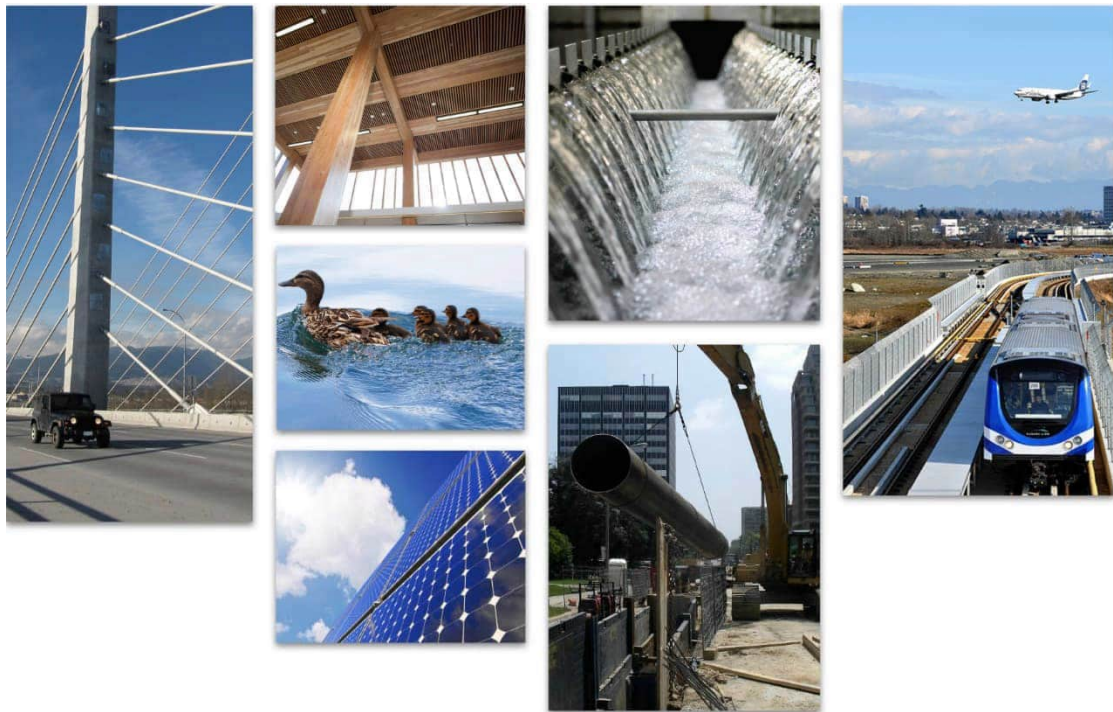


REPORT

Capital Region Southwest Water Services Commission

Camrose & Wetaskiwin Regional Water Feasibility Study



SEPTEMBER 2026

CONFIDENTIALITY AND © COPYRIGHT FOR THIS REPORT

This document is for the sole use of the addressee and Associated Engineering Alberta Ltd. The document contains proprietary and confidential information that shall not be reproduced in any manner or disclosed to or discussed with any other parties without the express written permission of Associated Engineering Alberta Ltd. Information in this document is to be considered the intellectual property of Associated Engineering Alberta Ltd. in accordance with Canadian copyright law.

This report was prepared by Associated Engineering Alberta Ltd. for the account of Capital Region Southwest Water Services Commission. The material in it reflects Associated Engineering Alberta Ltd.'s best judgement, in the light of the information available to it, at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Associated Engineering Alberta Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

EXECUTIVE SUMMARY

The City of Wetaskiwin and a portion of the County of Wetaskiwin in Gwynne source their water from Coal Lake, and the City of Camrose sources their water from Driedmeat Lake. These two water bodies are both part of the Battle River Basin, a prairie-based watershed system that relies heavily on localized precipitation rather than mountain snowpack or glacial runoff. As a result, these source water systems are particularly vulnerable to drought conditions, extended precipitation deficits, climate variability, and watershed stress, and the basin has remained under a provincial water shortage advisory since 2023 due to prolonged low-flow conditions and cumulative drought impacts. These conditions increase risks related to source water quantity, degraded water quality, algae growth, operational complexity, and long-term supply resiliency for communities dependent on lake-based water systems within central Alberta.

The Capital Region Southwest Water Services Commission is supportive of supplying water to the municipalities, but further study is required to confirm the feasibility and cost. This feasibility study will also support a funding application to Alberta Transportation and Economic Corridors under the Water for Life Program if a regional water supply is undertaken.

The Commission’s system is unable to supply these municipalities through the existing infrastructure. A dedicated supply main will be required. Additionally, through discussions between the Commission and EPCOR, EPCOR determined that they are unable to supply the addition of Camrose and Wetaskiwin through the existing 750 mm supply main from the Blackmud Booster Station and their tertiary pressure zone due to the flow and pressure capacity limitations. As such, a new tie-in point from EPCOR will be required within the City of Edmonton to supply the Commission, connecting into the EPCOR primary pressure zone. Supplying Camrose and Wetaskiwin through the Commission’s system, regardless of alignment, will require the new supply line.

Due to the timelines involved in securing grant funding and project implementation, a new regional waterline is likely to be completed over 10 years; this assumes that progress into detailed design and land acquisition can be prioritized in the short-term given the substantive front-end work for a project of this magnitude. Therefore, this report assumes that the 25-year study period will begin in 2036 and the ultimate design will be for 2061.

Design water demands for the three communities in the study area are summarized in **Table ES-1** below. The projected demands are based on existing populations, water consumptions, and peaking factors. A **1.0% growth rate** was applied to all three municipalities.

Table ES-1 Design Demands

Municipality	2036 Average Day Demands (L/s)	2036 Peak Day Demands (L/s)	2061 Average Day Demands (L/s)	2061 Peak Day Demands (L/s)
City of Camrose	70.4	126.8	90.3	162.6
City of Wetaskiwin	40.6	73.0	52.0	93.7
County of Wetaskiwin	0.7	1.3	0.9	1.6
Total	111.7	201.1	143.3	257.9

The proposed alignment includes a new tie-in point from EPCOR within the City of Edmonton to supply the Commission, connecting into the EPCOR primary pressure zone. Three proposed alignments were assessed:

1. Supply through the Nisku Booster Station and twinning the existing Commission line to the Town of Millet. From there, the waterline continues south to Wetaskiwin, then east to Camrose.
2. Supply through the City of Beaumont, then extending to the south to tie into the Armena line upstream of the Highway 21 Booster Station. From there, the waterline twins the existing line to the Hamlet of Armena, then south to Camrose, then west to Wetaskiwin.
3. Supply through Beaumont, then tie into the Millet line downstream of the Leduc Robinson Reservoir. From there, it would twin the Millet line, continue south to Wetaskiwin, and then east to Camrose.

Based on the analysis, **Alignment Option 2** is the preferred option for the regional water supply.

A desktop environmental and regulatory review was completed for all three alignment options to identify environmental sensitivities, anticipated regulatory permitting and compliance requirements, and anticipated agency review timelines. Permitting requirements may change depending on the construction methods proposed and should be revisited as additional design information becomes available. Option 2 will likely require less disturbance and reclamation of agricultural soils and fewer crossings of waterbodies than Options 1 and 3. Option 2 will also avoid intersections with Edmonton International Airport (EIA) land, which is owned by Transport Canada, and Telford Lake. Both are intersected by Option 1.

Approvals under the *Environmental Protection and Enhancement Act*, *Historical Resources Act*, *Public Lands Act*, and *Water Act* are anticipated for all alignment options. Option 1 will trigger additional regulatory approvals under the *Impact Assessment Act* and the *Water Act* for crossings with Transport Canada owned land and Telford Lake, respectively. Measures to ensure compliance with the *Migratory Birds Convention Act, 1994*, *Species at Risk Act*, *Agricultural Pests Act*, *Soil Conservation Act*, *Weed Control Act*, and *Wildlife Act* should also be incorporated in the next project stages. Camrose County and County of Wetaskiwin topsoil and clubroot bylaws and policies also apply.

A desktop geotechnical assessment was completed by Thurber Engineering Ltd. to determine the geotechnical considerations of the alignment options. Open cut method is deemed suitable to construct most of the alignment outside potential crossing locations. However, high groundwater may be encountered along the alignment that spans the eolian and glaciolacustrine deposits. Temporary excavation side slopes are anticipated to be stable at slopes of 1H:1V and 1.5H:1V or flatter for clay and sand, respectively, assuming dry conditions. A hybrid approach utilizing open cut for the majority of the alignment, with Horizontal Directional Drilling (HDD) or trenchless installation technologies such as Horizontal Auger Boring (HAB) at constrained crossings, represents the most balanced and practical solution.

As an alternative to a regional waterline, a high-level assessment was completed for upgrades to both the Camrose and Wetaskiwin Water Treatment Plants. Both WTPs would require extensive upgrades to remain viable beyond the next 10 years. The Camrose WTP requires unit process upgrades based on projected demand and capacity constraints as well as a few electrical, mechanical, and structural upgrades, while the Wetaskiwin WTP will not require unit process upgrades due to capacity but requires more extensive structural and mechanical upgrades. The upgrades at each WTP are the following:

Camrose WTP

- **Electrical:** motor control centers.
- **Structural:** lime silos and roof assembly.
- **Mechanical:** alum and lime clarifiers, floc tanks, and chemical room exterior walls.
- **Unit Process:** Pre-treatment solids contact clarifier (before 2036), granular activated carbon facility (before 2061), and ultraviolet disinfection system (before 2061). Chemical feed systems will require upgrades along with respective unit process upgrades.

Wetaskiwin WTP

- **Structural:** catwalks, superstructure, structural frame, ceilings, fire separation, and code compliance.
- **Building Mechanical:** safety equipment, heating and ventilation systems.
- **Process Mechanical:** filter air scour system, ultraviolet disinfection system, dissolved air flotation refurbishment, granular activated carbon filters.

In Alberta, several established provincial programs provide cost-shared funding for municipal water infrastructure, with varying alignment depending on project type:

- **Water For Life Program:** Water for Life is the overarching government-wide strategy for water in Alberta. The Water for Life Program, which launched in 2006, provides cost-shared funding to regional commissions or groups of two or more municipalities and consists of two funding streams, for new or existing regional water systems. Funding is typically up to 90% of project costs. It is understood from a meeting between Associated, the Commission, and TEC (Alberta Transportation and Economic Corridors) on September 4, 2026, that due to the value of this project, it is unlikely that the Water for Life Program would have sufficient capacity to fund 90% of the project. TEC advised that the Province is willing to work with the municipalities to determine project phasing and additional sources of funding, provincial and federal. For the purposes of this study, it has been assumed that contributions by the municipalities could be approximately one third of project costs, provided equal support from the provincial and federal governments.
- **Alberta Municipal Water/Wastewater Partnership:** The Alberta Municipal Water/Wastewater Partnership (AMWWP), which launched in 1991, provides cost-shared funding to eligible municipalities to help build municipal facilities for water supply and treatment, and wastewater treatment, conveyance, and disposal. Based on municipal population, grant funding for Wetaskiwin would be 31.3% of project costs and funding for Camrose would be 25.0% of project costs.

Both options are eligible for provincial funding; however, the regional waterline option is more favourably positioned due to its alignment with Alberta's long-term water management strategy. This creates a higher likelihood of securing funding and achieving a greater level of cost sharing, further strengthening its feasibility from a financial and strategic perspective.

Capital, Operations & Maintenance, and Life Cycle costs were determined for both the regional waterline and WTP upgrade options. The cost comparison, including potential funding, is provided in **Table ES-2**.

Table ES-2 Cost Comparison

Option	Capital Cost	Remainder After Funding	O&M Cost	Life Cycle Cost
WTP Upgrades				
Camrose WTP	\$68,175,000	\$51,131,000	\$77,700,000	\$128,931,000
Wetaskiwin WTP	\$39,400,000	\$27,068,000	\$48,659,086	\$88,059,086
Total WTP	\$107,575,000	\$78,199,000	\$126,359,086	\$216,990,086
Regional Pipeline				
Option 1	\$439,574,000	\$146,524,000	\$134,819,000	\$574,393,000
Option 2 (Preferred)	\$435,193,000	\$145,065,000	\$135,020,000	\$570,213,000
Option 3	\$397,142,000	\$132,380,000	\$134,856,000	\$531,998,000

The regional waterline option is characterized by higher upfront cost and certain construction-related risks such as geotechnical conditions and construction duration but provides significant long-term advantages, including secure water supply, strong funding alignment, and improved climate resilience. The standalone WTP upgrade option offers lower initial disruption but higher risk with maintain operations during upgrades, and is constrained by long-term risks, particularly the critical limitation of source water availability, which cannot be resolved through treatment improvements alone.

While both options are technically feasible, the comparison indicates that the **Regional Waterline Option** provides a more robust, scalable, and sustainable solution. Despite short-term construction risks, it mitigates the most significant long-term constraint—reliable access to sufficient source water—and aligns more closely with provincial infrastructure funding priorities and regional water management strategies.

TABLE OF CONTENTS

SECTION	PAGE NO.
Executive Summary	i
Table of Contents	v
List of Tables	vii
List of Figures	viii
1 Introduction	1-1
1.1 Scope	1-2
1.2 Background	1-2
2 Design Criteria	2-1
2.1 Historical Water Usage	2-1
2.2 Projected Water Demands	2-1
2.3 Pipeline Criteria	2-2
3 Alignment	3-1
3.1 Upstream Supply Main	3-1
3.2 Regional Alignment	3-1
3.3 Alignment Options	3-3
3.4 Alignment Analysis	3-12
4 Hydraulic Analysis	4-1
4.1 New Supply Main	4-1
4.2 Options Analysis	4-1
4.3 Existing System Hydraulic Considerations	4-6
5 Environmental & Regulatory Review	5-1
6 Geotechnical Assessment	6-1
7 Construction Considerations	7-1
7.1 Pipe Installation Method	7-1
7.2 Preferred Methodology	7-2
8 Water Treatment Plant Assessment	8-1
8.1 Water Treatment Plant Demands	8-1
8.2 Raw Water Diversion Licences	8-3
8.3 Treated Water Storage	8-6
8.4 Facility Upgrade Assessments	8-7
9 Grant Funding Review	9-1
9.1 Regional Waterline	9-1
9.2 Water Treatment Plant Upgrade	9-2

	9.3	Funding Summary	9-2
10		Costs Analysis	10-1
	10.1	Regional Waterline Opinion of Probable Cost	10-1
	10.2	Facility Upgrade & Refurbishment – Opinion of Probable Costs	10-2
	10.3	Life Cycle Cost Estimate	10-6
11		Risk Assessment	11-1
12		Options Comparison	12-1
13		Conclusion & Recommendations	13-1
		Closure	
		Appendix A - Environmental Overview Report	
		Appendix B - Desktop Geotechnical Study	
		Appendix C - Detailed Cost Breakdown	
		Appendix D - Comment Review Log	

LIST OF TABLES

		PAGE NO.
Table ES-1	Design Demands	i
Table ES-2	Cost Comparison	iv
Table 2-1	Water Consumption Records 2020 – 2024 (m³)	2-1
Table 2-2	Average Annual Historical Growth Rates	2-1
Table 2-3	Projected Water Demands	2-2
Table 3-1	Alignment Option Comparison	3-12
Table 5-1	Anticipated Regulatory Permits	5-3
Table 8-1	City of Camrose WTP Raw Water Capacity Requirements	8-1
Table 8-2	City of Wetaskiwin WTP Raw Water Capacity Requirements	8-3
Table 8-3	City of Camrose License Annual Raw Water Demands	8-4
Table 8-4	City of Camrose Licence Maximum Diversion	8-4
Table 8-5	City of Wetaskiwin License Annual Raw Water Demands	8-5
Table 8-6	City of Wetaskiwin Licence Maximum Diversion	8-5
Table 8-7	City of Camrose Water Storage Requirements	8-6
Table 8-8	City of Wetaskiwin Water Storage Requirements	8-7
Table 10-1	Regional Waterline Opinion of Probable Costs	10-2
Table 10-2	City of Camrose WTP Opinion of Probable Cost for Upgrades & Refurbishment	10-2
Table 10-3	City of Wetaskiwin WTP Opinion of Probable Cost for Upgrades & Refurbishment	10-3
Table 10-4	Regional Waterline O&M Costs	10-5
Table 10-5	WTP O&M Costs	10-6
Table 10-6	Opinion of Probable Life Cycle Cost (NPV)	10-6
Table 11-1	Regional Waterline Installation Risks	11-1
Table 11-2	Water Treatment Plan Upgrade Risks	11-1
Table 11-3	Comparative Risk Assessment	11-2
Table 12-1	Options Comparison	12-1

LIST OF FIGURES

	PAGE NO.
Figure 1-1 Existing Commission System	1-3
Figure 3-1 Alignment Options	3-2
Figure 3-2 Alignment Option 1 – Edmonton to Leduc	3-4
Figure 3-3 Alignment Option 1 – Leduc to Wetaskiwin	3-5
Figure 3-4 Alignment Option 1 – Wetaskiwin to Camrose	3-6
Figure 3-5 Alignment Option 2 – Edmonton to New Sarepta	3-7
Figure 3-6 Alignment Option 2 – New Sarepta to Wetaskiwin	3-8
Figure 3-7 Alignment Option 3 – Edmonton to Leduc	3-9
Figure 3-8 Alignment Option 3 – Leduc to Wetaskiwin	3-10
Figure 3-9 Alignment Option 3 – Wetaskiwin to Camrose	3-11
Figure 4-1 Hydraulic Grade Line Alignment Option 1	4-3
Figure 4-2 Hydraulic Grade Line Alignment Option 2	4-4
Figure 4-3 Hydraulic Grade Line Alignment Option 3	4-5
Figure 5-1 Environmental Overview	5-2
Figure 8-1 Camrose Water Treatment Plant 2061 Raw Water Treatment Capacity Summary	8-2
Figure 8-2 Wetaskiwin WTP 2061 Raw Water Treatment Capacity Summary	8-3
Figure 8-3 Camrose WTP Unit Process Capacity	8-8
Figure 8-4 Wetaskiwin WTP Unit Process Capacity	8-10

1 INTRODUCTION

The City of Camrose, the City of Wetaskiwin, and the County of Wetaskiwin approached the Capital Region Southwest Water Services Commission (Commission) regarding receiving regional water supply to each of the municipalities.

