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Abbreviations

AEP	Alberta Environment and Parks
DLO	Department Licences of Occupation
DRS	Disposition Reservation
EIA	environmental impact assessment
ESRD	Alberta Environment and Sustainable Resource Development
EZE	easement
FMZ	Fur Management Zone
GLIMPS	geographic land information management and planning system
GRP	grazing permit
KWBZ	Key Wildlife Biodiversity Zone
LAA	local assessment area
LUF	land-use framework
MC1	McLean Creek Dam
MDP	Municipal Development Plan
MGA	Municipal Government Act
NRCB	Natural Resources Conservation Board
PDA	project development area
PLA	pipeline agreement
PNT	protective notation

RAA	regional assessment area
REC	recreation lease
RFMA	registered fur management area
ROW	right-of-way
SSRP	South Saskatchewan Regional Plan
TOR	terms of reference
TPA	trapline agreement
VC	valued component
WMU	wildlife management unit

12.0 ASSESSMENT OF POTENTIAL EFFECTS ON LAND USE AND MANAGEMENT

This section describes the various ways in which land is used by humans and the management frameworks which guide its use, potential effects of the Project on land use and management, and measures to mitigate potential effects.

Land uses near the Project include privately owned residences, businesses, and recreation facilities; agriculture; activities on Crown lands; oil and gas and other industrial developments; consumptive recreation and livelihood and non-consumptive recreation; and unique sites and special features.

Land use and management is linked with other VCs, including vegetation and wetlands, aquatic resources, wildlife, historical resources, traditional land and resource use. Existing conditions for the VCs listed above are incorporated into this effects assessment.

12.1 SCOPE OF THE ASSESSMENT

12.1.1 Regulatory and Policy Setting

12.1.1.1 Federal Regulatory Requirements

Refer to Volume 1, Section 1.3 for federal regulatory requirements for the Project.

12.1.1.2 Provincial Regulatory Requirements

Refer to Volume 1, Section 1.3 for provincial regulatory approvals for the Project. Legislation and Guidelines. Provincial land use planning frameworks and plans as well as provincial acts that apply directly to land use are described below.

Alberta Land-Use Framework

Land-use planning in Alberta is guided by the *Land-Use Framework* (LUF) (GOA 2008), which outlines an approach to managing land and natural resources in a manner that would achieve Alberta's long-term economic, environmental and social goals. The LUF established seven new land use regions and called for the development of a regional plan for each. *The Alberta Land Stewardship Act* (2009) establishes the legal basis for the development of regional plans under the LUF and the Alberta Land Stewardship Regulation provides the rules for implementing regional plans under the LUF. The Project is in the boundaries of the *South Saskatchewan Regional Plan* (SSRP), which became effective on September 1, 2014 (AEP 2016a).

South Saskatchewan Regional Plan

The SSRP sets a long-term vision for the region, which includes supporting a growing population through economic diversification, including agriculture; opportunities for oil and natural gas production; renewable energy; forestry; and tourism (AEP 2017). The SSRP seeks to balance economic goals with environmental and social goals including sustaining air, water, land and biodiversity in healthy, functioning ecosystems; maintaining headwater and regional fresh water quality; and promoting conservation strategies to protect natural regions and promote recreation. The SSRP sets outcomes, objectives, strategies, actions, approaches, and tools to achieve these goals in its implementation plan. Outcomes and strategic direction include:

- The region's economy is growing and diversified using principles of sustainable development wherein economic development considers environmental sustainability and outcomes.
- Air quality is managed to support healthy ecosystems and human needs through shared stewardship and continued collaboration.
- Biodiversity and ecosystem function and benefits are sustained through shared stewardship.
- Watersheds are managed to support healthy ecosystems and human needs through shared stewardship.
- Land is used efficiently to reduce the amount of area that is taken up by permanent or long-term developments associated with the built environment.
- The quality of life of residents is enhanced through increased opportunities for outdoor recreation and nature-based tourism opportunities; and the preservation and promotion of the region's unique cultural and natural heritage.
- Indigenous peoples are included in land-use planning.
- Community development needs are anticipated and accommodated, and communities are strengthened.

The SSRP will be implemented on private lands through existing legislation such as the *Municipal Government Act* and through existing tools such as integrated landscape management plans and access management plans (AEP 2017). Strategies for integrated landscape management outlined in the SSRP include creating new and expanded conservation areas on provincial land.

Alberta Wildlife Act

Hunting is regulated by the Alberta *Wildlife Act* and Wildlife Regulation, which is administered by the Fish and Wildlife Division of AEP. The Canadian Wildlife Service, under the *Migratory Birds Convention Act*, manages migratory bird hunting.

Hunting management in Alberta uses five general zones (i.e., Boreal, Foothills, Parkland, Prairie and Mountains) and wildlife management units (WMUs) to manage wildlife resources. Each WMU has rules describing the time of year, method of hunting and quantity of a given species that can be hunted on a sustainable basis. For most species, a hunting licence is required from the government. Companies that operate as guides for hunters are given allocations in a WMU to harvest a certain number of animals of a certain species per year (APOS 2017a).

Trapping in Alberta is also regulated under Alberta's *Wildlife Act* as well as through trapping regulations using a registered trapline system and guidelines that provide direction on species management.

The Province of Alberta is divided into eight fur management zones and 1,632 registered fur management areas (RFMAs). Under Alberta's trapline system, trapline owners are licensed to harvest in one or more of the RFMAs through a registered fur management licence, also referred to as trapline agreements (TPAs).

Alberta Fisheries Act

Recreational fishing in Alberta is regulated by the *Alberta Fisheries Act* and fisheries regulations, administered by the Fish and Wildlife Division of AEP. The province has three management zones (Eastern Slopes, Parkland-Prairie and Northern Boreal), based on ecosystem type. The three zones are further partitioned into units, based on watershed, so that fishing regulations meet waterbody and fish population needs for individual areas.

12.1.1.3 Municipal Regulatory Requirements

The Project is in Rocky View County, Alberta (the Municipal District of Rocky View No. 44 became Rocky View County in June 2009). The Municipal District of Rocky View No. 44 Municipal Development Plan (MDP) outlines the County's vision for the future: the Municipality remains a major agricultural force in the region and considers infrastructure, environment, and quality of life in its decision-making (Municipal District of Rocky View No. 44 2010). Municipalities are delegated the responsibility of developing MDPs under the MGA (2017).

The Rocky View County Land Use Bylaw (Bylaw C-4841-97) implements the MDP and establishes land use districts and land uses (Rocky View County 2016a). Land use districts in or near the Project are:

- Ranch and farm – provides for agricultural activities as the primary land use on a quarter section of land or on large balance lands from a previous subdivision.
- Agricultural holdings – provide for a range of parcel sizes used for traditional and novel agricultural uses.
- Farmstead – provides for a single parcel of land containing an existing farmstead from an unsubdivided quarter section.
- Residential – for residential use.
- Public services district – provides for development of institutional, educational, and recreational uses
- Direct control district – provides for developments that, due to their unique characteristics, unusual site constraints or innovative ideas, require regulations unavailable in other land use districts

Although the purpose and intent of the Project is not consistent with the vision of the Rocky View County MDP and Land Use Bylaw, which protects agricultural land use in the region, Part 17, Division 1 of the *MGA* (2017) states that authorizations granted by the AEP and NRCB would prevail over compliance with the MDP and Bylaw. This Part of the MGA (2017) also states that municipal planning and development decisions must be aligned with regional plans under the *Alberta Land Stewardship Act* (2009) to achieve regional outcomes established in those plans. Lands under development for the Project would be managed by AEP. The SSRP would therefore provide the land use framework for lands in the PDA.

12.1.2 Engagement and Key Concerns

Alberta Transportation carried out an engagement and consultation program for the Project with both the public and Indigenous groups. This program and the results are presented in Volume 1, Section 6 and Section 7.

Issues and key concerns related to land use and management raised by the public included the following:

- McLean Creek Dam (MC1) alternative would be less disruptive to people than would the Project. MC1 does not require expropriation, does not take away the heritage of the land, and could be used for recreation and flood mitigation.
- The Project may cause disruption and loss of a way of life for landowners who are displaced because of the location of the reservoir.

- The reservoir area would sit empty for years between floods. Would current landowners be able to continue to use the lands under lease agreements and would there be a subset of the area altered by the flood and deemed unusable?
- Would the land be unusable because of the silt? What area would be covered in silt?
- The Project would permanently alter the landscape into an area where recreation and wildlife activities can no longer occur.
- There would be effects on the water tables and water for farming.
- Closing of Springbank Road during floods might be necessary.
- The effects of relocating pipelines due to the reservoir could be high.
- The effects on recreational use of the Elbow River could be high.

Alberta Transportation's engagement with Indigenous groups began in 2014 with five Indigenous communities. In June 2016, an additional eight Indigenous communities were engaged as outlined in the CEA Agency guidelines. Indigenous engagement has been ongoing prior to and through the Environmental Impact Assessment (EIA) process and will continue until a decision is made by Natural Resources Conservation Board (NRCB). Detailed information regarding the Indigenous Engagement program is presented in Volume 1, Section 7 and Volume 4, Appendix B.

Traditional Land and Resource Use (TLRU) information was gathered through Project-specific traditional use studies (TUS) conducted by potentially affected Indigenous groups and through the results of Alberta Transportation's Indigenous Engagement program. Alberta Transportation had received a Project-specific TUS from Piikani Nation, as well as a joint interim TUS from Blood Tribe and Siksika Nation. In addition to Project-specific sources, publicly-available literature was reviewed for TLRU information relevant to the Project. Secondary source materials reviewed include:

- TUS conducted by Indigenous groups
- TLRU assessments, supplemental filings, and hearing evidence for other developments
- government reports and databases
- legal proceedings
- historical and ethnographic literature
- relevant internet sources (such as Indigenous community websites and the Indigenous and Northern Affairs Canada website)

TLRU information was considered during the preparation of all aspects of the EIA, including both methodology and analysis, as stipulated by the CEA Agency project guidelines. TLRU information contributed to the understanding of existing land uses, was used to identify lands that are used traditionally, and informed the assessment of potential Project effects. While this information did not directly affect the significance definition it has been incorporated into the analysis of effects on which the significance determination was based. This applies equally to effects assessed for construction, dry operations, flood operations and post-flood operations. Generally, issues and concerns related to effects of industrial development on land use and management as reported by Indigenous groups through the review of Project-specific and publicly-available TLRU information, include:

- the floodwater in the reservoir could spill over onto the Tsuut'ina Reserve
- construction of the Project could affect current use of lands and resources for traditional purposes and cultural practices

The Tsuut'ina Nation expressed concern that the Project would not protect reserve lands and would increase the potential for flooding on reserve lands. The Tsuutina Nation stated "The Project will also have economic impacts on our community in that it will reduce our ability to develop our reserve lands as the Project will increase the risk that these lands will be subject to flooding and contamination, rendering them unsuitable for potential development. This represents a significant economic loss for our community. Should flood waters back up onto our reserve as a result of the Project, we will also face the costs associated with clean-up. We have experienced these costs first hand through the damage caused to our reserve in 2013."

The Montana First Nation asked whether, when the project lands are acquired by Alberta, they will they become Crown land.

As of January 1, 2018, no project-specific intangible concerns were identified with respect to land use and management.

12.1.3 Potential Effects, Pathways and Measurable Parameters

Table 12-1 presents the potential effects, pathways and measurable parameters for land use and management.

Table 12-1 Potential Effects, Effects Pathways and Measurable Parameters for Land Use and Management

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in land use	• Temporary or permanent removal or degradation of property, including agricultural lands • Temporary or permanent change to industrial land uses • Temporary or permanent removal or degradation of lands used for consumptive recreation and livelihood and non-consumptive recreation • Change in access	• Number of properties (residences, businesses, recreation organizations) affected by the Project • Area (ha) of agricultural lands affected. • Overlapping land uses • Amount (m^3) of aggregate required for the Project • Area (ha) of consumptive recreation and livelihood areas affected or removed • Area (ha) of non-consumptive recreation areas affected or removed • Frequency and duration of access restrictions
Change in parks, protected areas, and unique sites or special features	• Temporary or permanent removal or degradation of parks or protected areas • Temporary or permanent removal or degradation of unique sites or special features (e.g., historic sites, heritage rivers, and other designations) • Change in access	• Area of park or protected area affected (ha) • Area of unique site or special feature affected (ha) • Proximity to park, protected area, or unique site or special feature (e.g., campgrounds, picnic sites, recreation areas, historic site) • Frequency and duration of access restrictions

12.1.4 Boundaries

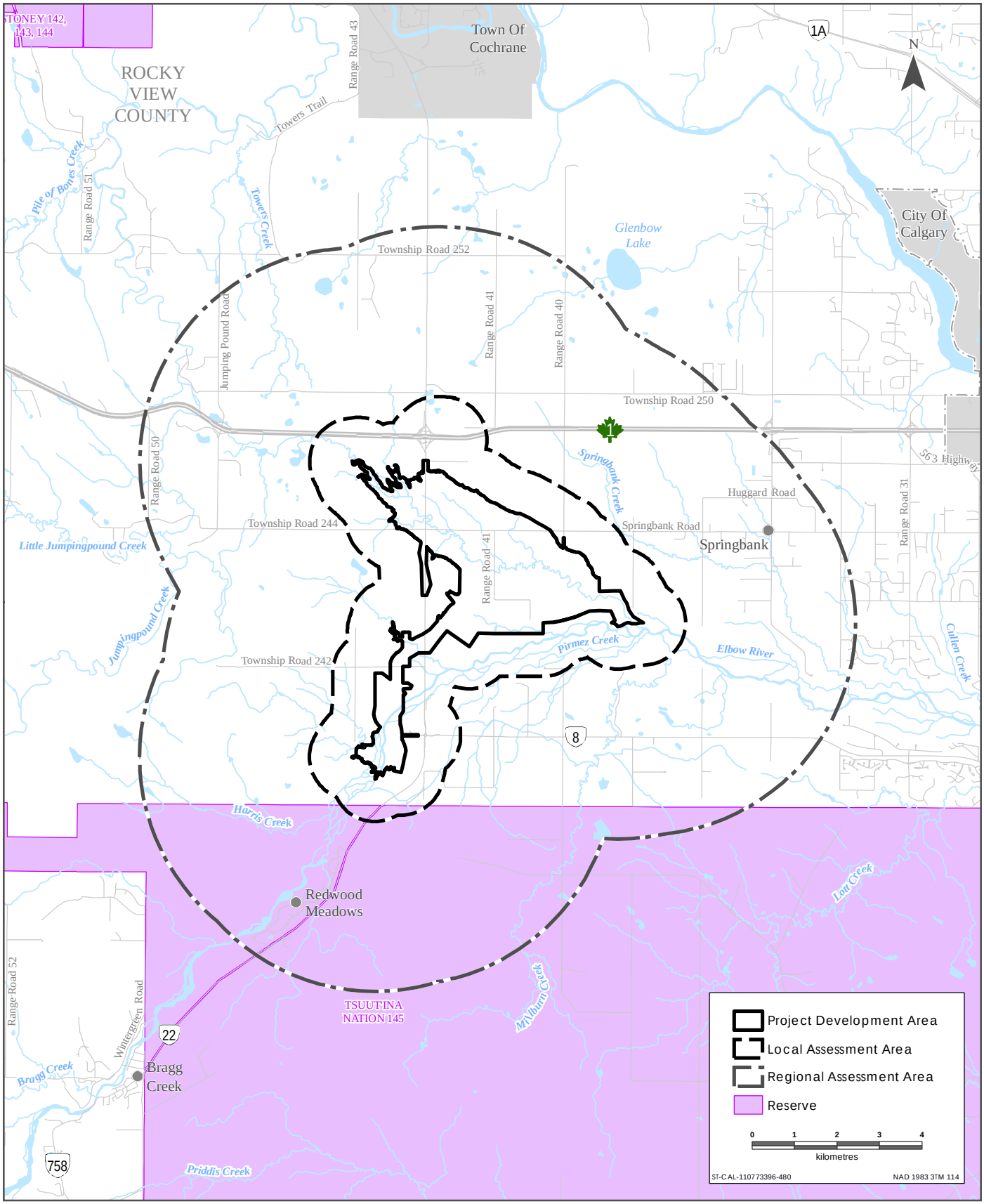
12.1.4.1 Spatial Boundaries

- Project development area (PDA) includes the anticipated area of physical disturbance associated with construction and operation and is 1,438 ha in extent.
- Local assessment area (LAA) Includes the PDA and a 1 km buffer centred on the PDA and is used to determine the significance of project-specific effects on land use and management. The LAA is 4,860 ha in extent.
- Regional assessment area (RAA) extends 5 km beyond the PDA and is used to assess where project-specific effects overlap with effects of past, present, and reasonably foreseeable future activities (i.e., cumulative effects). The RAA is 22,540 ha in extent. The RAA was chosen to comply with the requirements set out in the Proposed Terms of Reference and the CEAA requirements for the Project.

Figure 12-1 presents the spatial boundaries used in the land use and management assessment.

12.1.4.2 Temporal Boundaries

Project construction would take place over a 36-month period. Assuming regulatory approval by Q4 2018, construction would commence in Q1 2019. By Q4 2020, the Project would be able to accommodate a 1:100 year flood. Construction would be complete by Q1 2022 at which time the Project would be able to accommodate water volumes equal to the 2013 flood. Dry operations of the Project will occur indefinitely (i.e., permanent installation) after construction, with periods of dry operations alternating with flood and post-flood phases.



Sources: Base Data - ESRI, Natural Earth, Government of Alberta, Government of Canada
Thematic Data - ERBC, Government of Alberta, Stantec Ltd

Land Use and Management
Spatial Boundaries

Stantec

12.1.5 Residual Effects Characterization

Table 12-2 presents definitions for residual environmental effects on land use and management.

Table 12-2 Characterization of Residual Effects on Land Use and Management

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 land use and management relative to existing conditions. Adverse – a residual effect that moves measurable parameters in a direction detrimental to land use and management relative to existing conditions. Neutral – no net change in measurable parameters for land use and management relative to existing conditions.
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	Negligible – no measurable change to land use activities Low – a measurable change in land use patterns but the change is in normal range of variability of existing conditions Moderate – measurable change in land use patterns that falls outside normal variability of existing conditions, but would not prevent activities from continuing elsewhere in the LAA High – measurable change in land use patterns that would likely affect either the sustainability of land use and/or displace land use activities that cannot be accommodated elsewhere in the RAA
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 interact with those of other projects in the RAA
Frequency	Identifies how often the residual effect occurs and how often during the Project or in a phase	Single event – event occurs once Multiple irregular event – occurs more than once at no set schedule Multiple regular event – occurs more than once at regular intervals Continuous – occurs continuously

Table 12-2 Characterization of Residual Effects on Land Use and Management

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Duration	The period of 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 – residual effect restricted to 36 months (construction phase) or less Medium-term – residual effect extends for greater than 36 months but is reversed during the life of the Project Long-term – residual effect extends for the life of the Project (i.e., indefinitely)
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
Ecological and Socio-economic Context	Existing condition and trends in the area where residual effects occur	Resilient – land use in the assessment area is diverse and dynamic, and able to accommodate measurable changes in land use patterns Not Resilient – land use in the assessment area has limited diversity, and with limited capacity to accommodate measurable changes in land use patterns
Timing	Periods of time where residual effects from Project activities could affect the VC	Seasonality – residual effect is greater in one season than another (e.g., spring/summer vs. fall/winter) Time of day – residual effect is greater during daytime or nighttime Regulatory – provincial or federal restricted activity periods or timing windows (e.g., migration, breeding, spawning) related to the VC Not applicable - the residual effect of Project activities will have the same effect on the VC, regardless of timing

12.1.6 Significance Definition

A significant adverse environmental effect on land resource use is defined as one where:

- the Project does not comply with established or amended land use plans, policies or by-laws or
- the Project would create a change or disruption that restricts or degrades present land use capability to a point where the activities cannot continue at or near current levels and where compensation is not possible or
- the Project is not compatible with established park or protected area plans or policies. Unique sites or special features would be substantially and irreversibly compromised because of disrupted access or reduced quality of sites.

12.2 EXISTING CONDITIONS FOR LAND USE AND MANAGEMENT

12.2.1 Methods

12.2.1.1 Use of Existing Data

Existing condition information was collected from (see references in Section 12.8):

- existing relevant literature, such as government publications, land use surveys, regional studies, resource management plans and land use plans
- websites for government and non-government agencies and organizations, such as hunting, fishing and trapping information from the Government of Alberta
- government databases (e.g., the Alberta Geographic Land Information Management and Planning System [GLIMPS], Alberta Energy 2017) and digital datasets
- database analyses conducted by Stantec's geographical information services. Examples of data sources accessed include AltaLIS, GeoLOGIC Systems Ltd. (2015), AEP base mapping data, GeoBase, IHS Markit (2016)
- information provided during engagement and consultation for the Project

12.2.1.2 Field Surveys

Field surveys were not conducted because desktop information was readily available to perform the analysis. Field data from other disciplines (e.g., terrain and soils, vegetation-wetlands, wildlife, heritage resources, traditional land and resource use) were used to verify the desktop findings.

12.2.2 Overview

12.2.2.1 Land Use

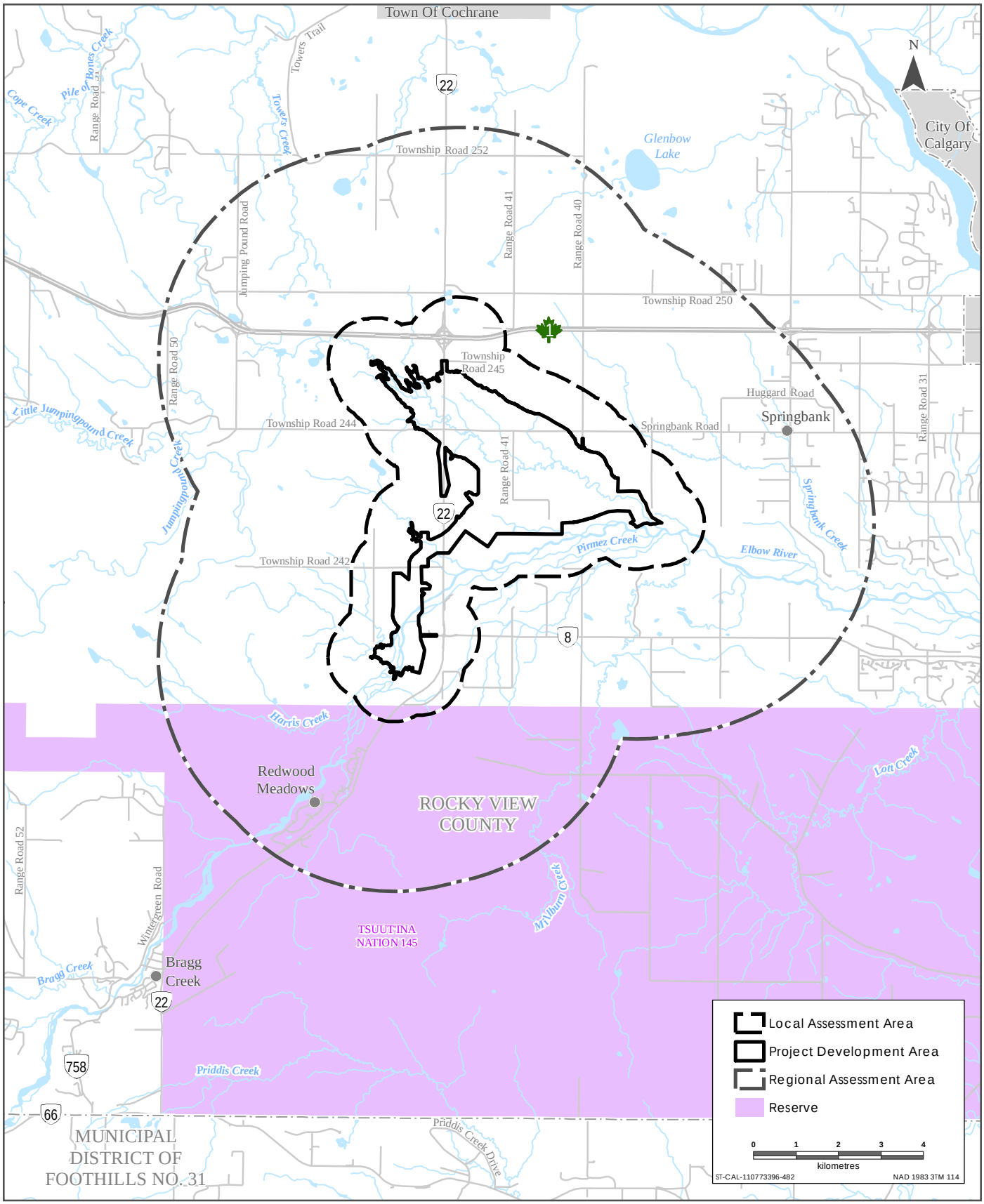
Urban and Residential Communities

The PDA, LAA, and RAA are in Rocky View County. No urban or residential communities are in the PDA. There is one First Nations reserve in the LAA: Tsuut'ina Nation 145 is 400 m to the south of the PDA. The community of Springbank and the Townsite of Redwood Meadows are in the RAA. The Townsite of Redwood Meadows includes several residences, businesses, services such as the Tsuut'ina Fire Department, a community building, and recreational facilities. The Hamlet of Bragg Creek is not in the LAA or RAA for Land Use and there are no anticipated Project-specific effects on land use and management in Bragg Creek.

Refer to Figure 12-2 for communities in the LAA and RAA.

Public Transportation Infrastructure

Highway 22, Springbank Road, Range Road 41, Township Roads 242, 244, and 245, and other unnamed roads intersect the PDA (Figure 12-2). The TransCanada Highway (Highway 1), Highway 8, and various other township roads, range roads, and other roads intersect the LAA and RAA. Alberta Transportation also holds dispositions for registered roadways in the LAA.



Sources: Base Data - ESRI, Natural Earth, Government of Alberta, Government of Canada
Thematic Data - ERBC, Government of Alberta, Stantec Ltd

Urban and Residential Communities and
Public Transportation Infrastructure in the Assessment Areas

Stantec

Land Ownership and Use

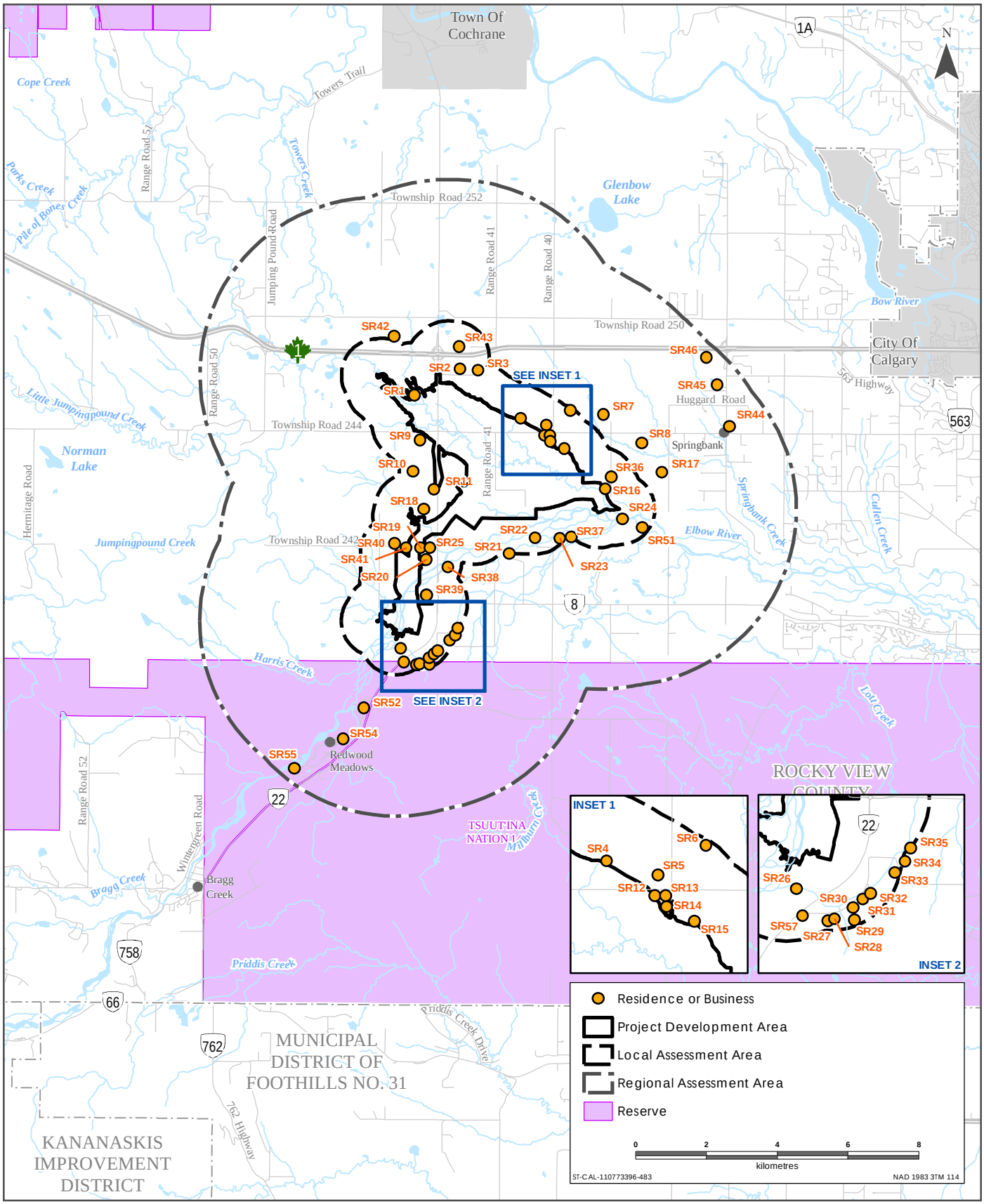
Lands in the PDA, LAA, and RAA are primarily privately owned. Some lands in the assessment areas are designated under the Rocky View County Land Use Bylaw as direct control or public service lands (Rocky View County 2016a); these lands are owned by organizations that operate summer camps at these properties.

Public land in the LAA is composed of rights-of-way (ROWs) for roads and road allowances and the bed and banks of the Elbow River and its tributaries. In addition, there are public lands in the LAA for which surface activity dispositions are held by individuals, businesses, or government departments.

There are 24 individuals who own land in the PDA. There are four business that own land in the PDA and the Kiwanis Club of Calgary owns land in the PDA.

There are 32 receptors[1] in the LAA, including RiverCross Ranch and Moose Hill Ranch Equestrian Centre (Figure 12-3). There are an additional five businesses in the LAA: a commercial premises, Bragg Creek Paintball, Entheos Conference and Retreat Centre, and River Spirit Golf Club. There are two organizations that run summer camps in the LAA: Kamp Kiwanis and Hope Mission Camp Gardner.

[1] Receptors are representative of residences. For example, RiverCross Ranch may be comprised of multiple residences, but is represented by one receptor.



Sources: Base Data - ESRI, Government of Alberta, Government of Canada
Thematic Data - ERBC, Government of Alberta, Stantec Ltd

Residences and Businesses in the Assessment Areas

Stantec

The Calgary Office – Rangeland District – Lands Division of Alberta Environment and Sustainable Resource Development (ESRD) holds a Protective Notation (PNT) disposition for watercourse protection for the Elbow River Boy Scout Camp in NE and NW-11-024-04 W5M (Camp Gardner). Scouts Canada previously operated Camp Gardner, but it was bought by Hope Mission in 2015. Hope Mission also holds a Recreation Lease (REC) disposition for recreational campsites in NW-11-024-04 W5M.

Mountain River Estates Ltd., a real estate company, holds Department Licences of Occupation (DLOs) for a water intake (NE-10-024-03 W5M) and erosion protection (NW-10-024-03 W5M). The Glencoe Golf and Country Club holds a DLO for a water intake in NW-11-024-03 W5M.

An individual holds a DLO for bank stabilization in LSDs 05, 06, and 11-03-024-04 W5M.

There are ten receptors in the RAA in addition to the receptors in the LAA. The Townsite of Redwood Meadows, Curtis Field Park, and Redwood Meadows Golf and Country Club are located in the Redwood Meadows Community. Springbank Community High School and Springbank Park for All Seasons, Springbank Middle School and Elbow Valley Elementary School, Calaway Park, and four residences are also in the RAA.

There are 20 domestic, agricultural, industrial, and other water wells in the PDA; 147 in the LAA; and 825 in the RAA. In primary sources reviewed for the Project, Indigenous groups, including Siksika Nation and Kainai First Nation (Blood Tribe), expressed concern that there are traditional use sites outside of the PDA that have not yet been studied (see Volume 3A, Section 14).

Agriculture

Private land in the PDA, LAA, and RAA is primarily used for farming and ranching. Agriculture, including annual crop, hayland, and tame pasture, covers 632.8 ha of the PDA (Table 12-3). For existing distribution of vegetation communities in the assessment areas, refer to the vegetation and wetlands assessment (Volume 3A, Section 10).

Table 12-3 Agriculture in the PDA, Existing Conditions

Agricultural Land Use Classes	Area (ha)
Annual Cropping	138.5
Hayland	82.8
Tame pasture	411.5
Total	**632.8**

One individual holds a grazing permit disposition (GRP) in the LAA in NE and NW-11-024-04 W5M. This disposition has an expiry date of December 31, 2017.

The PDA, LAA, and RAA do not overlap with any AEP administered provincial grazing reserves (AEP 2015).

Oil and Gas Development

Six oil and gas companies hold dispositions for pipelines in the LAA: Nova Gas Transmission Limited, Pengrowth Energy Corporation, Alberta Ethane Development Company, Foothills Pipe Lines (Alta) Ltd., and Plains Midstream Canada ULC hold Pipeline Agreement (PLA) dispositions for pipelines that intersect the PDA; and Shell Canada Ltd. holds a disposition for an abandoned pipeline that does not intersect the PDA.

There are 19 oil and gas well sites in the RAA. There are no oil and gas well sites in the PDA or LAA. There are seismic cutlines and trails in the PDA, LAA, and RAA.

ATCO Gas operates natural gas pipelines in the PDA, LAA, and RAA.

Electricity Infrastructure

AltaLink operates transmission lines that intersects the PDA across the diversion channel, LAA, and RAA. AltaLink also holds a DLO for transmission lines in the LAA, in SW, SE-11-024-04 W5M.

Fortis Alberta operates power lines, power poles, and street lights that intersect the PDA, LAA, and RAA.

Aggregate Development

Alberta Transportation holds a disposition reservation (DRS) for surface material extraction in the LAA, in NW-11-024-04 W5M. There are no other quarries or pits in the assessment areas.

Other

There are five communication towers in the LAA and eight in the RAA.

Telus Communications Inc. operates communications cables in trenches in the PDA, LAA, and RAA.

There is one easement (EZE) in the LAA held by Pirmez Creek Irrigation Society for "Other Non-Industrial" purposes in NW-04-024-03 W5M

Recreation and Livelihood

The PDA, LAA, and RAA overlap the Parkland and Foothills Wildlife Hunting Zones and WMUs 212 and 312. Regulated species hunted in these WMUS include white-tailed deer, mule deer, moose, elk, and gamebirds (GOA 2016b, c).

There are 11 guiding and outfitting organizations that operate in WMU 212 and seven guiding and outfitting organizations that operate in WMU 312 (APOS 2017b, pers. comm.).

The PDA, LAA, and RAA overlap with Fur Management Zone (FMZ) 8. Furbearer species in trapping seasons in FMZ 8 include badger, beaver, bobcat, coyote, fox, lynx, marten, mink, muskrat, squirrel, weasel, wolf, and wolverine. Trapping seasons are closed for fisher, lynx, marten, otter, and wolverine in FMZ 8 (GOA 2016-2017).

The PDA, LAA, and RAA are in Fish Management Zone 1 – Eastern Slopes, Watershed Unit ES1. Popular sportfish in ES1 include trout (e.g., brown, rainbow, and rainbow/cutthroat hybrid), mountain whitefish, and Arctic grayling (GOA 2016e).

In primary and secondary sources reviewed for the Project, Indigenous groups, including Stoney Nakoda Nations, Métis Nation of Alberta – Region 3, Tsuut'ina Nation, Ktunaxa Nation, Métis Nation British Columbia, Samson Cree Nation, Ermineskin Cree Nation, and Kainai First Nation (Blood Tribe) also stated the importance of harvesting in traditional territories as an historical and current-use activity for subsistence, treaty rights, and cultural practice. Harvesting may include hunting, trapping, fishing, and plant gathering. Through the Project-specific Indigenous engagement program, Stoney Nakoda Nations stated that there are two different traplines near the Project and voiced concern that areas used for trapping may be affected by the Project. A review of GLIMPS (2017) indicated that there are no Trap Line Agreements (TPAs) in the LAA.

In addition to recreation and livelihood organizations in the LAA, there are non-consumptive outdoor recreational activities that occur in the assessment areas: for example, kayaking, canoeing, rafting on the Elbow River; and walking and hiking.

In primary sources reviewed for the Project, Indigenous groups, including Siksika Nation and Kainai First Nation (Blood Tribe), expressed the importance of the Elbow River to Blackfoot traditions and culture. The Métis Nation of British Columbia noted the potential for the Project to affect water near the Alberta and British Columbia border, where a long history of Métis land use is documented.

12.2.2.2 Parks and Protected Areas and Unique Sites or Special Features

There are no provincial or federal parks or protected areas in the PDA, LAA, or RAA. There are no heritage rivers that intersect the PDA, LAA, or RAA (CHRS 2017).

Historic Sites

There are no designated historic sites in the PDA.

Our Lady of Peace Roman Catholic Mission is a designated historic site (HS 26535) that intersects the LAA, about 100 m from the PDA to the southwest of the water intake components (Figure 12-4). Although the Mission church building is no longer extant, there is a cairn and monument plaque to mark the site of the first church in southern Alberta (GOA 2013).

There are archaeological and palaeontological sites in the assessment areas. Refer to the heritage resources assessment for more information (Volume 3A, Section 13).

Culturally Significant Sites

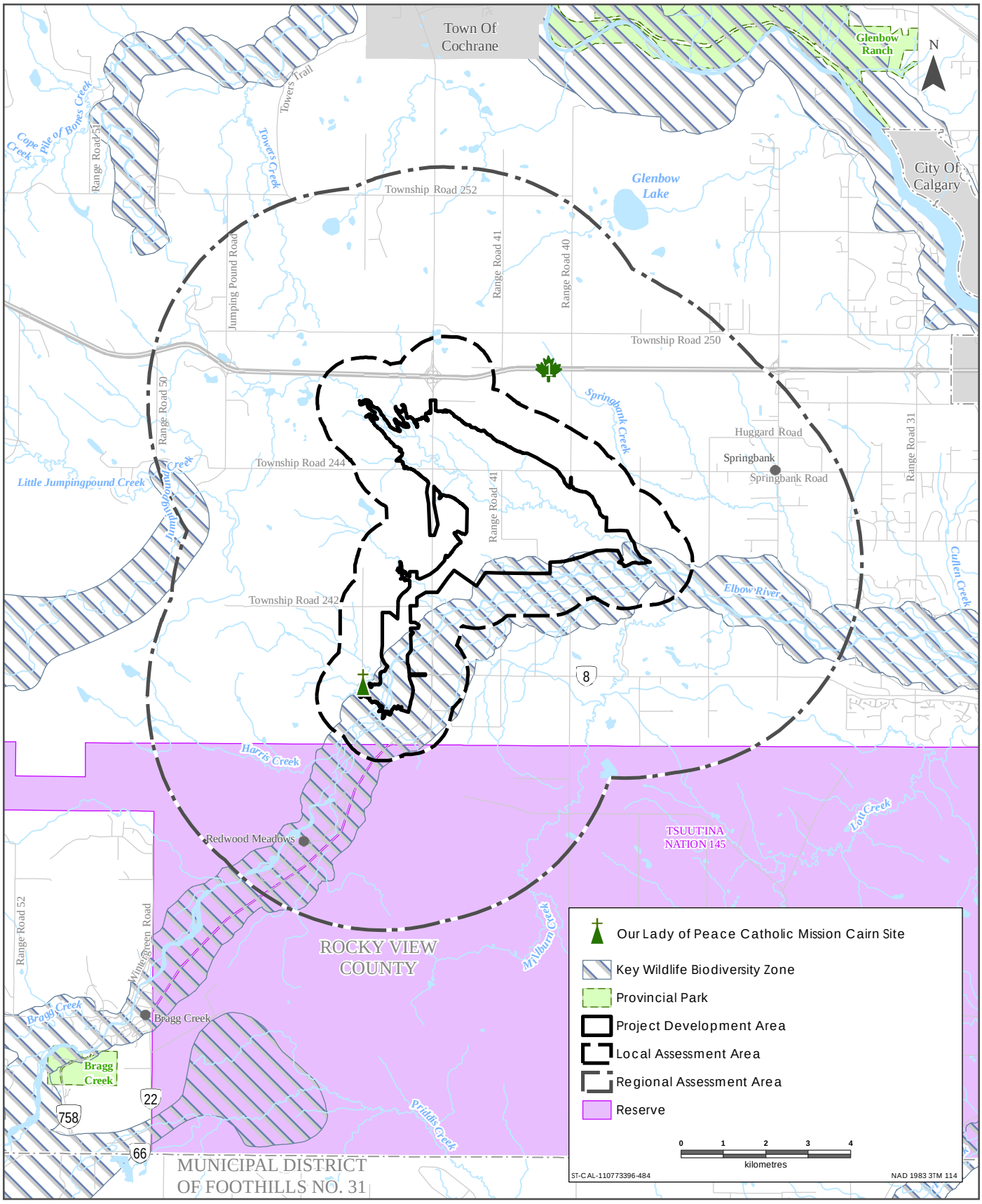
Culturally significant sites in the assessment areas are addressed in the traditional land and resource use assessment (Volume 3A, Section 14).

Wildlife and Fish Features

The assessment areas occur in sharp-tailed grouse and sensitive raptor ranges and overlaps with a key wildlife biodiversity zone (KWBZ) (AEP 2016b). There are no other key wildlife ranges, wildlife sanctuaries, or internationally significant areas for bird conservation that overlap with the assessment areas. Refer to the wildlife and biodiversity assessment for more information (Volume 3A, Section 11).

Terrain Features

Outcrops of bedrock can be found in the LAA. One sandstone outcrop occurs on a ridgetop near Highway 22 and approximately 1.3 km south of Springbank Road. Grey boulders below the outcrop may be limestone glacial erratics. Refer to the soils and terrain assessment (Volume 3A, Section 9) for further information on the topography, elevation and drainage patterns in the assessment areas.



Sources: Base Data - ESRI, Government of Alberta, Government of Canada
Thematic Data - ERBC, Government of Alberta, Stantec Ltd

Parks and Protected Areas, Unique Sites and Special Features in the Assessment Areas

12.2.2.3 Access

There is no public access on private land in the assessment areas. Access to businesses, institutions, and recreation organizations is intended for clientele. Access to industrial development infrastructure is restricted to operators.

Access for consumptive recreation and livelihood, non-consumptive recreation, and to unique sites or special features may be along existing roads and other public ROWs that intersect these areas. For example, sportfishing is likely 'walk and wade': anglers may drive along Highways 22 and 8 and walk along public ROWs that intersect the river (pers. comm. Harper 2017). Access to Our Lady of Peace Catholic Mission cairn and monument plaque at the southern end of Range Road 43 is accessible via Highway 22 and Township Road 242.

In primary and secondary sources reviewed for the Project, Indigenous groups, including Kainai First Nation (Blood Tribe), Tsuut'ina Nation, Samson Cree Nation, and Ktunaxa Nation, identified the importance of trails and travelways to access traditional territory and resource use areas as key to their way of life. Trails and travelways include rivers used in the past for canoeing.

12.3 PROJECT INTERACTIONS WITH LAND USE AND MANAGEMENT

Table 12-4 identifies the interaction of the Project with land use and management. These interactions are discussed in detail in Section 12.4 in the context of effects pathways, standard and project-specific mitigation and residual effects. A justification for no interaction is provided following the table.

Table 12-4 Project Interactions with Land Use and Management

Project Components and Physical Activities	Environmental Effects	
	Change in Land Use	Change in parks, protected areas, and unique sites or special features
Construction		
Clearing	✓	✓
Channel excavation	✓	✓
Water diversion construction	✓	✓
Dam and floodplain berm construction	✓	✓
Low-level outlet works	✓	✓
Road realignments and modifications	✓	✓
Lay down areas	✓	✓

Table 12-4 Project Interactions with Land Use and Management

Project Components and Physical Activities	Environmental Effects	
	Change in Land Use	Change in parks, protected areas, and unique sites or special features
Borrow area construction	✓	✓
Reclamation	✓	✓
Dry Operations		
Maintenance	✓	–
NOTES: ✓ = Potential interaction – = No interaction		

Maintenance during dry operations is not anticipated to affect parks and protected areas and unique sites or special features because this activity would not result in the temporary or permanent loss of these areas, sites, or features and there would be no change in access to them during dry operations.

There are no parks or protected areas in the PDA, LAA, or RAA. Therefore, changes to parks and protected areas is not discussed further. However, changes to unique sites or special features are discussed.

Refer to wildlife and biodiversity (Volume 3A, Section 11) for an assessment of potential effects on species with ranges in the assessment areas and KWBZ.

Refer to historical resources (Volume 3A, Section 13) for an assessment of potential effects on archaeological and palaeontological sites in the assessment areas. There are no heritage rivers in the PDA, LAA, or RAA; therefore, changes to heritage rivers is not discussed further.

Refer to traditional land and resource use (Volume 3A, Section 14) for an assessment of potential effects on culturally significant sites in the assessment areas.

Refer to the terrain and soils assessment (Volume 3A Section 9) for details on changes to topography, elevation, and drainage patterns.

12.4 ASSESSMENT OF RESIDUAL ENVIRONMENTAL EFFECTS ON LAND USE AND MANAGEMENT

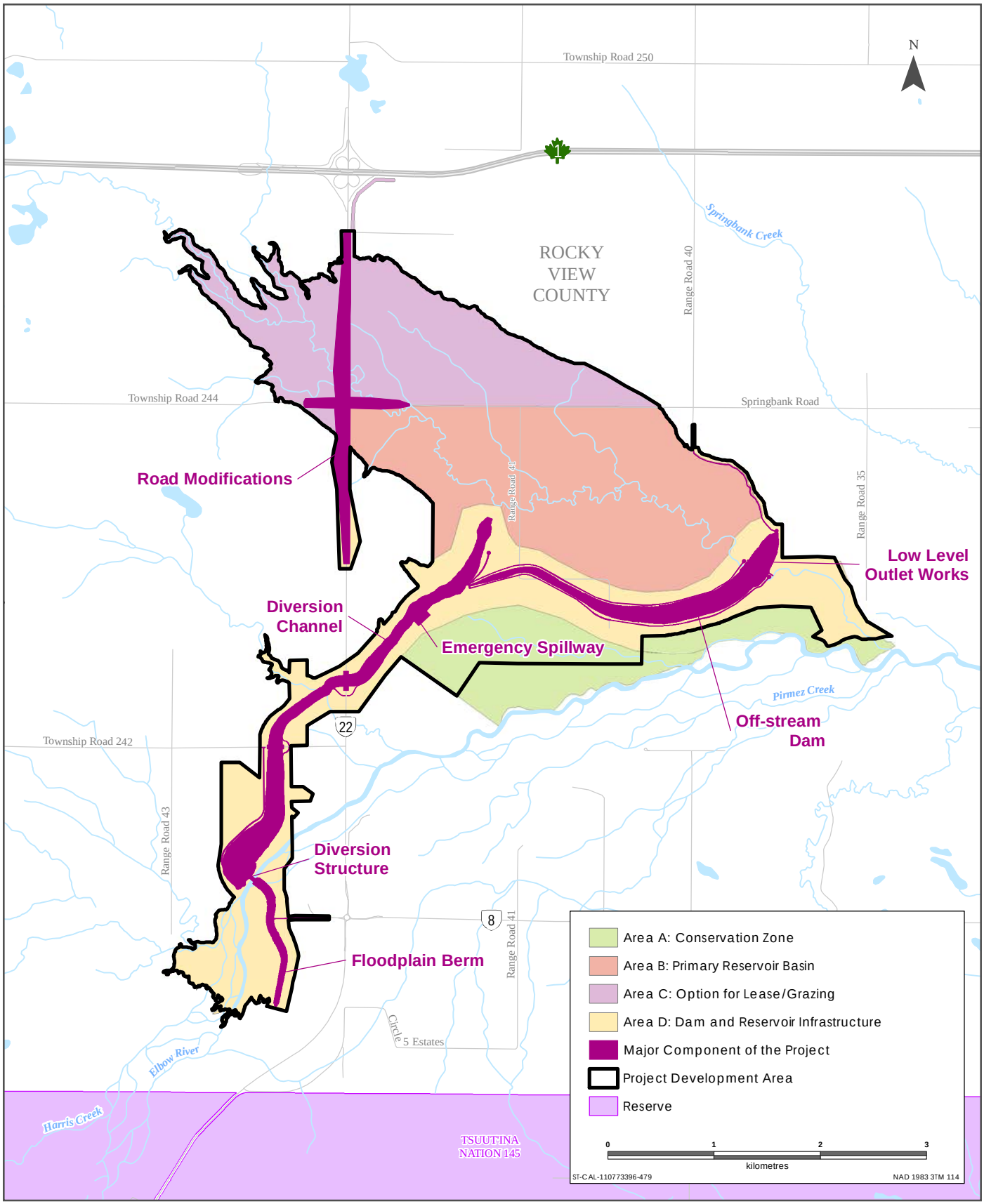
12.4.1 Analytical Assessment Techniques

Potential environmental effects on land use and management are qualitatively assessed by comparing existing land uses and management frameworks at Base Case to construction and dry operations.

12.4.2 Change in Land Use

The post-construction land uses in the PDA are presented in Figure 12-5. Post-construction land uses in the PDA include four areas with potential secondary land uses. The four areas are described below. AEP would own and manage these areas.

- Area A, conservation zone: public access and opportunities for low impact recreation. Limited improvements beyond reclamation of the construction site
- Area B, reservoir inundation zone: the reservoir allows for flood management, including post-flood cleanup and management of sediment and debris. There are secondary opportunities for research on flood reclamation, mitigation, and environmental effects. There is limited or no public access.
- Area C, optional grazing area: this area may remain open to grazing leases
- Area D, dam and reservoir infrastructure: there is no public access and would be fenced for public safety and security purposes.



Sources: Base Data - ESRI, Natural Earth, Government of Alberta, Government of Canada
Thematic Data - ERBC, Government of Alberta, Stantec Ltd

Post-construction Land Use in the PDA

12.4.2.1 Project Pathways

Temporary or Permanent Removal or Degradation of Property, including Agricultural Lands

As part of construction, private land in the PDA would be acquired by the Alberta government. Twenty-four individuals, four businesses, and the Kiwanis Club of Calgary would be affected through direct loss of private land in these areas.

As a result of construction, agricultural land in the PDA would decrease from 632.8 ha to 573.9 ha and the distribution of agricultural land units within each land use area would change (Table 12-5).

Table 12-5 Agriculture in the PDA – Application Case during Dry Operations

Agricultural Land Use Class	Management Area	Base Case Area (ha)	Application Case Area (ha)
Annual cropping	A	0.02	0.02
	B	8.1	0.0
	C	1.9	0.0
	D	128.5	10.5
	Total	**138.5**	**10.5**
Hayland	A	8.9	2.3
	B	4.3	0.0
	C	4.2	0.0
	D	65.4	0.7
	Total	**82.8**	**3.0**
Tame pasture	A	2.7	10.4
	B	270.1	302.1
	C	59.7	62.3
	D	79.0	185.6
	Total	**411.5**	**560.4**
Total		**632.8**	**573.9**

Results of public consultation indicated that residents and business owners in the PDA want to know what measures would be taken to compensate landowners for land and improvements and loss of businesses and way of life, which includes heritage ranching, grazing, and hay and grain-production. Land acquisition in the PDA would be carried out by Alberta Transportation, and landowners in these areas would be compensated for land and improvements to property.

Public consultation also indicated that participants would like clarity regarding how the PDA would be used during dry operations, such as for agriculture or recreation because the land would otherwise be unused between floods. The PDA would be managed for primary and secondary land uses during dry operations. Area A would be a conservation area with low impact recreation opportunities. Area B would be primarily used as a reservoir for flood management with opportunities for research during dry operations. Area C may be leased out for grazing. Area D would be used for water intake components and the off-stream dam. The PDA covers 1,438 ha of land over 38 quarter sections. Of this, 511.5 ha of agricultural lands in Areas A, B, and D of the PDA would be removed because of construction; however, 62.3 ha in Area C may be used for grazing (Table 12-5).

Temporary construction areas (e.g., laydown yards) would be reclaimed. Refer to the Project Conservation and Reclamation Plan for further details on post-construction reclamation. For the distribution of vegetation communities in the assessment areas at post-construction reclamation, compared to existing conditions, refer to the vegetation and wetlands assessment (Volume 3A, Section 10).

There are residences, businesses, and recreation organizations that occupy land in the LAA. Tsuut'ina Nation 145 is 400 m to the south of the PDA. Many residents farm, ranch, and otherwise cultivate lands in the LAA. There are seven dispositions related to residences, businesses, recreation organizations, and grazing in the LAA. Rocky View County expressed concerns that the Project may cause disruption and loss of a way of life for landowners who are adjacent to the off-stream reservoir (Rocky View County 2016b).

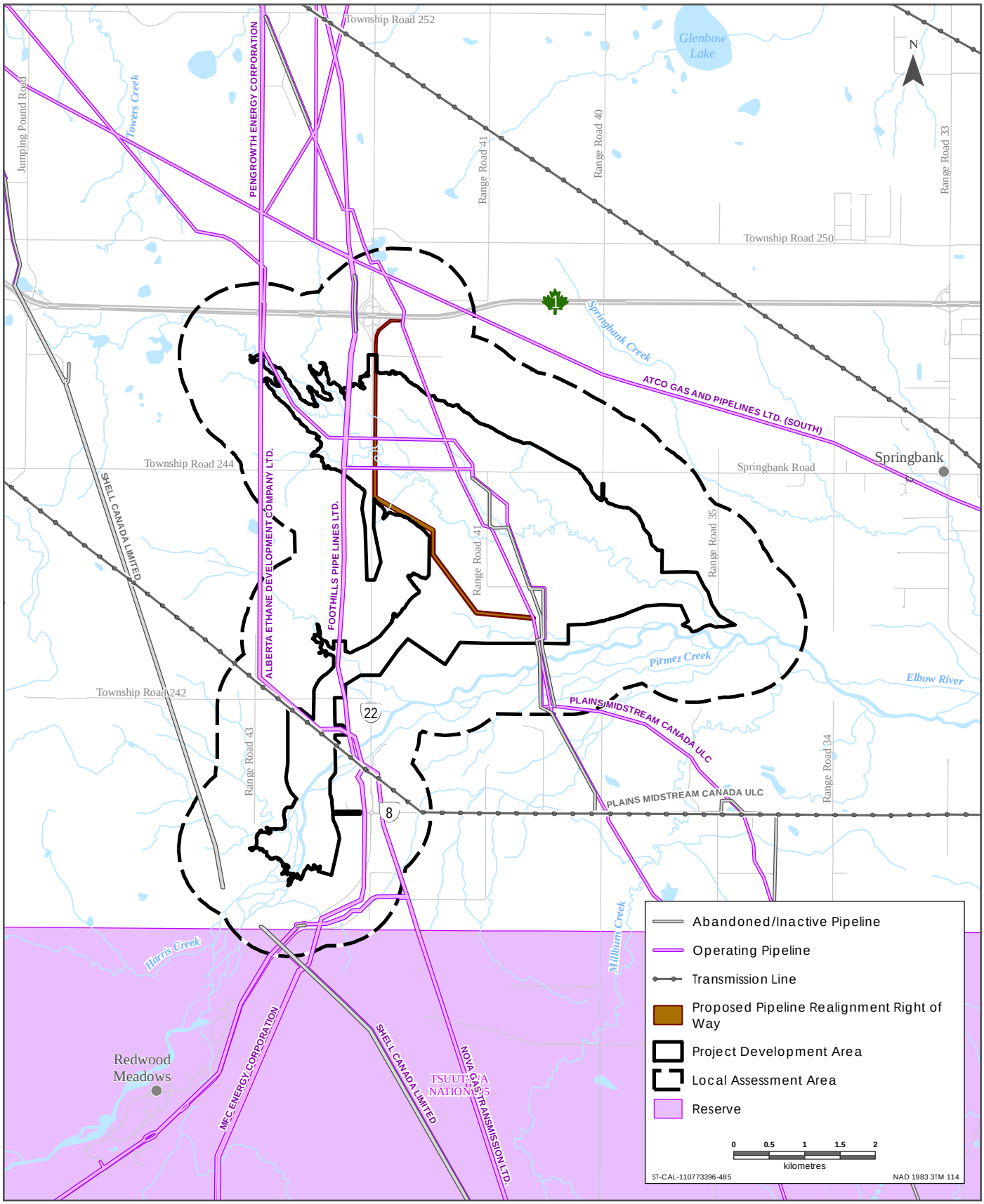
Construction would not result in the direct loss of land owned by residents, businesses, or recreation organizations in the LAA, which are predominantly privately owned. Construction would also not result in the direct loss of lands in Tsuut'ina Nation 145 or lands held under disposition in the LAA, except for lands held under a DLO for bank stabilization in LSDs 05, 06, and 11-03-024-04 W5M. These lands would not be removed or altered from current use.

Residents, business owners and their clientele, and summer camp employees and attendees near the Project may experience nuisance effects from noise and light and changes in air quality because of construction activities. Construction is anticipated to occur continuously for 36 months and portable light plants would operate as needed to provide illumination for construction. These concerns were raised by Rocky View County and members of the Tsuut'ina Nation 145 (Rocky View County 2016b; Tsuut'ina 2016). Refer to the acoustic environment assessment (Volume 3A, Section 4), air quality assessment (Volume 3A, Section 3), and public health and safety assessment (Volume 3A, Section 15) for further details on effects of noise, light, and air emissions on human receptors in the assessment areas. After construction is completed, noise, light, and air emissions from the Project would be negligible.

There are 144 domestic, agricultural, municipal, and other water wells in the LAA. Construction may affect water wells through excavation, dewatering, or the introduction of deleterious substances to groundwater. This was raised as a concern during public consultation. Refer to the hydrogeology assessment (Volume 3A, Section 5) for further details.

Changes to Industrial Land Use

There are five companies that hold dispositions for active pipelines that intersect the PDA. These pipelines would be retrofitted and/or re-routed prior to construction (Figure 12-6). Pipelines operated by Foothills Pipe Lines Ltd., Nova Gas Transmission Limited, Pengrowth Energy Corporation, and Alberta Ethane Development Company would be re-routed where they intersect the diversion channel; however, these pipelines would remain in their existing ROWs. Three pipelines operated by Plains Midstream Canada ULC would be re-routed from their existing ROWs to a new, shared ROW. Construction method for re-routing all pipelines is anticipated to be trenched/open cut. Utility retrofitting and relocation would be completed by third party contractors chosen by the operators of each pipeline. Utility relocation is anticipated to last nine months.



Sources: Base Data - ESRI, Natural Earth. Thematic Data - ERBC, GeoLOGIC (2015)

Existing Pipelines and Transmission Lines and Proposed Reroutes in the Local Assessment Area

AltaLink operates one transmission line that intersects the PDA in NE-10-024-04 W5M. After consultation with the operator, it was determined the transmission line does not need to be realigned and would stay in its existing ROW. As part of construction, an 'H' frame support would be relocated in the existing ROW and an additional 'H' frame would be constructed to support the transmission line (Figure 12-6).

Fortis Alberta, Telus Communications Inc, and Atco Electric operate utilities in the PDA and LAA. These utilities would be retrofitted or realigned on a case-by-case basis, in consultation with the operators.

Aggregate volumes required for the Project could potentially influence regional supplies and development plans. Alberta Transportation has identified potential aggregate sources: parts of the construction area would be excavated and a contingency borrow area may be developed in the off-stream reservoir. Material excavated from the diversion channel would be used in construction of some portions of the channel walls, the floodplain berm, and the dam. Materials from the borrow area, if needed to make up the required volumes, would also be used for construction of the dam and for road and bridge works. If materials from the PDA are not enough to make up the required volumes, aggregate materials may be sourced from outside of the PDA.

There are four additional dispositions related to industrial development in the LAA: Shell Canada Ltd. holds a PLA for an abandoned pipeline in SW-03-024-04 W5M and SE-04-024-04 W5M; AltaLink holds a DLO for transmission lines in SW, SE-11-024-04 W5M; Pirmez Creek Irrigation Society holds an EZE in NW-04-024-03 W5M; and Alberta Transportation holds a DRS for a surface material extraction site in NW-11-024-04 W5M. There are five communication towers in the LAA. Lands under these dispositions and the communication towers do not overlap with the PDA, so they would not be removed or altered from current uses.

There are three industrial or investigative water wells in the LAA. Construction may affect water wells through excavation, dewatering, or the introduction of deleterious substances to groundwater. Refer to the hydrogeology assessment (Volume 3A, Section 5) for further details.

Temporary or Permanent Removal or Degradation of Lands Used for Recreation and Livelihood

The PDA and LAA overlap with WMUs 212 and 312 and FMZ 8, in which regulated species may be hunted and trapped. Eighteen guiding and outfitting organizations also operate in WMU 212 and 312. Hunting and trapping occurs on private land to which the hunter or trapper has been granted access by the landowner. Recreational pursuits, including hunting, trapping and hiking, may also occur on public lands in the PDA and LAA. However, access to public lands is limited to roads and other public ROWs in the assessment areas.

As part of construction, private land in the PDA would be acquired by the Alberta government. Hunting, trapping, and hiking that currently take place on private land would no longer be permitted in Areas B, C, and D of the PDA because access to these areas would be restricted using barbed wire fencing. However, Area A would be a conservation area with low impact recreation opportunities, including hunting and trapping.

The PDA and LAA are in Fish Management Zone 1 – Eastern Slopes, Watershed Unit ES1. Access to the Elbow River for sportfishing is primarily along roads and public ROWs that intersect the river. There is little evidence of fishing from boats on the Elbow River (pers. comm. Harper 2017).

Rocky View County expressed concern that the Elbow River may be a navigable water subject to protection under the *Navigation Protection Act*, which would include prohibiting dewatering without approval (Rocky View County 2016b). The Elbow River is not a listed navigable waterway under the *Navigation Protection Act* Schedule (1985; GoC 2017); however, some recreational boating (e.g., kayaking, canoeing, rafting) does occur on the river in the PDA and LAA and the right of safe public navigation of any waterway must be maintained during the construction and operation of the Project (Transport Canada 2014).

In-stream construction of the water intake components is scheduled for two years. Construction of the water intake components may affect sportfish populations. Temporary or permanent loss of habitat that may affect number of sportfish available for recreational fishing is discussed in the fish and fish habitat assessment, (Volume 3A, Section 8). During construction and dry operations, access to the Elbow River for sportfishing and recreational boating in proximity to the Project would be affected by in-stream works and the on-going presence of the water intake components.

Individuals who access the LAA for recreation may be indirectly affected by construction activities that cause noise, light, and air emissions.

Change in Access

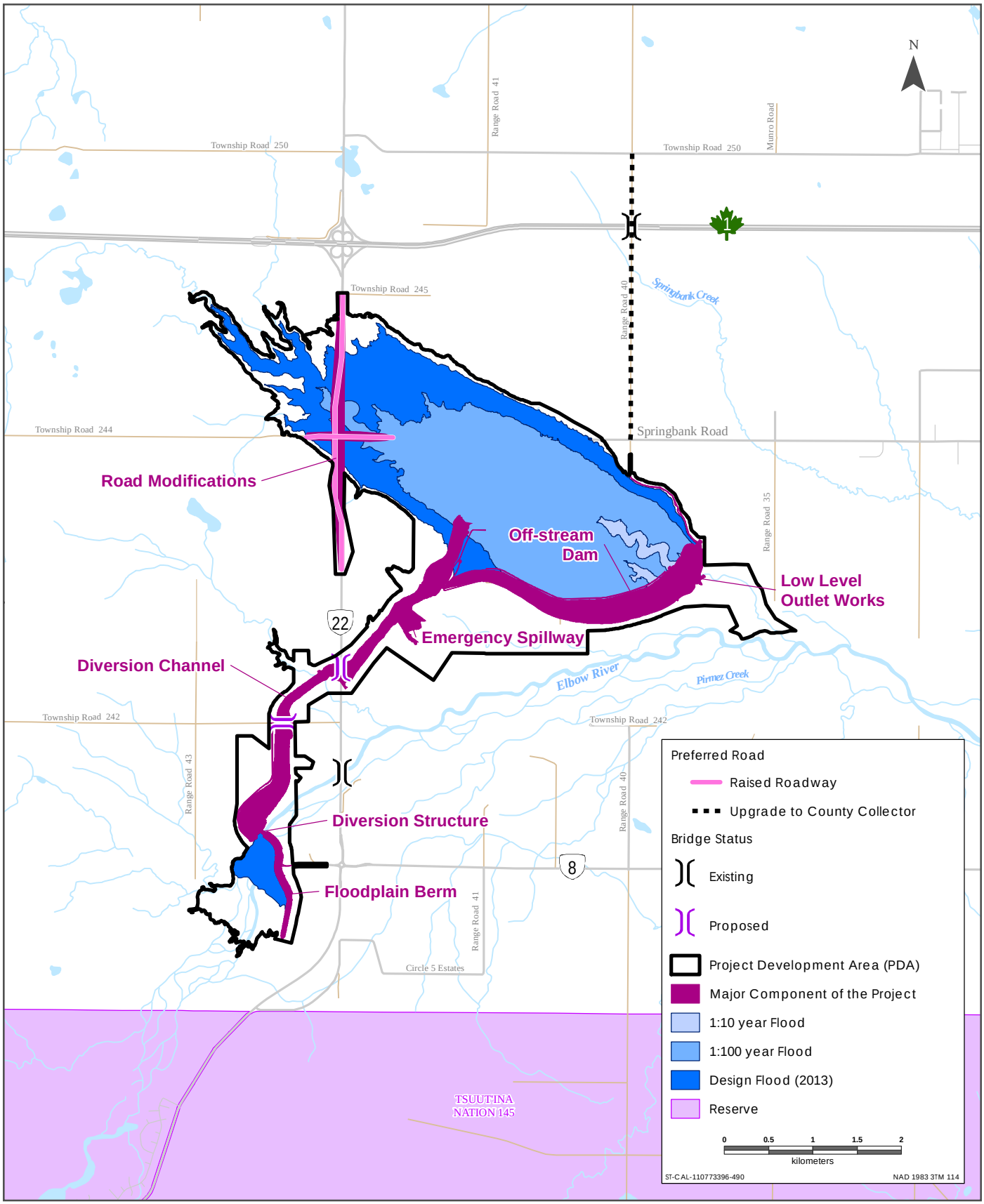
Access to the Project would include access roads developed during construction. On the north side of Elbow River, access would be primarily a gravel road on the southeast side of the diversion channel. Other gravel access roads would reach the Project from Springbank Road and Township Road 242. On the south side of the river, access would be from Highway 22 at the Highway 8 interchange. Access roads would include gated approaches along Highway 22, Springbank Road, and Township Road 242 to restrict public access to the PDA. Access roads to the Project as well as access roads constructed in the PDA (e.g., along the top of the dam) would be permanent for the life of the Project and would allow for maintenance activities during dry operations.

As part of construction, Highway 22 would be raised in its existing location and moved a maximum of 42 m west. Springbank Road would remain in its existing location. An overpass would be constructed at the intersection of Highway 22 and Springbank Road. Range Road 40 and Township Road 250 would be upgraded for use as a detour route in the event of a flood. Two new bridges are proposed on Highway 22 and on Township Road 242 over the diversion channel (Figure 12-7 and refer to Volume 1, Section 3.2.7)

Although unlikely, during the latter part of Highway 22 modification, traffic along Springbank Road may be diverted to the flood detour route on Range Road 40 and Township Road 250. At this point, upgrades to Range Road 40 and Township Road 250 are expected to be complete. Access restrictions are anticipated to last for approximately one month. However, details on traffic accommodation plans would not be available until construction staging and logistics have been finalized.

Detours because of roadworks are common in the region; nonetheless, land users in the LAA may experience changes to access during construction of road realignments and modifications, including longer travelling distance for residents of Rocky View County. This includes access to private property and agricultural lands, to businesses by business owners and clientele, to recreation organizations, and to lands used for livelihood, consumptive and non-consumptive recreation.

Restrictions during construction of road realignments and modifications may affect operators' ability to access existing assets for operations and maintenance in the LAA. Once utilities are relocated, similar restrictions could affect disposition holders in the PDA.



Sources: Base Data - Government of Alberta, Government of Canada, Thematic Data - Stantec Ltd.

Construction of Road Improvements and Bridges

Stantec

12.4.2.2 Mitigation

Mitigation measures to limit change in land use and management during construction and dry operations include the following:

- Residents, businesses, and recreation organizations who experience direct loss of private land in the PDA would be compensated for their land and improvements.
- Alberta Transportation will consult with landowners and disposition holders in the LAA and notify them of Project construction activities and schedule. Adequate warning will be provided to landowners to allow for management of livestock and other farming operations.
- Fences and gates (e.g., Texas gate) will be installed where required.
- Harassment of livestock and other wildlife will be prohibited by Project workers.
- Workers will be prohibited from carrying firearms.
- Food waste will be secured in appropriate facilities or vehicles.
- Construction activities will follow mitigation measures and guidelines outlined in the Project's ECO Plan to reduce noise, light, and air contaminant emissions in proximity to the Project.
- Alberta Transportation is in consultation with operators of utilities in the PDA to discuss retrofitting and relocation of utilities. Alberta Transportation will develop crossing agreements with operators of utilities in the PDA. Alberta Transportation will continue to consult with utility operators in the PDA and LAA regarding rerouting and realignment of utilities on a case by case basis.
- Alberta Transportation will implement access management plans, which includes gating approaches to Project access roads to restrict public access to the PDA.
- Access roads to the Project and in the PDA, including emergency access roads, will remain in place for the life of the Project.
- AEP will develop a management plan for the PDA that may allow for recreation in Area A during dry operations. Area A will be naturalized and access will not be restricted, although development of recreation infrastructure is not planned.
- AEP would avoid the substantial interference with public navigation of the Elbow River through the following design practices:
  - As part of construction, a permanent portage will be developed around the in-stream water intake components.

  - Signs directing traffic to detours will be installed during construction of road realignments and modifications.
  - Signs will be installed along the existing Elbow River channel and on the dam. Multiple signs will be placed upstream and downstream of the water intake components on both banks of the Elbow River. These signs will warn users on the Elbow River that they are approaching in-stream water intake components and of the associated danger with this infrastructure and to direct them to a portage location. A floating, high visibility boom will be in place upstream and downstream of the water intake components.

- Integrated landscape management policies will be implemented in the PDA through management of areas with primary and secondary land uses. Area A will become a conservation area and be naturalized at the completion of construction. Access to Area A would not be restricted; however, access (e.g., parking lots, hiking trails) would not be developed in Area A. Areas B, C, and D will be restricted to public access using barbed wire fencing, gates, and signs indicating “Danger” and “No Trespassing”. Area B and some of Area D will be revegetated at the completion of construction and would remain vegetated through dry operations. Grazing may be permitted on Area C. A management plan for the PDA will be developed by AEP in consultation with land users and the public.

12.4.2.3 Project Residual Effects

With the implementation of mitigation measures, change in land use during construction and dry operations are predicted to be the following:

- direction—residual effects on land use as a result of temporary or permanent removal or degradation of property, including agricultural lands; temporary or permanent removal or degradation of lands used for recreation and livelihood; and change in access are predicted to be adverse. Residual effects on land use because of change to industrial land use are predicted to be neutral.
- magnitude—residual effects because of loss of private land and agricultural lands are predicted to be high because they displace land use activities in the PDA that cannot be accommodated or replaced in the RAA. Residual effects because of changes in industrial land use, change in recreational land use, and indirect effects because of noise, light, and air emissions are predicted to be moderate because they are outside of normal range of variability for the region. However, industrial and recreational activities are anticipated to be able to continue elsewhere in the LAA. Residual effects because of detours and demand for aggregate are predicted to be low because they are in the normal variability of the region.
- geographic extent—residual effects because of loss of private land and agricultural activities are confined to the PDA.

- frequency—residual effects because of loss of private land and agricultural lands, changes to industrial land use, and changes to access due to detours would occur once; indirect effects on land users because of noise, light, and air emissions are predicted to be continuous; and the effects on land users because of the presence of the portage are predicted to be continuous
- duration—residual effects because of loss of private land and agricultural lands and changes to sportfishing and recreational boating are long-term (i.e., indefinite). Residual effects because of changes to hunting, trapping, and hiking are medium-term as recreation may be allowed in Area A of the PDA during dry operations. Other residual effects are short-term as they would be restricted to the construction phase (36 months) or shorter (1 month, in the case of detours; 9 months, in the case of utility relocation)
- reversibility—residual effects because of loss of private land and agricultural land are irreversible. Other residual effects are reversible
- ecological and socioeconomic context—residual effects occur in an area that is resilient and can accommodate measurable changes in land use patterns
- Timing - Timing is not applicable because effects from Project activities would be similar regardless of season or other timing considerations

12.4.3 Change in Parks and Protected Areas and Unique Sites or Special Features

12.4.3.1 Project Pathways

Our Lady of Peace Roman Catholic Mission cairn and monument plaque is located approximately 100 m from the PDA, to the southwest of the water intake components. The PDA does not overlap with the cairn and monument plaque; therefore, construction would not result in removal or degradation of this unique site.

Individuals who access this unique site may be indirectly affected by construction activities through access restrictions during construction of road realignments and modifications and noise, light, and air emissions. Detours because of roadworks are common in the region; however, individuals who typically access this unique site using Springbank Road and Highwa 22 would be required to detour to access this site. Construction of road realignments and modifications is anticipated to last for approximately one month. After construction is completed, noise, light, and air emissions would cease.

12.4.3.2 Mitigation

Alberta Transportation will consult with adjacent landowners and disposition holders in the LAA and notify them of construction activities and schedule. Detour signs for traffic and for the Our Lady of Peace Cairn will be installed during construction of road realignments and modifications. Construction activities would follow mitigation measures and guidelines outlined in the Project's ECO Plan to reduce noise, light, and air contaminant emissions.

12.4.3.3 Project Residual Effects

With the implementation of mitigation measures, Project residual effects during construction are predicted to be the following:

- direction—residual effects are predicted to be adverse because they are detrimental to land users who access Our Lady of Peace cairn and monument plaque relative to existing conditions
- magnitude—residual effects because of detours are predicted to be low because they are in the normal variability of the region; residual effects on land users because of noise, light, and air emissions are predicted to be moderate because they are outside of normal variability for the region
- geographic extent—residual effects would be restricted to the LAA
- frequency—changes to access as a result of detours would occur once; residual effects on land users as a result of noise, light, and air emissions are predicted to be continuous
- duration—residual effects are short-term because they would be restricted to the construction phase (3 years) or shorter (1 month, in the case of detours)
- reversibility—residual effects are reversible
- ecological and socioeconomic context—residual effects occur in an area that is resilient and can accommodate measurable changes in land use patterns
- Timing - Timing is not applicable because effects from Project activities would be similar regardless of season or other timing considerations

12.4.4 Summary of Project Residual Effects

Table 12-6 summarizes the residual environmental effects on land use and management during construction and dry operations.

Table 12-6 Project Residual Effects on Land Use and Management during Construction and Dry Operations

Residual Effect	Residual Effects Characterization								
	Project Phase	Timing	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Land Use	C/O	N/A	A/N	H/M/L	PDA/ LAA	LT/MT/ST	S/C	I/R	R
Change in parks, protected areas, and unique sites or special features	C	N/A	A	M/L	LAA	ST	S/C	R	R

KEY

See Table 12-2 for detailed definitions

Project Phase
C: Construction
O: Operation (Dry)

Timing Consideration
S: Seasonality
T: Time of dayR: Regulatory

Direction:
P: Positive
A: Adverse
N: Neutral

Magnitude:
N: Negligible
L: Low
M: Moderate
H: High

Geographic Extent:
PDA: Project Development Area
LAA: Local Assessment Area
RAA: Regional Assessment Area

Duration:
ST: Short-term;
MT: Medium-term
LT: Long-term

N/A: Not applicable

Frequency:
S: Single event
IR: Irregular event
R: Regular event
C: Continuous

Reversibility:
R: Reversible
I: Irreversible

Ecological/Socio-Economic Context:
R: Resilient
N: Not resilient

12.5 DETERMINATION OF SIGNIFICANCE

Although the purpose and intent of the Project is not consistent with the vision of the Rocky View County MDP and Land Use Bylaw, which protects agricultural land use in the region, the *MGA* (2017) states that authorizations granted by the AEP and NRCB would prevail over compliance with the MDP and Bylaw. Municipal planning and development decisions must be aligned with regional plans under the *Alberta Land Stewardship Act* (2009) to achieve regional outcomes established in those plans. Lands under development for the Project would be managed by AEP. The SSRP would therefore provide the land use framework for lands in the PDA (as outlined in the *MGA* [2017]).

The end land use of the PDA complies with outcomes and strategic directions outlined in the SSRP. Management of lands in the PDA by AEP would allow for multiple and at times competing land uses in the PDA. Land use in the PDA includes a conservation area with low intensity recreation, which is one strategy of integrated landscape management of land identified in the SSRP. Integrated landscape management would also be employed in the PDA through timely reclamation of the construction area. The Project achieves other outcomes and strategic directions outlined in the SSRP including advancing watershed management and including Indigenous peoples in land use policy development. Land use activities in Area A of the PDA would be directed by a management plan, which would be developed in consultation with land users, including Indigenous peoples. The Project would therefore comply with land use plans and policies established for the end land use of the PDA.

Current land uses such as industrial activity, livelihood and consumptive and non-consumptive recreation, and access to the LAA would be disrupted by construction, but these land uses would be able to continue at or near current levels during dry operations. The Project would create a change or disruption in current land uses such as agricultural use on private property or use of private property for residences, businesses, and recreational organizations to a point where these activities cannot continue at or near current levels in the PDA (except in Area C, where grazing may be permitted). However, landowners would be compensated for their lands and improvements.

Unique sites or special features near the Project would not be substantially or irreversibly compromised because of reduced access or reduced quality.

Therefore, residual effects on land use and management during construction and dry operations are predicted to be not significant.

12.6 PREDICTION CONFIDENCE

Prediction confidence is high based on the level of data available and on the implementation of the mitigation measures outlined above.

12.7 CONCLUSIONS

12.7.1 Change in Land Use

Land use in the PDA would be affected by construction of the Project, including permanent removal of private property and agricultural lands and changes to industrial development infrastructure. Property owners would be compensated for the acquisition of their lands by Alberta Transportation. Operators of industrial infrastructure would realign infrastructure as required during construction. Other land uses in the PDA including consumptive recreation and livelihood and non-consumptive recreation, including non-consumptive recreation on the Elbow River, would be affected by construction; however, these land uses would be able to continue at or near current levels elsewhere in the LAA during dry operations.

Land users in the LAA may be affected by temporary changes to access and nuisance noise, light, and air emissions during construction. However, these effects are limited to the construction phase or shorter and land users in the LAA are not anticipated to be affected during dry operations.

The Project would comply with the SSRP and implement integrated landscape management policies. Change in land use during construction and dry operations are predicted to be not significant.

12.7.2 Change in Parks and Protected Areas and Unique Sites or Special Features

Our Lady of Peace cairn and monument plaque would not be substantially or irreversibly compromised because of construction or dry operations. Access to this site would be temporarily disrupted and land users may experience nuisance noise, light, and air emissions during construction. However, these effects are short-term and would not affect access to or quality of the unique site during dry operations.

12.8 REFERENCES

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