmission pipeline and associated above-ground control structures. The new pipeline will be approximately 20 km in length, beginning at a control point located approximately 22.5 km south of Neepawa and terminating at another control point located approximately 3.5 km south of Neepawa. The project components are described in more detail in Chapter 2.0 (Project description).

12.2.2 Regulatory and policy setting

The following provincial laws, as well as associated regulations, policies, and guidelines, and Manitoba Hydro’s policies, were considered for assessing the project's effects on infrastructure and community services.

12.2.2.1 The Traffic and Transportation Modernization Act

The Traffic and Transportation Modernization Act is administered by Manitoba Transportation and Infrastructure and regulates provincial highway and road infrastructure, traffic, roadway speed limits, vehicle registration and license plates, license requirements for highway driving, vehicle and equipment standards, and prohibitions, offences, and penalties. Through this Act, Manitoba Transportation and Infrastructure reviews all applications for development permits on provincial roadways and reviews speed limit changes on all provincial roadways. The Act also allows local governments (i.e., municipalities and First Nations) to change speed limits on municipal and First Nation roads.

12.2.2.2 The Dangerous Goods Handling and Transportation Act

The Dangerous Goods Handling and Transportation Act and associated regulations outline the conditions and standards relating to the generation, handling, storage, transport and disposal of dangerous goods or hazardous waste. This Act and regulations will be applicable to the transportation and disposal of project-related hazardous wastes.

12.2.2.3 Municipal by-laws

By-laws relevant to the assessment of infrastructure and community services within the municipalities traversed by the project include the following:

- RM of North Cypress-Langford By-Law No. 02/2019, *Water By-law:* provides water rates for the Langford Water Utility.
- RM of North Cypress-Langford By-Law No. 03/2021, *Prevention and Control of Outdoor fires*: provides details on burning permit requirements, exemptions, restrictions and related penalties within the RM.
- RM of North Cypress-Langford By-Law No. 01/2024, *Waste and Recycling Special Service By-Law*: establishes rates for collection and transportation of solid waste and recyclable materials as a special service from 2024 to 2026.
- Town of Neepawa By-Law No. 2439, *Noise Control By-Law*: regulates and controls the timing and type of noise permitted within the town of Neepawa.
- Town of Neepawa By-Law No. 3155-16, *Traffic Control By-Law*: contains provisions for the control and regulation of traffic within the town of Neepawa.
- Town of Neepawa By-Law No. 3166-16, *Property Standards By-Law*: establishes standards of maintenance for dwellings and other structures, and regulates yards, nuisances, litter and derelict vehicles.
- Town of Neepawa By-Law No. 3174-17, *Reduced-Speed School Zones By-Law*: establishes reduced-speed school zones on municipal highways and provincial highways in the town of Neepawa.
- Town of Neepawa By-Law No. 3201-20, *Solid Waste and Recycling Regulations By-Law*: establishes the regulations for the collection of solid waste and recycling for the town of Neepawa.
- Town of Neepawa By-Law No. 3204-21, *Management and Regulation of Waterworks & Wastewater Systems By-Law*: involves the management and regulation of the water and wastewater systems in the town of Neepawa.

- Town of Neepawa By-Law No. 3217-22, *Water and Sewer Rates By-Law*: establishes water and sewer rates for the town of Neepawa's utility.

12.2.3 Consideration of engagement feedback

Project engagement (Chapter 4.0) actively sought to provide opportunities for concerned and interested parties to provide feedback on infrastructure and community services related to the project.

The following questions, concerns, and interests about the project regarding infrastructure and community services were raised during project engagement:

- Questions and interest in the ability to connect gas service to future properties in the project's area.
- Concerns about the potential impact of the pipeline project on future developments, hydroelectric distribution and road infrastructure.
- Questions about the potential impact of the construction of the pipeline on snowmobile routes and crossings.

12.2.4 Spatial boundaries

Three spatial boundaries are used to assess residual environmental effects of the project on infrastructure and community services:

- **Project development area (PDA):** the project footprint and anticipated area of physical disturbance during construction, operation, and decommissioning of the project. The PDA is described in detail in Chapter 2.0 (Project description). The total area of the PDA is 54.4 ha.
- **Local assessment area (LAA):** includes all components of the PDA and consists of the area of the administrative boundaries of the Municipality of North Cypress-Langford and the Town of Neepawa. The LAA is intended to encompass the communities with which the project may interact on infrastructure and community services.
- **Regional assessment area (RAA):** the RAA is the same as the LAA for the assessment of project effects on infrastructure and community services because the area is deemed to encompass a sufficiently broad area for assessing cumulative effects. The total area of the LAA/RAA is 177,129 ha.

Map 11-1 illustrates the spatial boundaries for the assessment of project effects on infrastructure and community services.

12.2.5 Temporal boundaries

The primary temporal boundaries for the assessment of project effects on infrastructure and community services are based on the timing and duration of project activities as follows:

- Construction – estimated to take approximately 12 months, beginning in the winter of 2027
- Operation and maintenance – estimated to be at least 50 years based on the pipeline's design life
- Decommissioning – estimated to occur within a one-year period once the project has reached the end of its serviceable life

12.2.6 Potential effects, pathways, and measurable parameters

The potential project effects on infrastructure and community services, along with effects pathways and measurable parameters, are outlined in Table 12-1.

Table 12-1: Potential effects, effects pathways, and measurable parameters for infrastructure and community services

Potential Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Reduced availability of accommodations	Influx of project workers may increase demand for accommodations in the region.	Availability of accommodations (e.g., inventory of rental properties) Anticipated workforce numbers
Increased traffic and strain on transportation infrastructure	Project-related traffic may increase the demand on transportation infrastructure, potentially increasing travel times, affecting road conditions, and causing (or being involved in) collisions.	Current capacity of highways and roads (PTHs and PRs) in the LAA/RAA Daily road traffic volume Anticipated project-related traffic volumes Qualitative assessment of the existing conditions of roads and highways, and the anticipated change due to heavy loads carried by trucks
Strain on health and emergency response services	Increased demand for health and emergency response services as a result of project activities and the influx of project workers	Capacity of health care and emergency response services Number of workers for each phase (construction, operations, and decommissioning)
Strain on waste management facilities	Increased pressure on waste facilities resulting from wastes generated by project activities	Tonnage and types of waste materials generated by the project that will be disposed of in local/regional facilities Capacity of local/regional waste disposal facilities

12.2.7 Residual effects characterization

Table 12-2 provides the specific quantitative measures and qualitative categories used to characterize the residual effects on infrastructure and community services.

Table 12-2: Characterization of residual effects on infrastructure and community services

Characterization	Quantitative Measure or Definition of Qualitative Categories
Direction – the long-term trend of the residual effect	**Positive –** a residual effect that moves measurable parameters in a direction beneficial to infrastructure and community services relative to baseline. **Adverse –** a residual effect that moves measurable parameters in a direction detrimental to infrastructure and community services relative to baseline. **Neutral –** no net change in measurable parameters for infrastructure and community services relative to baseline.
Magnitude - the amount of change in measurable parameters of the VC relative to existing conditions	**No measurable change –** no measurable change in the effect on infrastructure and community services can be noted **Low –** a measurable change to infrastructure and community services capacity, but services can take place at similar levels as under baseline conditions without strain **Moderate –** measurable change in infrastructure and services capacity, where services are under strain but can take place at similar levels as under baseline conditions **High –** measurable change in infrastructure and services capacity, where services and capacity are strained to a point that they cannot take place at similar levels as under baseline conditions

Table 12-2: Characterization of residual effects on infrastructure and community services

Characterization	Quantitative Measure or Definition of Qualitative Categories
Geographic Extent - the geographic area in which a residual effect occurs	**PDA –** residual effects are restricted to the PDA **LAA –** residual effects extend into the LAA **RAA –** residual effects extend into the RAA
Duration – the time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured or otherwise perceived	**Short-term –** the residual effect is restricted to the construction phase **Medium-term –** the residual effect extends through to completion of post-construction reclamation **Long-term -** the residual effect extends for the life of the project
Frequency - identifies how often the residual effect occurs and how often during the project or in a specific phase	**Single event** Multiple irregular event – occurs at no set schedule Multiple regular event – occurs at regular intervals Continuous – occurs continuously
Reversibility - pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases	**Reversible –** the residual effect is likely to be reversed after activity completion and reclamation Irreversible – the residual effect is unlikely to be reversed

12.2.8 Significance definition

For this assessment, adverse residual effects on infrastructure and community services are considered significant if, following the application of mitigation and management measures, the proposed project disrupts, restricts, or degrades present infrastructure and community services to a point where activities cannot continue at or near baseline levels and for a period of time that continues beyond the construction phase (*i.e.,* into operations and/or decommissioning).

12.3 Existing conditions

Baseline information for this assessment was gathered through a detailed review of available desktop data. The existing conditions described in this section focus on:

- Short-term accommodations
- Transportation infrastructure
- Healthcare, emergency, and social services
- Waste management

12.3.1 Short-term accommodations

According to Airbnb, as of November 2025, there are four listings available in the LAA/RAA, including entire apartments, bungalows and houses, primarily located in Neepawa (Airbnb, 2025). There are also two listings on TripAdvisor for hotels in the LAA/RAA, also located in Neepawa (TripAdvisor, 2025).

12.3.2 Transportation infrastructure

12.3.2.1 Road transportation

The PDA can be accessed through PTHs and PRs. Most rural areas within the RAA are also connected by a square-mile grid of gravel or earth roads, maintained by each municipality. The highways and roads in the RAA are detailed below.

There are several PTHs and PRs that are crossed or paralleled by the PDA:

- PTH 5 – partly Roads and Transportation Association of Canada (RTAC) route, majority Class A1 highway, running south from the town of Neepawa, parallel to the PDA.
- PR 353 - majority Class B1 provincial route, running east-west through the PDA approximately 2,5 km from the south end of the pipeline.
- PR 465 - majority Class B1 provincial route, running east-west through the PDA approximately 9 km from the south end of the pipeline.

Other PTHs and PRs that traverse the LAA/RAA, but not the PDA, include:

- Trans-Canada Highway 1- travels east-west, south of the PDA in the RM of North Cypress-Langford.
- Trans-Canada Highway 16- travels east-west, north of the PDA in the RM of North Cypress-Langford.

- PR 351 - majority Class B1 provincial route, running east-west, south of the LAA/RAA.
- PR 464 - majority Class B1 provincial route, running north-south through the LAA/RAA.

Table 12-3 includes current daily traffic volumes for provincial trunk highways and provincial roads with monitoring sites located in the LAA/RAA.

Table 12-3: Current traffic volumes on provincial trunk highways and provincial roads in the LAA/RAA

Road or highway	Highway section/location	Current volume of vehicles/day for annual average daily traffic
TCH 1	East of PTH 5	3,170 – 6,310
TCH 16	2.5 km west of JCT PTH 5	3,130 – 3,370
PTH 5	South of PR 353	700 – 990
PR 351	East of PTH 5	420 – 560
PR 353	1.0 km east of PR 464	160 – 280
PR 464	South of PTH 16	130 – 170
PR 465	West of PR 464	30 – 40

Source: University of Manitoba and Manitoba Infrastructure, 2019

Rail transportation

The Canadian Pacific and CN main railway lines intersect the LAA/RAA of the project, both running east-west. The former crosses the northern side of the LAA/RAA, and the latter crosses the southern side (CN eBusiness, n.d.). The proposed project's activities (see Chapter 2.0) do not include the use of rail transportation infrastructure in the RAA.

12.3.2.2 Air transportation

There are no official Nav Canada-certified airports within the LAA/RAA of the project (Government of Canada, n.d.). The project activities (Chapter 2.0) do not include the use of air transportation infrastructure in the RAA.

12.3.3 Healthcare, emergency, and social services

The Prairie Mountain Health Regional Authority serves the RAA, which provides full-time ambulance service to the Town of Neepawa. The closest 24/7 emergency service in the RAA is the Neepawa Health Centre in the Town of Neepawa. Additionally, a new health centre is under construction east of Neepawa, with an estimated opening to the public in early 2027, providing emergency and healthcare services. Other health facilities in the Town of Neepawa include home care, mental health services, primary care, and public health services provided by the local health unit. Additionally, Country Meadows Personal Care Home Services is also active in the same area, offering a range of home care programs (Prairie Mountain Health; Town of Neepawa, n.d.).

In terms of fire protection services in the RAA, the North Cypress-Langford Fire Department provides emergency services to the RM of North Cypress-Langford, drawing from a team of volunteers (RM of North Cypress-Langford, n.d). The Town of Neepawa also has a volunteer fire department, which provides services to oversee controlled burns in addition to fire emergency services within the town (Town of Neepawa, n.d.).

12.3.4 Waste management

Within the RAA, the Town of Neepawa's sanitary sewer system is managed by a three-cell lagoon, which provides wastewater treatment to the residents (Town of Neepawa, n.d.).

For the period from 2025 to 2027, OSS Waste Disposal Ltd. provides recycling and garbage collection services to the Town of Neepawa (Town of Neepawa, n.d.). The RM of North Cypress-Langford has two solid waste transfer stations. One is located east of Carberry, approximately 18 km south-west of the south end of the PDA, and the other is situated at Fairview, just north of the Trans-Canada Highway on Road 84W, approximately 15 km south of the south end of the PDA. Additionally, there is one drop-off location, north of Highway 16 on Road 86W, within the municipality for residents to dispose of their garbage (North Cypress-Langford, n.d.).

12.4 Project interactions with infrastructure and community services

Table 12-4 identifies, for each potential effect, the project activities that might interact with infrastructure and community services and result in the identified effect.

Table 12-4: Project interactions with infrastructure and community services

Project activities/components	Reduced availability of accommodations	Increased traffic and strain on transportation infrastructure	Strain on health and emergency response services	Strain on waste management facilities
Construction of pipeline and control points				
Mobilization and staff presence	✓	✓	✓	✓
Vehicle and equipment use	–	✓	✓	–
Access development	–	–	-	-
Marshalling yards (temporary work or storage areas)	–	–	–	–
Right-of-way preparation – flagging, clearing of vegetation, topsoil stripping	–	–	–	-
Pipe stringing (including welding, coating)	–	–	–	✓
Pipe installation – trenching and lowering	–	–	–	–
Horizontal directional drilling	–	–	–	✓
Testing (hydrostatic pressure testing of pipeline, x-ray)	–	–	–	–
Backfilling and contouring	–	–	–	–
Control points (including temporary bypass and hot tap installations, fencing, compaction of subsoil, and gravel application)	–	–	–	–
Clean-up and reclamation	–	–	–	✓
Operation and maintenance of pipeline and control points				
Presence of pipeline and control points	–	–	–	–
Vehicle and equipment use	–	✓	✓	–

Table 12-4: Project interactions with infrastructure and community services

Project activities/components	Reduced availability of accommodations	Increased traffic and strain on transportation infrastructure	Strain on health and emergency response services	Strain on waste management facilities
Maintenance activities	✓	–	✓	✓
Ground pipeline patrols - depth of cover surveys, cathodic protection monitoring, leak surveys (every 5 years)	–	–	–	–
Valve operation checks (annually)	–	–	–	–
Vegetation management	–	–	–	-
Decommissioning of pipeline and control points				
Mobilization and staff presence	✓	✓	✓	✓
Vehicle and equipment use	–	✓	✓	–
Pipeline disconnection (Isolate, purge, and cap off below grade)	–	–	–	–
Removal of above-ground components (dismantling, removal from site, disposal)	–	–	–	✓
Rehabilitation	–	–	–	–
Clean-up and demobilization	–	–	–	✓

✓= Potential interaction

– = No interaction

12.5 Assessment of project effects

As presented in Section 12.1 (Summary of conclusions), the project is anticipated to result in adverse residual effects on infrastructure and community services. These residual effects are anticipated to be negligible to low in magnitude and most pronounced during the construction phase of the project for each of the potential effects assessed:

- Reduced availability of accommodations
- Increased traffic and strain on transportation infrastructure
- Strain on health and emergency response services
- Strain on waste management facilities

This section presents the assessment of project effects undertaken for each of the potential effects identified above, including the analytical assessment techniques, effects pathways for the interactions identified in Table 12-5, proposed mitigation measures, and the characterization of residual project effects.

12.5.1 Reduced availability of accommodations

12.5.1.1 Analytical assessment techniques

Project-related changes to the availability of short-term accommodations are assessed by considering pre-project inventory levels for temporary accommodations in the LAA/RAA in relation to the number of project workers who may require accommodations.

12.5.1.2 Effects pathways

<u>Construction</u>

During construction, the influx of project workers and contractors may increase demand for short-term accommodations through patronage, thereby reducing the availability of temporary accommodations for local and non-local individuals (e.g., tourists) in the LAA/RAA.

Given that tourism is not a major economic driver in the LAA/RAA (see Chapter 11 – Economic opportunities), it is not anticipated that there will be a high level of competition for temporary accommodations in the LAA/RAA.

As discussed in Section 12.2.1, there are approximately six temporary accommodations in the LAA/RAA. The estimated workforce at peak construction is 100 workers.

Operations

The availability of accommodations may also be reduced during the operational phase of the project, as well as during maintenance and inspection activities, if more than one day of work is required and workers must stay overnight in the LAA/RAA.

Decommissioning

The availability of accommodations may also be reduced during decommissioning due to the mobilization and presence of staff and contractors working on decommissioning activities. The workforce during the decommissioning phase is expected to be smaller than during construction, resulting in a lower demand for short-term accommodations during decommissioning compared to construction.

12.5.1.3 Mitigation for reduced availability of accommodations

Mitigation for reduced availability of accommodations involves:

- If the demand for short-term accommodations exceeds the availability in the RAA, Manitoba Hydro will work with the contractor to identify alternative solutions, such as seeking accommodations in neighbouring or nearby municipalities, towns, or cities with availability.

12.5.1.4 Characterization of residual effects on reduced availability of accommodations

The need for short-term accommodations will be better understood after a contractor has been hired and the distribution of the workforce (local vs. non-local) is known.

Following the implementation of mitigation measures described above, residual effects for reduced availability of accommodations are characterized as follows:

- Direction: Adverse
- Magnitude: No measurable change (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular events, as different work crews may mobilize for different project activities of varying durations
- Reversibility: Reversible

12.5.2 Increased traffic and strain on transportation infrastructure

12.5.2.1 Analytical assessment techniques

Project-related increases to traffic and strain on transportation infrastructure are assessed by quantitative consideration of the current capacity of PTHs and PRs in the LAA/RAA, their daily traffic volumes in relation to anticipated project-related traffic volumes, and though the qualitative consideration of the conditions of existing roads and highways and the manners in which the project vehicles and equipment travelling in the area may change those conditions.

12.5.2.2 Effects pathways

<u>Construction</u>

The assessment of potential project effects on traffic and transportation infrastructure focuses on the movement of workers, materials, and equipment to and from the project site along PTHs and PRs, as discussed in Section 1.3.2 PTH 5 is likely to be utilized the most by construction crews to access the right-of-way (*i.e.,* PDA) during construction, given that the PDA runs parallel to PTH 5.

Project construction is anticipated to directly increase road traffic due to the presence of up to 50 project-related vehicles (*e.g.,* cars, pickup trucks, and heavy trucks and equipment) per day (*i.e.,* up to one vehicle per two workers at the peak of construction), which will be needed to transport people (*i.e.,* project workers/contractors and service providers), materials, and equipment to, from, and throughout the PDA. Adverse impacts on road infrastructure could occur due to:

- An increase in vehicles travelling on the roads in the RAA.
- A change in the type and weight of vehicles that will be on the road (e.g., heavy trucks with construction materials and equipment).
- An increase in utilization (*e.g.,* wear and tear) of roads.

<u>Operations</u>

Operations will also involve project-related traffic travelling in the LAA/RAA and have the potential to result in the same impacts to road infrastructure as during the construction phase. However, due to the smaller workforce and infrequent activities during the operation phase of the project, only a small number of vehicles and equipment (approximately 2 – 4) will be in the LAA/RAA for short, isolated periods of time.

Decommissioning

The effects of the project on traffic and strain on transportation infrastructure during the decommissioning phase are anticipated to be similar to those during the operation phase, given the smaller workforce and infrequent activities anticipated during the decommissioning phase. A smaller number of vehicles and equipment (approximately 2 – 4) will be in the LAA/RAA for short, isolated periods of time.

12.5.2.3 Mitigation for increased traffic and strain on transportation infrastructure

Mitigation for increased traffic and strain on transportation infrastructure includes:

- All materials transported by truck will be compliant with any weight restrictions or permits, spring road restrictions, or geometric constraints set out by Manitoba Transportation and Infrastructure or municipal governments.
- Vehicles transporting dangerous goods or hazardous products will display required placards and labelling in accordance with provincial legislation and Manitoba Hydro guidelines.
- Manitoba Hydro will work with local authorities to address any damage to roads that occurs because of the project.

These mitigation measures will support addressing concerns received during engagement about the potential impacts of the project on the existing transportation infrastructure, including conflicts with future road infrastructure projects and snowmobile transportation and crossings.

Manitoba Hydro will also obtain the following permits, as applicable, from Manitoba Transportation and Infrastructure, as per the *Traffic and Transportation Modernization Act*:

- Permit for construction above or below ground that falls within 250 feet of a PTH or 150 feet of a PR.
- Permit to construct, modify, or relocate an access or intensify its use.
- Permit to place any structures (including access driveways) on, under, or above the ground within 28.1 meters of the edge of the highway right-of-way.
- Permit to place any plantings within 15 meters of the edge of the highway right-of-way.
- Discharge water or other liquid materials into the ditch on any highway rights-of-way.

12.5.2.4 Characterization of residual effects on increased traffic and strain on transportation infrastructure

Predicted residual effects of increased traffic and strain on transportation infrastructure include higher traffic on roads adjacent to the PDA, resulting from the influx of workers and equipment travelling to and from the project site, especially during construction.

Following the implementation of mitigation measures described above, residual effects for increased traffic and strain on transportation infrastructure are characterized as follows:

- Direction: Adverse
- Magnitude: Negligible (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular events, as different work crews may mobilize for different project activities of varying durations
- Reversibility: Reversible

12.5.3 Strain on health and emergency response services

12.5.3.1 Analytical assessment techniques

Project-related increases in the strain on health and emergency response services are assessed by considering the number of workers that the project will bring to the area during construction, operations, and decommissioning, as well as the current capacity of healthcare and emergency response services in the LAA/RAA.

12.5.3.2 Effects pathways

<u>Construction</u>

The influx of a temporary workforce has the potential to place additional demand (i.e., strain) on the available capacity of local health and emergency response services in the LAA/RAA. The project activities that involve an increase in non-local workers and/or increased use of vehicles and equipment in the area may result in increased strain on health and emergency response services due to the inherent increase in risk for injuries, illnesses, and/or accidents.

It is anticipated that up to 100 workers will be present during the peak of construction. If some of the workforce is hired locally, those individuals would already be accessing local health and emergency response services and would therefore contribute less incremental strain than non-local workers visiting the area exclusively to work on the project.

Operations

Given the small workforce and infrequent activities during the operation phase of the project, the potential effect on health and emergency response services may occur if more than one day of work is required and workers must stay overnight in the LAA/RAA.

Decommissioning

There is potential for the workforce during the decommissioning phase to place additional demand on the capacity of local health and emergency response services in the LAA/RAA, similar to the construction phase, but to a lesser extent, given the smaller workforce.

12.5.3.3 Mitigation for strain on health and emergency response services

Mitigation measures for strain on health and emergency response services include:

- An Emergency Response Plan will be developed. As part of the development and implementation, Manitoba Hydro will collaborate with local emergency responders to ensure timely emergency response times. Project personnel will be made aware of the plan, and designated staff will receive training. Among other elements, the plan will address handling and storage of materials, driving safety, animal encounters, emergency response communications, spill response, personnel injury response, and vehicle collisions.
- Project contractors will have first aid at project sites to provide services to project workers/contractors.
- As part of ongoing project engagement, Manitoba Hydro will continue to engage with and share project information with local governments.

12.5.3.4 Characterization of residual effects on strain on health and emergency response services

The potential for strain on health and emergency response services is anticipated to be the most pronounced during construction, as this phase will bring the highest number of temporary workers into the RAA.

Based on the estimated increase in the number of temporary individuals in the area (up to 100 project workers), in comparison to the population currently serviced by the health and emergency response services in the area (see Section 5.9, Communities and population), it is anticipated that health and emergency services in the area will be able to accommodate the increased demand that may result from the project. It is anticipated that some of the workforce will be local, meaning people who already use the health and emergency response services in the area.

After the application of mitigation measures, the residual effects of the project on health and emergency response services are predicted to be:

- Direction: Adverse
- Magnitude: No measurable change (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular
- Reversibility: Reversible

12.5.4 Strain on waste management facilities

12.5.4.1 Analytical assessment techniques

The assessment of potential strain on waste management facilities focuses on the quantity and types of waste generated by the project that will be disposed of in local/regional disposal facilities, as well as the capacity of these facilities.

12.5.4.2 Effects pathways

<u>Construction</u>

During the construction phase, the project-related influx of workers, materials, and equipment to the LAA/RAA is anticipated to result in increased consumption of goods and materials as well as associated waste generation, which could strain the existing waste management facilities in the LAA/RAA. In addition to the mobilization and presence of staff, project activities that may generate waste during construction include horizontal directional drilling, pipe stringing, and clean-up and demobilization.

Drilling fluid waste will be produced during horizontal directional drilling. Construction of the pipeline will also involve the production of steel shavings and pieces of steel pipe as waste during pipe stringing.

The generation of hazardous wastes due to the project is anticipated to be related to accidents and malfunctions such as hydrocarbon spills (Chapter 15.0). Hazardous waste is disposed of at licensed facilities.

Operations

During operations, solid waste that may be produced by staff, maintenance activities, and vegetation management will ultimately be disposed of at local waste disposal facilities. This may occur if more than one day of work is required and workers must stay overnight in the LAA/RAA.

Decommissioning

The decommissioning phase is anticipated to have similar effects on waste management facilities to the construction phase of the project. Additionally, the removal of above-ground components (*e.g.,* control points) is likely to generate waste that may be disposed of in the LAA/RAA, thereby increasing the strain/demand on existing waste management facilities.

12.5.4.3 Mitigation for strain on waste management facilities

Mitigation for the strain on waste management facilities involves:

- Manitoba Hydro and its contractors will utilize Waste and Recycling Management Plans to manage waste and recycling in accordance with The Public Health Act and The Dangerous Goods Handling and Transportation Act. This plan outlines policies related to reducing the amount of solid waste generated, facilitating recycling wherever possible, and storing, transporting, and disposing of solid waste at designated facilities.
- Drilling fluid waste will be managed in accordance with Manitoba Hydro's contractor environmental responsibilities (CER) related to directional drilling, which requires that all drilling fluids and waste materials, including drill cuttings, be collected and properly disposed of at an approved location, and under no circumstances drained into waterbodies, riparian areas, or wetlands.
- Subject to suitable soil conditions and drainage, and compliance with The Public Health Act and/or The Environment Act, wastewater will be transported to an appropriate wastewater facility.

12.5.4.4 Characterization of residual effects on strain on waste management facilities

The potential for strain on waste management facilities is anticipated to be most pronounced during construction, as this phase will be associated with waste generation from the highest potential number of project workers, use of the greatest volume of materials, and the most activities that may generate waste.

After the application of mitigation measures, the residual effects of the project on waste management facilities are predicted to be:

- Direction: Adverse
- Magnitude: No measurable change (during operations) to low (during construction and decommissioning)
- Geographic extent: LAA/RAA
- Duration: Long-term
- Frequency: Multiple irregular
- Reversibility: Reversible

12.5.5 Summary of residual effects characterization

Table 12-5 characterizes the residual effects on infrastructure and community services.

Table 12-5: Project residual effects on infrastructure and community services

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Reduced availability of accommodations						
Construction	A	L	LAA/RAA	LT	IR	R
Operation		NC				
Decommissioning		L				
Increased traffic and strain on transportation infrastructure						

Table 12-5: Project residual effects on infrastructure and community services

Residual Effects Characterization						
Project Phase	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility
Construction		L				
Operation	A	NC	LAA/RAA	LT	IR	R
Decommissioning		L				
Strain on health and emergency response services						
Construction		L				
Operation	A	NC	LAA/RAA	LT	IR	R
Decommissioning		L				
Strain on waste management facilities						
Construction		L				
Operation	A	NC	LAA/RAA	LT	IR	R
Decommissioning		L				

12.5.6 Cumulative effects

The assessment of cumulative effects is initiated with a determination of whether two conditions exist:

- the project has residual effects on the VC, and
- a residual effect could interact with residual effects of other past, present, or reasonably foreseeable future physical activities.

If either condition is not met, further assessment of cumulative effects is not warranted because the project does not interact cumulatively with other projects or activities.

For the assessment of project effects on infrastructure and community services, both above conditions exist, and a cumulative effects assessment is therefore presented in this section.

12.5.6.1 Project residual effects likely to interact cumulatively

Table 12-6 shows the project and physical activities inclusion list, which identifies other projects and physical activities that might act cumulatively with the project to impact infrastructure and community services. Where residual effects from the project act cumulatively with residual effects from other projects and physical activities, a cumulative effects assessment is carried out.

Table 12-6: Potential cumulative effects on infrastructure and community services

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects			
	Reduced availability of accommodations	Increased traffic and strain on transportation infrastructure	Strain on health and emergency response services	Strain on waste management facilities
Past and ongoing projects and activities				
Domestic resource use (e.g., hunting, trapping, fishing, non-commercial agriculture)	-	-	-	-
Recreational activities (e.g., canoeing, snowmobiling, hiking)	-	-	-	-
Industrial and commercial resource use, including commercial agriculture	-	-	-	-
Existing infrastructure (non-Manitoba Hydro) such as roads, railways, telecommunication lines, pipelines, water and wastewater treatment facilities	-	-	-	-

Table 12-6: Potential cumulative effects on infrastructure and community services

Other projects and physical activities with potential for cumulative environmental effects	Potential cumulative environmental effects			
	Reduced availability of accommodations	Increased traffic and strain on transportation infrastructure	Strain on health and emergency response services	Strain on waste management facilities
Existing Manitoba Hydro hydroelectric and natural gas infrastructure	-	-	-	-
Residential and institutional developments	-	✓	-	✓
Future projects and activities				
Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony	-	✓	-	✓
Residential and institutional developments	-	✓	-	✓

✓ = Other projects and physical activities whose residual effects are likely to interact cumulatively with project residual environmental effects.

– = Interactions between the residual effects of other projects and those of the project residual effects are not expected.

The residual project effects are not anticipated to cumulatively interact with ongoing or future projects and activities, affecting the availability of short-term accommodations or straining health and emergency response services, as they are not expected to result in a notable influx of non-local individuals into the RAA during the project period.

12.5.6.2 Cumulative effect on increased traffic and strain on transportation infrastructure

The assessment of the cumulative effects of increased traffic and strain on transportation infrastructure, which may result from the project in combination with other projects and activities, including pathways to effect and mitigation measures, is described below.

12.5.6.3 Pathways for cumulative effect

Cumulative effects on increased traffic and strain on transportation infrastructure due to the combination of the project activities with the ongoing and future residential and institutional developments, and the Domestic Wastewater Lagoon and Livestock Slaughter Facility construction, as identified in Table 12-6, relate to the need for transportation of workers, materials, and equipment during the development of these projects. Specifically, with the construction of the Domestic Wastewater Lagoon and Livestock Slaughter Facility for Sprucewood Colony, which is located approximately 2 km southwest of the existing Neepawa Primary Gate Station, where the new gas pipeline would initiate, there may be a more noticeable cumulative effect compared to the rest of the PDA, due to the proximity of the projects.

12.5.6.4 Mitigation measures

The mitigation measures identified in the section 12.5.2.3 will also apply to the cumulative effects of traffic and transportation infrastructure.

12.5.6.5 Residual cumulative effect

With the implementation of mitigation measures identified to address the increase in traffic and strain on transportation infrastructure, this project, in combination with other ongoing and future projects, is expected to contribute minimal cumulative effects on infrastructure and community services, anticipated to be of non-measurable magnitude. The anticipated cumulative effects will be long-term (during the project's lifespan) and occur on a continuous basis throughout the RAA while activities/project activities overlap but will be reversible after decommissioning.

12.5.6.6 Cumulative effect on strain on waste management facilities

The assessment of the cumulative effects of strain on waste management facilities, which may result from the project in combination with other projects and activities, including pathways to effect and mitigation measures, is described below.

12.5.6.7 Pathways for cumulative effect

Cumulative effects resulting in strain on waste management facilities may result from the combination of the project activities with ongoing and future residential and institutional developments, and the Domestic Wastewater Lagoon and Livestock Slaughter Facility, as identified in Table 12-6. Pathways relate to the need for waste disposal during the projects, particularly during construction when construction schedules overlap. In general, the activities undertaken for the projects and the presence of workers in the area may produce a cumulative effect due to the generation of diverse types of waste that will need to be disposed of in the management facilities in the LAA/RAA.

12.5.6.8 Mitigation measures

The mitigation measures identified in the section 12.4.3 apply to the cumulative effects of the strain on waste management facilities.

12.5.6.9 Residual cumulative effect

With the implementation of mitigation measures identified to address the strain on waste management facilities, this project, in combination with other ongoing and future projects, is expected to have minimal cumulative effects on waste management facilities in the area.

The anticipated cumulative effects are anticipated to be of a non-measurable magnitude, be long-term (during the project's lifespan), potentially affecting waste management services throughout the RAA, and occur on a continuous basis when project schedules overlap but be reversible after decommissioning.

12.5.7 Determination of significance

With mitigation and environmental protection measures, the residual effects on infrastructure and community services are predicted to be no significant. The proposed project is not anticipated to disrupt, restrict, or degrade existing infrastructure and community services to a point where activities cannot continue at or near baseline levels for a period that extends beyond the construction phase (*i.e.,* into operations and/or decommissioning).

12.5.8 Prediction confidence

The prediction confidence in the assessment of effects on infrastructure and community services is moderate, based on the data collected for this assessment and an understanding of project pathways and effects from comparable past projects. Prediction confidence is based on the information compiled during desktop-based data compilation, engagement feedback, and an understanding of project activities, location, and schedule

12.5.9 Follow-up and monitoring

Due to confidence in predictions and monitoring results from Manitoba Hydro's other similar projects in Manitoba, a comprehensive environmental monitoring plan has not been proposed for this project. However, if environmental inspections identify unexpected effects, monitoring and follow-up will be undertaken in pursuit of appropriate rehabilitation, as per the EPP (see Chapter 16).

Sensitivity to future climate change scenarios

The effects of climate change on infrastructure and community services are expected to be related to the anticipated increase in temperature, changes in precipitation patterns, and associated extreme weather events (e.g., flooding).

Higher temperatures, extreme weather events, and changes in precipitation patterns can lead to increased wear and tear on infrastructure. Roads, bridges, buildings, and other critical infrastructure may suffer from increased deterioration and damage due to flooding, erosion, and freeze-thaw cycles. Altered precipitation patterns can also potentially affect water treatment and supply systems.

Extreme weather events, including heatwaves, storms, and wildfires, can strain healthcare facilities and emergency response services and potentially affect the health and well-being of communities (Chapter 10.0).

13.0Climate and greenhouse gases

This chapter and associated Appendix D (Greenhouse gas assessment report) address Manitoba Environment and Climate (2023)'s requirement for the description of potential effects of the development encompassing climate change implications, including a greenhouse gas (GHG) inventory calculated according to guidelines developed by Environment Canada (2021) and the United Nations (IPCC 2019).

Manitoba Hydro remains committed to continuing our work on climate change and adapting our processes to ensure Manitobans' energy expectations are met in the future. Over 99% of the electricity Manitoba Hydro produces is from non-fossil generation sources and our electrical system will be required to support additional electrification in Manitoba. While reducing fossil fuel use is necessary, a key learning from Manitoba Hydro's integrated resource planning is that the strategic use of natural gas, by both industry and for home heating, supports an affordable pathway to net-zero in Manitoba. The proposed project consists of the construction and operation of an approximately 20 km, 6-inch steel natural gas pipeline and two control points, south of Neepawa, in the RM of Langford-North Cypress. The project's objective is to provide natural gas transmission capacity to meet growing customer demand and support near-term approved and planned developments in the Neepawa area.

The following sections outline projections of how climate in the area may change in the future and provide a summary of the GHG assessment undertaken for the project. Chapter 5 (Environmental setting) includes a description of historic climate conditions. In addition, each valued component (VC)'s assessment chapter includes a discussion about sensitivity to climate change scenarios (see Sections 6.5.7 [Important sites]; 7.5.8 [Vegetation]; 8.5.8 [Wildlife and wildlife habitat]; 9.5.8 [Commercial agriculture]; 10.5.8 [Human health risk]; 11.5.9 [Economic opportunities]; and 12.5.10 [Infrastructure and community services]). There was no feedback related to climate change and GHGs during project engagement.

13.1 Future climate

Climate is the long-term pattern of weather for a specific area, and it plays an important role in multiple aspects of the proposed project. For example, the design and operation of natural gas installations can be affected by ambient temperatures and frost heaving. Extreme climate events such as snow accumulation and prolonged heat exposure can impact pipe loading and the integrity of pressure vessel systems.

In summary, there is reasonable agreement among simulations that the future climate for the project area will be warmer than historic conditions, with more precipitation, on average, during winter and spring seasons. Although there is also some agreement regarding changes in other climatic variables (e.g., reduced mean annual wind speeds), there is generally lower scientific confidence regarding these changes.

Global Climate Models (GCMs) driven by future greenhouse gas emission scenarios are used to project how Earth's climate may evolve in the future. Forty-two simulations from 14 GCMs and three GHG emission scenarios (Shared Socioeconomic Pathways; SSP2-4.5, SSP3-7.0, SSP5-8.5; Riahi et al., 2017) provide the basis for the assessment herein which utilize the latest GCM datasets (i.e., from the Coupled Model Intercomparison Project phase 6; CMIP6; Eyring et al., 2016). For temperature and precipitation projections, we rely on an ensemble of simulations known as ESPO-G6-R2 (Lavoie et al., 2024) which have been downscaled and bias-adjusted by the Ouranos Consortium. For other variables (evaporation, runoff, windspeed, and soil moisture), we rely on projected changes derived from the raw CMIP6 GCM data. Agreement among GCM projections is assessed in accordance with the Sixth Assessment Report (AR6) published by the Intergovernmental Panel on Climate Change (IPCC; Gutiérrez et al., 2021), where high model agreement corresponds to cases where 80% or more of the ensemble agrees on the sign of projected change. This simple measure of agreement can provide some additional context to characterize the climate change signals.

Tables 13-1 and 13-2 and text below characterize projections specific to a grid point near Neepawa, Manitoba for two future scenarios that align with Global Warming Levels (GWL) of +1.19°C and +2.19°C above the 1981-2020 period. Relative to pre-industrial conditions (e.g., the 1850-1900 period in IPCC studies) these two scenarios correspond to GWLs of approximately +2° and +3°C. Although the specific time period in which a GCM simulation realizes a given GWL varies from model to model, the ensemble median of GCMs projects the +1.19°C GWL scenario to be realized in the 2026-2065 period, and the +2.19°C GWL scenario to be realized in the 2048-2087 period. Projected changes (often referred to as deltas) indicate how the overall long-term climate may differ from the reference period, so information presented in this section can be complementary to historic climate normals presented in Section 5.2.1. Note that Table 13-1 and Table 13-2 present projected changes for precipitation, wind speed, and soil moisture in terms of percentages (% change) as opposed to absolute change (e.g., mm/month or km/h).

Table 13-1: Median projected change (deltas) from two sources (ESPO-G6-R2 and raw CMIP6 GCMs) of GCM simulations for a Global Warming Level of +1.19°C above 1981-2020 at the grid point nearest Neepawa, MB. Cell colours reflect ensemble agreement on the direction of change. In accordance with the agreement terminology defined in Gutiérrez et al. (2021), dark green indicates high model agreement (i.e., ≥80% of models) that an *increase or decrease will occur. Non-coloured cells depict cases when there is low model agreement (i.e., <80% agree on the sign of change).*

	ESPO-G6-R2				raw CMIP6 GCMs			
	Tmin (°C)	**Tmean** (°C)	**Tmax** (°C)	**Precipitation (%)**	**Evaporation (mm/month)**	**Runoff** (mm/month)	**Wind Speed** (%)	**Soil Moisture (%)**
Annual	2.35	2.23	2.08	4.41	1.87	-0.26	-1.90	0.23
Winter	3.05	2.62	2.08	8.88	0.92	1.00	-1.47	0.63
Spring	1.99	2.00	1.88	10.98	4.92	-1.01	-1.64	0.61
Summer	2.07	2.23	2.44	-2.27	0.78	-0.60	-2.25	0.09
Fall	2.05	2.11	2.17	5.39	0.86	-0.33	-2.11	-0.02

Table 13-2: Same as Table 13-1, but for a Global Warming Level of +2.19°C above 1981-2020. Note only 27 of the 42 simulations reach this level of warming.

	ESPO-G6-R2				raw CMIP6 GCMs			
	Tmin (°C)	**Tmean** (°C)	**Tmax** (°C)	**Precipitation (%)**	**Evaporation (mm/month)**	**Runoff** (mm/month)	**Wind Speed** (%)	**Soil Moisture (%)**
Annual	4.42	4.13	3.97	5.81	2.01	-0.74	-2.95	0.15
Winter	5.78	5.09	4.05	14.17	2.11	1.29	-1.97	0.74
Spring	3.52	3.51	3.57	17.47	7.82	-2.41	-2.34	0.51
Summer	4.01	4.15	4.28	-7.71	-0.76	-1.36	-4.12	-0.12
Fall	3.67	3.76	3.99	9.02	0.96	-0.38	-3.43	-0.42

The ESPO-G6-R2 ensemble median projects annual average temperatures to increase by 2.23°C for the 1.19°C GWL scenario and 4.13°C for the 2.19° GWL scenario. Both future scenarios show high agreement that temperature will increase in all seasons. For minimum temperature (Tmin) and mean temperature (Tmean), projections show the largest increases to occur in winter. For maximum temperature (Tmax), projections show the largest increases to occur in summer. There is high agreement that winter and spring precipitation will increase for both future scenarios. There is also high agreement that fall precipitation will increase and that summer precipitation will decrease for the +2.19°C GWL scenario. As expected, increasing temperature generally results in increasing evaporation, except for the +2.19°C GWL scenario in summer where evaporation is projected to decrease, possibly a result of reduced water availability, which depending on changes in precipitation, may result in overall wetter or drier conditions. The interaction of precipitation and evaporation, along with other water balance components, can manifest as changes in local (grid-point) runoff. Although projections tend towards increased winter runoff and decreases in other seasons, these projections are generally accompanied with lower agreement. This result is attributable, in-part, to increased winter temperatures contributing to earlier snowmelt, which may leave less snow to melt in the spring. GCMs generally show high agreement that future mean wind speeds will decrease and low agreement with respect to changes in soil moisture.

Daily data from the ESPO-G6-R2 ensemble was also used to drive a WATFLOOD hydrological model to simulate climate change impacts on streamflow for the +1.19°C GWL scenario. Modelling details, including descriptions of the methods used to generate future streamflow scenarios, are described in Sagan et al. (2025). For the Whitemud River near Keyes site (05LL005), which represents a drainage basin of 1,820 km^2, the ensemble median projects increased average flows in all seasons with strong agreement in winter, spring, summer, and annual scales. For the Whitemud River at Westbourne site (05LL002), which represents a larger drainage basin of 6,360 km^2, the ensemble median also projects increased average flows in all seasons with strong agreement in winter, spring, summer, and annually. Compared to the Whitemud River near Keyes site, the Whitemud River at Westbourne is subject to larger relative (i.e. percent) changes annually, as well as in the spring, summer, and fall seasons, and a smaller relative increase in the winter. In general, with increasing temperatures, it may be reasonable to anticipate increased flows in the late winter and early spring months due to more frequent mid-winter melt events and an earlier spring freshet. Some of the other hydrologic features seen in the projections are a result of more complex environmental interactions occurring across large spatial scales.

It is important to recognize that due to the data and methods used to compute deltas presented in this section, results may require special interpretation. For example, the deltas calculated are based on multiple GCMs with varying spatial resolutions, and biases. Furthermore, the ensemble median projections are derived independently for each variable and each season. In general, there tends to be greater confidence in GCM abilities to simulate temperature and precipitation in comparison to other variables such as evaporation, runoff, wind speed, and soil moisture. As such, projected changes should be interpreted accordingly.

13.2 Greenhouse gases

A greenhouse gas (GHG) Assessment was undertaken for the Project. The GHG Assessment divided project GHG effects into two main categories:

1. Project infrastructure, which includes physical assets built, upgraded, and expanded as required for Project implementation
2. Potential market responses, which includes incremental changes to energy, fuel choices, and GHG emissions in the local area resulting from the project's impact on supply, demand, and prices.

Recognizing Project infrastructure as being the primary focus of this EA, the GHG assessment focused on the first category – Project infrastructure. A GHG life cycle assessment (LCA) was undertaken as it is an appropriate tool to capture both primary and secondary GHG effects related to Project infrastructure. It is also the standard assessment type Manitoba Hydro has undertaken for other major natural gas and electricity infrastructure projects. Considering both construction-related and post-construction-related GHG emissions, the total considered life cycle GHG emissions for the Project are estimated to be 422.51 tonnes of carbon dioxide equivalent per installed pipeline km (t CO2e/km), or 8,530 tonnes of CO2e (t CO2e), for the entire pipeline over the 50-year assumed lifespan of the project. When the full profile of life cycle GHG emissions is considered, Post Construction: Pipeline Operations (Table 13-3) is the single largest emissions category over the 50-year assumed lifespan, accounting for 43% of the total considered LCA emissions. For context, 2023 operating emissions along Manitoba Hydro's existing Natural Gas Distribution System were 40,800 tonnes CO2e, over 4 times the LCA emissions estimate for the project over its assumed 50-year life.

Table 13-3: LCA Emissions Summary Table

Activity	t CO2e/km	t CO2e	% of total
Construction: Material Supply Chain	65.86	1,330	16%
Construction: On-Site Energy	144.71	2,922	34%
Construction: Land Use Change	15.97	322	4%
Construction: Labour Transport	13.54	273	3%
Construction: Project Commissioning	0.02	0	0%
Post Construction: Pipeline Operations	182.42	3,683	43%

Post Construction: Pipeline Decommissioning	0.64	13	0%
Total	422.51	8,530	

The secondary category of market responses, or potential upstream and downstream effects related to the product (e.g., natural gas) being distributed through the project's infrastructure (e.g., the pipeline), were considered separately from the assessment of project infrastructure.

The Neepawa system needs to be upgraded and looped to meet both current capacity requirements and projected capacity requirements for the rapidly growing community. Per 2021 census data, Neepawa is the third fastest growing community in Manitoba and the thirteenth nationwide. Between 2016 and 2021 the community population grew 23%. The 20-year projected load growth in Neepawa, excluding the expansion of rural communal settlements, is projected to be 47% higher than the 2024 Design Winter Peak Load.

As new housing, commercial/institutional and industrial developments are being planned in Neepawa to serve the growing population, upgrading the Neepawa system has a strong business case, compared to meeting projected load growth via electrification - the costs to electrify the projected capacity needs were estimated to be 20x the most expensive natural gas pipeline expansion option identified and therefore was not considered to be economically feasible. There is also currently no provincial policy in place to restrict reasonable (i.e., internal Manitoba Hydro business case justified) expansion of Manitoba's natural gas distribution system's capacity. Therefore, the Baseline Scenario for the Project was assumed to be identical to the Project Scenario and no incremental market responses are assumed.

On an absolute basis (i.e., compared with a do-nothing scenario), additional natural gas usage can be expected in the Neepawa region. On an absolute basis, by providing additional natural gas capacity to Neepawa, the project will likely increase local natural gas emissions (both direct and indirect), potentially reduce diesel and propane emissions from surrounding agricultural and industrial operations, and decrease regional electricity generation emissions – likely resulting in a net decrease in global emissions (compared to a do-nothing scenario); however, these GHG effects are not additional. Further details about the greenhouse gas assessment undertaken for the project can be found in Appendix D.

13.3 Mitigation for greenhouse gas emissions

Based on the GHG assessment conducted for the project, project infrastructure related GHG emissions are anticipated to be most pronounced during the construction phase of the project.

As part of its contractor evaluation process, in pursuit of retaining a contractor to construct our licensable projects, Manitoba Hydro evaluates bids on specific environmental aspects including each bid's proposed methodology for reducing GHG emissions and other climate change mitigations that will be implemented during the work. Manitoba Hydro will implement mitigation measures including the following to address project-related GHG emissions from construction and maintenance activities:

- Limiting the amount of vegetation removed to what is required to safely construct and operate the pipeline.
- Encouraging the productive use of wood/timber removed during clearing activities.
- Ensuring all vehicles and equipment are regularly inspected and maintained to optimize energy efficiency.
- Reducing idling to the extent possible and utilizing equipment or vehicles with auto-shutoff, if available and practical.
- Encouraging vans/shuttle buses and/or carpooling of workers when practical.
- Using electric and/or hybrid vehicles to the extent practical.
- Developing a waste management plan that promotes reuse and/or recycling whenever feasible and promoting the composting of organic waste when feasible/practical.
- Planning work activities to reduce the distance of travel, e.g., using direct routes of travel, reducing the amount of transport trips (full vs. half loads), and utilizing appropriate local facilities near the project site to source materials and/or for waste disposal, when practical.

14.0 Effects of the environment on the project

Effects of the environment on the project refer to effects that may result from forces of nature physically interacting with a project or hampering the ability to conduct projects activities in their normal, planned manner. These effects may result from physical conditions, landforms, and general site characteristics that may act on the project such that project components, schedule, and/or costs could be substantively and adversely changed.

Typically, potential effects of the environment on any project are a function of project or infrastructure design and the risks of natural hazards and influences of nature.

While environmental forces (e.g., severe weather, climate change) have the potential to adversely affect a project, engineering design accounts for environmental forces relevant to a project and the associated loadings or stresses they may pose on the project. The methods used for mitigating potential effects of the environment on the project are inherent in the planning, engineering design, construction, and operation plans of a well-designed project intended to be in service for several decades or longer.

The most likely anticipated effects of the environment on the Neepawa gas transmission project are short-term disruptions in construction and maintenance activities and the economic costs of repair. Considering project-specific mitigation, the residual effects associated with such effects are anticipated to be most pronounced during the operations phase and inconsequential.

14.1 Effects analysis

Effects of the environment on the project could occur during all phases of the project, i.e., construction, operations, and decommissioning. However, they are anticipated to have the greatest likelihood of occurring during operations, because the anticipated duration of operations is at least 50 years, which provides the greatest likelihood for environmental forces to interact with the project and project activities.

Potential effects of the environment on the project may include:

- Increased risk of damage to infrastructure
- Delays in construction and/or maintenance activities during operations
- Increased risks to safety of the public and workers

14.1.1 Effects pathways

Over the course of the project’s lifecycle, it may be subject to severe weather events. While Manitoba Hydro designs its infrastructure to withstand extreme weather, it is not possible to design for all eventualities. Flooding, fires, and other extreme weather may result in effects to the project and/or its activities.

14.1.1.1 Flooding

Potential effects of severe flooding in the project area include hindering access to project components, diminished pipeline and above-ground structures’ integrity, and reduction of soil cover above the pipeline (Kelly WM Scott & Associates 2011; Stantec 2014, Abegaz et. al. 2024). During construction, flooding may result in schedule delays if the PDA cannot be accessed or if flooding is present within the PDA that would make project activities impractical or impossible to be conducted in a safe and environmentally responsible manner. Scheduled maintenance activities may also experience delays for similar reasons if flooding occurs during operations.

During operations, the weight and density of soil can change because of flooding causing bending and shifting of the pipeline, which gradually thins the pipeline’s metal over time potentially causing ruptures (Abegaz et. al. 2024). In addition, flooding can increase water tables resulting in a net upward force of the pipeline which can result in increased risk of rupture or separation of the pipe.

Corrosion has been found to be a main contributing factor to pipeline failure (Abegaz et. al.). Increased exposure to floodwaters has the potential to accelerate corrosion on the outside of the pipeline resulting in weakened pipeline material and compromised structural integrity of the pipeline. In addition, above-ground components such as valves, which are used to control the flow of gas in the system, would also be at risk of corrosion impacts during floods (Laciak et. al. 2019). Valves are already susceptible to corrosion from the atmosphere.

During operations, flooding may also affect pipelines through causing soil erosion/displacement. Depending on the amount and speed of floodwaters, floods have the potential to erode soil and damage buried pipelines. Exposure of the pipeline increases a pipeline’s vulnerability to debris that may be present in floodwater (Abegaz et. al. 2024; Kelly WM Scott & Associates 2011).

Reduction in the depth of soil cover overlying the pipeline would trigger the need to undertake maintenance activities to restore soil cover depth that meets standards as set out by the Canadian Standards Association and Manitoba Hydro’s Depth of Cover Standard 510.02 (Manitoba Hydro 2024).

The area traversed by the project has generally low flood susceptibility based on a national map of flood susceptibility or flood prone areas made available by Natural Resources Canada (Government of Canada 2025).

14.1.1.2 Fires

There is the potential for grass fires to occur in the ditches along roads traversed and adjacent to the final preferred route during dry conditions. Causes of grass fires include natural causes such as lightning, and human activities including machinery sparks, smoking, and controlled agricultural burns.

Crop residue burning by agricultural producers within the RAA is a not a common practice, at least at a broad, field-scale. Residue burning in the area is typically only completed as a maintenance issue if excessive residue needs to be removed from the field or in localized areas requiring excessive vegetation removal (e.g., potholes or other drown-out areas).

Crop residue burning is regulated in Manitoba under the Burning of Crop Residue and Non-Crop Herbage Regulation (M.R. 77/93), brought into force in 1993 primarily to protect human health and safety related to smoke and smoke events. Under the regulation, crop residue is generally permitted during the daytime period (i.e., begins not earlier than sunrise and ends not later than sunset of the same day) between November 16 and July 31. Between August 1 and November 15, burning is prohibited unless authorized by the province if weather conditions are deemed suitable. Regardless of season, crop residue burning must be conducted following conditions outlined in the regulation, including following safety precautions to prevent the spread of fire. Burning is to be supervised and precautions that are reasonably necessary to protect persons and the property of others from the fire are taken. This is to include ensuring that the area in which the burning takes place is surrounded by a fireguard consisting of a strip of land that is tilled or substantially free of readily combustible matter and/or by natural or man-made barriers.

A loss of control of a crop residue burn could result in damage to above-ground infrastructure components of the project.

14.1.1.3 Extreme weather

In addition to floods and fires, other weather events that could adversely affect the project are severe storms and tornados. There is potential for these events to occur within the RAA, as published records confirm that tornadoes have been documented (ECCC 2015 & Western University Northern Tornadoes Project 2025). More recently, a small tornado was sighted northeast of the RAA in Gladstone, in the neighbouring

RM of Westlake-Gladstone, in 2023 (Blume 2023), and a historic flash flooding event that impacted Neepawa in July 2020 following two intense rainstorms (Devereux 2020).

Snow and ice storms are not likely to affect construction because most construction activities are anticipated to take place during warmer months when the ground is not frozen. Thunderstorms are more likely to overlap with planned project activities. Reduced visibility during thunderstorms may result in heightened public and worker safety risk during construction or periodic maintenance activities where equipment and materials may be travelling along roads to or from the PDA or be present along roadsides traversed by the PDA. Extreme rainfall events during construction and maintenance activities could result in water pooling in the pipeline trench and cause a delay in the completion of these activities.

Although lightning and tornadoes do not pose a direct threat to the pipeline, they both may result in short-term delays to construction and maintenance activities to protect project workers from unsafe working conditions. There is also a risk that above-ground components could be damaged by lightening or a tornado.

Over the next 100 years, Manitoba will likely experience warmer temperatures, a greater frequency of storm events, increasing storm intensity, and an increase in annual precipitation. Potential effects of climate change on the operation and maintenance of the project would relate to increases in the frequency of severe weather events, changes in temperature, and changes in precipitation. It is expected that increases in extreme weather events would affect operation and maintenance of the project by increasing the frequency of unexpected maintenance requirements due to storm damage. Chapter 13.0 includes a discussion about future climate predictions.

14.1.1.4 Frost heaving

Soils in Manitoba can experience frost heaving, but the extent to which it affects pipelines depends on specific conditions such as soil texture (i.e., proportions of silt, clay, and sand particles in soil) and moisture. Within the project area, typical winter temperatures are sufficient to cause seasonal freezing in the upper layers of the soil profile. Frost heaving in the vicinity of oil and gas pipelines is a result of water in the soil freezing and ice growth which results in soil expansion and the uneven uplift of the ground (Wang et al. 2024).

The project area is not located within a permafrost zone (Government of Canada, n.d.), which reduces the potential for frost heaving in buried pipelines. The project area experiences a temperate climate with warm summers and long, cold winters, where the ground rarely remains frozen throughout the year.

14.1.2 Mitigation of effects of the environment on the project

Possible effects of the environment on the project are mitigated predominantly through consideration of environmental forces that may act upon the project during design and planning. The project is being designed and will be constructed and operated with regard for health, safety, and environmental protection to minimize potential environmental effects that could occur during construction, operations, and decommissioning, and/or result from forces of nature and affect the project physically or hamper the ability for project activities to proceed normally as planned.

Mitigations built into design and planning of the project include:

- Designing the project to meet applicable Canadian Standards Association (CSA) standards including CSA Z662:23, as well as Manitoba Hydro natural gas standards (e.g., Manitoba Hydro Natural Gas Standard Depth of Cover - Pipeline 510.02).
- Scheduling project activities to avoid periods with the highest risk of severe weather where possible
- Ensuring the pipeline is buried to a sufficient depth to minimize effects from flooding
- Adherence to Manitoba Hydro's environmental protection plan (see Chapter 16.0), including erosion and sediment control planning
- Preparing and maintaining an emergency response plan that includes extreme weather events and grass fires
- Regular inspections/patrols during operations, including depth of cover surveys, cathodic protection monitoring, leak detection surveys and valve operation checks to ensure integrity of the pipeline

14.2 Assessment conclusions

Despite the mitigation measures identified, it is possible that the environment may still cause residual effects to the project. Following the application of mitigation measures, residual effects may include:

- Delays in construction activities and/or scheduled maintenance activities resulting from flooding, fire, or other weather events compromising the safety or environmental suitability of working conditions or hindering access
- Loss of soil cover over the pipeline resulting from flooding or extreme rain events during operations

- Risk to above-ground components of the project during floods, fires, or other extreme weather that may physically interact with above-ground structures

The most likely effects of the environment on the project are short-term disruptions in construction and maintenance activities and the economic costs of repair.

The residual effects of the environment on the project are anticipated to be confined to the PDA (*i.e.,* project footprint), and occurring at irregular intervals throughout the project lifecycle (*i.e.,* until decommissioning is complete).

Although the effects of an individual event on the project could have substantive effects at a localized scale, in particular if above-ground components were to be impacted, the potential for these events to occur is anticipated to be low following the implementation of mitigation measures. Overall, the residual effects of the environment on the project are anticipated to be inconsequential.

15.0Accidents and malfunctions

In the context of environmental assessment, an accident is an unexpected and unintended interaction of a project component or activity with environmental, health-related, social, or economic conditions, and a malfunction is a failure of a piece of equipment, a device, or a system to operate as intended (Impact Assessment Agency of Canada 2025). Accidents and malfunctions can occur because of abnormal operating conditions, wear and tear, human error, equipment failure, or other possible causes.

Many accidents or malfunctions are preventable and can be readily addressed or prevented by good planning, design, equipment selection, hazards' analysis and corrective action, emergency response planning, and mitigation. Pipelines are designed with safety measures to minimize the likelihood of accidents, and operators are required to follow strict regulations to protect the integrity of the pipeline system. Regular inspections, maintenance, and emergency response plans are crucial in mitigating the potential likelihood and impact of accidents or malfunctions. Emergency responders and pipeline operators work together to address and resolve incidents promptly to protect public safety and the environment.

15.1 Summary of conclusions

The likelihood of the accidents and malfunctions assessed in this chapter taking place on the Neepawa gas transmission project is anticipated to be low, given the measures that will be undertaken to prevent their occurrence. As a result, residual effects of accidents and malfunctions on the environment (*i.e.,* on the valued components assessed in this report) are anticipated to be low in magnitude and are anticipated to be not significant.

If an accident or malfunction does occur, it is anticipated that it would happen at a low frequency, be of a short duration, and/or affect a limited geographic extent such that major residual adverse environmental effects would be unlikely.

15.2 Scope of the assessment

This chapter presents the detailed assessment undertaken to reach the above conclusions (Section 15.1), including discussion of potential accidents and malfunctions associated with the project that could result in appreciable adverse environmental effects, mitigation measures reducing the likelihood and severity of their occurrence, and characterization of the anticipated residual effects following mitigation.

The focus is on credible accidents that have a reasonable probability of occurrence, and where the resulting residual environmental effects could be major without careful management. Accident and malfunction event scenarios have been conservatively selected to represent higher consequence events that would also address the consequences of less likely or lower consequence scenarios.

The following accidents, malfunctions, and unplanned events are assessed in this chapter and were selected based on experience with similar projects and professional judgment:

- Worker accident
- Hazardous materials spill
- Fire
- Vehicle accident
- Encounter of a heritage site or object
- Pipeline leak or rupture
- Third-party interference

It is noted that accidents and malfunctions are evaluated individually, in isolation of each other, as the probability of a series of accidental events occurring in combination with each other is deemed unlikely. These possible events, on their own, generally have an exceptionally low probability of occurrence and thus their environmental effects are of low likelihood. They have an even lower likelihood of occurring together – thus their combination is not considered credible, nor of a measurable likelihood of occurrence.

For the purposes of this assessment, the characterization of residual effects of accidents and malfunctions consider the valued component (VC)-specific thresholds used to characterize residual project and cumulative effects provided in each VC chapter within this report (see Chapters 6.0 – 12.0).

Additionally, residual effects of accidents and malfunctions are considered significant if an event is anticipated to result in human mortality or affects one or more valued components in a manner that would meet the VC-specific definition for significance provided in each of the seven VC chapters within this report.

15.3 Effects assessment for accidents and malfunctions

This section describes the ways each potential accident or malfunction may affect the VCs assessed in this report.

Table 15-1 presents the potential interactions between the assessed valued components and potential accidents or malfunctions. Following the table, there is a section assessing the project and cumulative effects of each potential accident or malfunction, including discussion of the VC interactions identified in Table 15-1, mitigation in place to manage the risk of each potential accident or malfunction, and a characterization of the potential residual effects following mitigation.

Table 15-1: Potential interactions between accidents and malfunctions and assessed valued components

Potential accidents and malfunctions	Important sites	Vegetation	Wildlife and wildlife habitat	Commercial agriculture	Human health risk	Infrastructure and community services	Economic opportunities
Worker accident	-	-	-	-	✓	✓	-
Hazardous material spills	✓	✓	✓	✓	✓	✓	-
Fire and explosions	✓	✓	✓	✓	✓	✓	-
Vehicle accident	-	-	✓	-	✓	✓	-
Encounter of a heritage site or object	✓	-	-	✓	✓	-	-
Pipeline leak or rupture	✓	✓	✓	✓	✓	✓	-
Third-party interference	-	-	-		✓	✓	✓

✓ = Potential interactions that might cause an effect.
- = Interactions not expected.

15.3.1 Worker accident

A worker accident has the potential to interact with human health and well-being and infrastructure and community services as it could result in harm, injury, or death to workers and could prompt the need for emergency response and medical services.

Adherence to public safety codes and regulations will help the project to be conducted in a safe manner, protecting workers and the public. Safety risks to workers will be reduced by complying with the requirements of various governing standards including the federal Canada Labor Code, the *Transportation of Dangerous Goods Act (Canada)*, the *Workplace Health and Safety Act* (Manitoba) and associated regulations.

Workers will be trained in practices to prevent workplace accidents including Workplace Hazardous Materials Information System (WHMIS), first aid, and other applicable training. These trainings and associated procedures are designed to prevent serious injury to staff and the public as well as to minimize the occurrence of unplanned events and minimize potential damage to the environment.

With the application of, and compliance with, the above-mentioned acts, regulations, and standards, including the application of safety and security measures that are known to effectively mitigate potential environmental effects, the potential effects of a worker accident during all project phases are considered not significant.

15.3.2 Hazardous material spills

Hazardous materials could be released into the air, soils, surface water or groundwater because of an accidental spill during construction, operation, or decommissioning activities.

In general, hazardous material spills have the potential to:

- Contaminate surface and groundwater, release fumes that may cause inhalation risk (human health and well-being, wildlife and wildlife habitat)
- Contaminate soil (important sites, commercial agriculture, vegetation, wildlife and wildlife habitat, human health and well-being)
- Potential strain on waste disposal and emergency and healthcare services (infrastructure and services)

Spills are usually localized and cleaned up by on-site crews using standard equipment based on regulatory requirements, guidelines, and industry best practices. Implementation of a detailed spill response plan and a well-designed construction environmental protection plan (Chapter 16.0) will result in minimal potential effects through accidental releases.

Effects due to hazardous material spills will be mitigated through the following:

- Prior to commencing construction activities, the contractor shall develop a spill response plan that must be submitted to Manitoba Hydro for review and acceptance.
- The contractor will be required to provide environmental training, as well as training in spill prevention and response, to construction personnel.
- Prior to the commencement of construction activities, Manitoba Hydro will ensure that spill response equipment is readily available.
- Spills will be contained, cleaned, and reported to applicable authorities as follows:
    - Contaminated material or potentially hazardous material will be contained.

    - Proper safety precautions (e.g., protective clothing and footwear) will be implemented.
    - The contractor will follow their spill response plan and ensure that the province's spill-reporting line is notified for reportable spills.
    - Contaminated wastes, such as used cleaning cloths, absorbents, and pads, will be stored in proper waste containers.
    - Waste material will be disposed of at approved disposal facilities.
- Construction equipment will be cleaned and maintained in good working condition, with visual inspections of equipment performed on a regular basis. Petroleum products such as gasoline, diesel fuel, and oil will be properly labeled in accordance with the appropriate legislation and regulations.
- Refueling, oiling, and maintenance of equipment, as well as storage of hazardous materials, will be conducted in a designated and contained area(s). Servicing of equipment (e.g., oil changes and hydraulic repairs) will be completed in designated areas. Vehicles will be equipped with spill containment and cleanup materials.
- Personnel handling fuels and hazardous wastes will have WHMIS training and be qualified to manage these materials in accordance with the manufacturer’s instructions and applicable regulations.
- Hazardous waste and storage area(s) will be clearly marked and secured. Industrial waste will be reused or recycled on a priority basis. Where reuse or recycling opportunities are not available, industrial waste will be collected and disposed of at an approved facility.
- Garbage receptacles for solid non-hazardous wastes will be available. These wastes will be collected on a regular basis or as they are generated and will be disposed of at approved locations.

With the above-mentioned mitigation measures and emergency response procedures implemented, the potential residual environmental effects of a hazardous material spill during all project phases are considered not significant.

15.3.3 Fires and explosions

A fire may arise from the use of equipment during construction or maintenance activities (e.g., machinery sparks) as well as the ignition of spilled materials. When a gas line ruptures, the released natural gas can accumulate in enclosed or low-lying areas, creating a highly combustible environment, and even a small spark, e.g., from match, electrical switch, or static electricity, can ignite an explosion.

Potential effects caused by fires and explosions include:

- Safety risks and exposure to diminished air quality for workers and the public (human health and well-being)
- Need for emergency response and medical services (infrastructure and community services)
- Loss of or damage to property or resources (human health and well-being, commercial agriculture)
- Direct vegetation and habitat loss (vegetation, wildlife and wildlife habitat, and commercial agriculture)
- Soil and shallow groundwater contamination with sediment-laden water used in extinguishing the fire (human health and well-being, wildlife and wildlife habitat)
- Damage to infrastructure or heritage sites or objects (infrastructure and community services, important sites)
- Production of carbon dioxide from combustion of methane would contribute to GHG emissions

In the unlikely event of a fire, local emergency response will be able to reduce the severity and extent of damage.

A large fire could create particulate matter levels greater than the ambient air quality standard over distances of several kilometers or damage vegetation or infrastructure in the area, but such situations would be of short duration, infrequent, and are not anticipated to result from the project because of planned mitigation and prevention measures. The potential residual environmental effects of a fire are therefore considered not significant.

15.3.4 Vehicle accident

A vehicle accident arising from project-related activities could cause injury or death to workers or the public (human health and well-being) and wildlife (wildlife and wildlife habitat) and could prompt the need for emergency response and medical services and/or disrupt access to communities in the area in the event of a prolonged highway closure (infrastructure and community services). The potential for a fire or hazardous material spill, which could be associated with a vehicle accident have been assessed above.

The potential for a vehicle accident would exist during construction, operation, and decommissioning phases of the project when project related traffic (vehicles and machinery) is travelling to, from, and along the project development area. The likelihood of a vehicle accident is greatest during construction when the number of project-related vehicles in the PDA will be at its peak, of up to 50 project related vehicles per day (assuming 2 workers per vehicle).

Effects due to vehicle accidents will be mitigated through the following:

- Project-related vehicles will observe traffic rules and provincial and federal highway regulations.
- Trucking activity will observe speed limits and weight restrictions.

Because the project will comply with applicable traffic rules and regulations and given that the project will result in a relatively small increase in traffic volumes, the potential residual environmental effects of a vehicle accident are considered not significant.

15.3.5 Encounter of a heritage site or object

Cultural or heritage sites or objects may be encountered during activities involving ground disturbance such as vegetation clearing and trenching. It is less likely that heritage sites or objects will be encountered during operations.

The encounter of a heritage site or object has the potential to affect historical and cultural items of importance to First Nations, the Red River Métis, and the public, as well as the information that those items hold (important sites). Should the encounter of a heritage site or object occur on or near land utilized for commercial agricultural activities, it would have the potential to disrupt ongoing agricultural activities (commercial agriculture) and could cause stress for the associated landowners (human health and well-being).

Effects associated with the encounter of a heritage site or object will be mitigated through the following:

- The heritage potential of the PDA is analyzed during the environmental assessment. In areas identified as having high potential for heritage resources, a preconstruction archaeological survey may be conducted.
- Areas of potential heritage concern along the proposed project location have been identified for pre-construction archaeological field surveys by a qualified archaeologist as detailed in Chapter 6.0 and Appendix E.
- If a heritage site or object is discovered, project work will cease around the discovery and the project archaeologist will be contacted. Work in the area will continue only when approval is received from the project archaeologist or the Historic Resources Branch.
- Should the encounter of a heritage site or object occur on land used for commercial agriculture and preclude use of that land for typical agricultural operations/activities, Manitoba Hydro may consider compensating the producer for ancillary damages on a case-by-case basis.

Additional mitigation for the protection of heritage sites or objects is outlined in the Culture and Heritage Resource Protection Plan (CHRPP) (Appendix E). The CHRPP provides clear instructions on how to proceed should Manitoba Hydro, its contractors, and/or consultants, discover or disturb a cultural or heritage sites or objects and outlines processes for ongoing protection

Given the planned mitigation and precautions related to heritage resources, the potential residual effects are considered not significant.

15.3.6 Pipeline leak or rupture

A gas leak is a failure of pipeline in the form of pinholes or punctures while a rupture is a longitude or circumferential crack (Wang, 2014). Both pinholes/punctures and cracks in pipelines result in gas leaks.

Pipeline gas leaks and ruptures may occur because of accidental damage caused during construction or excavation activities or as a result of corrosion of the line over time (Alberta Energy Regulator, 2024; U.S. Department of Transportation, 2018, Transportation Safety Board of Canada). Mechanical failures, manufacturing defects, inadequate maintenance and natural disasters such as flooding are other sources of pipeline failures such as leaks and ruptures (U.S. Department of Transportation, 2018; Tip of the Mitt Watershed Council, n.d.).

In addition to the pipeline, valves which are crucial for controlling the flow of gas can also fail or malfunction resulting in an uncontrolled release of gas.

Potential effects caused by gas leaks and ruptures include:

- Soil and groundwater contamination from release of natural gas, condensate or other hazardous substances such as corrosion inhibitors and anti-freeze agents (commercial agriculture, vegetation, wildlife and wildlife habitat, human health and well-being)
- Safety risks to workers and the public from fires and explosions should there be sources of ignition in the vicinity of the gas leak or rupture (Environment Defense Fund, 2023) (human health and well-being)
- Need for emergency response and medical services in event of fire or explosion (infrastructure and community services)
- Loss or damage to property or resources from fire or explosion (human health and well-being, commercial agriculture)
- Direct vegetation and habitat loss (vegetation, wildlife and wildlife habitat, and commercial agriculture) from potential fire and explosions
- Damage to infrastructure or heritage sites or objects (infrastructure and community services, important sites) from fire or explosion

- Unintentional methane releases from leaks or ruptures would contribute to greenhouse emission

Effects due to pipeline leak or rupture will be mitigated through the following:

- Manitoba Hydro will regularly carry out maintenance and inspection activities to assess and identify areas of potential concern.
- Manitoba Hydro employees carrying out maintenance and inspection activities will be trained on procedures to follow in the event a gas leak or rupture is identified.
- As part of the Click Before You Dig MB program, Manitoba Hydro will locate and mark its underground gas lines in response to submitted requests for utility locates before the commencement of excavation activities in the vicinity of the project.

If a pipeline leak or rupture were to occur, the potential effects identified above would be anticipated to be of short duration. Because of planned mitigation and prevention measures, however, pipeline leaks or ruptures are not anticipated, and the potential residual environmental effects of gas leaks and ruptures are therefore considered not significant.

15.3.7 Third-party interference

Third-party interference refers to damage that is caused by individuals or organizations that are not part of the company that owns a pipeline (Guo 2018). Activities by third parties that can affect the integrity of a pipeline include excavation or digging during construction work or farming activities in the vicinity of a buried pipeline without prior knowledge of the pipelines' existence (Guo 2018). Since the pipeline is in an area with a lower population density, the risk of deliberate third-party interference is likely reduced (Wang 2014). Vandalism and sabotage are other examples of third-party interference where individuals or organizations conduct deliberate acts of vandalism or sabotage that result in damage to pipeline infrastructure. A third type of third-party interference involves cybersecurity threats that include hacking and cyberattacks.

Potential effects from third party-interference include:

- Risks to public safety and the environmental from pipeline failures from both inadvertent and intentional third-party interference (human health and well-being)
- Loss of service affecting end-users
- Financial losses from shutdowns (economic opportunities)
- Strain on health and emergency response services (infrastructure and community services)

Effects due to third-party interference will be mitigated through the following:

- Pipeline surveys and inspections during operations will be done on a regular basis to help to protect against deliberate third-party interference.
- Landowners will be aware of the location of the pipeline on their land (i.e., depth of cover surveys) to mitigate accidental third-party interference (from excavation and agricultural activities).
- Manitoba Hydro will locate and mark its underground gas lines in response to submitted requests for utility locates before the commencement of excavation activities in the vicinity of the project.
- The pipeline will be marked with signs at each mile road and where the pipeline crosses waterways or other service roads.

It is anticipated that situations arising from third party interference would be of short duration and localized. With the implementation of planned mitigation and prevention measures, third-party interference events are considered to have low likelihood. The potential residual environmental effects of third-party interference are therefore considered not significant.

15.4 Assessment conclusion for accidents and malfunctions

The project is being designed and will be constructed and operated with regard for health, safety, and environmental protection to minimize potential environmental effects that could result during the normal course of construction, operation, and maintenance as well as those that could result from accidents and malfunctions.

The careful planning of the project and the implementation of proven and effective mitigation will minimize the potential for accidents and malfunctions. The effects of an individual accident or unplanned event could have notable effects at a localized scale. However, the potential for these events to occur, given the measures that will be undertaken to prevent their occurrence, is low. If accidents or malfunctions were to occur, it is anticipated that they would occur at a low frequency and that the effects would be of a short duration and of limited geographic extent such that major residual adverse environmental effects will not likely occur.

Overall, given the nature of the project, the accidents and malfunctions considered, and proposed mitigation, the potential residual environmental effects of project-related accidents and malfunctions on the valued components considered in this report, are assessed as not significant.

16.0Environmental protection program

16.1 Introduction

Manitoba Hydro will implement the mitigation measures, monitoring and other follow-up actions identified during the assessment through an Environmental Protection Program (EPP). The EPP provides the framework for implementing, managing, monitoring, and evaluating environmental protection measures consistent with regulatory requirements, corporate commitments, beneficial practices, and public expectations. Environmental protection, management and monitoring plans will be prepared and implemented under the EPP, to address environmental protection requirements in a responsible manner.

The purpose of this chapter is to outline how Manitoba Hydro will implement, manage, and report on environmental protection measures, monitoring and other follow-up actions as well as regulatory requirements and other commitments identified in this environmental assessment report.

Manitoba Hydro developed the EPP in accordance with its environmental policy.

Manitoba Hydro's Corporate Environmental Management Policy states the corporation is committed to protecting the environment by:

- Ensuring that work performed by its employees and contractors meets environmental, regulatory, contractual, and voluntary commitments
- Recognizing the needs and views of its interested parties and ensuring that relevant information is communicated
- Continuously assessing its environmental risks to ensure they are managed effectively
- Reviewing its environmental objectives regularly, seeking opportunities to improve its environmental performance
- Considering the life cycle impacts of its products and services
- Ensuring that its employees and contractors receive relevant environmental training
- Fostering an environment of continual improvement

16.2 Environmental management

Manitoba Hydro is proceeding with self-verification under the International Organization for Standardization (ISO) 14001 Environmental Management System Standard.

An environmental management system is a framework for developing and applying an organization's environmental policy that includes the organizational structure, responsibilities, practices, processes, and resources at all levels of the corporation. The environmental management system includes commitments to comply with legislation, licenses, permits and guidelines, conduct inspections and monitoring, and review the results for adherence to requirements. Maintaining self-verification under the ISO standard promotes quality, performance, and continual improvement in the delivery of Manitoba Hydro's environmental protection program.

16.3 Adaptive management

Adaptive management is a planned systematic process employed with the goal of continually improving environmental management practices by learning from their outcomes. The environmental protection program for the project has established the principles of adaptive management allowing for flexibility in the mitigation of adverse environmental effects that may result from the project. Manitoba Hydro will use the information gathered during follow up and monitoring activities to verify the accuracy of the environmental assessment effects, predictions and the effectiveness of implemented mitigation measures.

Manitoba Hydro designed the EPP to be adaptive and responsive throughout the project lifecycle by evaluating program documents, processes, procedures, and mitigation measures through inspection, monitoring and communication programs and conducting reviews to facilitate updates to the program.

Within the EPP, adaptive management will take place in two primary areas:

- At the management level, involving changes with the program structure itself
- At the implementation level, involving individual mitigation measures as management and implementation teams evaluate the onsite effectiveness of mitigation strategies or the program.

16.4 Environmental protection program framework

Manitoba Hydro's Environmental Protection Program (EPP) provides the framework for the delivery, management and monitoring of environmental and socio-economic protection measures that satisfy corporate policies and commitments, regulatory requirements, environmental protection guidelines and beneficial practices. The EPP:

- Describes how Manitoba Hydro is organized
- Functions to deliver timely, effective, comprehensive solutions and mitigation measures to address potential environmental effects
- Defines roles and responsibilities for Manitoba Hydro employees and contractors

- Outlines management, communication, and reporting structures

The EPP includes the varying aspects of protecting the environment during the pre-construction, construction, operation and decommissioning phases of the project.

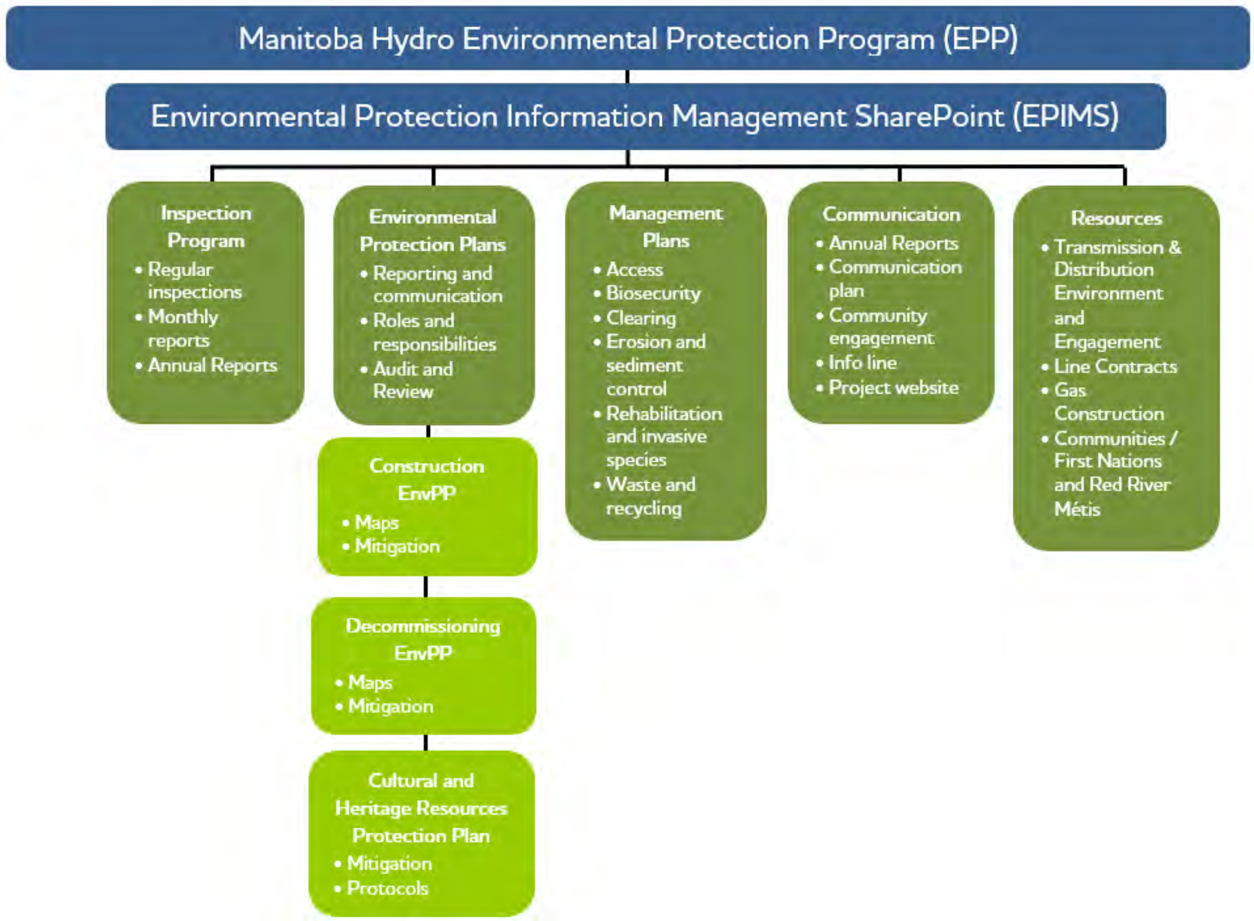


Figure 16-1 illustrates the components of the EPP. The following sections describe each component in further detail.

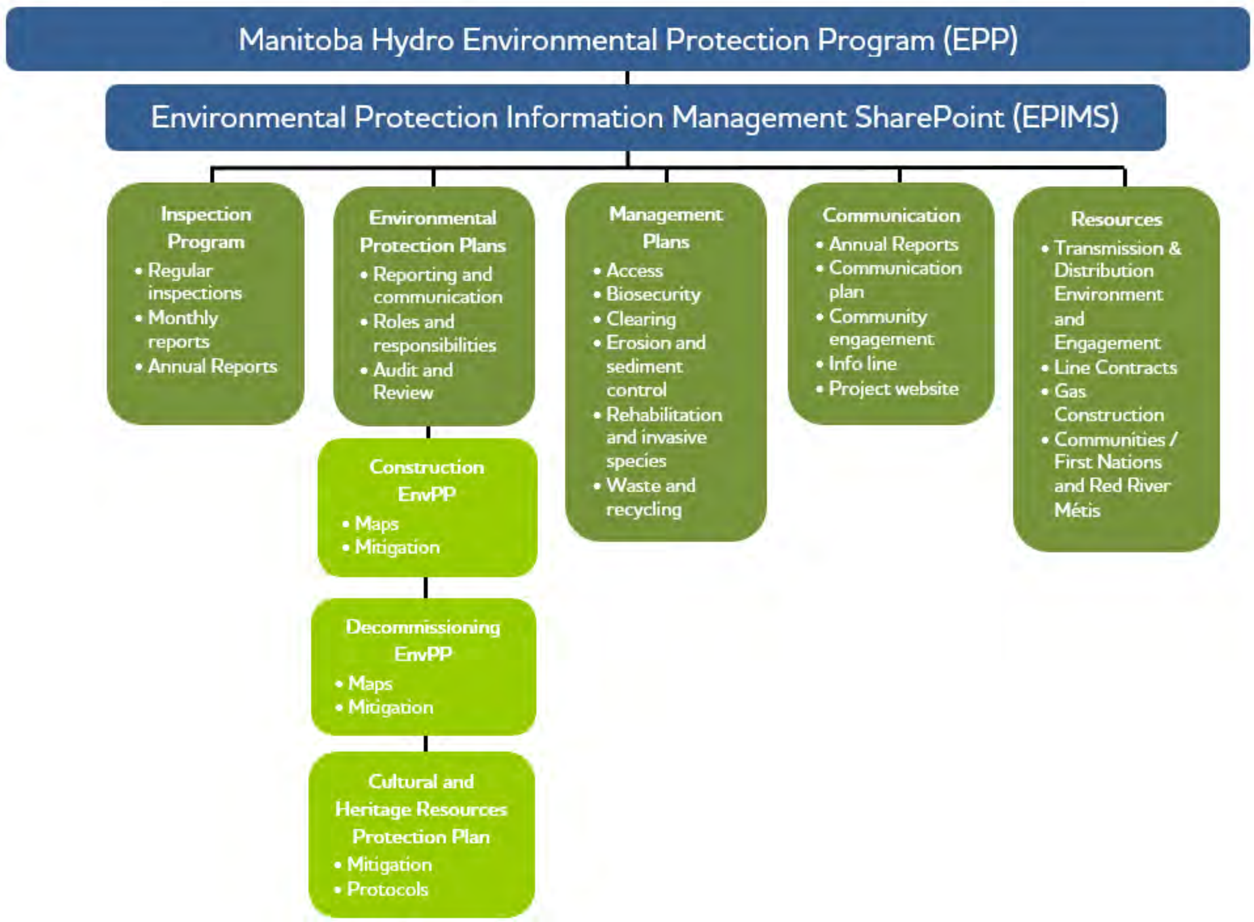


Figure 16-1: Environmental protection program components

16.5 Organization

The organizational structure of the EPP (Figure 16-2) includes senior Manitoba Hydro management, project management and implementation teams that work together to provide timely and effective implementation of environmental protection measures identified in environmental protection plans. Manitoba Hydro senior management is responsible for the overall EPP, including resourcing, management, and performance, and is accountable for regulatory compliance, policy adherence and interested party satisfaction.

The environmental protection management team is composed of senior Manitoba Hydro staff and is responsible for the management of environmental protection plans, including compliance with regulatory and other requirements, quality assurance and control, consultation with regulators, and related project engagement activities. Environmental consultants and advisors support the management team.

The environmental protection implementation team is composed of Manitoba Hydro operational field and office staff and is responsible for the day-to-day implementation of environmental protection plans, including monitoring, inspecting, and reporting. The implementation team works closely with other Manitoba Hydro staff as required.

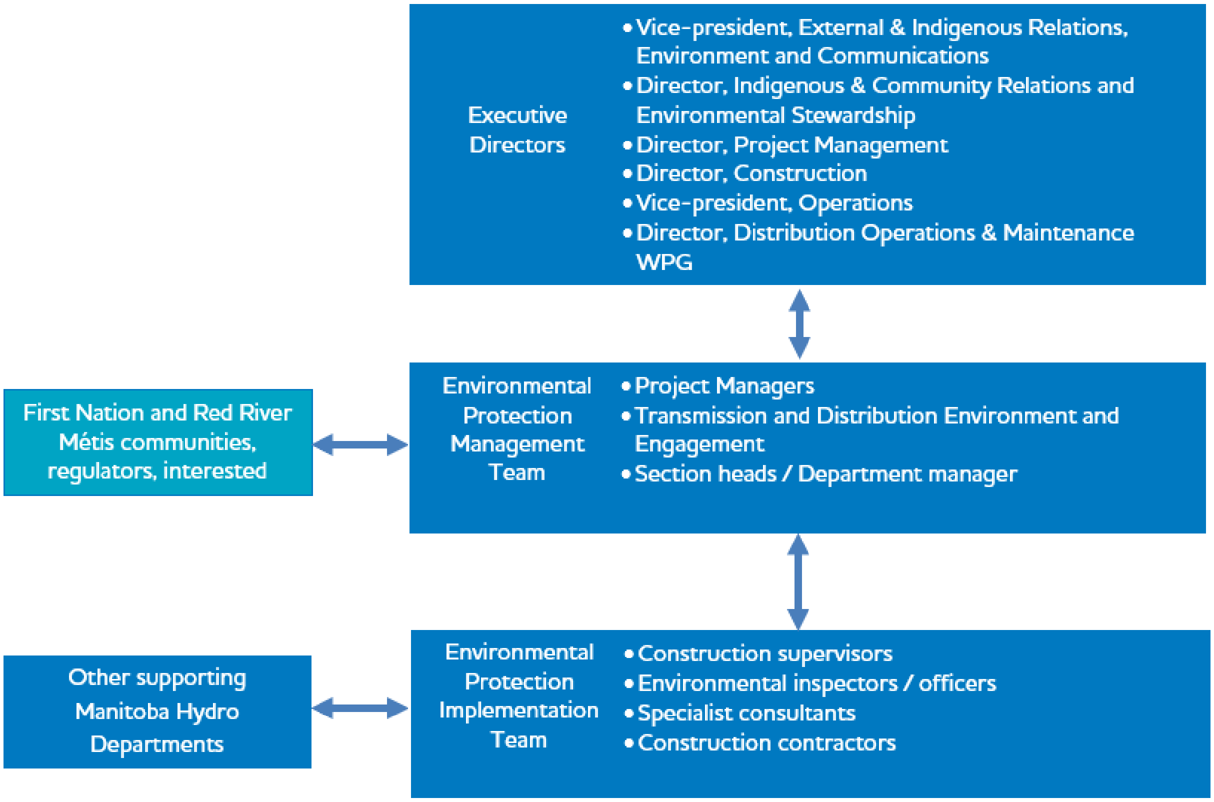


Figure 16-2: Environmental protection program organizational structure

16.5.1 Resources

Manitoba Hydro commits resources early in the planning cycle to provide effective environmental assessment, mitigation, and monitoring. Teams of engineers and environmental professionals develop preventative or avoidance mitigation measures that include design and routing alternatives. In addition, there are resource allocations for the delivery and implementation of environmental protection measures to meet corporate policy and government regulatory requirements.

Manitoba Hydro is committed to staffing the environmental protection program with environmental inspectors and providing required support, including training, financial resources, and equipment.

16.5.2 Roles and responsibilities

Figure 16-3 illustrates the typical organizational lines of reporting and communications. The roles and responsibilities for delivery of the project and implementation of environmental protection measures are as follows:

- The project engineer has overall responsibility for the implementation of the environmental protection plans and reports to a section head or department manager.
- The Transmission & Distribution Environment and Engagement Department oversees the development of environmental protection documents and associated inspection and monitoring programs, including ongoing project engagement activities.
- The construction contractor is responsible for ensuring work adheres to the environmental protection plans and reports to the construction supervisor.
- Environmental inspectors and officers have the primary responsibility to confirm that environmental protection measures and specifications are implemented per the environmental protection plans as well as provide information and advice to the construction supervisor.
- Manitoba Hydro field safety, health and emergency response officers are responsible for the development and execution of the safety program and occupational health and safety practices at the various construction sites.

Other Manitoba Hydro employees, including engineers and technicians, provide information and advice to the construction supervisor.

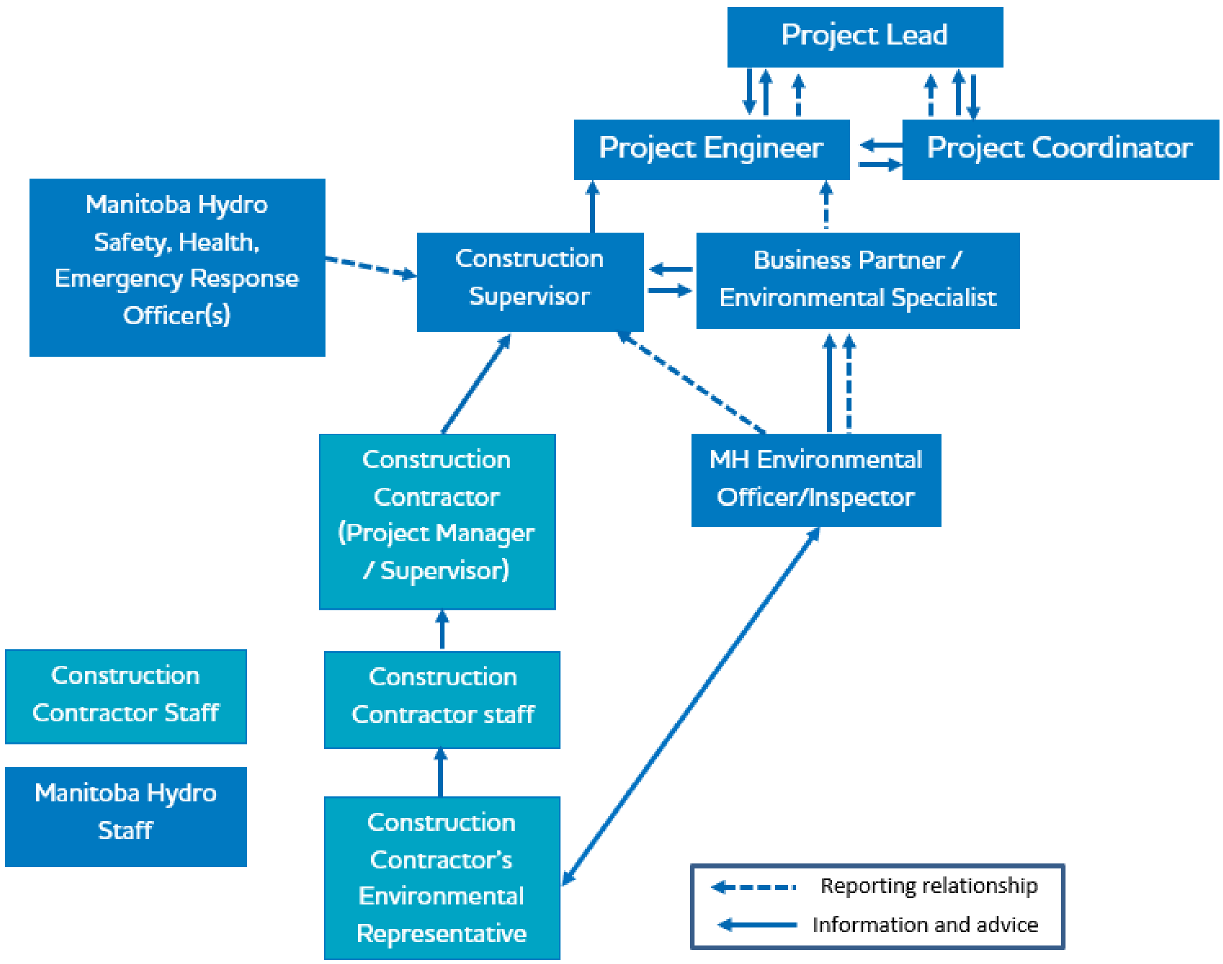


Figure 16-3: Typical organizational lines or reporting and communications

16.5.3 Communication and reporting

Manitoba Hydro personnel will maintain ongoing communication with Manitoba Environment and Climate Change, other provincial and federal departments, First Nation communities and Red River Métis citizens and organizations regarding implementation of the environmental protection plan. The construction supervisor and environmental inspectors will maintain ongoing communication with the contractor and contract staff through daily tailboard meetings and weekly or otherwise scheduled construction meetings at the worksite. Inspection reports as well as incident, monitoring and other reports will be prepared and available for the regulators, contractors, and Manitoba Hydro staff.

16.5.4 Environmental protection plans

Environmental protection plans document environmental protection measures to provide for compliance with regulatory and other requirements, and to achieve environmental protection goals consistent with corporate environmental policies. Manitoba Hydro designs the environmental protection plans as user-friendly reference documents that provide project managers, construction supervisors and contractors with detailed lists of environmental protection measures and other requirements implemented in the design, construction, and operation phases of a project.

Manitoba Hydro organized the environmental protection measures by construction component and activity, and environmental component and issue to assist project personnel in implementing measures for work sites and activities.

Manitoba Hydro will develop the environmental protection plans described in the following sections.

16.5.4.1 Construction

The construction environmental protection plan (CEnvPP) will be prepared prior to construction. It is a key element in implementing effective environmental protection and limiting the potential adverse environmental effects identified in the environmental assessment report. It also outlines actions to identify unforeseen environmental effects and implement adaptive management strategies to address them. An important component of an environmental protection plan is review and updating. This allows environmental protection measures to remain current, continually improving environmental performance.

A CEnvPP is composed of general and specific environmental protection measures that cover all aspects of the work and the environment. General environmental protection measures for the project include mitigation measures and follow-up actions identified in the environmental assessment report, including design mitigation, provincial and federal regulatory requirements, beneficial practice guidelines, Manitoba Hydro environmental policies and commitments, and input during project engagement.

The CEnvPP lists the general environmental protection measures for major components and activities associated with the project. Environmental protection measures are provided for environmentally sensitive sites (ESS) identified during project engagement and assessment activities. Environmentally sensitive sites are locations, features, areas, activities, or facilities along or immediately adjacent to the transmission line corridor or other project components that are ecologically, socially, economically, or culturally important and sensitive to disturbance by the project and, as a result, require site-specific mitigation measures.

The CEnvPP will contain orthophoto map sheets that provide Manitoba Hydro project managers, construction supervisors, employees, contractors, and contract employees with detailed site-specific environmental protection information (e.g. topsoil stripping depth and handling, heritage resources, waterbodies) that can be implemented, managed, evaluated, and reported on in the field.

16.5.4.2 Operation and maintenance

Contractor Environmental Responsibility Bulletins (Appendix F) articulate the standard mitigation measures that will be implemented during operations and maintenance activities. A specific operation and maintenance environmental protection plan is not planned at this time.

16.5.4.3 Decommissioning

A decommissioning environmental protection plan will be prepared at the end of the project's operational life and will contain decommissioning methods, waste and recycling management, and mitigation measures to address environmental effects and legislation that is in effect at that time.

16.5.4.4 Cultural and heritage sites / objects

The fact that cultural and heritage sites / objects have intrinsic value to Manitobans is understood by Manitoba Hydro and addressed through a separate protection plan. The culture and heritage resource protection plan (Appendix E) outlines protection measures in the event of the discovery of previously unrecorded cultural and heritage sites / objects during construction and describes the ongoing monitoring of known cultural and heritage sites / objects for disturbance.

16.5.5 Management plans

Management involves the organization of activities and resources to resolve or respond to environmental problems, issues, or concerns. Management plans provide reasoned courses of action to achieve pre-defined goals or objectives. Management plans will be prepared to address important management issues, regulatory requirements and corporate commitments identified in the environmental assessment report. The management plans will describe the management actions, roles and responsibilities, evaluation mechanisms, updating requirements and reporting schedules. The following management plans will be prepared prior to the start of construction of the project:

- Access
- Biosecurity
- Clearing
- Erosion protection and sediment control
- Rehabilitation and invasive species
- Waste and recycling

Environmental inspectors / officers will conduct regular inspections during construction to ensure adherence to the plans. The following sections describe each plan.

16.5.5.1 Access management plan

Prior to the start of construction, Manitoba Hydro will prepare an access management plan to minimize the need to construct new access roads and trails.

The access management plan will outline:

- The use of existing roads and trails to the extent possible during construction
- Management objectives and principles
- Security requirements, including
    - Terms and conditions for access
    - Restrictions on firearms
    - Hunting and fishing
    - Other resource use activities
- Environmental protection measures including
    - Timing windows
    - Vehicle cleaning and servicing
    - Load restrictions
    - Warning signage
    - Speed limits
    - Sensitive area avoidance
    - Stream crossings
    - Other environmental issues
- Access management issues and mitigation strategies
- Safety of construction workers and the public
- Respect for First Nation and Red River Métis rights and resource users
- Protection of natural, cultural and heritage sites / objects

16.5.5.2 Biosecurity

Prior to the start of construction Manitoba Hydro will prepare a biosecurity management plan for the project to provide guidance to Manitoba Hydro staff and contractors to prevent the introduction and spread of weeds and other pests, including invasive species, in agricultural land and livestock operations through project pre-construction and construction activities.

16.5.5.3 Erosion protection and sediment control

Prior to the start of construction, Manitoba Hydro will develop an erosion protection and sediment control framework to guide each contractor in preparing an erosion protection and sediment control plan to limit adverse environmental effects of sediment releases on the aquatic environment in accordance with provincial and federal legislation and guidelines, and corporate environment policies and guidelines.

The plan will prescribe environmental protection measures including:

- Ground protection measures
- Establishment of buffer zones
- Avoidance of sensitive areas
- Use of bioengineering techniques

16.5.5.4 Rehabilitation and invasive species

Prior to the start of construction, Manitoba Hydro will prepare a rehabilitation and invasive species management plan in accordance with environmental protection measures and provincial guidelines for rehabilitation.

The plan will prescribe measures for:

- Washing equipment and vehicles prior to mobilizing to the project site
- Weed management at construction sites
- Restoring and re-vegetating disturbed sites

16.5.5.5 Waste and recycling

Prior to the start of construction, Manitoba Hydro or the contractor will develop a waste and recycling management plan to manage waste at construction locations in accordance with provincial legislation and guidelines, and corporate policies and procedures for the protection of human health and the environment.

The plan will include measures for:

- Waste reduction
- Recycling and reusing initiatives
- Storage of kitchen wastes
- Recycling and disposal of construction wastes
- Disposal of wastes at licenced facilities

16.6 Follow-up and monitoring

Follow-up and monitoring are intended to verify the accuracy of the environmental assessment of a project, assess the effectiveness of measures taken to mitigate adverse effects and determine compliance with regulatory requirements. Where required Manitoba Hydro implements the follow-up and monitoring activity using two programs called inspection and environmental monitoring, which are discussed further in the sections below.

16.6.1 Inspection program

An inspection is a type of monitoring and/or follow-up and monitoring activity that includes documenting observations and evaluations of a construction or maintenance project and related work activities to verify conformance with specified requirements, drawing, and standards. Environmental inspection is an essential and key function in environmental protection and implementation of mitigation measures.

Manitoba Hydro has established a comprehensive integrated environmental inspection program to comply with regulatory approvals and meet corporate environmental objectives. The program includes environmental inspectors onsite during construction activities which have elevated environmental risk such as clearing and excavation. Manitoba Hydro's approach to environmental inspection includes:

- Compliance with regulatory approvals
- Adherence to environmental protection plans
- Qualified environmental inspectors
- Environmental support and guidance
- Scheduled monitoring and inspection during construction
- Interaction with contractors (e.g., pre-construction meeting, regular meetings)
- Review of inspection and monitoring information
- Quick response to incidents or changing conditions
- Monthly summary reports
- Reporting to regulators
- Notification to regulators of emergency or contingency situations

Environmental inspectors / officers will:

- Visit active work sites to inspect for compliance with licence, permit or other approval terms and conditions, and adherence to environmental protection plan general and specific mitigation measures
- Report all instances of non-compliance to the construction supervisor, contractor, and when appropriate the applicable regulatory authority
- Report incidents including accidents and malfunctions (e.g., material spills, fires, and explosions) and associated environmental damage to the construction supervisor and applicable regulatory authority, if required
- Record all inspection activities in a daily journal and complete daily inspection forms
- Provide daily and monthly inspection reports electronically to the environmental protection information management system for review and viewing by applicable Project staff

Incidents will be dealt with immediately and followed up in subsequent daily inspection reports.

16.6.2 Valued component monitoring program

Due to the well-understood and limited potential effects to the area traversed by the final preferred route; a VC specific monitoring plan has not been prepared for this project. Should environmental inspections discover unexpected VC-specific effects or damage (e.g., damage to wildlife habitat), a VC-focused monitoring plan that outlines monitoring steps to ensure appropriate rehabilitation and follow-up, may be developed.

16.6.3 Environmental protection information management SharePoint (EPIMS)

An environmental protection information management SharePoint (EPIMS) is a tool that is used monitor, track and report on environmental protection implementation and performance, regulatory compliance, and incident reporting.

The environmental protection information management SharePoint (EPIMS) functions as an internal, central repository of environmental protection information, including:

- Environmental protection documents
- Reference information such as regulations and guidelines
- Inspection reports
- Monitoring field data and reports

16.7 Pre-construction activities

Manitoba Hydro will undertake several activities prior to commencing construction of the project to set the direction for environmental protection and compliance with legislated requirements.

Manitoba Hydro will obtain licenses, permits, authorizations and other approvals, including property agreements, right-of-way easements and releases, prior to commencement of construction of each project component. Additional terms and conditions of these approvals will be incorporated into the construction environmental protection plan. Additional approval requirements to be obtained by the contractors will be identified and communicated to the successful bidders.

The Transmission & Distribution Environment and Engagement Department will typically participate in the tender / direct negotiated contract development process to make sure environmental requirements are included as contract specifications. Bidders are required to list and defend their environmental record and must have an environmental management plan, including a commitment to environmental protection.

Meetings will be held with the contractors to review the environmental protection requirements, establish roles and responsibilities, management, monitoring and other plans, inspection and reporting requirements, and other submittals. Prior to the start of construction, contractor employees will receive orientation on environmental protection requirements.

16.8 Work stoppage

The duty to stop work rests with everyone encountering situations where the environment, including biophysical, socio-economic and heritage sites / objects, are threatened by an activity or occurrence that has not been previously identified, assessed, and mitigated. Work stoppage is also to occur at specific sites in the event of an environmental accident, extreme weather event or if suspected human remains are discovered. Individuals discovering such situations are to inform their supervisor who will report the matter to the construction supervisor or environmental inspector / officer immediately. The contractor is also required to stop or modify work where construction activities are adversely affecting the environment or where mitigation measures are not effective in controlling environmental effects. Remedial action plans or other environmental protection measures will be developed and implemented immediately after discussion and prior to resumption of work if previously halted. Work is not to resume until the situation has been assessed and responded to and Manitoba Hydro approves the resumption of work. Stop work orders will be documented, reported to regulatory authorities (if applicable) and reviewed at construction meetings.

16.9 Review and updating

16.9.1 Incident reviews

CEnvPP will be subject to review in the event of an incident, including environmental accidents, fires and explosions, reportable releases of hazardous substances and non-compliance situations.

16.9.2 Auditing

Auditing is a systematic approach to defining environmental risk and/or determining the conformance of an operation with respect to prescribed criteria. An environmental audit typically involves a methodical examination of evidence that may include interviews, site visits, sampling, testing, analysis, and verification of practices and procedures. Environmental protection plans for the project will be subject to internal and external audits. The audit results will help to evaluate the effectiveness of environmental protection measures, to learn from inspection and monitoring programs, and to improve project planning and environmental assessment performance.

16.9.3 List of revisions

A list of revisions will be maintained at the beginning of each environmental protection plan that identifies the nature of the revision, section revised and dates.

16.10 Summary

This chapter outlined the environmental protection program where environmental protection commitments, mitigation measures and follow-up actions identified in this environmental assessment report will be implemented, managed, reported, and evaluated. The purpose, organization, responsibilities, management, communication, and other aspects of the environmental protection program were described. Environmental protection plans are described as they relate to the construction, operation and decommissioning stages in the project planning cycle and environmental assessment and licensing process. Implementation of follow-up actions, including inspection, management and auditing are discussed. Environmental management plans are also identified.

17.0 Conclusion

This report outlined the environmental assessment of potential biophysical and socio-economic effects of the proposed Neepawa gas transmission project.

The environmental assessment was focused on seven valued components, specifically important sites, vegetation, wildlife and wildlife habitat, commercial agriculture, human health risk, economic opportunities, and infrastructure and services.

Detailed conclusions related to predicted residual effects and the characterization of those effects are included in each valued component assessment chapter (Chapters 6.0 – 12.0). A summary of conclusions is included at the beginning of each of these chapters.

To summarize at a high-level, the conclusions of the assessment of anticipated residual environmental effects of the Neepawa gas transmission project include, but are not limited to, the following:

- Potential project effects are anticipated to be most pronounced during the construction phase of the project.
- No Crown land will be traversed by the proposed project.
- Potential effects on the natural environment are limited as most of the proposed project development area is previously disturbed and developed. The project development area traverses predominantly agricultural land.
- The project is anticipated to directly alter less than 2.1 ha of forest.
- The project is not anticipated to alter wetlands.
- The proposed project has low potential to affect species of conservation concern.
- The project has potential to adversely affect important sites, including heritage resources and cultural sites or features, through ground disturbance.
- Cultural experiences in the area may be affected due to changes to the sensory experience and access.
- A total of 49 ha of land will be temporarily lost from agricultural production during project construction and there will be a short-term disruption to agricultural activities during one growing season.
- There will be permanent loss of an estimated 0.80 ha (1.98 ac) of land from agricultural use, which will be occupied by above-ground control points throughout the lifetime of the project.

- Agricultural land capabilities along the pipeline route are anticipated to return to pre-disturbance levels.
- Anticipated residual effects related to human health risk include a temporary increase in noise levels. Project-related effects on air quality are anticipated to be negligible.
- An increase in traffic in the assessment area is anticipated as well as potential for small increases in strain on the availability of short-term accommodations, transportation infrastructure, health and emergency response services, and waste management facilities.
- The project is anticipated to result in positive outcomes for economic opportunities, including potential opportunities for employment and local spending on goods and services.
- The total considered life cycle GHG emissions for the project are estimated to be 422.51 tonnes of carbon dioxide equivalent per installed pipeline km (t CO_2e/km), or 8,530 tonnes of CO_2e (t CO_2e), for the entire pipeline over the 50-year assumed lifespan.
- 'Post Construction: Pipeline Operations' is the single largest GHG emission category over the 50-year assumed lifespan, accounting for 43% of the total considered life cycle assessment emissions.

Manitoba Hydro understands that the severity of residual project effects may be experienced uniquely by different individuals, nations, and communities.

Mitigation measures informed by Manitoba Hydro's experience with similar projects as well as engagement feedback from this and other projects will be implemented to reduce adverse effects of the project. Certain mitigations have been built into project design. Routing the pipeline to parallel an existing natural gas pipeline has mitigated overall project conflicts with agricultural activities and the use of horizontal directional drilling to install the pipeline beneath certain areas, including the Brookdale Drain and a wet deciduous forest area along the proposed route, mitigates effects to natural vegetation, wildlife habitat, and species of conservation concern.

Table 17-1 at the end of this chapter, provides a comprehensive record of additional project-specific mitigation measures identified throughout this report. The mitigation measures in Table 17-1 represent Manitoba Hydro's commitments related to the proposed project, if approved.

With the implementation of the mitigation built into project design as described in Chapter 2.0 and the mitigation measures identified in Table 17-1 to reduce and manage potential adverse effects on the biophysical and socioeconomic environment, the residual effects of the Neepawa gas transmission project are predicted to be **not significant**.

The project will provide a benefit to Manitobans, bringing energy to life.

Table 17-1: Comprehensive mitigation list for the Neepawa gas transmission project

Mitigation measure	Chapter reference
A pre-construction survey of areas with heritage potential will be conducted. A total of ten areas of heritage concern have been identified, including three reported burials, a major trail, and areas in proximity to known archaeological sites. These features may have the potential for heritage resources on or along their margins.	6.0 (Important sites)
Mitigation for the protection of heritage sites or objects is outlined in the CHRPP. The CHRPP (Appendix E) will provide clear instructions on how to proceed should Manitoba Hydro, its contractors and/or consultants, discover or disturb a cultural or heritage site or object and will determine the ongoing protection measures for the resources through processes outlined in this document.	6.0
If a heritage site or object is discovered, project work will cease around the discovery and the project archaeologist will be contacted. Work in the area will continue only if approval is received from the archaeologist or the Historic Resources Branch.	6.0
Manitoba Hydro will work to notify engaged First Nations and the Manitoba Métis Federation about archaeological finds.	6.0
Manitoba Hydro remains open to engaged First Nations and the Manitoba Métis Federation identifying sensitive sites, including important sites, to help inform the environmental protection program for the project.	6.0
Identified cultural and heritage sites will be incorporated into environmental protection plans prior to construction.	6.0
Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.	6.0
Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in a field visit(s) to observe construction activities.	6.0
Manitoba Hydro will provide notification to engaged First Nations and the Manitoba Métis Federation and relevant interested parties prior to the start of construction.	6.0
Indigenous Cultural Awareness Training will be required for project workers (i.e., both Manitoba Hydro staff and contractors).	6.0
Manitoba Hydro will reach out to engaged First Nations and the Manitoba Métis Federation to determine interest in arranging a ceremony or ceremonies, recognizing that participation will be guided by each nation’s cultural practices, protocols, and preferences.	6.0
Manitoba Hydro will continue to consider feedback related to mitigation for how the project contributes cumulatively to effects to important sites in the RAA.	6.0
Species at Risk (SAR) will be protected in accordance with provincial and federal legislation and provincial and federal guidelines.	7.0 (Vegetation)

Table 17-1: Comprehensive mitigation list for the Neepawa gas transmission project

Mitigation measure	Chapter reference
A 30 m setback distance will be applied to known SAR.	7.0
Setbacks and buffers along the right-of-way (ROW) will be clearly identified by signage or flagging prior to construction, and signage or flagging will be maintained during construction to alert crews to the presence of the setback.	7.0
If previously unidentified plant SAR are found on the ROW prior to or during construction, the occurrences will be flagged for avoidance where possible.	7.0
If avoidance of listed SAR is not possible, the regulators will be contacted to determine the most appropriate mitigation action. This could include harvesting seed from the PDA, salvaging and transplanting portions of sod, collecting cuttings or transplanting whole plants.	7.0
Access shall be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.	7.0
All equipment must arrive at the ROW or project site clean and free of soil or vegetation debris.	7.0
Weed control along access roads and trails will be conducted in accordance with the Rehabilitation and Invasive Species Management Plan.	7.0
Equipment will be cleaned before moving from locations with identified invasive weed infestation.	7.0
Wildlife features (*e.g.*, stick nests) will be identified in the Construction Environmental Protection Plan (CEnvPP), and mitigation, such as buffers, will be applied.	8.0 (Wildlife and wildlife habitat)
Environmentally sensitive sites, features, and areas will be identified and mapped before construction.	8.0
Construction activities will not take place outside of the reduced risk timing windows for wildlife species without additional mitigation measures such as pre-construction nest searches.	8.0
Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.	8.0
Hunting and harvesting of wildlife, or possession of firearms by project staff, will not be permitted while working on project sites.	8.0
Construction activities will be restricted to roads, trails and cleared construction areas in accordance with the Access Management Plan.	8.0

Table 17-1: Comprehensive mitigation list for the Neepawa gas transmission project

Mitigation measure	Chapter reference
Project-related vehicles will comply with all traffic rules, including speed limits and provincial and federal highway regulations.	8.0
Construction activities will not take place outside of the reduced risk timing windows for wildlife species without additional mitigation.	8.0
The trench will be inspected before backfilling to prevent amphibians or other wildlife from being inadvertently buried.	8.0
Manitoba Hydro will pay compensation for damage to infrastructure/crops from construction or maintenance activities. Where possible, construction schedules will take into consideration the timing of agricultural activities.	9.0 (Commercial agriculture)
Compensation will be provided to landowners for: damage to property, any relocation of incompatible agricultural buildings, and temporary loss of agricultural land	9.0
Areas of temporary soil disturbance on agricultural lands will be rehabilitated in accordance with the Rehabilitation and Invasive Species Management Plan. This plan will be developed before construction and would be part of the overall Environmental Protection Program, as described in Chapter 16.0.	9.0
Manitoba Hydro will contact directly affected landowners to discuss how to reduce effects on their agriculture activities.	9.0
A pre-construction field soil survey will be undertaken along the pipeline route to facilitate development of project-specific topsoil stripping depth and soil handling recommendations.	9.0
Effects of soil compaction and rutting will be mitigated by managing equipment traffic routes and activities for access development, temporary work area setup, right-of-way preparation, pipeline stringing and installation, and control point preparation. Contractors will be restricted to roads and trails and cleared construction areas in accordance with the Access Management Plan.	9.0
The pipeline will be constructed in agricultural areas when soils are not saturated to limit compaction, rutting, and admixing. If this is not possible, other mitigation or rehabilitation measures will be conducted to reverse effects of compaction (*e.g.,* deep ripping or tillage)	9.0
If working on saturated soils during non-frozen ground conditions, equipment and techniques that distribute ground pressure (*e.g.,* construction mats, geofabric and padding and corduroy) will be used to avoid compaction and admixing	9.0
Manitoba Hydro will develop an erosion protection and sediment control framework to guide each contractor in preparing of erosion protection and sediment control plans. The objective of these will be to limit adverse environmental effects of sediment releases on the aquatic environment. These will be developed in accordance with provincial and federal legislation and guidelines, and corporate environment policies and guidelines.	9.0
Prior to construction, if producers indicate a specific activity or practice that will be affected by the project, Manitoba Hydro will make reasonable efforts to implement specific mitigation, where possible, to reduce local effects.	9.0
Where conflict and/or interference can't be avoided including where timing of project activities overlaps with producer activities during the growing season, Manitoba Hydro will pay compensation pursuant to the Landowner Compensation Program.	9.0

Table 17-1: Comprehensive mitigation list for the Neepawa gas transmission project

Mitigation measure	Chapter reference
Construction damage compensation is offered to landowners who experience damage to their property due to the construction, operation and maintenance of the pipeline. It will be provided to compensate a landowner for damages such as the reapplication or rejuvenation of compacted topsoil where the remedial work requires farm machinery and the expertise of the landowner. This will include damage to existing irrigation or drainage infrastructure, in the event this occurs.	9.0
Structure Impact Compensation is a one-time payment to landowners for each structure placed on land classed as agricultural. Structure Impact Compensation will cover: reduced productivity in an area of overlap around each structure, additional time required to maneuver farm machinery around each structure, and double application of seed, fertilizer and weed control in the area of overlap around each structure.	9.0
Ancillary damage compensation is a one-time payment when Manitoba Hydro's use of the right-of-way directly or indirectly affects the use of the property. It will be provided for: constraint effects such as restricted access to adjacent lands and traditional effects such as highest and best use of land.	9.0
Per the agricultural biosecurity SOP (Manitoba Hydro 2023b), Manitoba Hydro staff and contractors will complete the following requirements (detailed, scenario-based procedures will be followed by staff and contractors, as presented in the agricultural biosecurity SOP): • While working in livestock settings (i.e., a property or portion of a property where livestock are kept): o Visually inspect, clean, and disinfect tools and footwear before entering and leaving fields or identified controlled access zones (e.g., a zone defined by a livestock producer to control entry onto their property). o Visually inspect and mechanically clean vehicles, if vehicles used in fields or identified controlled access zones. Pressure washing vehicles may be necessary if heavily soiled. o Record all actions and procedures followed. o Boot covers may be required in livestock settings in certain instances • While working in crop settings (i.e., a property or portion of a property where crops such as corn, wheat or canola are grown): o Vehicles, equipment, tools and footwear should enter and exit fields in a clean condition. o Mechanically clean vehicles, equipment, tools and footwear. o If mechanical cleaning is not sufficient, one or both of the following is required: 1) disinfection of vehicles, equipment, footwear and tools for footwear is required, 2) washing (pressure or mobile) at the field approach or off site. o Record all actions and procedures followed.	9.0
Manitoba Hydro will discuss with landowners and/or producers, ways to minimize effects to agricultural operations where construction or maintenance activities have the potential to interfere with field activities.	9.0
Manitoba Hydro will ask producers or landowners to avoid spreading manure or pasturing livestock, if applicable, in the pipeline right-of-way prior to construction.	9.0
Manitoba Hydro will require all equipment to arrive at the right-of-way or project site clean and free of soil or vegetative debris (including weed seeds).	9.0
Manitoba Hydro will continue to work with agricultural producers affected by the project and representative producer/commodity organizations to determine site and operation-specific mitigation to lessen the potential for cumulative effects to commercial agriculture.	9.0

Table 17-1: Comprehensive mitigation list for the Neepawa gas transmission project

Mitigation measure	Chapter reference
Mud, dust, and vehicle emissions will be managed in a manner that considers the safe and continuous public activities near construction sites, where applicable.	10.0 (Human health risk)
Construction staff will be encouraged to carpool to reduce the amount of traffic in the area.	10.0
Construction activities will be conducted per applicable noise bylaws. As specified by the municipal by-laws, no construction activities that generate excessive noise will occur between 10:00 p.m. and 7:00 a.m.	10.0
Manitoba Hydro will collaborate with proponents and government agencies managing the existing ongoing projects and activities in the area, where appropriate, to address cumulative effects.	10.0
Manitoba Hydro will contact local municipal authorities, First Nations and the Manitoba Métis Federation representatives, prior to project start-up, to provide details about the upcoming project and associated employment and/or business opportunities for the region.	11.0 (Economic opportunities)
Manitoba Hydro will continue to engage with First Nations and the Manitoba Métis Federation to understand contextual considerations related to training, employment and business opportunities on the project.	11.0
Manitoba Hydro will continue to meet with First Nations and the Manitoba Métis Federation to discuss multiple projects in the region to support longer-term employment and business opportunities.	11.0
Manitoba Hydro will continue to provide information to communities in the LAA/RAA on training, employment and business opportunities associated with project construction, operation and decommissioning.	11.0
If the demand for short-term accommodations exceeds the availability in the RAA, Manitoba Hydro will work with the contractor to identify alternative solutions, such as seeking accommodations in neighbouring or nearby municipalities, towns, or cities with availability.	12.0 (Infrastructure and community services)
All materials transported by truck will be compliant with any weight restrictions or permits, spring road restrictions, or geometric constraints set out by Manitoba Transportation and Infrastructure or municipal governments.	12.0
Vehicles transporting dangerous goods or hazardous products will display required placards and labelling in accordance with provincial legislation and Manitoba Hydro guidelines.	12.0
Manitoba Hydro will work with local authorities to address any damage to roads that occurs because of the project.	12.0
Manitoba Hydro will obtain the applicable permits from Manitoba Transportation and Infrastructure as per the *Traffic and Transportation Modernization Act*.	12.0
An Emergency Response Plan will be developed. As part of the development and implementation, Manitoba Hydro will collaborate with local emergency responders to ensure timely emergency response times. Project personnel will be made aware of the plan, and designated staff will receive training. Among other elements, the plan will	12.0

Table 17-1: Comprehensive mitigation list for the Neepawa gas transmission project

Mitigation measure	Chapter reference
address handling and storage of materials, driving safety, animal encounters, emergency response communications, spill response, personnel injury response, and vehicle collisions.	
Project contractors will have first aid at project sites to provide services to project workers/contractors.	12.0
As part of ongoing project engagement, Manitoba Hydro will continue to engage with and share project information with local governments.	12.0
Manitoba Hydro and its contractors will utilize Waste and Recycling Management Plans to manage waste and recycling in accordance with The Public Health Act and The Dangerous Goods Handling and Transportation Act. This plan outlines policies related to reducing the amount of solid waste generated, facilitating recycling wherever possible, and storing, transporting, and disposing of solid waste at designated facilities.	12.0
Drilling fluid waste will be managed in accordance with Manitoba Hydro's contractor environmental responsibilities (CER) related to directional drilling (see Appendix F) .	12.0
Subject to suitable soil conditions and drainage, and compliance with The Public Health Act and/or The Environment Act, wastewater will be transported to an appropriate wastewater facility.	12.0
As part of its contractor evaluation process, in pursuit of retaining a contractor to construct our licensable projects, Manitoba Hydro evaluates bids on specific environmental aspects including each bid's proposed methodology for reducing GHG emissions and other climate change mitigations that will be implemented during the work.	13.0 (Greenhouse gases and climate)
Manitoba Hydro will implement mitigation measures including the following to address project-related GHG emissions from construction and maintenance activities: • Limiting the amount of vegetation removed to what is required to safely construct and operate the pipeline. • Encouraging the productive use of wood/timber removed during clearing activities. • Ensuring all vehicles and equipment are regularly inspected and maintained to optimize energy efficiency. • Reducing idling to the extent possible and utilizing equipment or vehicles with auto-shutoff, if available and practical. • Encouraging vans/shuttle buses and/or carpooling of workers when practical. • Using electric and/or hybrid vehicles to the extent practical. • Developing a waste management plan that promotes reuse and/or recycling whenever feasible and promoting the composting of organic waste when feasible/practical. • Planning work activities to reduce the distance of travel, e.g., using direct routes of travel, reducing the amount of transport trips (full vs. half loads), and utilizing appropriate local facilities near the project site to source materials and/or for waste disposal, when practical.	13.0

Table 17-1: Comprehensive mitigation list for the Neepawa gas transmission project

Mitigation measure	Chapter reference
Workers will be trained in practices to prevent workplace accidents including Workplace Hazardous Materials Information System (WHMIS), first aid, and other applicable training.	15.0 (Accidents and malfunctions)
Prior to commencing construction activities, the contractor shall develop a spill response plan that must be submitted to Manitoba Hydro for review and acceptance.	15.0
The contractor will be required to provide environmental training, as well as training in spill prevention and response, to construction personnel.	15.0
Prior to the commencement of construction activities, Manitoba Hydro will ensure that spill response equipment is readily available.	15.0
Spills will be contained, cleaned, and reported to applicable authorities as follows: • Contaminated material or potentially hazardous material will be contained. • Proper safety precautions (e.g., protective clothing and footwear) will be implemented. • The contractor will follow their spill response plan and ensure that the province's spill-reporting line is notified for reportable spills. • Contaminated wastes, such as used cleaning cloths, absorbents, and pads, will be stored in proper waste containers. • Waste material will be disposed of at approved disposal facilities.	15.0
Construction equipment will be cleaned and maintained in good working condition, with visual inspections of equipment performed on a regular basis. Petroleum products such as gasoline, diesel fuel, and oil will be properly labeled in accordance with the appropriate legislation and regulations.	15.0
Refueling, oiling, and maintenance of equipment, as well as storage of hazardous materials, will be conducted in a designated and contained area(s). Servicing of equipment (e.g., oil changes and hydraulic repairs) will be completed in designated areas. Vehicles will be equipped with spill containment and cleanup materials.	15.0
Personnel handling fuels and hazardous wastes will have WHMIS training and be qualified to manage these materials in accordance with the manufacturer’s instructions and applicable regulations.	15.0
Hazardous waste and storage area(s) will be clearly marked and secured. Industrial waste will be reused or recycled on a priority basis. Where reuse or recycling opportunities are not available, industrial waste will be collected and disposed of at an approved facility.	15.0
Garbage receptacles for solid non-hazardous wastes will be available. These wastes will be collected on a regular basis or as they are generated and will be disposed of at approved locations.	15.0
Project-related vehicles will observe traffic rules and provincial and federal highway regulations.	15.0
Trucking activity will observe speed limits and weight restrictions.	15.0
The heritage potential of the PDA is analyzed during the environmental assessment. In areas identified as having high potential for heritage resources, a preconstruction archaeological survey may be conducted.	15.0

Table 17-1: Comprehensive mitigation list for the Neepawa gas transmission project

Mitigation measure	Chapter reference
Areas of potential heritage concern along the proposed project location have been identified for pre-construction archaeological field surveys by a qualified archaeologist as detailed in Chapter 6.0 and Appendix E.	15.0
If a heritage site or object is discovered, project work will cease around the discovery and the project archaeologist will be contacted. Work in the area will continue only when approval is received from the project archaeologist or the Historic Resources Branch.	15.0
Should the encounter of a heritage site or object occur on land used for commercial agriculture and preclude use of that land for typical agricultural operations/activities, Manitoba Hydro may consider compensating the producer for ancillary damages on a case-by-case basis.	15.0
Manitoba Hydro will regularly carry out maintenance and inspection activities to assess and identify areas of potential concern.	15.0
Manitoba Hydro employees carrying out maintenance and inspection activities will be trained on procedures to follow in the event a gas leak or rupture is identified.	15.0
As part of the Click Before You Dig MB program, Manitoba Hydro will locate and mark its underground gas lines in response to submitted requests for utility locates before the commencement of excavation activities in the vicinity of the project.	15.0
Pipeline surveys and inspections during operations will be done on on a regular basis, to help protect against deliberate third-party interference.	15.0
Landowners will be aware of the location of the pipeline on their land (i.e., depth of cover surveys) to mitigate accidental third-party interference (from excavation and agricultural activities).	15.0
Manitoba Hydro will locate and mark its underground gas lines in response to submitted requests for utility locates before the commencement of excavation activities in the vicinity of the project.	15.0
The pipeline will be marked with signs at each mile road and where the pipeline crosses waterways or other service roads.	15.0

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Appendix A: Project engagement materials

Appendix B: Heritage technical report

Appendix C: Vegetation technical data reports

Appendix D: Greenhouse gas assessment report

Appendix E: Cultural and heritage resources protection plan

Appendix F: Contractor environmental responsibility bulletins