The primary driver for this request is the increasing concern regarding the long-term reliability, resiliency, and sustainability of the existing source water supplies within the Battle River Basin. The proposed regional approach supports common objectives related to protecting secure drinking water supplies, improving drought resiliency, promoting regional collaboration, and developing sustainable long-term water infrastructure solutions.

The City of Camrose currently sources raw water from Driedmeat Lake, located approximately 13 km southeast of the City. Raw water is conveyed to the City's water treatment plant (WTP), where it undergoes treatment prior to distribution throughout the municipal system. The WTP regularly experiences operational challenges associated with elevated concentrations of organic matter, algae, and seasonal raw water quality fluctuations. In recent years, concerns regarding source water reliability have increased due to prolonged dry conditions, declining lake levels, and ongoing precipitation deficits throughout the watershed.

Recent monitoring and reporting within the Battle River Basin indicate that, despite above-average snowfall in parts of Alberta during the winter of 2025–2026, the region continues to experience significant water supply pressures. The Battle River Basin has remained under a provincial water shortage advisory since 2023 due to prolonged low-flow conditions and cumulative drought impacts. Existing low water levels in Driedmeat Lake, combined with limited spring runoff recovery following multiple dry years, have heightened concerns regarding the long-term sustainability of the City's raw water supply. Watershed representatives have also noted that recent precipitation is largely being absorbed into depleted soils rather than replenishing lake storage volumes.

The City of Wetaskiwin currently sources raw water from Coal Lake, located approximately 10 km northeast of the City. Raw water is pumped to the City's WTP, where it undergoes treatment prior to distribution throughout the municipal system and to the Hamlet of Gwynne. Similar to Camrose, the Wetaskiwin WTP experiences ongoing treatment challenges associated with elevated levels of organic matter, colour, algae, taste and odour compounds, and seasonal raw water quality variability. Coal Lake has historically experienced significant algae blooms and elevated organic concentrations, resulting in treatment process upgrades to maintain regulatory compliance and treated water quality objectives.

Coal Lake and Driedmeat Lake are both part of the Battle River Basin, a prairie-based watershed system that relies heavily on localized precipitation rather than mountain snowpack or glacial runoff. As a result, these source water systems are particularly vulnerable to drought conditions, extended precipitation deficits, climate variability, and watershed stress. These conditions increase risks related to source water quantity, degraded water quality, algae growth, operational complexity, and long-term supply resiliency for communities dependent on lake-based water systems within central Alberta.

Miquelon Lake Provincial Park has also expressed interest in being serviced by the Commission. Where feasible, Miquelon Lake has been incorporated into the regional pipeline demands and alignment.

The Commission is supportive of supplying water to the municipalities, but further study is required to confirm the feasibility and cost. This feasibility study will also support a funding application to TEC under the Water for Life Program if a regional water supply is undertaken.

1.1 Scope

The primary objective of the study is to determine the feasibility of water supply to both Cities and the County through supply from the Commission's system. The scope of the study includes:

- Assess regional water supply to the City of Camrose, City of Wetaskiwin, and the County of Wetaskiwin from the Commission.
- Complete a capacity review of the Commission System to determine regional servicing options, preferred connection location(s), and impacts to Commission's system.
- Coordination with EPCOR on impacts to their system.
- Review existing water treatment plants and identify the upgrades required for each municipality's water supply system for a 25-year design based on current standards.
- Assess impacts to the City of Camrose, City of Wetaskiwin, and the County of Wetaskiwin's storage and distribution systems.
- Environmental and geotechnical overviews to identify any areas that could affect routing and cost.
- Capital Costs and Life Cycle costs for each option.
- Conclusions and Recommendations on a preferred regional supply option.

1.2 Background

1.2.1 Existing System

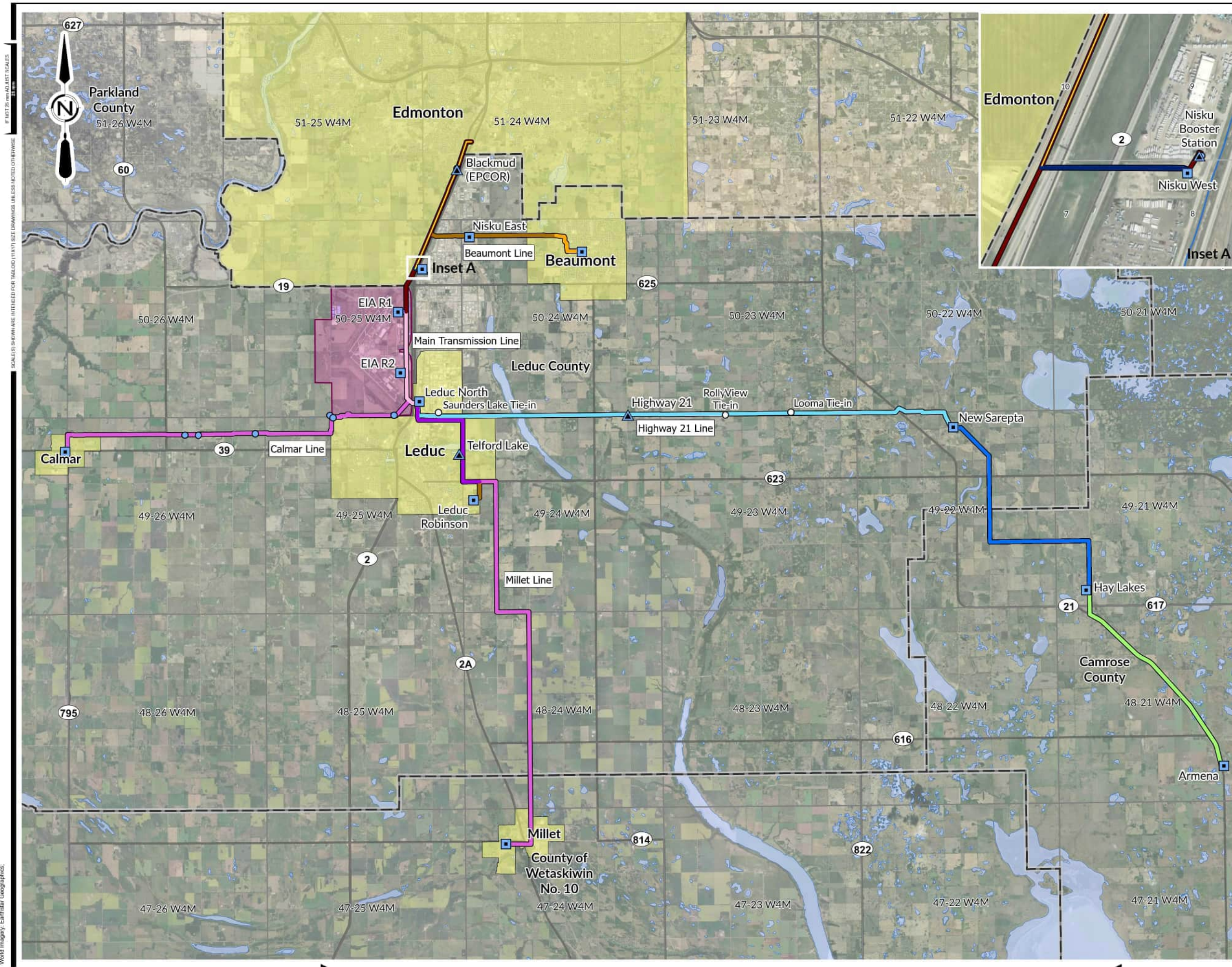
The Commission currently supplies water to the following members, along with several small commercial and residential users:

- Leduc County, including the Hamlet of New Sarepta and Edmonton Airports (as a customer of Leduc County)
- City of Beaumont
- City of Leduc
- Town of Calmar
- Village of Hay Lakes
- Camrose County (Hamlet of Armena)
- Town of Millet

Water is supplied from the Blackmud Booster Station within the City of Edmonton, owned by EPCOR, to the Nisku Booster Station constructed by the Commission in 2021. The Nisku East, Nisku West, and City of Beaumont reservoirs and fill stations are located upstream of the Nisku Booster Station and are therefore supplied directly from the Blackmud Booster Station, while the rest of the Commission's system is supplied through the Nisku Booster Station.

Figure 1-1 shows the existing Commission system.

SAVE DATE: 2025-04-20 2:05 PM SAVED BY:
DRAWING PATH: D:\project_data\2025-3197-00\2025-3197-00.aprx
DATA SOURCE: World Imagery, Vector
World Imagery, Earthstar Geographics



- LEGEND:**
- CRSWSC Facility**
- ▲ Booster Station
 - Reservoir
 - Single Connection
 - Future Tie-In
- Existing Waterline CRSWSC**
- Pipe Diameter (mm)**
- 150
 - 200
 - 250
 - 300
 - 400
 - 500
 - 550
 - 600
 - 750
 - 900
- Waterline Owned by EPCOR
- Base Data**
- Highway
 - Water Body
 - Edmonton International Airport Land

FIGURE 1-1

CRSWSC
CAMROSE & WETASKIWIN FEASIBILITY STUDY

EXISTING SYSTEM

AE PROJECT No. 2025-3197-00
SCALE 1:180,000
DATE 2026APR21
PROJECTION NAD 1983 3TM 114
DRAWN BY DD
CHECKED BY KR
DESCRIPTION ISSUED FOR DRAFT

0 2,500 5,000
m

1.2.2 Required Upstream Infrastructure

The Commission's system will require construction of an additional meter vault and second fill line to service the City of Beaumont, due to pumping limitations at EPCOR's Blackmud Booster Station and capacity limitations of the existing fill line. The addition of a second fill line will also provide improved supply security by creating a more resilient loop for emergency management. It also increases overall system reliability by providing redundancy to the existing supply line to the City of Beaumont, which is constructed of C303 bar-wrapped concrete cylinder pipe. Although this pipe type is generally considered lower risk than older C301 prestressed wire concrete cylinder pipe, the transmission main has been in service since 1987. The proposed connection would improve system resilience and reduce reliance on a single supply route.

The capacity assessment completed for the Commission's Water Master Plan (2026) indicates that a second feed line of 600 mm diameter will be required to supply Beaumont, required shortly after 2031, and prior to 2036 based on velocity criteria during peak demand periods. As such, a new tie-in point from EPCOR will be required north of Beaumont within EPCOR's tertiary pressure zone, however, EPCOR can only guarantee average day demands through this new supply due to pressure limitations.

Based on several meetings between the Commission and EPCOR, EPCOR determined that they are unable to supply the addition of Camrose and Wetaskiwin through the existing 750 mm supply main from the Blackmud Booster Station and the tertiary pressure zone due to the flow and pressure limitations. A new transmission line will be required from within the City of Edmonton to supply the Commission, connecting into the EPCOR primary pressure zone. Supplying Camrose and Wetaskiwin through the Commission's system, regardless of the alignment, will require the new supply line.

Due to the timelines involved in securing grant funding and project implementation, a new regional waterline is likely to be completed over 10 years; this assumes that progress into detailed design and land acquisition can be prioritized in the short-term given the substantive front-end work for a project of this magnitude. Therefore, this report assumes that the 25-year study period will begin in 2036 and the ultimate design will be for 2061.

2 DESIGN CRITERIA

2.1 Historical Water Usage

Each municipality provided water consumption records from 2020 through 2024. These have been reviewed in conjunction with the City of Camrose and City of Wetaskiwin Water Master Plans.

Table 2-1 summarized the historical water consumption records for the three municipalities. The records indicate that from 2020 to 2024 there has been an increase of 37,331 m³ in water demand in total. The average annual increase in water consumption over this period was 0.3% per year.

Table 2-1 Water Consumption Records 2020 – 2024 (m³)

Municipality	2020	2021	2022	2023	2024
City of Camrose	1,886,942	2,010,467	1,983,928	1,984,458	1,971,302
City of Wetaskiwin	1,188,968	1,192,173	1,194,297	1,198,387	1,135,657
County of Wetaskiwin (Gwynne Truckfill) *	13,291	15,107	17,284	20,156	19,573
Total	3,089,201	3,217,747	3,195,509	3,203,001	3,126,532

*The truckfill in Gwynne is also used by County residents in the surrounding area

Table 2-2 shows the average annual historical growth rates (water demand) for each for each municipality from 2020 to 2024.

Table 2-2 Average Annual Historical Growth Rates

Municipality	Growth in Water Demand 2020-2024
City of Camrose	1.1%
City of Wetaskiwin	-1.1%
County of Wetaskiwin (Gwynne Truckfill)	10%

The high growth rate in water demand in the County of Wetaskiwin can be attributed to a charter school that has been operating within the Hamlet of Gwynne over the past few years. As the population in the region has been fairly stagnant, the County believes that the impact to water demand due to the charter school will not continue to grow.

2.2 Projected Water Demands

The Average Day (AD) demand is defined as the average daily water usage in a year. For this study, the AD was determined using the 2024 consumption records. The peak day (PD) demand represents the maximum consumption on a single day. To project the PD demand, a PD to AD ratio (PD factor) is used. It was determined that a PD factor of 1.8 would be used, which aligns with the Commission's Water Master Plan. The PD demand is then used in determining the delivery capacity required for regional supply.

A **growth rate of 1.0%** was applied to each municipality for the design period. This growth rate is consistent with the City of Camrose and City of Wetaskiwin's Water Master Plans, and with the Commission's Water Master Plan for rural communities (the County).

Table 2-3 provides the projected AD and PD for each municipality over a 25-year design life (2036-2061).

Table 2-3 Projected Water Demands

Municipality	2036		2046		2061	
	AD (L/s)	PD (L/s)	AD (L/s)	PD (L/s)	AD (L/s)	PD (L/s)
City of Camrose	70.4	126.8	77.8	140.1	90.3	162.6
City of Wetaskiwin	40.6	73.0	44.8	80.7	52.0	93.7
County of Wetaskiwin (Gwynne Truckfill)	0.7	1.3	0.8	1.4	0.9	1.6
Total	111.7	201.1	123.4	222.1	143.3	257.9

2.3 Pipeline Criteria

A maximum velocity of 1.5 m/s is recommended for supply waterlines, as maintaining velocities at or below this threshold minimizes head loss and pumping requirements, improving system efficiency. While this limit primarily serves as a design guideline for new infrastructure, it also supports lower long-term operations and maintenance costs by reducing energy consumption and minimizing wear on system components. Existing waterlines can typically accommodate higher velocities before replacement is required; however, acceptable operating velocities should be evaluated on a case-by-case basis considering pipe material, age, condition, and system criticality.

Operating above 3.0 m/s is generally considered a threshold where risks to system performance, reliability, and asset life increase significantly. While short-term or localized exceedances may be manageable, sustained operation at these velocities typically warrants mitigation (e.g., upsizing pipes, operational controls, or system upgrades) and should be carefully evaluated. High velocities and potential sudden changes in these velocities can result in pressure surges and possibly negative pressure, which can then cause serious pipe (equipment) damage.

The minimum system pressure recommended for supply waterlines is 140 kPa (20 psi) to maintain positive pressure within the waterline. For the purposes of this study, the alignment will be designed to a minimum of 172 kPa (25 psi). The maximum recommended system pressure must account for potential surge pressures and must not exceed the maximum allowable pipe pressure based on AWWA standards. For the purposes of this study, a pipe pressure rating of 165 psi will be assumed.

The Hazen-Williams pipe roughness coefficient (C-value) for plastic pipe will be 135, which is aligned with the Commission's Water Master Plan.

3 ALIGNMENT

3.1 Upstream Supply Main

The ultimate demands for Camrose and Wetaskiwin represent a significant portion of the Commission's current supply, so a new supply main upstream of the Commission's existing system will be required.

The Commission worked together with EPCOR to assess the feasibility of servicing the proposed demands, including evaluating potential supply options from EPCOR's transmission system. EPCOR determined that the new upstream supply line will need to connect to an existing watermain near the E.L. Smith WTP within EPCOR's primary pressure zone, with the exact tie-in location and details to be finalized jointly with EPCOR to ensure compatibility within their system. The supply line will travel southeast through urban development within Edmonton, along the Transportation Utility Corridor of Anthony Henday Drive, and through rural annex land towards the existing supply main along Highway 2, near Discovery Park. The new main will tie into the existing supply main from EPCOR on Highway 2, upstream of the Nisku Booster Station. The upstream supply main alignment was selected based on available rights-of-way within the City of Edmonton where construction is feasible. The upstream supply main will be included in all alignment options. Pumping upgrades in EPCOR's upstream system are not included in this assessment and will be determined during detailed design.

3.2 Regional Alignment

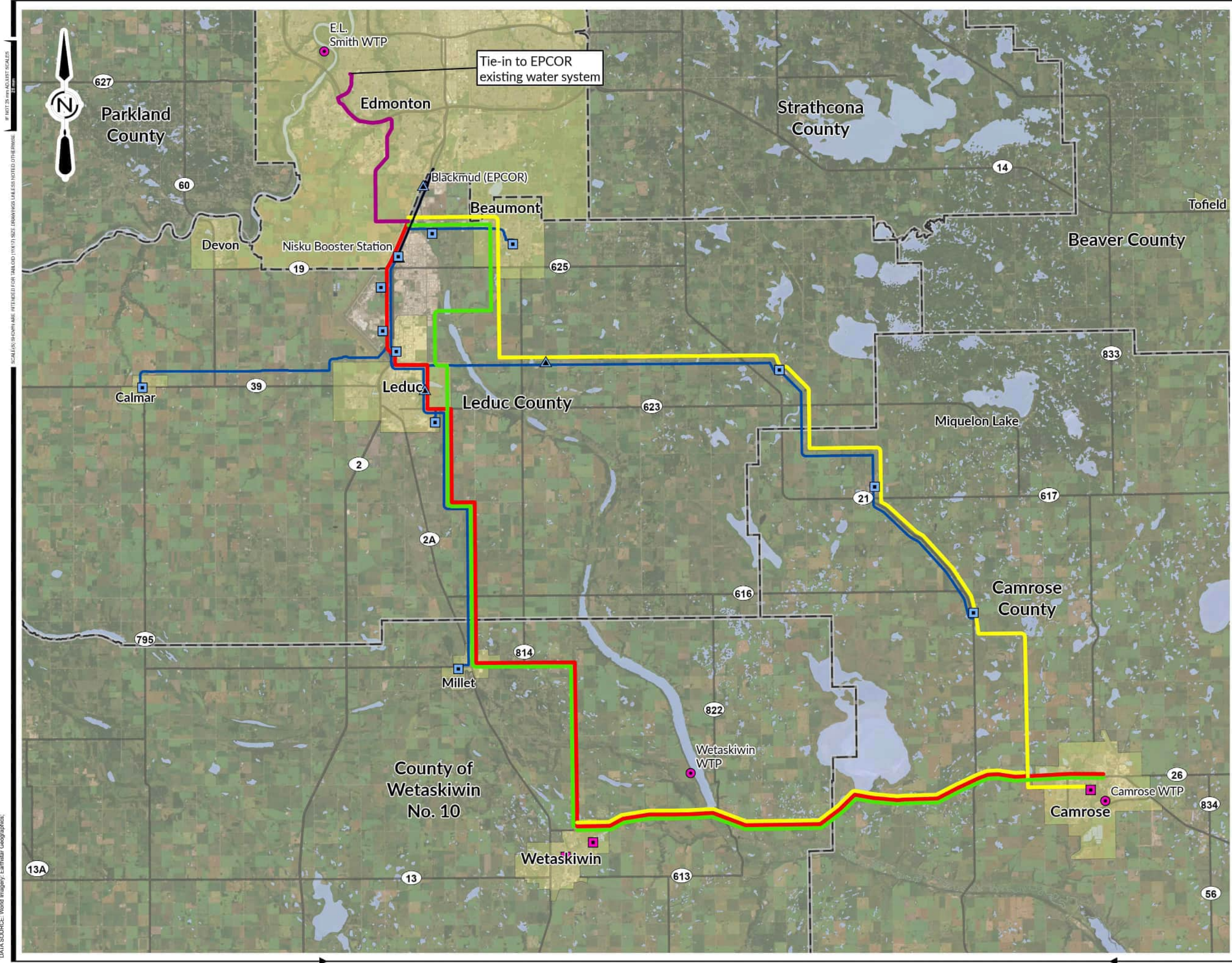
From the new upstream supply main, several alignment options have been developed for the regional extension from the Commission's system. A desktop review was completed to consider the following:

- Direct routing to minimize costs and pressure losses.
- Use of existing road rights-of-way, where possible, to avoid land acquisition time and cost, recognizing that land acquisition may still be required where the alignment parallels provincial highway rights-of-way.
- Minimizing environmental impacts.
- Avoiding conflicts with existing utilities, highways, and waterbodies.
- The capacity of existing Commission infrastructure and system hydraulics.
- Tie-in connection locations.

The terminus location and alignment through both Camrose and Wetaskiwin will be determined in detailed design.

Three alignment options were identified and assessed, and an overview of each option are shown on **Figure 3-1**. Note that pipeline alignments only are included on the figure, no new facilities are included.

- **Alignment Option 1** – Nisku Booster Station to Wetaskiwin then Camrose
- **Alignment Option 2** – Beaumont to Camrose then Wetaskiwin
- **Alignment Option 3** – Beaumont to Wetaskiwin then Camrose



- LEGEND:**
- Existing CRWSWC Waterline
 - Waterline Owned by EPCOR
 - New Supply Main
 - Alignment 1
 - Alignment 2
 - Alignment 3
- Existing CRWSWC Facility**
- Booster Station
 - Reservoir
- Other Facilities**
- Water Treatment Plant
 - Reservoir
 - Truck Fill
- Base Data**
- Highway
 - Watercourse
 - Water Body

FIGURE 3-1
CRWSWC
CAMROSE & WETASKIWIN FEASIBILITY STUDY
PROJECT ALIGNMENT OVERVIEW

3.3 Alignment Options

All three options would require a new upstream supply main connecting to the EPCOR system within the City of Edmonton, near E. L. Smith Water Treatment Plant, as shown on **Figure 3-1**.

Alignment Option 1: Nisku Booster Station → Wetaskiwin → Camrose

Alignment Option 1 involves connecting a new transmission main from the Nisku Booster Station and twinning the existing Commission line to the Town of Millet. From there, the waterline would continue south to the City of Wetaskiwin, then east to the City of Camrose.

The twinned line would be installed within the Commission's Right-of-Way (ROW) alongside the existing line. Beyond Millet, the waterline would follow Township Road 475 east, then Secondary Highway 814 to the City of Wetaskiwin. From Wetaskiwin, the line would follow Highway 13 east to the City of Camrose.

Alignment Option 2: Beaumont → Camrose → Wetaskiwin

Alignment Option 2 involves extending the upstream supply main east towards Beaumont, tying into the future 2nd Feed Line. The waterline will then turn to the south to tie into the Armena line upstream of the Highway 21 Booster Station. From there, the waterline would twin the existing line to the Hamlet of Armena, then continue south to the City of Camrose, then west to the City of Wetaskiwin.

The new waterline will follow Range Road 243 traveling south from Beaumont until it reaches the Armena line, then would be installed within the Commission's ROW along the existing line. South of Armena, the waterline will continue south until turning east on Township Road 480, then turn south again on Range Road 205. The waterline would then split, going east along Highway 13 into Camrose and west along Highway 13 to Wetaskiwin.

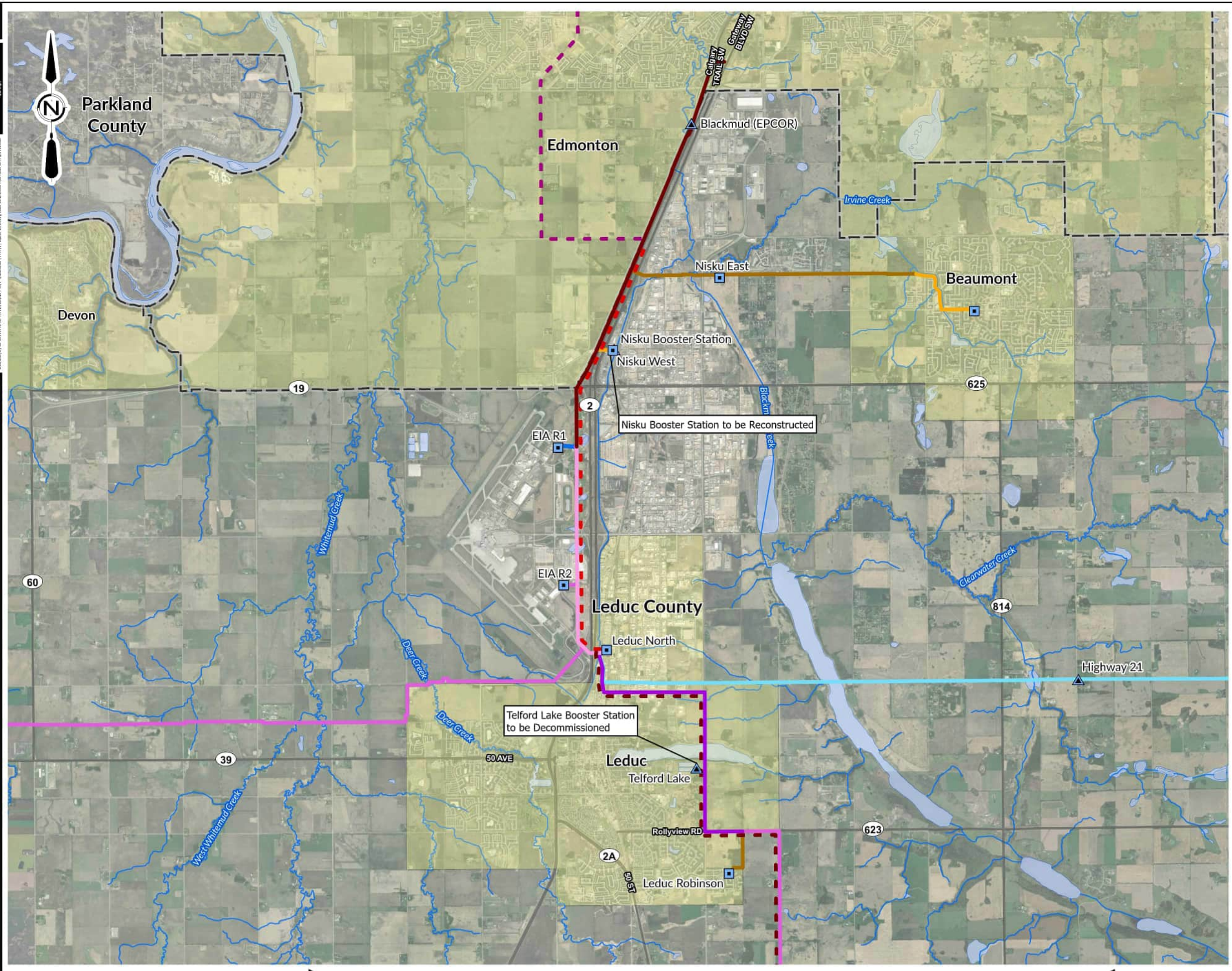
Option 2 also allows for servicing of Miquelon Lake, as it could be serviced from near Hay Lakes on the Armena line.

Alignment Option 3: Beaumont → Wetaskiwin → Camrose

Alignment Option 3 involves the same extension and tie-in connection to the Beaumont future 2nd Feed Line as in Alignment Option 2, but rather than following the Armena line it would tie into the Millet line downstream of the Leduc Robinson Reservoir. From there, it would twin the Millet line, like in Alignment Option 1, continue south to Wetaskiwin, and then east to Camrose.

The waterline will follow Range Road 243 traveling south from Beaumont, then turn west along Township Road 502 past Saunders Lake. Then, it will turn south again along Range Road 245 until tying into the Millet line. The new waterline can also cross-connect into the Armena line where it crosses. The waterline will then twin the existing Millet line, being installed within the Commission's existing ROW, before following Township Road 475 east, then Secondary Highway 814 east and south to Wetaskiwin. From Wetaskiwin, the waterline would follow Highway 13 east to Camrose.

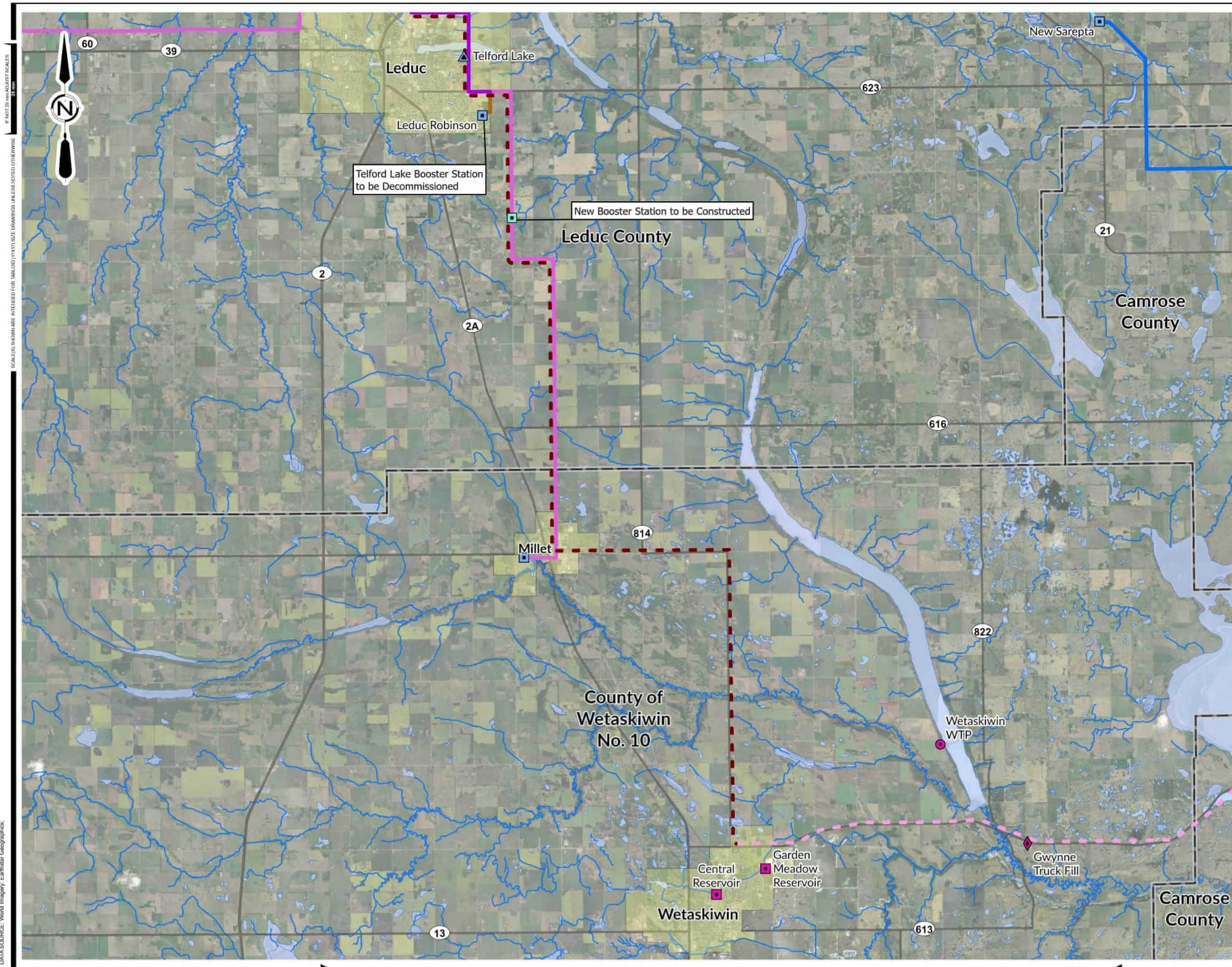
Detail alignments for all three options are shown on **Figures 3-2 to 3-9**. Note the alignments into both Camrose and Wetaskiwin are conceptual only; alignments within City limits will be determined during detailed design.



- LEGEND:**
- Existing CRSWSC Facility**
- ▲ Booster Station
 - Reservoir
- Other Facilities**
- Water Treatment Plant
 - Reservoir
 - ◆ Truck Fill
- Alignment 1 Diameter (mm)**
- 600
 - 750
 - 1050
 - New Upstream Supply Main (900)
- Existing Waterline CRSWSC Diameter (mm)**
- 150
 - 200
 - 250
 - 300
 - 400
 - 500
 - 550
 - 600
 - 750
 - 900
- Base Data**
- Highway
 - Watercourse
 - Water Body

FIGURE 3-2
CRSWSC
CAMROSE & WETASKIWIN FEASIBILITY STUDY
ALIGNMENT OPTION 1
EDMONTON TO LEDUC

AE PROJECT No. 2025-3300-00
SCALE 1:80,000
DATE 2026JUN22
PROJECTION NAD 1983 3TM 114
DRAWN BY DD
CHECKED BY KR
DESCRIPTION ISSUED FOR DRAFT



- LEGEND:**
- Existing CRSWSC Facility**
- Booster Station
 - Reservoir
- Other Facilities**
- Water Treatment Plant
 - Reservoir
 - Truck Fill
- Alignment 1 Diameter (mm)**
- 600
 - 750
 - 1050
 - New Upstream Supply Main (900)
- Existing Waterline CRSWSC Diameter (mm)**
- 150
 - 200
 - 250
 - 300
 - 400
 - 500
 - 550
 - 600
 - 750
 - 900
- Base Data**
- Highway
 - Watercourse
 - Water Body

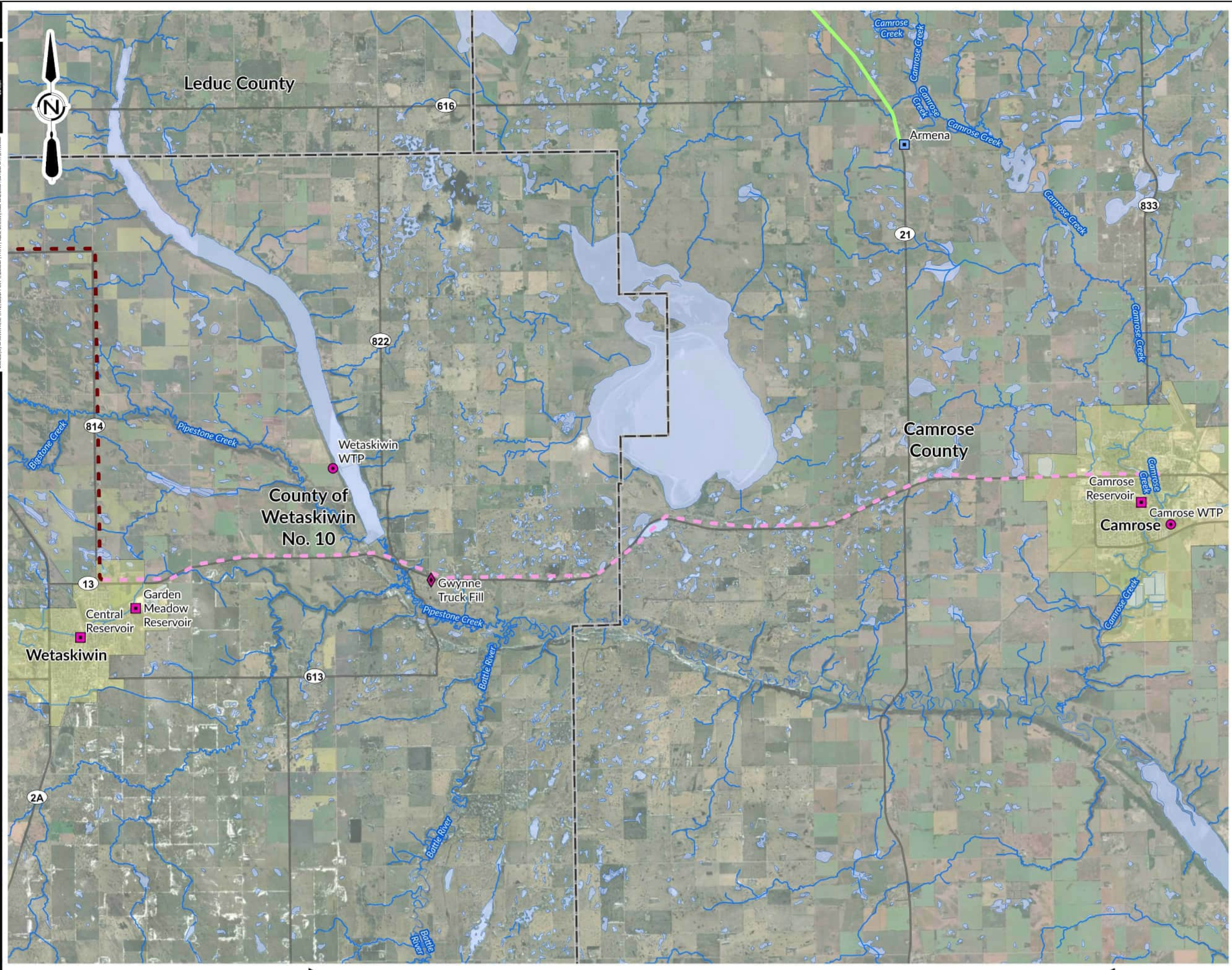
FIGURE 3-3

CRSWSC
CAMROSE & WETASKIWIN FEASIBILITY STUDY

ALIGNMENT OPTION 1
LEDUC TO WETASKIWIN

AE PROJECT No. 2025-3300-00
SCALE 1:140,000
DATE 2026JUN22
PROJECTION NAD 1983 3TM 114
DRAWN BY DD
CHECKED BY KR
DESCRIPTION ISSUED FOR DRAFT

0 1,500 3,000 m



LEGEND:

Existing CRSWSC Facility

- ▲ Booster Station
- Reservoir

Other Facilities

- Water Treatment Plant
- Reservoir
- ◆ Truck Fill

Alignment 1 Diameter (mm)

- 600
- 750
- 1050
- New Upstream Supply Main (900)

Existing Waterline CRSWSC Diameter (mm)

- 150
- 200
- 250
- 300
- 400
- 500
- 550
- 600
- 750
- 900

Base Data

- Highway
- Watercourse
- Water Body

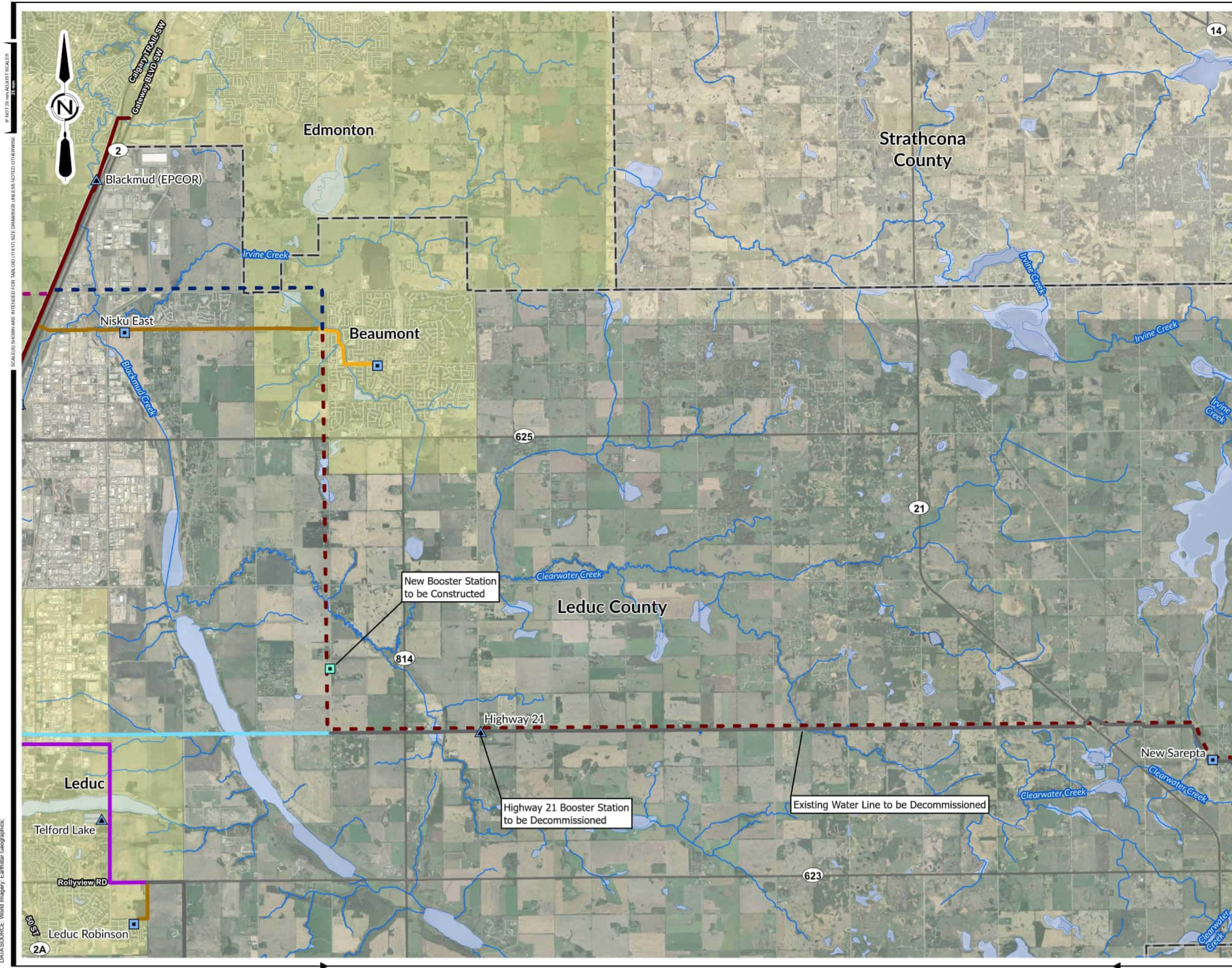
FIGURE 3-4

CRSWSC
CAMROSE & WETASKIWIN FEASIBILITY STUDY

ALIGNMENT OPTION 1
WETASKIWIN TO CAMROSE

AE PROJECT No. 2025-3300-00
SCALE 1:125,000
DATE 2026JUN22
PROJECTION NAD 1983 3TM 114
DRAWN BY DD
CHECKED BY KR
DESCRIPTION ISSUED FOR DRAFT

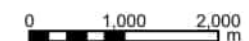
0 1,500 3,000 m

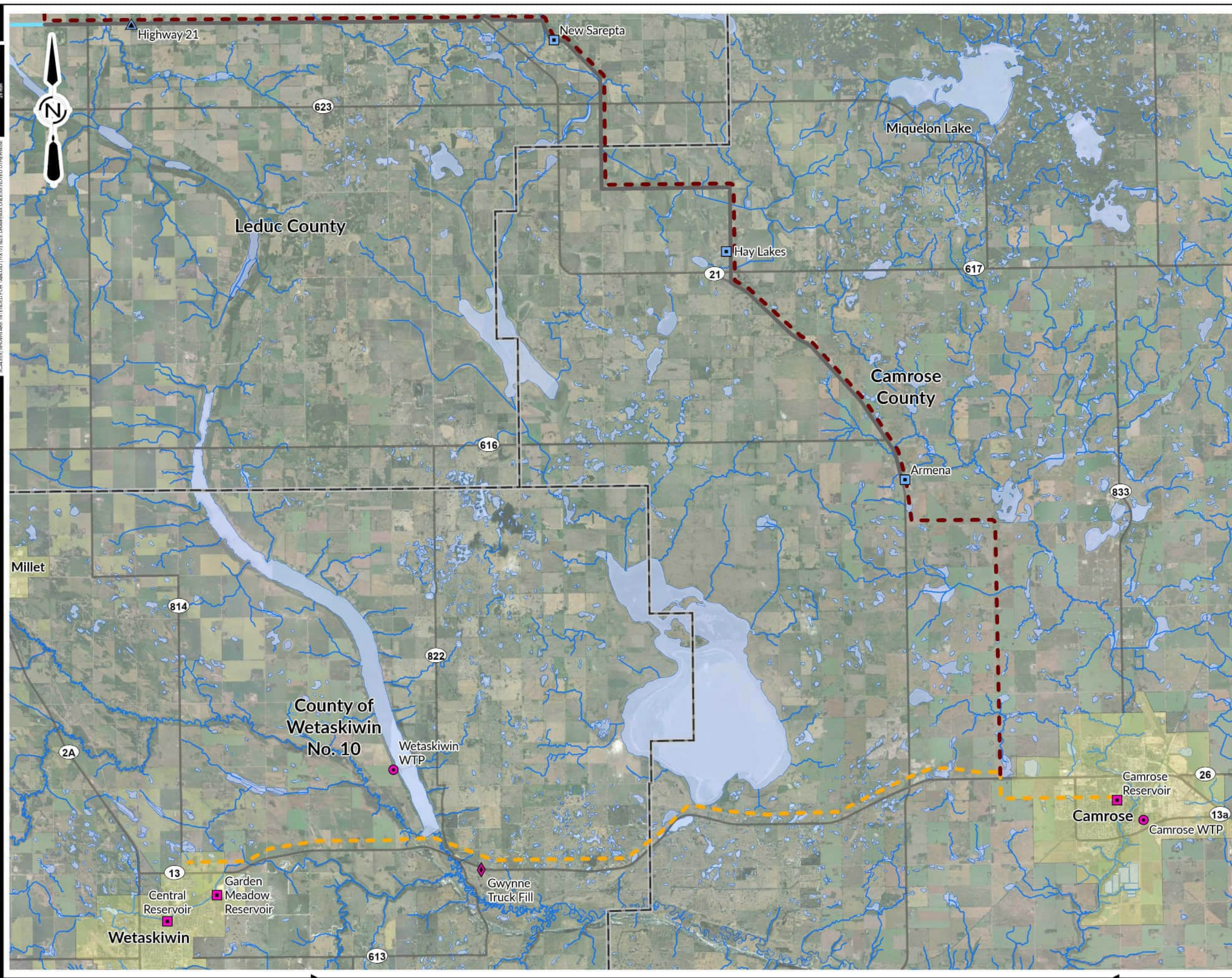


- LEGEND:**
- Existing CRSWSC Facility**
- Booster Station
 - Reservoir
- Other Facilities**
- Water Treatment Plant
 - Reservoir
 - Truck Fill
- Alignment 2 Diameter (mm)**
- 500
 - 750
 - 900
 - New Upstream Supply Main (900)
- Existing Waterline CRSWSC Diameter (mm)**
- 150
 - 200
 - 250
 - 300
 - 400
 - 500
 - 550
 - 600
 - 750
 - 900
- Water Line to be Decommissioned
- Base Data**
- Highway
 - Watercourse
 - Water Body

FIGURE 3-5
CRSWSC
CAMROSE & WETASKIWIN FEASIBILITY STUDY
ALIGNMENT OPTION 2
EDMONTON TO NEW SAREPTA

AE PROJECT No. 2025-3300-00
SCALE 1:80,000
DATE 2026JUN22
PROJECTION NAD 1983 3TM 114
DRAWN BY DD
CHECKED BY KR
DESCRIPTION ISSUED FOR DRAFT



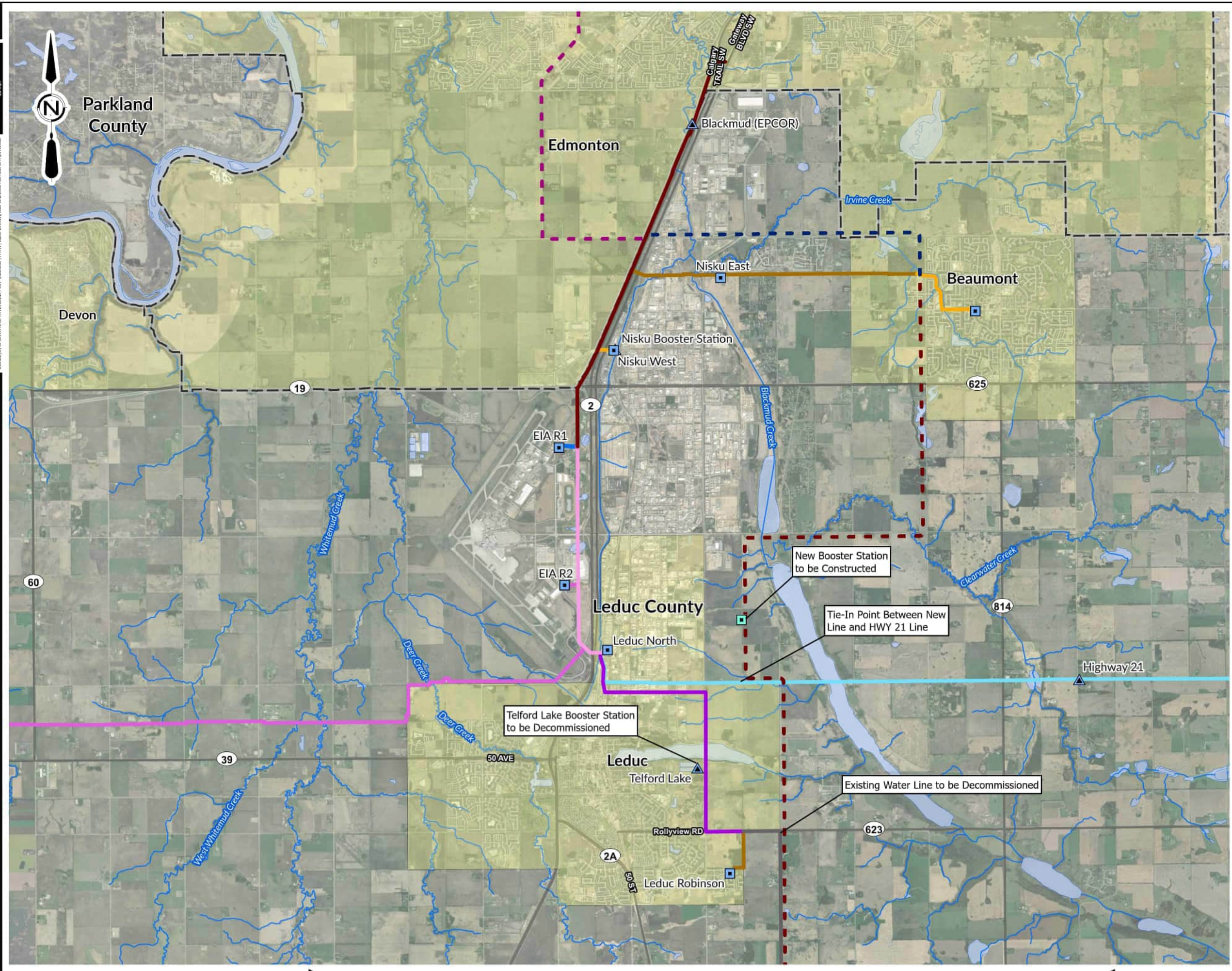


LEGEND:
 Existing CRSWSC Facility
 ▲ Booster Station
 ■ Reservoir
 Other Facilities
 ● Water Treatment Plant
 ■ Reservoir
 ◆ Truck Fill
 Alignment 2 Diameter (mm)
 — 500
 - - 750
 - - 900
 — New Upstream Supply Main (900)
 Existing Waterline CRSWSC
 Diameter (mm)
 — 150
 — 200
 — 250
 — 300
 — 400
 — 500
 — 550
 — 600
 — 750
 — 900
 — Water Line to be Decommissioned
 Base Data
 — Highway
 — Watercourse
 — Water Body

FIGURE 3-6
 CRSWSC
 CAMROSE & WETASKIWIN FEASIBILITY STUDY
 ALIGNMENT OPTION 2
 NEW SAREPTA TO WETASKIWIN

AE PROJECT No. 2025-3300-00
SCALE 1:140,000
DATE 2026SEP23
PROJECTION NAD 1983 3TM 114
DRAWN BY DD
CHECKED BY KR
DESCRIPTION ISSUED FOR DRAFT

0 1,500 3,000
 m

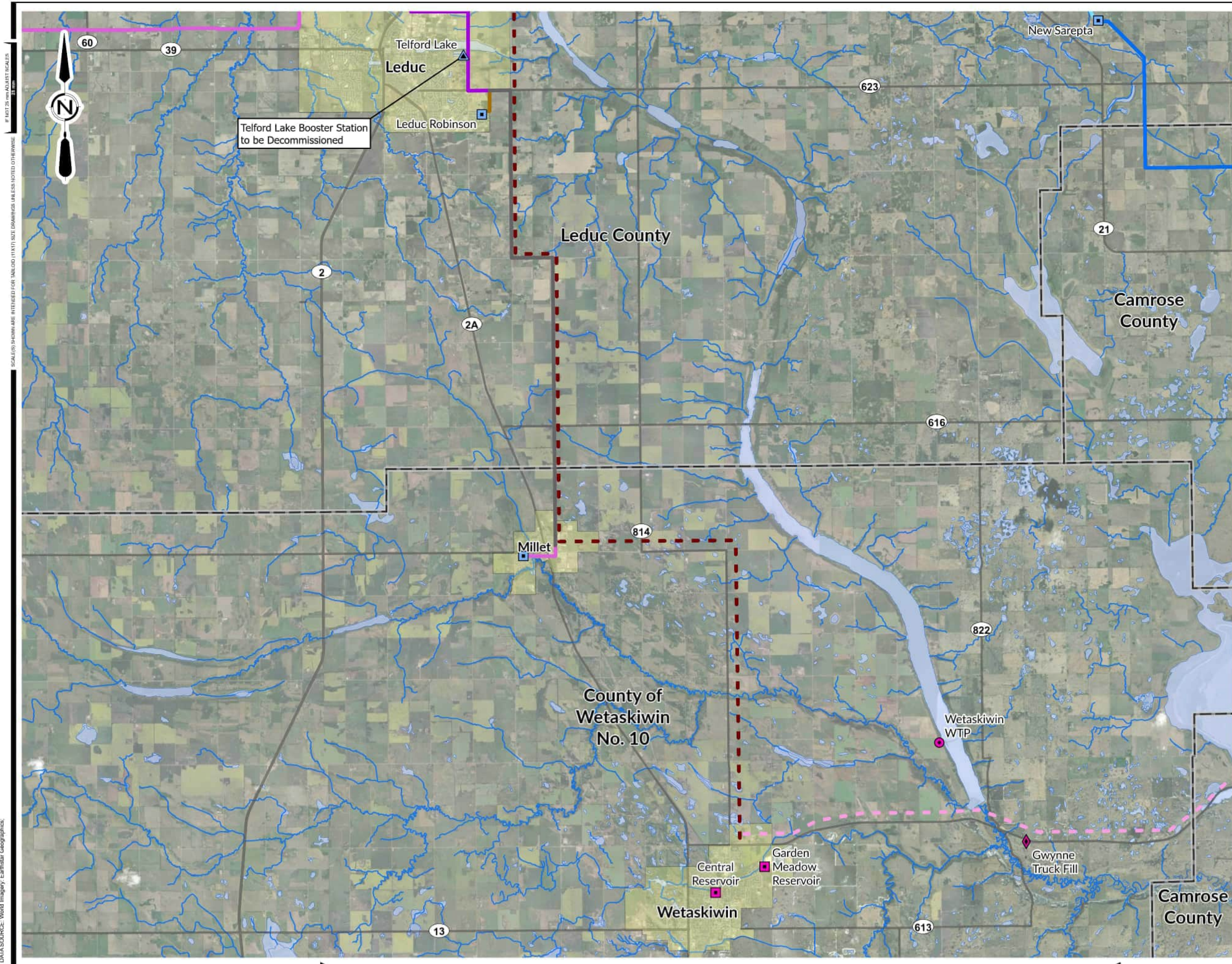


- LEGEND:**
- Existing CRSWSC Facility
- Booster Station
 - Reservoir
- Other Facilities
- Water Treatment Plant
 - Reservoir
 - Truck Fill
- Alignment 3 Diameter (mm)
- 600
 - 750
 - 900
 - New Upstream Supply Main (900)
- Existing Waterline CRSWSC Diameter (mm)
- 150
 - 200
 - 250
 - 300
 - 400
 - 500
 - 550
 - 600
 - 750
 - 900
- Water Line to be Decommissioned
- Base Data
- Highway
 - Watercourse
 - Water Body

FIGURE 3-7
CRSWSC
CAMROSE & WETASKIWIN FEASIBILITY STUDY
ALIGNMENT OPTION 3
EDMONTON TO LEDUC

AE PROJECT No. 2025-3300-00
SCALE 1:80,000
DATE 2026JUN22
PROJECTION NAD 1983 3TM 114
DRAWN BY DD
CHECKED BY KR
DESCRIPTION ISSUED FOR DRAFT





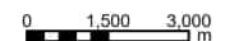
- LEGEND:**
- Existing CRWSWC Facility**
- Booster Station
 - Reservoir
- Other Facilities**
- Water Treatment Plant
 - Reservoir
 - Truck Fill
- Alignment 3 Diameter (mm)**
- 600
 - 750
 - 900
 - New Upstream Supply Main (900)
- Existing Waterline CRWSWC Diameter (mm)**
- 150
 - 200
 - 250
 - 300
 - 400
 - 500
 - 550
 - 600
 - 750
 - 900
- Water Line to be Decommissioned
- Base Data**
- Highway
 - Watercourse
 - Water Body

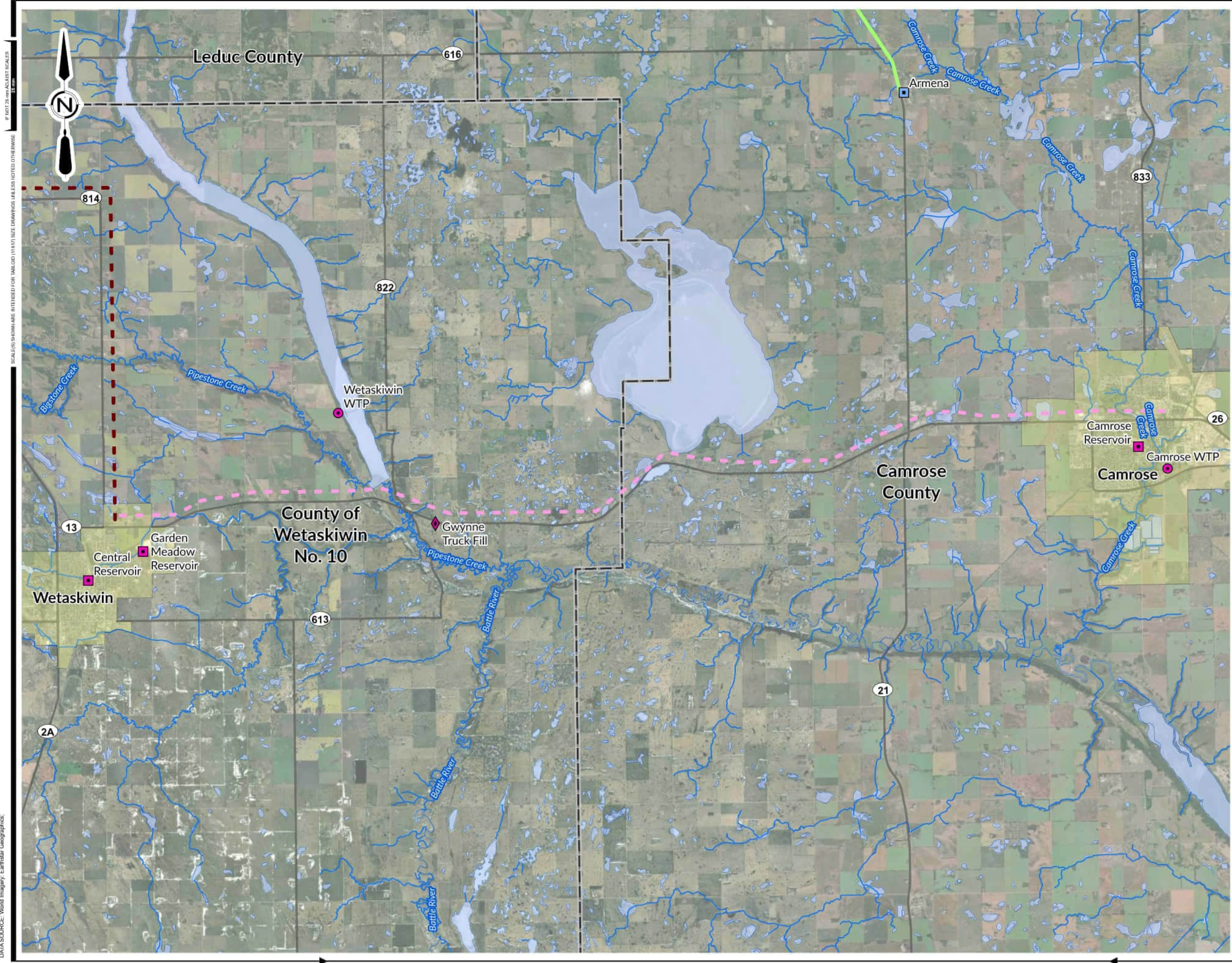
FIGURE 3-8

CRWSWC
CAMROSE & WETASKIWIN FEASIBILITY STUDY

ALIGNMENT OPTION 3
LEDUC TO WETASKIWIN

AE PROJECT No. 2025-3300-00
SCALE 1:140,000
DATE 2026JUN22
PROJECTION NAD 1983 3TM 114
DRAWN BY DD
CHECKED BY KR
DESCRIPTION ISSUED FOR DRAFT





LEGEND:

Existing CRWSWC Facility

- ▲ Booster Station
- Reservoir

Other Facilities

- Water Treatment Plant
- Reservoir
- ◆ Truck Fill

Alignment 3 Diameter (mm)

- 600
- 750
- 900
- New Upstream Supply Main (900)

Existing Waterline CRWSWC Diameter (mm)

- 150
- 200
- 250
- 300
- 400
- 500
- 550
- 600
- 750
- 900
- Water Line to be Decommissioned

Base Data

- Highway
- Watercourse
- Water Body

FIGURE 3-9

CRWSWC
CAMROSE & WETASKIWIN FEASIBILITY STUDY

ALIGNMENT OPTION 3
WETASKIWIN TO CAMROSE

3.4 Alignment Analysis

The three alignments were assessed on the following criteria:

- Length – the longer the pipeline the higher the construction cost and hydraulic losses.
- Land Parcels – more land acquisition increases costs and can slow implementation of the project.
- Water and Roadway Crossings – permitting and need for specialised contractors for trenchless crossings.
- Ease of Construction – any considerations which may impact construction cost and schedule.
- Qualitative Cost Considerations.

Table 3-1 details the comparison of the three alignments based on the above criteria.

Table 3-1 Alignment Option Comparison

	Option 1	Option 2	Option 3
Description	Twinned line from Nisku Booster Station to Millet, new line to Wetaskiwin, new line to Camrose.	New line from the upstream supply main east towards Beaumont, twinned line to Armena, new line to Camrose, new line to Wetaskiwin.	New line from the upstream supply main east towards Beaumont, twinned line to Millet, new line to Wetaskiwin, new line to Camrose.
Length	114 km	130 km	115 km
Land	Majority of the waterline will be within the Commission's existing line ROW or County Road ROW. Land may be required along Hwy 13 and 814.	Majority of the waterline will be within the Commission's existing line ROW or County Road ROW. Land may be required along Hwy 13.	May require some land parcel acquisitions south of Beaumont. Land may be required along Hwy 13 and 814.
Waterbody Crossings	Telford Lake (500 m) – twinning of existing line Pipestone Creek – crossed twice Other unnamed (further detailed in Section 5)	Pipestone Creek - crossed once Other unnamed (further detailed in Section 5)	Blackmud Creek Pipestone Creek - crossed twice Other unnamed (further detailed in Section 5)
Roadway Crossings	Highway 2, 21, 13 Urban crossings within Leduc Secondary Highway 625, 623, 616, 814, 822 16 Rural Roads	Highway 21, 13 Secondary Highway 625, 623, 621, 616, 822 26 Rural Roads	Highway 21, 13 Secondary Highway 625, 623, 816, 814, 822 20 Rural Roads

	Option 1	Option 2	Option 3
Constructability	The twinned portion along Highway 2 and within Leduc is extremely congested with urban development, narrow ROW, and existing utilities. The remainder of the twinned line is generally rural and accessible.	The extent of the twinned line is generally rural and accessible.	The extent of the twinned line is generally rural and accessible.
Qualitative Cost Considerations	Pipeline Costs: Medium due to larger pipe sizes and Highway 2 congestion. Pumping Costs: highest due to upgrades at Nisku Booster Station	Pipeline Costs: Highest due to length. Pumping Costs: Similar to Option 3	Pipeline Costs: Lowest due to length Pumping Costs: Similar to Option 2

4 HYDRAULIC ANALYSIS

A conceptual hydraulic analysis was conducted for the three alignment options for the ultimate design demands in 2061 (refer to **Figure 3-1**). The hydraulic analysis considered plastic pipe (HDPE or PVC) and assumed a nominal pipe diameter. It should be noted that the ground profile for the hydraulic analysis was obtained via LiDAR survey and will require refinement during the detailed design stage following a comprehensive topographic survey. The PVC SDR 25 pipe pressure rating of 165 psi was selected for the analysis as it is reasonably conservative and matches the recent 900 mm PVC pipe installed at the discharge of the Nisku Booster Station.

A Hydraulic Grade Line (HGL) was produced for each alignment option considered. Each HGL shows the required pumping head (displayed as an elevation), in comparison to the existing ground conditions and the pipe rating, which represents the maximum allowable pressure along the line. Individual HGL figures are presented in the sections below.

4.1 New Supply Main

The new supply main through Edmonton consists of 900 mm diameter pipe for all alignment options. Two booster stations will be located along the pipeline, at the transition points to the secondary and tertiary pressure zones, respectively. The hydraulic analysis assumes an initial pressure head of 29 m at the tie-in point to EPCOR's existing system, in order to provide a minimum pressure requirement of 25 psi at the inlet of the Secondary Zone Booster Station. Upstream conditions in the EPCOR system are unknown at this time and will need to be reviewed during detailed design.

4.2 Options Analysis

Alignment Option 1: Nisku Booster Station → Wetaskiwin → Camrose

Alignment Option 1 consists of the following:

- 1,050 mm diameter pipe twinning the main supply line from the Nisku Booster Station to Leduc North
- 750 mm diameter pipe twinning the line to Millet, and continuing down from Millet to Wetaskiwin
- 600 mm diameter pipe from Wetaskiwin to Camrose

The EPCOR-owned supply main to the Commission may require twinning as well, between the new supply main and the Nisku Booster Station, due to velocity and head losses in that pipe. Significant upgrades would be required at the Nisku Booster Station to accommodate the flow and pumping head requirements, and a new booster station would be required south of the Leduc Robinson lateral. Pumping requirements at the new booster station are 278 L/s at 23 m of head (south of the Leduc Robinson lateral). The new pipeline and booster station will be able to convey the Leduc Robinson and Millet demands, so the Telford Lake Booster Station would no longer be required. As the alignment does not cross through Beaumont, there will be no opportunity to offset the PD demands and pressures at Beaumont, which the Beaumont 2nd Feed Line cannot provide.

The projected future pumping requirement at the Nisku Booster Station would require 856 L/s at 70 m of head, which cannot be achieved with the current pumping configuration. The extensive upgrades will require construction of a new booster station, as there is insufficient space at the current location to accommodate the equipment required for the projected flow and pumping head. As the Nisku Booster Station was recently constructed in 2021, such upgrades will likely render this alignment option impractical due to costs and other factors.

Figure 4-1 provides the HGL for Alignment Option 1.

Alignment Option 2: Beaumont → Camrose → Wetaskiwin

Alignment Option 2 consists of the following:

- 900 mm diameter pipe extending from the upstream supply main at Highway 2 towards Beaumont.
- 750 mm diameter pipe tying into the Beaumont 2nd Feed Line upstream of Beaumont, extending south towards the Armena line and replacing it, from the tie-in point upstream of the Highway 21 Booster Station to Armena, and 750 mm pipe continuing down from Armena to Camrose.
- 500 mm diameter pipe from Camrose to Wetaskiwin.

The alignment extending through Beaumont will allow for offsetting the PD demands and pressures that the Beaumont 2nd Feed Line cannot provide, with a 900 mm diameter pipe. A new booster station would be required upstream of the Highway 21 pipeline replacement to accommodate the flow and head requirements, and the Highway 21 Booster Station would no longer be required. Miquelon Lake can also be supplied from the replacement of the Armena line.

Supply for Nisku East, Beaumont, Camrose, Wetaskiwin, New Sarepta, Hay Lakes, and Armena would be through the new regional waterline. Supply for Edmonton Airports, Nisku West, Leduc, Calmar, and Millet would be through the existing waterline. Pumping requirements at the new booster station will be 302 L/s at 75 m of head (north of Highway 21). Pumping requirements at Nisku Booster Station will be 541 L/s at 31 m of head.

Figure 4-2 provides the HGL for Alignment Option 2.

Alignment Option 3: Beaumont → Wetaskiwin → Camrose

Alignment Option 3 consists of the following:

- 900 mm diameter extending from the upstream supply main at Highway 2 towards Beaumont
- 750 mm diameter pipe tying into the Beaumont 2nd Feed Line upstream of Beaumont, tying into the Armena line where it crosses, twinning the line to Millet from just downstream of Leduc Robinson, and extending down from Millet to Wetaskiwin
- 600 mm diameter pipe from Wetaskiwin to Camrose

The alignment extending through Beaumont will allow for offsetting the PD demands and pressures that the Beaumont 2nd Feed Line cannot provide, with a 900 mm diameter pipe. A new booster station would be required upstream of the Highway 21 pipeline tie-in to accommodate the flow and head requirements, and the Telford Lake Booster Station would no longer be required.

Supply for Nisku East, Beaumont, Camrose, Wetaskiwin, New Sarepta, Hay Lakes, Armena, and Millet would be through the new regional waterline. Supply for Nisku West, Edmonton Airports, Leduc, and Calmar would be through the existing waterline pumping requirements at the new booster station will be 320 L/s at 72 m of head (north of Highway 21). Pumping requirements at Nisku Booster Station will be 521 L/s at 55 m of head.

Figure 4-3 provides the HGL for Alignment Option 3.

Figure 4-1 Hydraulic Grade Line
Alignment Option 1

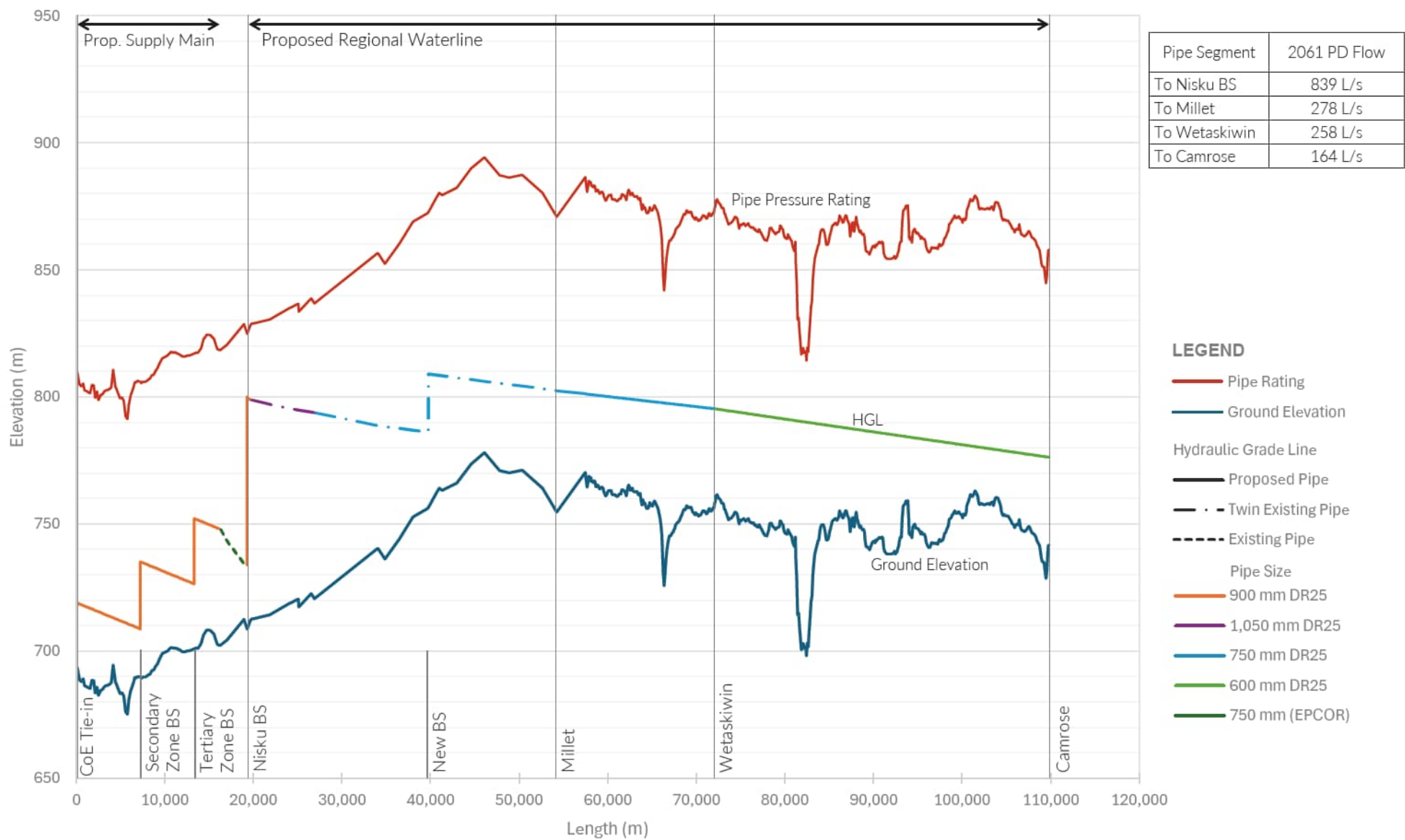
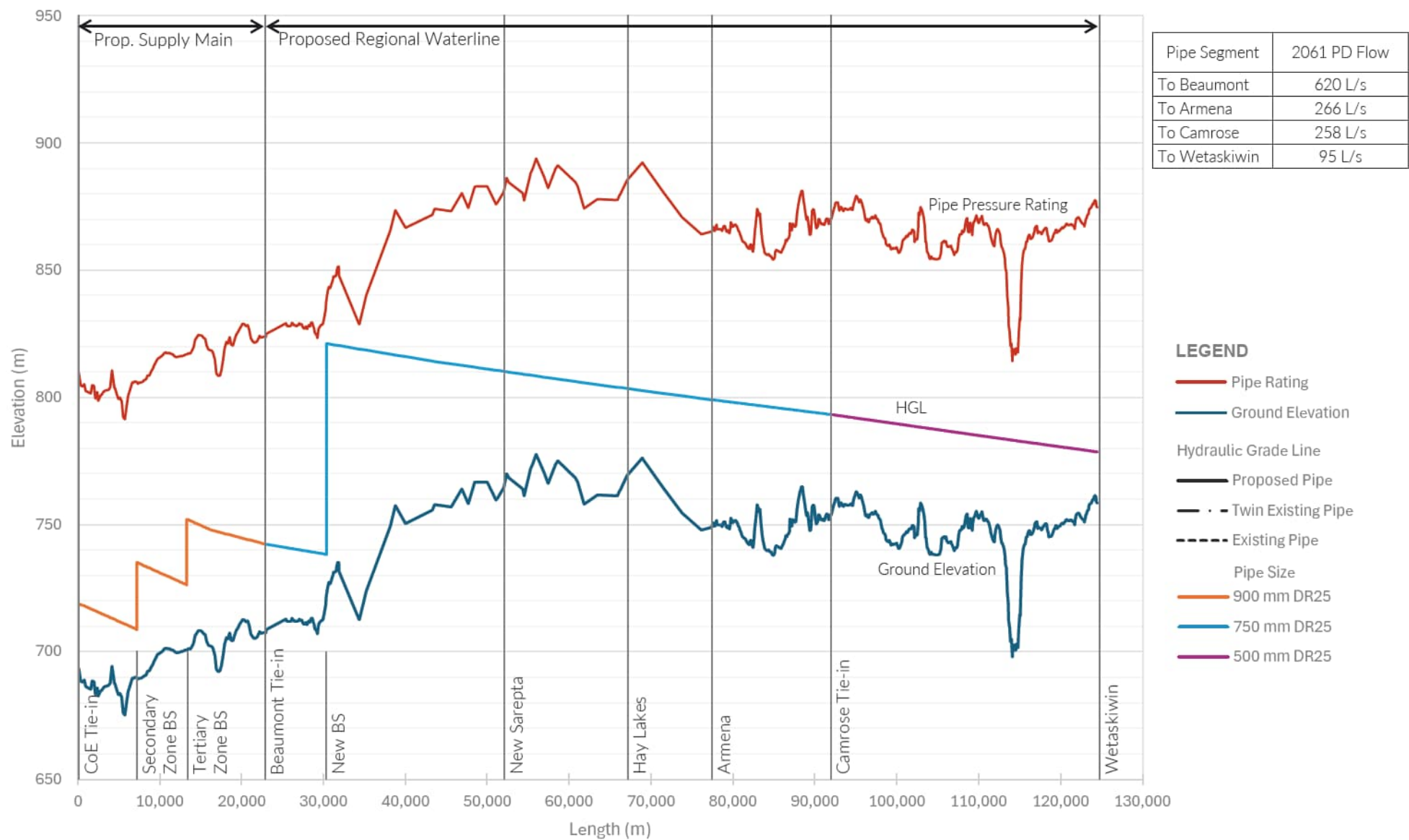
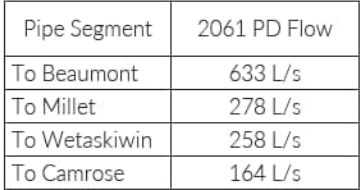


Figure 4-2 Hydraulic Grade Line
Alignment Option 2



Alignment Option 3



Pipe Segment	2061 PD Flow
To Beaumont	633 L/s
To Millet	278 L/s
To Wetaskiwin	258 L/s
To Camrose	164 L/s

4.3 Existing System Hydraulic Considerations

There are a number of considerations that will directly affect the Commission and operation of the existing regional system, as outlined below.

In the existing Commission system, the Highway 21 line experiences the most significant head losses and consequently requires higher pumping head at the Nisku Booster Station and Highway 21 Booster Station (without consideration for Camrose and Wetaskiwin demands). **Alignment Option 1** is the only option that does not offset the constraints of the Highway 21 line, including future demands as the line approaches capacity, and pumping upgrades will be required in the future. This option also does not offset the constraints of the Beaumont 2nd Feed Line, which cannot provide PD demands or pressures. Option 1 will also require complete reconstruction of the Nisku Booster Station to accommodate the projected increase in flows and pumping requirements. Twinning of the existing transmission main in Option 1 involves the most congested urban area, around Nisku and the EIA.

Alignment Option 2 will eliminate the need for upgrades along the Highway 21 waterline as this waterline will be intercepted and replaced by the proposed larger waterline servicing Camrose and Wetaskiwin. By accommodating the Highway 21 demands within the new pipeline, the Nisku Booster Station pumping requirements will be reduced by approximately 30 m in 2061. The higher capacity of the new line will accommodate additional growth along the Highway 21 route than can be achieved by the existing watermain.

Additionally, the new pipeline will offset the PD demands and pressures of Beaumont from the Beaumont 2nd Feed Line, and a portion of the flows through the existing transmission main downstream of the Nisku Booster Station. The Commission's Water Master Plan projects that the 600 mm steel transmission main located between the EIA Reservoir R1 and the Leduc North Reservoir requires twinning with a 750 mm diameter line prior to 2051 due to increasing velocity. With the reduced demands through this line in Option 2, those upgrades may be delayed beyond the timelines proposed in the Master Plan. However, the line should be monitored in the future for excessive velocity due to increases in demand.

Alignment Option 3 can intercept and tie into the Highway 21 waterline, which would also reduce the pumping requirements at the Nisku Booster Station (by transferring the demand to the new system and off of the Nisku Booster), similar to Option 2. It will also offset the PD demands and pressures of Beaumont from the Beaumont 2nd Feed Line. However, without the Telford Lake Booster Station, Nisku must provide the required pressure to the Leduc Robinson Reservoir, so pumping requirements at Nisku will be reduced by approximately 10 m in 2061 (versus 30 m reduction in Option 2). As well, pumping upgrades will be required along the Highway 21 line. As in Option 2, the demands along the existing transmission main to Leduc would be reduced, thereby delaying the required upgrades detailed in the Water Master Plan.

5 ENVIRONMENTAL & REGULATORY REVIEW

A desktop environmental review was conducted to assess the environmental sensitivities associated with the three waterline alignment options. Desktop resources and government databases were reviewed for information on land use, soils, surface water and aquatic resources, vegetation, wildlife, historical and cultural resources, and potential contamination. The intent of this review is to determine the overall environmental impact of each alignment option and to compile anticipated regulatory requirements and compliance considerations.

In consideration of environmental sensitivities, Option 2 is recommended as the preferred alignment. Option 2 will likely require less disturbance and reclamation of agricultural soils and fewer crossings of waterbodies than Options 1 and 3. Option 2 will also avoid intersections with EIA land, which is owned by Transport Canada, and Telford Lake. Both are intersected by Option 1. **Figure 5-1** shows an overview of the environmental sensitivities along the alignment options.

Option 2 will intersect with critical habitat for the gypsy cuckoo bumblebee (*Bombus bohemicus*), which is listed as Endangered on Schedule 1 of the *Species at Risk Act*. It is expected that impacts to the critical habitat can be mitigated. All options will intersect the 200 m piping plover buffer around Bittern Lake between Wetaskiwin and Camrose. It is recommended that work within the buffer occur outside the sensitive timing window of April 15 to July 31 and that work within the buffer should follow existing disturbances.

All options are expected to intersect Historical Resource Value listings of 1h, which denotes a site designated as a Provincial Historic Resource or a World Heritage Site. Work within land designated as HRV 1 requires Ministerial approval. It is likely that measures to avoid the HRV 1h listings will be required in the next stages of design regardless of which option is selected.

Approvals under the *Environmental Protection and Enhancement Act*, *Historical Resources Act*, *Public Lands Act*, and *Water Act* are anticipated for all alignment options. Option 1 will trigger additional regulatory approvals under the *Impact Assessment Act* and the *Water Act* for crossings with Transport Canada owned land and Telford Lake, respectively. Regulatory submissions under the *Fisheries Act* and the *Canadian Navigable Waters Act* are not anticipated if trenchless methods are used. Measures to ensure compliance with the *Migratory Birds Convention Act, 1994*, *Species at Risk Act*, *Agricultural Pests Act*, *Soil Conservation Act*, *Weed Control Act*, and *Wildlife Act* should also be incorporated in the next project stages. Camrose County and County of Wetaskiwin topsoil and clubroot bylaws and policies also apply.

Table 5-1 lists the anticipated regulatory permits and their timelines, based on current legislation.

Please refer to the complete environmental overview provided in **Appendix A** for a full description of environmental sensitivities, regulatory applications, regulatory compliance considerations, and project recommendations.

Table 5-1 Anticipated Regulatory Permits			
Legislation and Permit	Application Trigger	Anticipated Project-Specific Requirements	Regulatory Agency and Timeline
Federal			
<i>Fisheries Act</i> (RSC 1985, c. F-14) Request for review	Work that may impact fish and fish habitat, or work completed below the high-water mark of a fish-bearing waterbody	Where trenchless methods (such as HDD) are used near water, the Fisheries and Oceans Canada measures to protect fish and fish habitat (Fisheries and Oceans Canada, 2025) can be followed, and no request for review is required. If open cut or trenched methods are used near water, a request for review may be required.	Fisheries and Oceans Canada N/A (3–4 months if request for review is required)
<i>Impact Assessment Act</i> (SC 2019, c. 28, s. 1) Environmental effects evaluation	Specific to Option 1 Work that may cause adverse environmental impacts on federally owned land	Twinning of the existing waterline from Edmonton to Millet for Option 1 passes through Transport Canada owned land, leased by the ERAA, and may trigger federal review. The requirements will be determined through consultation with the ERAA.	ERAA Timeline at ERAA discretion
<i>Canadian Navigable Waters Act</i> (RSC 1985, c. N-22) Approval	Construction of a work under a non-scheduled navigable water	Pipestone Creek may be considered navigable under the Act. Where trenchless methods are used (e.g., HDD), an approval will not be required.	Transport Canada N/A (3 months if approval is required)
Provincial			
<i>Environmental Protection and Enhancement Act</i> (RSA 2000, c. E-12) <i>Conservation and Reclamation Regulation</i> (Alberta Reg. 115/1993) Conservation and reclamation approval	Construction of a Class I pipeline	It is expected that a conservation and reclamation approval will be required for all options due to the length of each option, regardless of the pipe diameter.	Alberta Environment and Protected Areas 3–6 months
<i>Historical Resources Act</i> (RSA 2000, c. H-9) Approval	Ground disturbance within a provincially designated historic resource value area	Extensive ground disturbance projects require an approval for the proposed project works. Applications for approval are submitted to the Historic Resources Management Branch of Alberta Arts, Culture and Status of Women for assessment of resources within the project area. A historic resources impact assessment may be required as part of this project, following direction provided by Alberta Culture.	Alberta Culture 3–4 months An extended time frame will be required if a historic resources impact assessment is required.
<i>Public Lands Act</i> (RSA 2000, c. P-40) Temporary field authorization	Temporary occupation of Crown-claimed lands	Pipeline crossings under existing permissions (e.g., within the road ROW) should not require an approval under this Act. Temporary/short-term use (e.g., laydowns) may require a temporary field authorization. Applications for a temporary field authorization are submitted to Alberta Forestry and Parks via email.	Alberta Forestry and Parks 1 month
<i>Water Act</i> (RSA 2000, c. W-3) Approval	Utility installation where the conditions of the Code of Practice cannot be met	Where the project's waterbody crossings (including wetland crossings) cannot follow the Code of Practice for Pipelines and Telecommunication Lines Crossing Waterbodies (Government of Alberta 2013), an approval will be required. Twinning of the existing waterline below Telford Lake for Option 1 will require approval. Approvals may be required for the waterbody crossings along Highway 13 between Camrose and Wetaskiwin for all options. Applications for an approval will be submitted through DRAS, supplemented by the design drawings. Additional project details may be required, including the construction specifications and schedule. A pre-consultation assessment request must be submitted to the Aboriginal Consultation Office in support of this application. The results of the Indigenous consultation process are required before the licence may be issued.	Alberta Environment and Protected Areas 3–4 months

Legislation and Permit	Application Trigger	Anticipated Project-Specific Requirements	Regulatory Agency and Timeline
Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body Notification	Utility installation where the conditions of the Code of Practice can be met	Where the project’s watercourse crossings (including wetland crossings) can follow the Code of Practice for Pipelines and Telecommunication Lines Crossing Waterbodies (Government of Alberta 2013), a Code of Practice notification will be required for all watercourse and wetland crossings. Notifications must be submitted through DRAS at least 14 days before work begins and require stamped and signed engineering drawings of the crossings. For crossings of Class A, B, or C watercourses, recommendations from a qualified aquatic environmental specialist may be required. Wetland crossings have additional submission requirements where temporary or permanent impacts occur. For temporary impacts associated with pipeline construction, a wetland impact assessment form will need to be submitted. The project must meet all the conditions in the applicable Code of Practice. If the conditions cannot be met, an approval will be required.	Alberta Environment and Protected Areas At least 14 days before the activity begins
Water Act Licence	Operation of a “works” as defined in the Water (Ministerial) Regulation (Alberta Reg. 43/1997)	The application will be submitted through DRAS and will be supplemented by project design drawings and a hydrological assessment. Complex projects may require additional project details, including the construction specifications, schedule, operational plans, water requirements, and method of operation. The Government of Alberta requires a fee for a licence, depending on the volume of water applied for. A pre-consultation assessment request must be submitted to the Aboriginal Consultation Office in support of this application. The results of the Indigenous consultation process are required before the licence is issued.	Alberta Environment and Protected Areas 3–4 months

6 GEOTECHNICAL ASSESSMENT

A desktop geotechnical review was conducted by Thurber Engineering Ltd. (Thurber). The full report is provided in [Appendix B](#).

The main geotechnical considerations along the alignment options are the following:

- Glaciolacustrine and eolian deposits with a high groundwater table are present mainly around Wetaskiwin and Millet.
- Shallow bedrock depths are present in the area around Beaumont and Leduc, where several crossings would be required.
- Potential slope instability at watercourse crossings and presence of nearby top-of-valley slopes to the south of the proposed alignment near Wetaskiwin.
- Multiple pipeline and creek/river crossings. Pipeline companies should be contacted to confirm the depth of cover above the pipelines at potential crossing locations.
- Wetlands and organic deposits present to the north of the proposed alignment between Camrose and Wetaskiwin.

Open cut method is deemed suitable to construct most of the alignment outside potential crossing locations. However, high groundwater may be encountered along the alignment that spans the eolian and glaciolacustrine deposits. Temporary dewatering may be required during excavation, and continuous dewatering will likely be required when sand is encountered within the depth of excavation. The dewatering of water-bearing sand/gravel in eolian and sands of the glaciolacustrine deposits is anticipated to be difficult and will likely require dewatering points. If groundwater seepage is encountered in the clay moraine it should be handled with typical sumps and pumps.

Temporary excavation side slopes are anticipated to be stable at slopes of 1H:1V and 1.5H:1V or flatter for clay and sand, respectively, assuming dry conditions. Cobbles or boulders may be present in the till deposits, and this may hinder the installation of the pipe. If the trench base is situated in soft clays or saturated sands below the water table where the pipe support conditions may be poor, special bedding procedures may be required to improve pipe support conditions and reduce future settlement of the pipes. However, it is important to note that the special bedding procedures do not eliminate the need to adequately dewater the base as pipes installed on a wet disturbed trench base could settle and distort once the trench is backfilled.

If native sand or silt is present at the base of trench level, it is important that it is dewatered to at least 1 m below the base of the trench before installing the pipe to avoid placing the pipe on a loose disturbed base which could settle and distort the pipe after the trench backfill is placed.

HDD should be feasible to install the proposed pipeline below identified watercourse crossings. A specific “No-Drill zone” may have to be established at identified crossing locations and particularly at crossings with potential slope stability issues. For preliminary design purposes, it is recommended that the entry and exist points be located at least 20 m away from the crest of the valley slope or bridge approach fill. The pipe should be located at least 10 m below stream bed for valleys less than 4 m in height and 15 to 20 m for valleys greater than 4 m in height.

HDD may also be used to install the line at pipeline crossings and the entire alignment. However, HDD is anticipated to be difficult in saturated eolian or glaciolacustrine deposits and the likelihood of borehole collapse and frac-out is

high. Hydro-fracture analyses should be undertaken during the detailed design to confirm the bore path and the minimum depth of cover below stream beds and pipelines.

Shallow trenchless installation technologies such as HAB and Pipe Ramming (PR) may be used to complete shallow installations below roadways (if any). It should be noted that PR is more favourable than HAB when sand under high groundwater table is encountered along the drilling path. Temporary shoring and dewatering will likely be required when sand under high groundwater conditions is encountered at the entry and exit pits. A survey monitoring program should be established during construction to assess the impact of installation on roadways.

Slope stability analyses should be undertaken at locations where potential or signs of instability are identified (based on the LiDAR data). This includes water course crossing locations and locations where the stream top of bank exists in the general vicinity of the proposed alignment. This is to determine a safe setback for the pipe from the top of the bank.

A detailed geotechnical investigation should be undertaken to provide more specific recommendations for the design and the construction of the proposed waterline.

7 CONSTRUCTION CONSIDERATIONS

7.1 Pipe Installation Method

A comparison of construction methods was undertaken to evaluate the suitability of HDD and Open Cut installation for large diameter pipelines. For this project, the proposed pipeline diameters will range from 500 mm to 1,050 mm.

7.1.1 HDD

HDD is a trenchless method used for the guided installation of new pipelines and conduits. Originating in the 1970s from oil field and water well drilling technologies, HDD has become a widely adopted technique across North America, particularly by municipalities and utility providers. Its non-invasive nature allows for installations beneath surface structures, roads, and waterways with minimal surface disturbance at entry and exit points. The HDD process consists of two main phases:

- **Phase 1: Pilot Bore** – A drill rig launches a pilot bore from the surface, guided by an electronic locator system to the designated exit point.
- **Phase 2: Reaming and Pipe Installation** – Upon reaching the exit point, a back reamer is attached and pulled back through the borehole to enlarge it. The product pipe is then pulled into place from the exit to the entry point. Drilling fluid, typically a bentonite-water mixture with additives, is continuously circulated to assist with soil removal, borehole stabilization, and pipe lubrication.

Key design considerations for HDD include:

- Surface topography and features
- Bore path curvature and exit angle
- Depth of installation
- Geotechnical conditions and soil composition
- Pipe material and diameter
- Available laydown area for the product pipe

As pipeline diameter increases, the cost and complexity of HDD installations also increase due to higher drilling forces, larger equipment requirements, and more stringent design constraints. One of the key risks associated with HDD is hydraulic fracturing (“frac-out”), which occurs when drilling fluid pressures exceed the confining strength of the surrounding soils, potentially resulting in unintended surface releases. Mitigation measures may include increasing bore depth, reducing drill length, or adjusting alignment to avoid sensitive areas and existing utilities.

For large diameter pipelines, HDD requires specialised equipment capable of accommodating significant pullback loads and maintaining bore stability. Successful implementation is highly dependent on detailed geotechnical investigations, as subsurface conditions—including soil type, groundwater presence, cobbles, and bedrock—directly influence constructability and risk. While HDD can be well-suited for crossings of roadways, railways, watercourses, and environmentally sensitive areas due to its minimal surface disruption, it is generally not cost-effective for long-distance installation at larger diameters.

Additional risks include borehole instability, excessive drilling pressures, and inadvertent drilling fluid returns, all of which require careful design, monitoring, and contingency planning during construction.

Final recommendations for HDD segments will be made following the completion of the detailed geotechnical investigation.

7.1.2 Pilot Tube Auger Boring (Crossings)

Auger boring (both HAB and PR) is another trenchless technique used primarily for short crossings. It involves the use of an auger boring machine to simultaneously advance an over-sized casing pipe and remove spoil. The machine applies thrust to push the casing forward while rotating internal augers to excavate and transport soil back to the entry pit. This process is repeated until the casing reaches the desired length. Once the casing pipe is installed the waterline pipe is installed inside of the casing.

7.1.3 Open Cut Method

The conventional open cut method, also known as cut and cover construction, involves excavating a trench along the full length of the pipeline alignment, placing the pipe within the trench, and subsequently backfilling and restoring the surface. This method provides direct access to the pipeline during installation, allowing for straightforward placement, inspection, and compaction.

Open cut has been employed for centuries in the installation of underground utilities. It remains the most widely adopted and standard approach for new utility installations. The method is considered low-tech, with minimal advancements in technology or methodology over the past five decades. As such, it requires relatively straightforward planning and implementation.

For large diameter pipelines, open cut is generally the most conventional and widely used approach, as it accommodates a broader range of pipe materials and diameters with fewer technical constraints. It also allows for real-time adjustment to encountered subsurface conditions. However, this method requires sufficient ROW and access along the alignment and typically results in greater surface disruption, including impacts to roadways, vegetation, and adjacent infrastructure. Additional considerations may include temporary traffic management, dewatering, and restoration requirements.

7.2 Preferred Methodology

The review indicates that while open cut installation is generally the preferred method for large diameter pipeline segments due to its cost-effectiveness and lower construction risk, HDD provides significant advantages in minimizing surface and stakeholder impacts. As such, a hybrid approach utilizing open cut for the majority of the alignment, with HDD or auger boring applied at constrained crossings, represents the most balanced and practical solution.

8 WATER TREATMENT PLANT ASSESSMENT

This analysis will outline potential upgrades to the treatment requirements for the existing water treatment facilities in each municipality. The scope of work for this task will include:

- Review existing water quality information from the source water and available water diversion information for each source.
- Develop high-level upgrades for treatment options to meet project water demands and Alberta Environment and Parks Standards and Guidelines for Waterworks and Health Canada's Guideline for Canadian Drinking Water Quality.

8.1 Water Treatment Plant Demands

The following section outlines the capacities for both the Camrose and Wetaskiwin WTPs, respectively.

As water is treated, a portion is lost as waste, such as blowdown and backwash. To produce the treated water required by the community, the treatment plant must treat additional water to account for in-plant losses. The in-plant losses depend on the treatment process at each facility.

Camrose Water Treatment Plant Capacity

The in-plant losses at the Camrose WTP are:

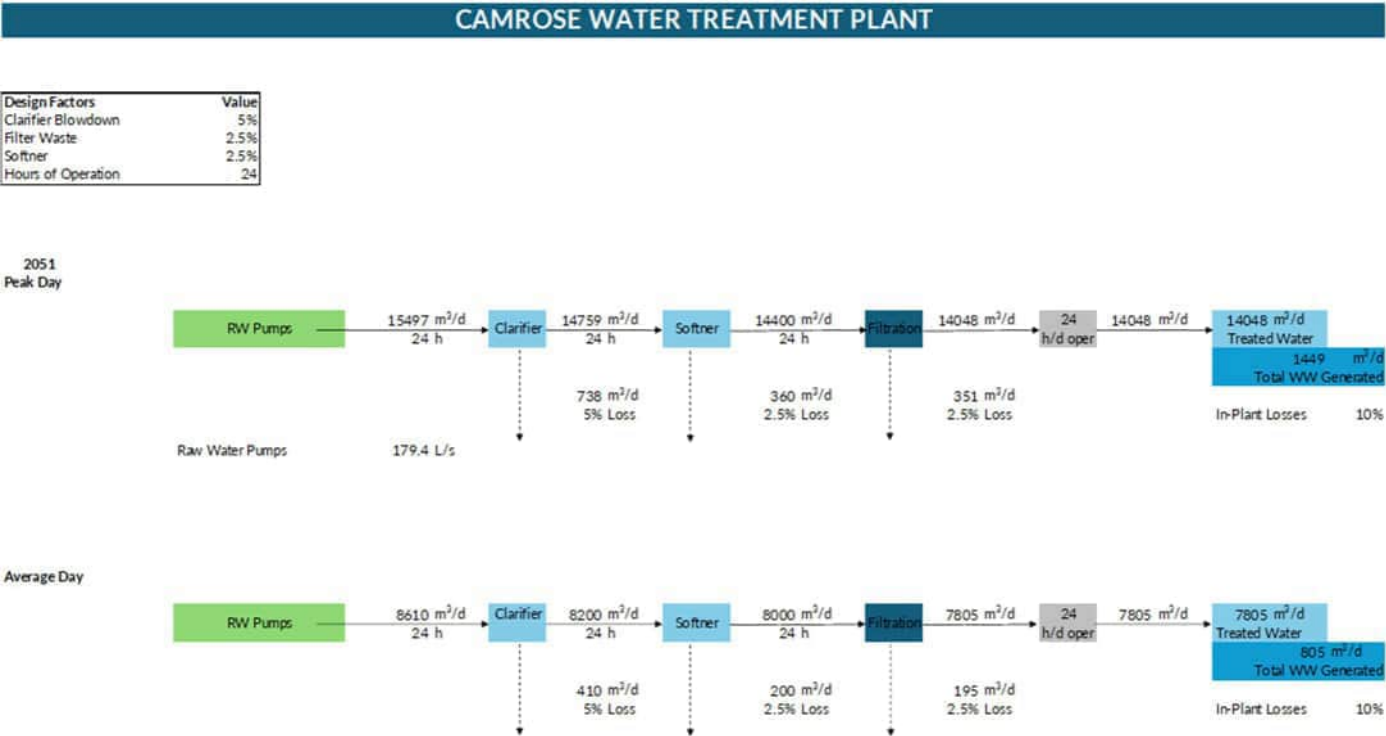
- 5% in-plant losses for blowdown for the solids contact clarifier
- 2.5% in-plant losses for blowdown for the softening clarifier
- 2.55% in-plant losses for filter backwash supply

Table 8-1 summarizes the WTP capacity requirements to meet the raw water capacity needed to satisfy the required treated water demand for the City of Camrose. **Figure 8-1** summarizes the 2061 treated water demands, in-plant waste production and the raw water treatment requirements for PD and AD.

Table 8-1 City of Camrose WTP Raw Water Capacity Requirements

Parameter	2026	2036	2061
Peak Day Treated Water Demands (m ³ /day)	9,917	10,954	14,048
In-Plant Waste during Peak Day Demand (m ³ /day)	1,023	1,130	1,449
Peak Day Raw Water Treatment Capacity Requirement (m ³ /day)	10,940	12,084	15,497

Figure 8-1 Camrose Water Treatment Plant 2061 Raw Water Treatment Capacity Summary



Wetaskiwin Water Treatment Plant Capacity

The in-plant losses at the Wetaskiwin WTP are:

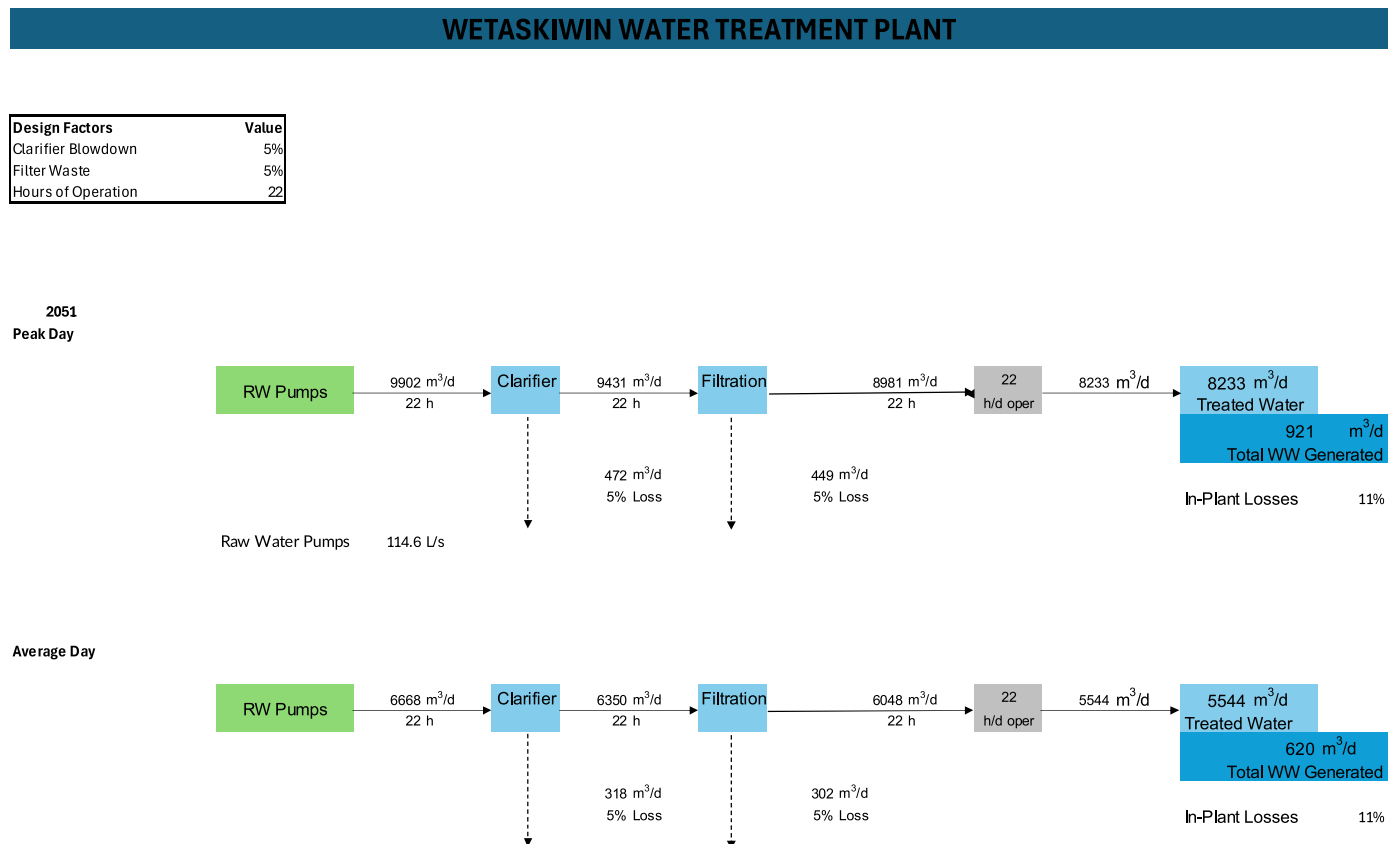
- 5% in-plant loss for blowdown for the dissolved air flotation clarifier
- 5% in-plant loss for filter backwash supply
- 2 hours for WTP maintenance

The City of Wetaskiwin provides potable water through a water line to the Town of Gwynne. **Table 8-2** summarizes the raw water demands needed to satisfy the required treated water demands for the City of Wetaskiwin during PD. **Figure 8-2** summarizes the 2061 treated water demands, in-plant loss (waste production) and the raw water treatment requirements for PD and AD.

Table 8-2 City of Wetaskiwin WTP Raw Water Capacity Requirements

Parameter	2026	2036	2061
Peak Day Treated Water Demands (m ³ /day)	5,812	6,420	8,233
In-Plant Waste (m ³ /day)	650	718	921
Peak Day Raw Water Demands (m ³ /day)	6,990	7,722	9,902

Figure 8-2 Wetaskiwin WTP 2061 Raw Water Treatment Capacity Summary



8.2 Raw Water Diversion Licences

Camrose WTP Raw Water Diversion

The raw water source for the City of Camrose is Driedmeat Lake, which is located approximately 13 km southeast of the City. The lake level is stabilized by a dam and weir structure at its downstream end. The City holds several active licenses that permit a combined annual withdrawal of 4,663,700 m³ from Driedmeat Lake. Driedmeat Lake watershed collects surface water from the area. The raw water source could be highly restricted if climate change leads to

additional drought and leads deteriorating water quality due to less water in the watershed. The City has two withdraw licences from Driedmeat Lake:

Water Diversion License 00044708-00-00

Permits a combined annual withdrawal of 3,083,700 m³. Maximum Daily Diversion Rate: 0.1 m³/s (8,640 m³/day).

Water Diversion License 00404908-00-00

Allows for an additional 1,580,000 m³/year from Driedmeat Lake. This allocation is split between urban use (1,150,000 m³) and agricultural/industrial use (430,000 m³), specifically for the Cargill facility. Maximum Daily Diversion Rate: 0.3 m³/s (25,920 m³/day).

The City of Camrose has been allocated 4,233,700 m³ annually for the WTP. The licence has 430,000 m³ allocated for industrial use, which is provided to the Cargill facility that is fed from the raw water line before the WTP. At present, it is anticipated that the Battle River Water basin has limited unallocated water remaining. If additional diversion licence amounts are required for the City of Camrose, the likely options will be negotiating raw water purchases from other major users, such as ATCO Battle River Generation Station. At present, there are no cost estimates for purchasing licences from major users, nor is there any likelihood that a major user would allow the purchase of a portion of their licence. **Table 8-3** summarizes the annual raw water diversion requirements for the City of Camrose; the WTP would have sufficient annual water system allocation for the 25 years of the study period.

Table 8-3 City of Camrose License Annual Raw Water Demands

Item	2026	2036	2061
Average Day Raw Water Demand, m ³ /day	6,078	6,714	8610
Annual Raw Water Demand, m ³	2,218,365	2,450,455	3,142,542
Current License(s) Allocation, m ³ /year	4,233,700	4,233,700	4,233,700
Surplus, m³/year:	2,015,335	1,783,245	1,091,158

Table 8-4 summarizes the peak day raw water demands and the maximum daily diversion allotments under the licences. The current license does allow for a maximum daily diversion of 25,920 m³/day, which is sufficient to satisfy the 2061 peak day raw water demand.

Table 8-4 City of Camrose Licence Maximum Diversion

Item	2026	2036	2061
Peak Day Raw Water Demand, m ³ /day	10,940	12,084	15,497
Current License(s) Maximum Diversion, m ³ /day	25,920	25,920	25,920
Surplus, m³/day:	14,980	13,836	10,423

Wetaskiwin WTP Raw Water Diversion

Coal Lake is the raw source for the City of Wetaskiwin. Coal Lake is a surface water source; the City has historically faced challenges typical of prairie lakes, such as seasonal algal blooms and high levels of organic carbon, colour, and iron. Coal Lake is recharged by surface runoff from the surrounding area and is subject to seasonal precipitation. Coal Lake is located approximately 9 km east of the City of Wetaskiwin. The raw water source could be severely restricted if climate change leads to additional drought and deteriorating water quality due to reduced watershed flow. Wetaskiwin has one withdrawal licence from Coal Lake:

Water Diversion License 00044708-00-00

Permits a combined annual withdrawal of 2,466,9630 m³ (2,000 acre-feet). Maximum Daily Diversion Rate: 0.33 m³/s (28,454 m³/day – 5,220 gal/min).

At present, it is anticipated that the Battle River Water basin has limited unallocated water remaining. If Wetaskiwin requires additional diversion licence amounts, the likely options will be negotiating raw water purchases from other major users. At present, there are no cost estimates for purchasing licences from major users, nor is there any likelihood that a major user would allow the purchase of a portion of their licence. **Table 8-5** summarizes the annual raw water diversion requirements for the City of Wetaskiwin; the WTP would have sufficient annual water system allocation for the 25 years of the study period.

Table 8-5 City of Wetaskiwin License Annual Raw Water Demands

Item	2026	2036	2061
Average Day Raw Water Demand, m ³ /day	3,883	4,289	4,980
Annual Raw Water Demand, m ³	1,417,660	1,565,485	2,007,865
Current License(s) Allocation, m ³ /year	2,466,963	2,466,963	2,466,963
Surplus, m³/year:	1,049,303	901,478	459,098

Table 8-6 summarizes the peak day raw water demands and the maximum daily diversion allotments from the licences. The current license allows a maximum daily diversion of 28,454 m³/day, which is sufficient to meet the 25-year peak day raw water demand.

Table 8-6 City of Wetaskiwin Licence Maximum Diversion

Item	2026	2036	2061
Peak Day Raw Water Demand, m ³ /day	6,990	7,722	9,902
Current License(s) Maximum Diversion, m ³ /day	28,454	28,454	28,454
Surplus, m³/day:	21,464	20,732	18,552

8.3 Treated Water Storage

The Commission's Water Supply Policy details the storage requirements for members and customers at two times the AD demand plus fire storage, where provided. The following detail the storage requirements for both communities.

City of Camrose Treated Water Storage Assessment

The City of Camrose maintains a total existing potable water storage capacity of 25,680 m³, which is distributed across three reservoirs located at two primary high lift pump stations. High Lift Pump Station No. 2 (HLPS #2), situated on the WTP property at 3701 – 50 Street, houses a clearwell reservoir with a capacity of 4,680 m³. Due to the age and condition of the reservoir at HLPS#2, upgrades or replacement should be considered in the next ten years. The remaining 21,000 m³ of storage is provided at High Lift Pump Station No. 3 (HLPS #3) in Rudy Swanson Park, which consists of a 9,000 m³ north reservoir (constructed in 1983) and a 12,000 m³ south reservoir (constructed in 1992).

Table 8-7 summarizes the requirements for regional water storage at different time horizons, including fire storage requirements. Fire storage requirements for the City of Camrose is based on the peak fire flow rate as provided in the 2025 Water Distribution System Master Plan of 233 L/s for 3 hours.

Table 8-7 City of Camrose Water Storage Requirements

Parameter	2026	2036	2061
2x Average Day (m ³)	11,019	12,172	15,609
Fire Storage Requirement (m ³)	2,520	2,520	2,520
Total Water Storage Requirement (m ³)	13,539	14,692	18,129
Existing Storage Available (m ³)	25,680	25,680	25,680
Surplus (m³):	12,141	10,988	7,551

The data indicates that there is sufficient water storage to meet the 35-year design horizon.

City of Wetaskiwin Treated Water Storage Assessment

The City of Wetaskiwin maintains a total treated water storage capacity of 18,485 m³ distributed between two primary locations. The Garden Meadows Reservoir provides the majority of this volume with a capacity of 11,365 m³. The Central Reservoir accounts for the remaining 7,120 m³ and comprises two above-ground tanks with volumes of 2,270 m³ and 4,550 m³, supplemented by 300 m³ of underground storage located at the pumphouse. **Table 8-8** summarizes the requirements for regional water storage at different time horizons, including fire storage requirements. Fire storage requirements for the City of Wetaskiwin is based on the peak fire flow rate as provided in the 2020 Water Distribution System Master Plan of 233 L/s for 3 hours.

Table 8-8 City of Wetaskiwin Water Storage Requirements

Parameter	2026	2036	2061
2x Average Day (m ³)	6,348	7,012	8,992
Fire Storage Requirement (m ³)	2,520	2,520	2,520
Total Water Storage Requirement (m ³)	8,868	9,532	11,512
Existing Storage Available (m ³)	18,485	18,485	18,485
Surplus (m³):	9,617	8,953	6,973

The data indicates that there is sufficient water storage to meet the 35-year design horizon. Although not considered in the analysis, The Central Reservoir concrete is in poor condition and will require refurbishment or replacement, but these costs are not considered as part of this analysis.

County of Wetaskiwin Treated Water Storage Assessment

The County of Wetaskiwin has two storage reservoirs of 240 m³ each, totalling 480 m³ of treated water storage. As the County does not have any fire hydrants in the area, no fire storage is required. The total required storage is therefore the two times AD flow, which results in 110 m³ in 2026, 121 m³ in 2036 and 155 m³ in 2061, indicating the County has sufficient storage for the design horizon.

8.4 Facility Upgrade Assessments

There are two main drivers that require WTPs to complete upgrades at the facility: (1) capacity upgrades and (2) infrastructure renewal due to age. The following sections review both the Camrose and Wetaskiwin WTPs for capacity and asset assessments.

Capacity for the existing process units was developed through a review of the system design with recommended design criteria from Alberta Environment and Protected Area's Standards and Guidelines for Municipal Waterworks, existing reports, and drawings. Information for the capacity assessment were gathered from existing reports, drawings, and operational manuals.

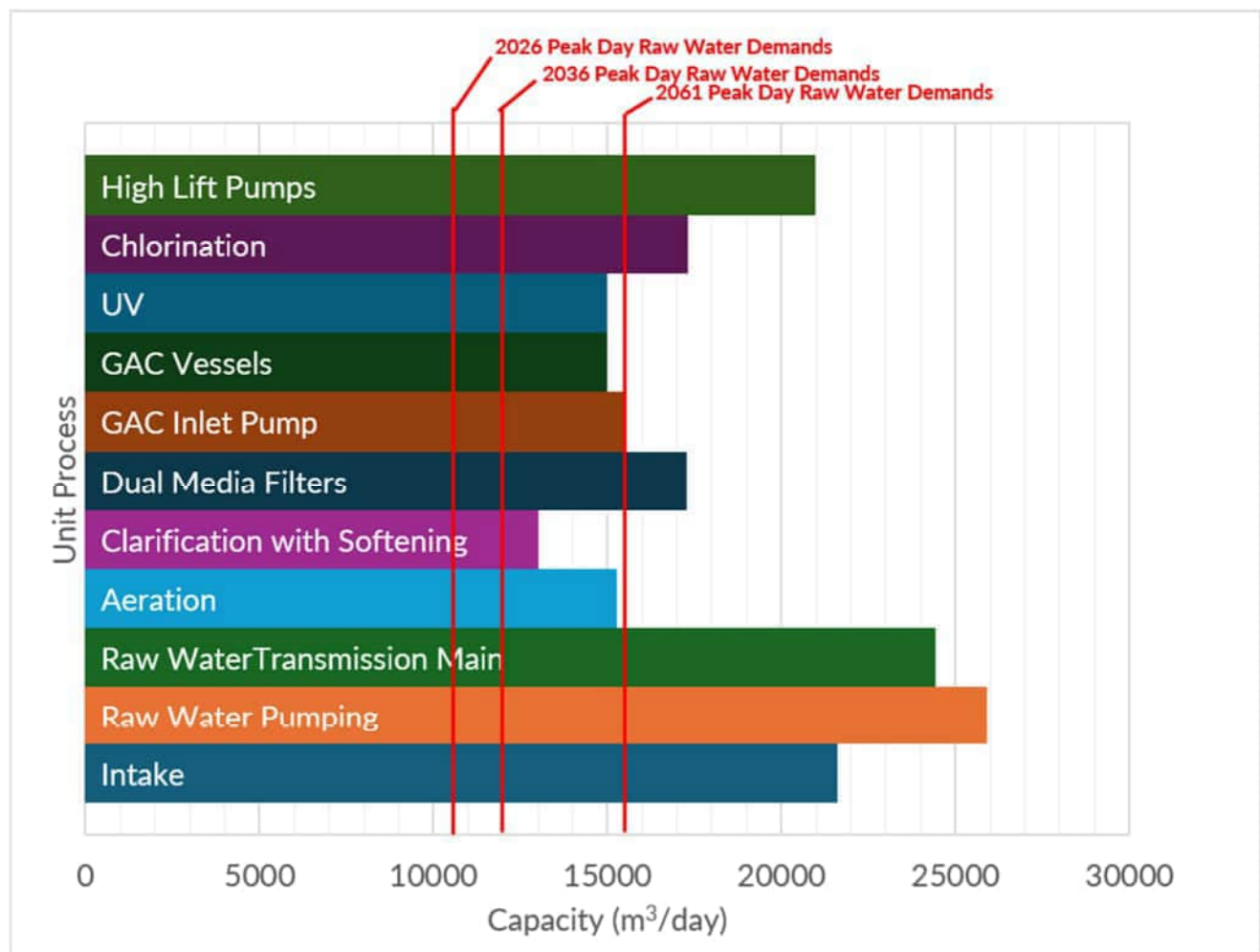
Camrose WTP Capacity Assessment

The Camrose WTP has an existing raw water pump station at Driedmeat Lake, consisting of a raw water intake and a pump station with three raw water pumps and a blower to aerate the pump well. The raw water transmission line runs from the raw water pump station to the WTP, covering approximately 14 km through farmland south of Camrose.

The WTP consists of two solids contact clarifiers in series: the first clarifier acts as a solids-removal unit, and the second acts as a lime softener. The City has the option to operate both units in parallel as solids-clarifying units, but that would require discontinuing softening for the community. Following the softening process, water is passed through re-carbonation tanks before entering three dual media filters, which remove any remaining particles. The water is then filtered through granular activated carbon to remove additional organic carbon. The next step in the process is to treat the water with ultraviolet disinfection to further treat *Giardia* and *Cryptosporidium*. The Camrose WTP uses free chlorine as the primary disinfectant, then adds ammonia to the water. Chloramines are used as a secondary disinfectant in the distribution system to control disinfection by-products.

Figure 8-3 summarizes the different unit processes within the Camrose WTP with their anticipated capacity and the required treatment capacity over the 25-year study horizon. Based on the water demand projections over 25-year study period, the first treatment unit to require upgrades will be the pre-treatment solids contact clarifier, which will need a capacity upgrade within the next 5 years. The addition of the new pre-treatment units would require significant capital investment, and a decision on the regional water line would need to be made quickly to avoid the capital investment. Due to the existing configuration of the plant, a pre-treatment system upgrade may require a complete twinning of the WTP. Before 2061, the existing granular activated carbon facility and ultraviolet disinfection system will also require expansion. Chemical feed systems will require upgrades along with respective unit process upgrades.

Figure 8-3 Camrose WTP Unit Process Capacity



Camrose WTP Asset Assessment

The existing Camrose WTP began construction in 1987; as of 2026, the facility is approximately 39 years old. At this age, the plant requires upgrades to refurbish the existing system and replace the aging infrastructure before failure. In 2026, the City of Camrose is replacing the existing dual media filter underdrains and media. This upgrade is expected to be complete in the spring at a cost of \$4.5 million. The City has begun an MCC upgrade for the WTP electrical system, which is near the end of its life. The first phase of this upgrade will occur late in 2026.

ISL Engineering and Land Services completed a City of Camrose “*Raw Water Pumping and Treatment Study*” (July 2022), which looked at the asset condition of the existing raw water and treatment systems and identified the following asset issues.

Electrical

- Motor control centers are at end of life and require replacement, along with renewal of starts and electrical subsystems.

Structural

- **Lime Silo:** Repair or replacement of six base steel panels and re-coating of the silo exterior due to corrosion and disintegration.
- **Roof Assembly:** Re-sealing of all roof penetrations, repair of panel clips on the west side, replacement of loose screws, and priming/painting of curbs in the short-term; roof assembly replacement in the long-term.

Process Mechanical

- **Clarifiers (Alum and Lime):** Removal of corrosion from supports, repainting, and potential replacement of support structures.
- **Floc Tanks:** Monitoring and interior repair of water leakage through pipe penetrations.
- **Chemical Room Exterior Wall:** Replacement of corroded/disintegrated metal panels and flashings.

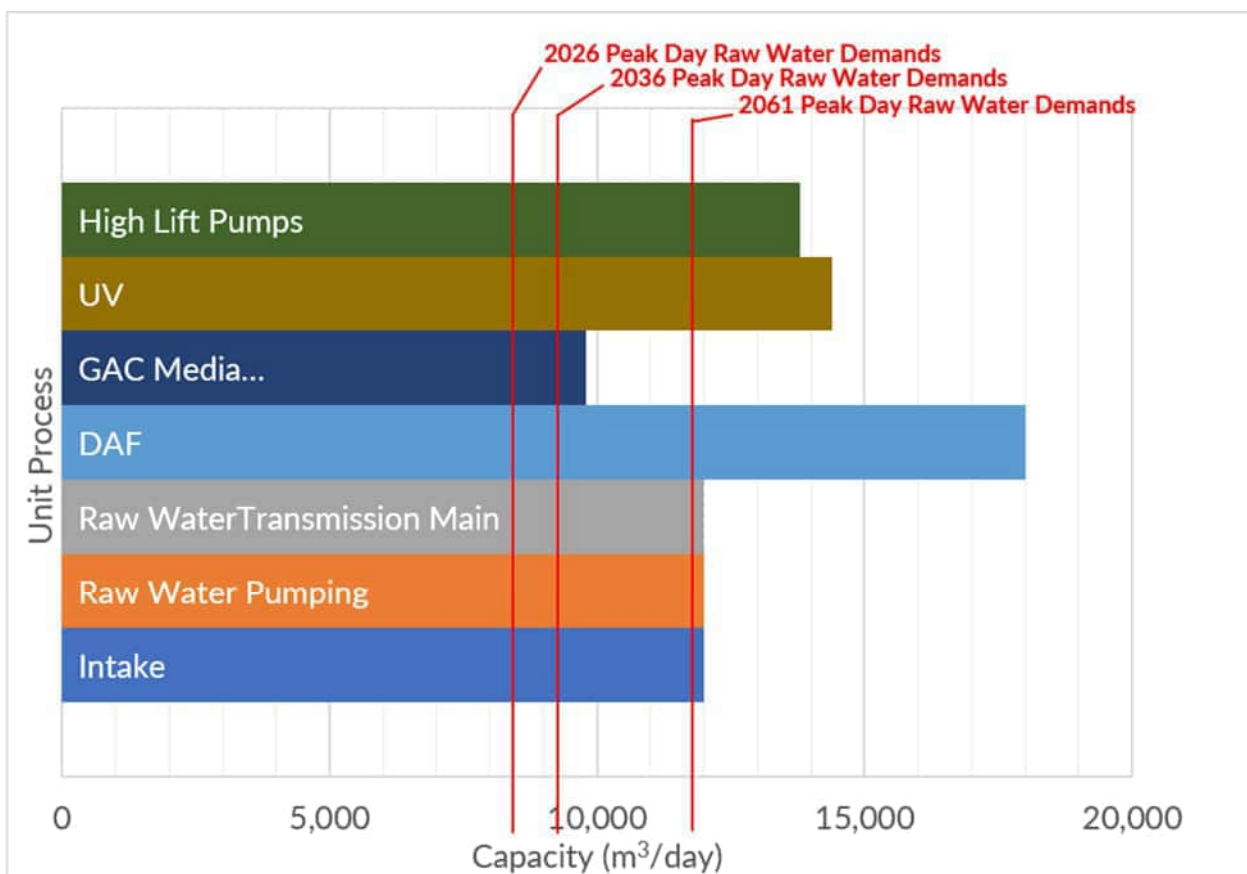
Wetaskiwin WTP Capacity Assessment

The Wetaskiwin WTP has an existing raw water pump station at Coal Lake, consisting of a raw water intake and a pump station with four raw water pumps and a compressor to aerate the intake. The raw water transmission line runs from the raw water pump station at the edge of Coal Lake to the WTP at the top of the hill, covering approximately 200 m along the steep embankment.

The WTP consists of two dissolved flotation clarifiers in parallel. