

**SPRINGBANK OFF-STREAM RESERVOIR PROJECT
ENVIRONMENTAL IMPACT ASSESSMENT
VOLUME 3A: EFFECTS ASSESSMENT (CONSTRUCTION AND DRY OPERATIONS)**

Assessment of Potential Effects on Infrastructure and Services
March 2018

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Abbreviations

AADT	average annual daily traffic
EA	environmental assessment
EIA	environmental impact assessment
EIS	environmental impact statement
LAA	local assessment area
MLS	multiple listing service
PDA	project development area
RAA	regional assessment area
TAS	traffic accommodation strategies
TLRU	traditional land and resource use
TOR	Terms of Reference
TUS	traditional use study
VC	valued component

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16.0 ASSESSMENT OF POTENTIAL EFFECTS ON INFRASTRUCTURE AND SERVICES

Project workers, project-related business growth and project activities would increase demands for infrastructure and services during the construction phase. These increases have the potential to exceed present capacities. The Project also requires revisions to the existing local road network, which may affect the capacity of roads to meet additional Project-related demands.

16.1 SCOPE OF THE ASSESSMENT

16.1.1 Regulatory and Policy Setting

The environmental effects assessment for infrastructure and services has been prepared in accordance with the requirements of the provincial Terms of Reference (TOR) and federal Environmental Impact Statement (EIS) Guidelines for the Project. Concordance tables, demonstrating where TOR requirements and EIS Guidelines have been addressed are provided in Volume 4, Appendix A.

16.1.2 Engagement and Key Concerns

Alberta Transportation carried out an engagement and consultation program for the Project with both the public and Aboriginal communities. This program and the results are presented in Sections 6 and 7 of Volume 1. Consultation has been ongoing prior to and throughout the project planning process and will continue through the remaining phases of the Project. Stakeholder feedback will be considered when making Project decisions, where possible and appropriate. See Sections 6 and 7 in Volume 1 for more details on the public (Section 6) and Aboriginal communities (Section 7) consultation process including comments received during the development of the Environmental Impact Assessment (EIA).

Key topics and issues of concern related to infrastructure and services received during public consultation are listed below:

- Highway 22 and Springbank Road alterations are a priority for area residents.
- MC1 would not disrupt people whereas the Project does.
- Springbank Road should only be closed in the event of a flood.
- There is a high volume of traffic on roads in the area and roads should be maintained.
- There are concerns about increased traffic on Township Road 250 and Range Road 40.
- Concern about increased travel time for residents of nearby communities.

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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 Canadian Environmental Assessment Agency (CEA Agency) guidelines. Indigenous engagement has been ongoing prior to and through the 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. As of January 1, 2018, Alberta Transportation had received a Project-specific TUS report from Piikani Nation, as well as a joint interim TUS report 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:

- regulatory 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. No issues or concerns related to infrastructure and services were identified through the review of Project-specific and publicly-available TLRU information.

As of January 1, 2018, no project-specific intangible concerns were identified with respect to infrastructure and services.

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16.1.3 Potential Effects, Pathways and Measurable Parameters

Effects on infrastructure and services are primarily caused by the in-migration of project workers and their families, Project-related business growth and project activities, which would increase demands for community services and infrastructure during the construction and operation phases, potentially beyond existing capacities. Project activities during construction, including road and bridge construction on Highway 22, Springbank Road and Township Road 242, would have effects on transportation infrastructure and services.

Table 16-1 presents the potential effects, pathways and measurable parameters for Infrastructure and Services.

Table 16-1 Potential Effects, Effects Pathways and Measurable Parameters for Infrastructure and Services

Potential Environmental Effect	Effect Pathway	Measurable Parameter(s) and Units of Measurement
Change in infrastructure and services	Project workers, Project-related business growth and Project activities have the potential to increase demands for infrastructure and services during the construction and operation phases.	<ul style="list-style-type: none"> Resident and transient population (number of persons) Parameters based on affected infrastructure and services (e.g. wastewater treatment capacity, caseload/officer, emergency services call volumes, student/teacher ratio)
Change in accommodation availability	Project construction and operations would require additional workers, which have the potential to increase demands for accommodation.	<ul style="list-style-type: none"> Availability of accommodations (vacancy rates, inventory levels) Cost of accommodation (\$) Shelter-to-income ratio
Change in transportation infrastructure and services	Demand on local transportation infrastructure and services might be affected by Project activities and Project-related population growth.	<ul style="list-style-type: none"> Traffic volume (vehicles/day) Average travel time (trips/hour)

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16.1.4 Boundaries

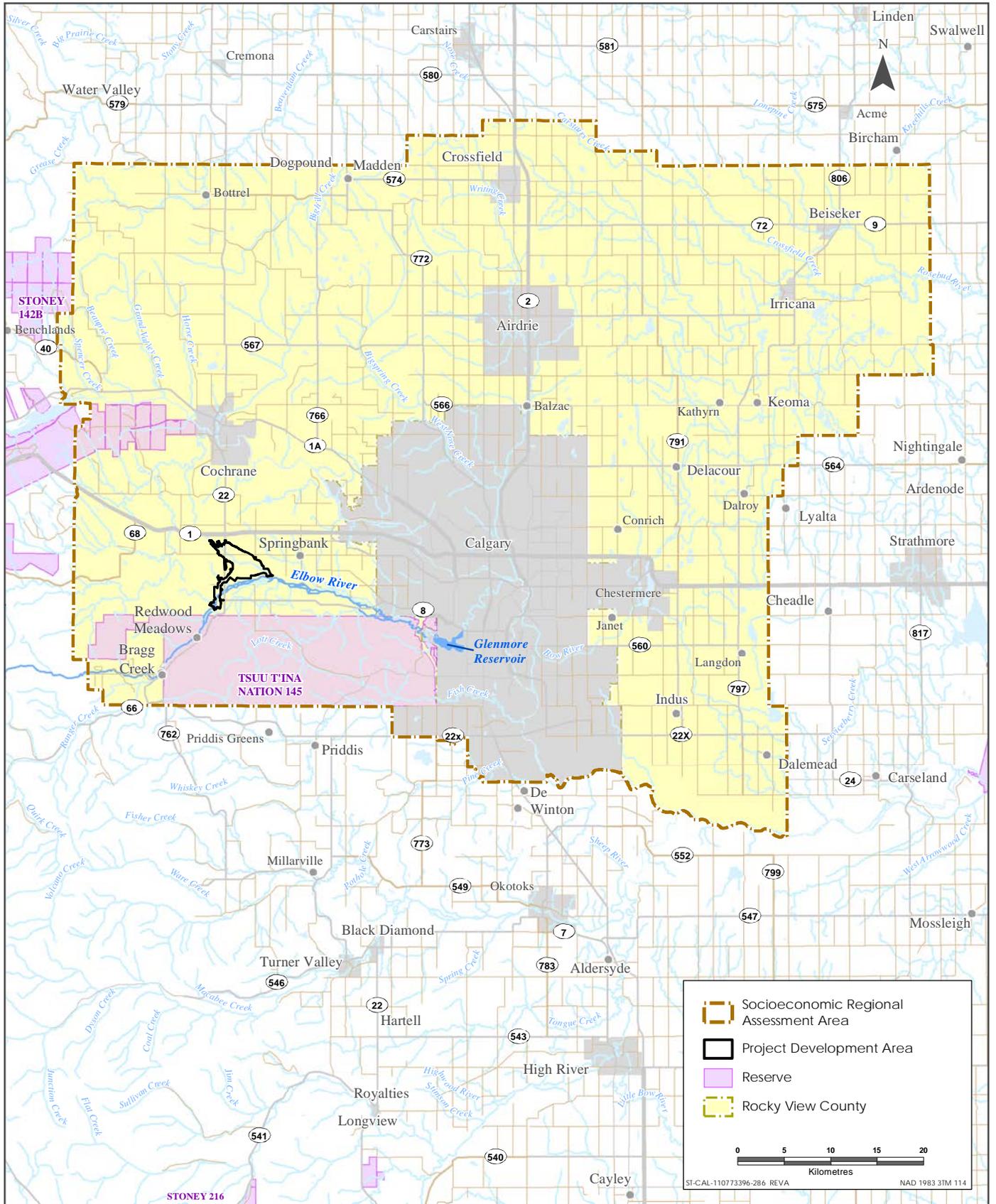
16.1.4.1 Spatial Boundaries

The project development area (PDA) is the anticipated area of physical disturbance associated with the construction and operation of the Project (Figure 16-1). The PDA is 1,438 ha.

The local assessment area (LAA) is the maximum area within which environmental effects can be predicted or measured with a reasonable degree of accuracy and confidence. The LAA includes the PDA and adjacent areas where environmental effects may reasonably be expected to occur.

The regional assessment area (RAA) is the area (Figure 16-1) within which the Project's environmental effects may interact or accumulate with the environmental effects of other projects or activities that have been or will be carried out such that cumulative environmental effects may potentially occur.

For infrastructure and services, the LAA and RAA are the same and include the communities that might experience increased demand on infrastructure and services as a result of the Project. Because the LAA and RAA are the same, the analysis in this section uses RAA. The RAA follows the boundary of Rocky View County, and includes the City of Calgary. The only Aboriginal Reserve in the RAA is Tsuu T'ina Nation 145.



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

Existing Roads in the Regional Assessment Area



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16.1.4.2 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.

16.1.5 Residual Effects Characterization

Table 16-2 lists definitions for characterization of residual environmental effects on Infrastructure and Services.

Table 16-2 Characterization of Residual Effects on Infrastructure and Services

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual effect	Positive — an increase in capacity of infrastructure and services. Adverse — a decrease in capacity of infrastructure and services. Neutral – no net change in measurable parameters for Infrastructure and Services relative to baseline.
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	Low —demand on infrastructure and services remain at or near to baseline conditions. Moderate — demand on infrastructure and services approaches current capacity, standard or threshold but would not result in a reduction in standards of service. High — demand on infrastructure and services exceeds current capacity, standard or thresholds that result in a reduction in standards of service.
Geographic Extent	The geographic area in which a residual effect occurs	PDA — residual environmental effect is restricted to the PDA. RAA — residual environmental effect extends into the RAA.

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Table 16-2 Characterization of Residual Effects on Infrastructure and Services

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Frequency	Identifies how often the residual effect occurs	Single event - occurs once Multiple irregular event - occurs at no set schedule Multiple regular event - occurs at regular intervals Continuous - occurs continuously
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 the construction phase (36 months) Long-term - residual effect extends through the operation phase (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 conditions and trends in the area where residual effects occur	Low Capacity—infrastructure and services have limited capacity to accommodate increased demand Moderate Capacity—infrastructure and services can accommodate some levels of increased demand High Capacity—infrastructure and services have capacity to accommodate increased demand.
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

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16.1.6 Significance Definition

A significant adverse residual effect occurs when there is an exceedance of available capacity, or a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies, or mitigation measures. A significant adverse residual effect is also unlikely to recover to existing conditions.

16.2 EXISTING CONDITIONS FOR INFRASTRUCTURE AND SERVICES

16.2.1 Methods

Baseline information on infrastructure and services was collected from:

- Statistics Canada
- municipalities
- provincial departments, agencies, boards and commissions
- planning boards and boards of trade
- community development corporations

These sources are used in the assessment to provide regional context for the Project and to assess the project effects on the capacity and use of transportation infrastructure and services in the RAA.

The most recently available data on baseline conditions and trends for infrastructure and services, including information on current capacities is presented in Section 16.2.2.

16.2.2 Overview

Rocky View County contains farms, small acreages, commercial developments, natural resource extraction sites and some light industry relating to the oil and gas sector. The County is predominantly rural and has 17 hamlet and country residential communities. Between 1991 and 2011, the County's population almost doubled, growing from 18,939 to 36,461 residents. In 2016, the population of Rocky View County was 39,407 (Statistics Canada 2016). County residential development accounted for much of the growth, with 48% of new homes located in the communities of Bearspaw, Bragg Creek, East Balzac, Elbow Valley, and Springbank (Rocky View County 2013).

In March 2015, 50% of the homes on the market in Rocky View County were single-detached units with valuations exceeding \$850,000. The average price of a home in Rocky View County was \$916,229 in 2015 and \$1.2 million in 2016 (CMHC 2016a). Overall sales activity in Rocky View County has been slowing down since 2015. Between January and October 2015, there were 128 Multiple Listing Service (MLS) sales in Rocky View County of properties over \$1 million

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compared with 205 for the same period in 2014. Luxury homes in Rocky View County are often going for much lower than list price (Toneguzzi 2015).

The City of Calgary is Canada's third largest municipality with a 2016 population of about 1.25 million. The Calgary region represents a diverse economic environment that includes energy, agriculture, manufacturing, transportation and logistics, film, television and creative industries. Calgary's geographic location and size make it a major urban centre and service provider for the southern half of the province of Alberta. There are more than 220 public schools across Calgary with 15 new school openings expected from 2016 to 2018. There are eight hospitals and five cancer care centres in the Calgary Zone and, in 2016, Calgary ranked number two in Canada for healthy lifestyle and life satisfaction. The 2013 Citizen Satisfaction Survey (Ipsos Reid 2013) reveals that 95% of Calgary's population find the quality of services offered by the City to be good or very good (Calgary Economic Development 2015).

The City of Calgary has a large and diverse housing stock and a large supply of rental housing. Calgary has recently been experiencing a decline in housing demand because of a slow-down in economic activity that has resulted in losses in full-time employment and slower population growth. While the vacancy rate is forecast to decline in 2017 (7.5%) and 2018 (6.5%), it is expected to remain above historical averages (CMHC 2016b).

16.2.3 Current Conditions

16.2.3.1 Roads

Highways are under the jurisdiction of Alberta Transportation and are maintained by private contractors. A highway is typically asphalt-surfaced although there are two gravel-surfaced highways within Rocky View County. Township and range roads are built within public RoWs and are under the control and jurisdiction of the County. Rocky View County has 29 highways, which connect with the County's 2,342 km of road network. Figure 16-1 shows the road network in the RAA.

Highway 22 is a key north/south arterial highway that connects the communities of Black Diamond, Turner Valley, Priddis, Bragg Creek, Redwood Meadows and Cochrane west of Calgary. It is also a major truck route connecting Highway 1, Highway 22X, Highway 8 and various other provincial highways. Within the RAA, Highway 22 is a two-lane undivided rural highway. Alberta Transportation has plans for twinning the highway on its current alignment in the next ten years, although a date for the twinning has not been set.

East of Highway 22, Springbank Road is a paved east/west regional collector road in Rocky View County that provides access to existing properties and future development within the area. It is a key parallel access road south of Highway 1 that provides connection between Highway 22 and Old Banff Coach Road, which will connect to the future Calgary Ring Road. Springbank

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Road functions as a parallel network to the provincial highway system that allows traffic to travel short distance trips without accessing Highway 1. West of Highway 22, Township Road 244, which is a continuation of Springbank Road, functions as a gravel collector roadway.

Township Road 242, west of Highway 22 functions as a two-lane roadway. It primarily serves a small number of country residential dwellings and the Copithorne gravel pit. Township Road 242 is not within the reservoir area but does intersect the diversion channel.

Table 16-3 lists the average annual daily traffic (AADT) volumes on Highway 22 between Highway 1 and Highway 8. The average annual traffic growth rate between 2006 and 2015 was 4.3%, which is higher than the provincial average of 2.0% for the same period.

Table 16-4 lists the AADT volumes on Springbank Road, both west and east of Highway 22. The 12-year average annual growth rate was -1.1% west of Highway 22 (2003 to 2015) and 3.4% east of Highway 22 (2004 to 2016).

Table 16-3 Highway 22 Historical Traffic Volumes in RAA, South of Highway 1

Year	AADT	% Change
2006	8,770	-
2007	10,000	14.0
2008	9,860	-1.4
2009	9,930	0.7
2010	10,320	3.9
2011	10,080	-2.3
2012	10,080	0.0
2013	10,290	2.1
2014	10,340	0.5
2015	12,140	17.4
9-yr Average Annual Growth Rate =		4.3
SOURCE: Stantec 2016		

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Table 16-4 Township Road 244 and Springbank Road Historical Traffic Volumes

Year	AADT (Township Road 244 – West of Hwy 22)	% Change	AADT (Springbank Road – East of Hwy 22)	% Change
2003	75	-	-	-
2004	73	-2.7	891	-
2005	69	-5.5	-	-
2006	115	66.7	-	-
2008	100	-13.0	-	-
2010	96	-4.0	-	-
2011	48	-50.0	-	-
2012	91	89.6	-	-
2013	232	154.9	-	-
2014	68	-70.7	961	7.9
2015	65	-4.4	-	-
2016	-	-	1,252	30.3
	12-yr Average Annual Growth Rate =	-1.1	12-yr Average Annual Growth Rate =	3.4
SOURCE: Stantec 2016				

Table 16-5 lists the AADT volumes on Township Road 242 west of Highway 22. The average annual growth rate between 2003 and 2015 was 126.3%, but from 2003 to 2014 it was 19%. It is speculated that the increase in the growth rate on Township Road 242 between 2014 and 2015 can be attributed to the Copithorne gravel pit operations.

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Table 16-5 Township Road 242 Historical Traffic Volumes

Year	AADT	% Change
2003	32	-
2004	70	118.8
2005	84	20.0
2006	94	11.9
2008	82	-12.8
2011	103	25.6
2012	114	10.7
2014	66	-42.1
2015	517	683.3
12-yr Average Annual Growth Rate =		126.3
SOURCE: Stantec 2016		

16.3 PROJECT INTERACTIONS WITH INFRASTRUCTURE AND SERVICES

Table 16-6 identifies for each potential effect, the project components and physical activities that might interact with infrastructure and services. These interactions are discussed in detail in Section 16.4 in the context of effects pathways, standard and project-specific mitigation and residual effects. A justification for no effect is provided following the table.

Table 16-6 Project-Environment Interactions with Infrastructure and Services During Construction and Dry Operations

Project Components and Physical Activities	Environmental Effects		
	Change in Infrastructure and Services	Change in Accommodation Availability	Change in Transportation Infrastructure and Services
Construction			
Clearing	-	-	-
Channel excavation	-	-	-
Water diversion construction	-	-	✓
Dam and berm construction	-	-	✓
Low-level outlet works construction	-	-	-
Road construction	-	-	✓

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Table 16-6 Project-Environment Interactions with Infrastructure and Services During Construction and Dry Operations

Project Components and Physical Activities	Environmental Effects		
	Change in Infrastructure and Services	Change in Accommodation Availability	Change in Transportation Infrastructure and Services
Bridge construction	-	-	✓
Lay down areas	-	-	-
Borrow extraction	-	-	-
Reclamation	-	-	-
Utility realignments	-	-	-
Dry Operations			
Maintenance	-	-	-
NOTES: ✓ = Potential interaction - = No interaction			

Project construction would require approximately 450 workers. It is assumed that nearly all of the construction workers would live within daily commuting distance and would not require additional housing or rental accommodations. Specialist workers may need to relocate to the LAA/RAA for part of the construction, however, there is an abundance of temporary accommodations in the City of Calgary. Similarly, since most Project workers are anticipated to be local, it is not likely that additional population-based demands would be placed on community infrastructure and services, including those related to power, water and sewer, waste, recreation, and education.

There are oil and gas pipelines and a power line within the diversion channel, dam, and reservoir areas. Pipelines that cross the diversion channel would be buried beneath it and those in conflict within the dam and reservoir PDAs would be relocated. The power line would be moved. It is assumed that these changes would occur without long interruptions in service. See Volume 1, Section 3.2.9 for details.

Project activities will not interact directly with any infrastructure and services located on the Tsuut'ina reserve within the LAA/RAA. If population-related demands were expected, they would likely occur in the larger service areas within the LAA/RAA,. However, as described above, since workers will likely live within commuting distance of the Project, no additional population-based demands are expected to be placed on any communities within the LAA/RAA, including Tsuu T'ina Nation 145.

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During dry operations, only two full-time employees would be required, therefore dry operations has no interaction with infrastructure and services.

16.4 ASSESSMENT OF RESIDUAL ENVIRONMENTAL EFFECTS ON INFRASTRUCTURE AND SERVICES

16.4.1 Analytical Assessment Techniques

Potential environmental effects on Infrastructure and Services are qualitatively assessed by comparing anticipated demand with existing capacity, as established through baseline data.

16.4.2 Change in Transportation Infrastructure and Services

16.4.2.1 Project Pathways

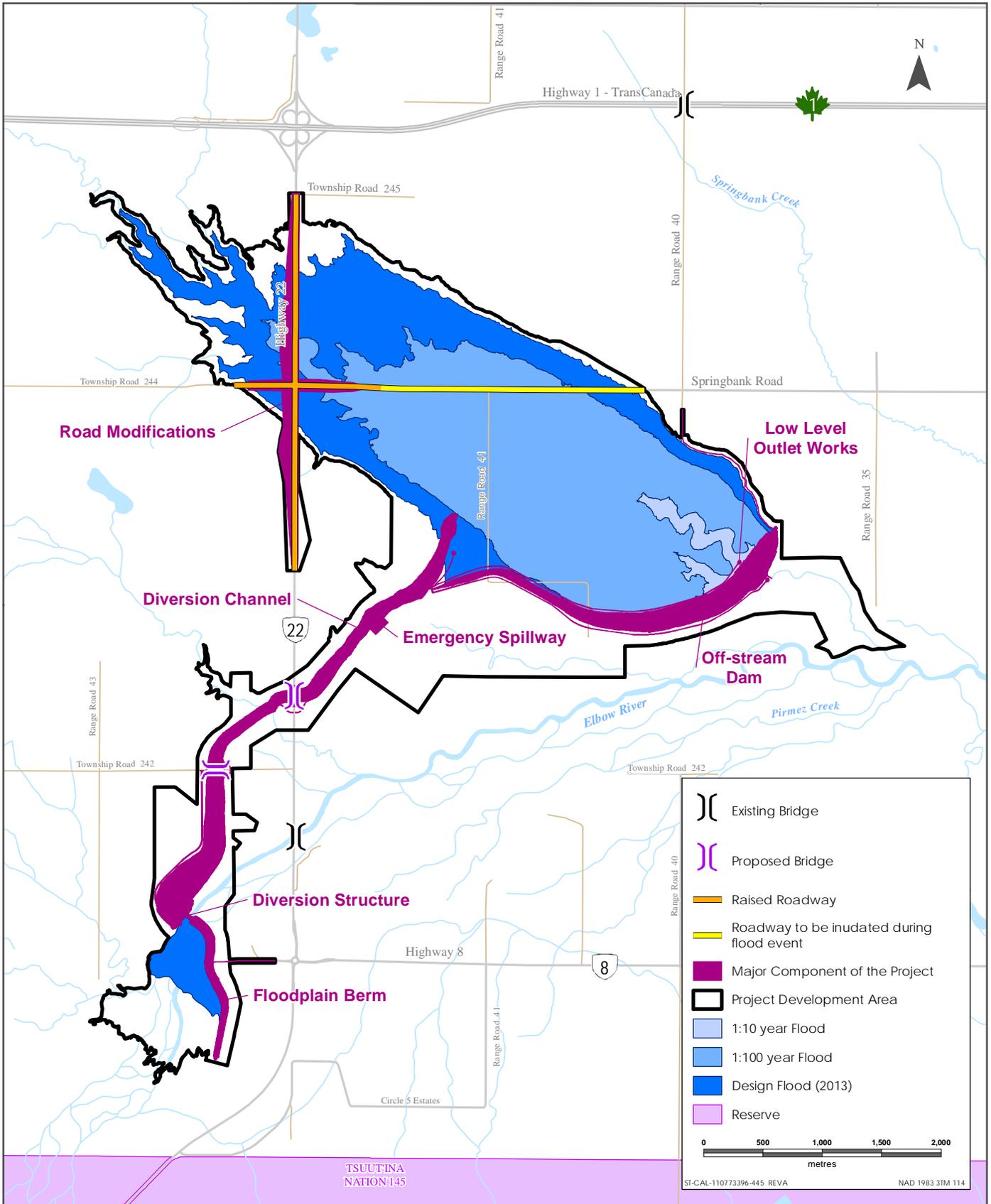
Environmental effects on transportation infrastructure and services would occur as a result of the Project construction activities, including road and bridge construction.

The presence of construction vehicles and equipment on the local roads and highways and the transportation of Project workers to the Project site would periodically increase local traffic and might cause brief traffic disruptions. As well, road and bridge works on Highway 22, Springbank Road and Township Road 242 have the potential to affect traffic flows.

Modifications to certain roads in the RAA as a result of the Project are shown in Figure 16-2 and would consist of the following:

- raising the gradeline of Highway 22 west of the existing lanes and building a new bridge over the diversion channel on the existing alignment
- retaining existing Springbank Road and Township Road 244 except for a new raised intersection at Highway 22; and upgrading Range Road 40 to serve as a detour, along with Township Road 250, when the off-stream reservoir is flooded
- building a bridge over the diversion channel on the existing alignment of Township Road 242 and Highway 22

The proposed improvement plans have been presented to Rocky View County.



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



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For the preferred option, traffic would be maintained on the existing Highway 22 during construction. In order to maintain traffic along Highway 22 during construction, the new lanes would be constructed in the location of the future southbound twinning lanes (west) to avoid impacting the existing highway.

Although unlikely, during the latter part of Highway 22 construction, traffic along Springbank Road might have to 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. This detour would create a longer travelling distance for residents of Rocky View County but is not expected to create capacity issues on Range Road 40 and Township Road 250. However, details on traffic accommodation plans would not be available until construction staging and logistics have been finalized.

Project construction would involve the movement of materials and use of equipment and construction vehicles along or across public roads. The addition of this equipment to the local roadways for Project construction, employee commuter traffic, and traffic delivering materials to the site would increase demands on road infrastructure and might cause traffic disruptions.

Some specialized workers and members of the management team may be transported by plane to and from the LAA/RAA; however, these numbers are expected to be very small and not affect air traffic and infrastructure. Rail traffic is not anticipated to be affected by project activities.

16.4.2.2 Mitigation

Mitigation measures to reduce the Project's effects on transportation infrastructure are outlined below.

- A project specific traffic accommodation strategy will be developed for the Project.
- The details of day-to-day road construction management such as detours, signage, flagpersons and timing of activities will be set out in traffic accommodation strategies (TAS) that will be developed by the contractor(s) and reviewed and approved by Alberta Transportation.

Alberta Transportation will consult regularly with Rocky View County to provide project updates, and to identify and address project-related traffic problems and other potential implications for services and infrastructure.

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16.4.2.3 Project Residual Effects

During construction, traffic along Springbank Road may be diverted to Range Road 40 and Township Road 250 or a temporary detour to Highway 22 may be constructed. This may create a longer travelling distance for residents of Rocky View County but would not create additional demands on Springbank Road. Range Road 40 and Township Road 250 have the capacity to handle additional traffic created by the detour. Because the modifications to Highway 22 would be constructed alongside and prior to closure of the existing road, access to the area would be uninterrupted and existing infrastructure would be able to accommodate Project-related traffic increases.

The addition of equipment to the local roadways for Project construction may cause traffic disruptions. However, construction would occur beside the existing Highway 22 and is not anticipated to adversely affect traffic. Vehicles may be expected to slow down in construction areas but no additional demands on the local roads are expected. Employee commuter traffic and traffic delivering construction materials, supplies and services to the site may increase traffic volumes; however, with mitigations described above and the capacity of the local road network, the traffic associated with the Project can easily be accommodated.

A summary of the characterization of the residual effect on transportation based on direction, magnitude, geographic extent, timing (if applicable), frequency, duration, reversibility and ecological and socio-economic context is provided in Table 16-7.

16.4.3 Summary of Project Residual Effects

Table 16-7 summarizes the residual environmental effects on infrastructure and services during construction. The residual adverse effects of the Project on transportation infrastructure and services during construction are predicted to be low in magnitude, short-term, and continuous. Effects are likely to be reversed following construction and would occur in a socio-economic context of high capacity. Timing is not applicable because effects from project activities would be similar regardless of season or other timing considerations. Based on the limited disruptions to traffic and infrastructure, effects on Indigenous commercial activities are also expected to be low in magnitude.

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Table 16-7 Project Residual Effects on Infrastructure and Services during Construction

Residual Effect	Residual Effects Characterization								
	Project Phase	Timing	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Ecological and Socio-economic Context
Change in Transportation Infrastructure and Services									
Change in Transportation Infrastructure and Services	C	N/A	A	L	RAA	ST	C	R	HC
<p>KEY</p> <p>See Table 16-2 for detailed definitions</p> <p>Project Phase C: Construction DO: Dry Operations</p> <p>Timing Considerations S: Seasonality T: Time of day R: Regulatory</p> <p>Direction: P: Positive A: Adverse N: Neutral</p> <p>Magnitude: N: Negligible L: Low M: Moderate H: High</p> <p>Geographic Extent: PDA: Project Development Area LAA: Local Assessment Area RAA: Regional Assessment Area</p> <p>Duration: ST: Short-term; MT: Medium-term LT: Long-term</p> <p>N/A: Not applicable</p> <p>Frequency: S: Single event IR: Irregular event R: Regular event C: Continuous</p> <p>Reversibility: R: Reversible I: Irreversible</p> <p>Ecological/Socio-Economic Context: LC: Low Capacity MC: Moderate Capacity HC: High Capacity</p>									

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16.5 DETERMINATION OF SIGNIFICANCE

The Project would not result in:

- an exceedance of available capacity or
- a substantial decrease in the quality of a service provided, on a persistent and ongoing basis, which cannot be mitigated with current or anticipated programs, policies, or mitigation measures

Therefore, Project residual effects on infrastructure and services are assessed as not significant for the construction phase (there are no interactions during the dry operation phase).

16.6 PREDICTION CONFIDENCE

The level of confidence in the predictions is high because the

- known effectiveness of the standard management tools and mitigation measures that would be in place
- readily understood effects of the planned construction activities
- capacity of the existing local transportation network

16.7 CONCLUSIONS

Construction of the Project would affect existing roadways and local traffic in the RAA because of road improvements and Project-related traffic, but residual adverse effects on transportation infrastructure and services are predicted to be not significant.

16.8 REFERENCES

Calgary Economic Development. 2015. Why Calgary. Available at:
<http://www.calgaryeconomicdevelopment.com/why-calgary/>

CMHC. 2016a. Housing Now Tables Calgary CMA, April 2016. Available at: https://www.cmhc-schl.gc.ca/odpub/esub/64167/64167_2016_M04.pdf

CMHC. 2016b. Housing Market Outlook Calgary CMA, Fall 2016. Available at:
https://www.cmhc-schl.gc.ca/odpub/esub/64339/64339_2016_B02.pdf?fr=1479399856836

Ipsos Reid. 2013. The City of Calgary Citizen Satisfaction Survey, Final Report. Available at:
http://www.calgary.ca/cfod/csc/Documents/2013_Citizen_Satisfaction_survey.pdf

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Rocky View County. 2013. Rocky View County County Plan. Available at:
<http://www.rockyview.ca/Portals/0/Files/BuildingPlanning/Planning/CountyPlan/RVC-County-Plan.pdf>

Stantec. 2016. Springbank Off-Stream Reservoir Project (SR1) – Highway 22 and Springbank Road Planning Study, Draft Report. Prepared for Alberta Transportation.

Statistics Canada. 2016. Census Profile, 2016 Census. Rocky View County, Municipal district [Census subdivision], Alberta and Alberta [Province]. Available at:
<http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=4806014&Geo2=PR&Code2=48&Data=Count&SearchText=Rocky%20View%20County&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=4806014&TABID=1>

Toneguzzi, M. 2015. Record housing sales over \$3 million this year in Rocky View County. Article, November 6, 2015, Calgary Herald. Available at:
<http://calgaryherald.com/business/real-estate/record-housing-sales-over-3-million-this-year-in-rocky-view-county>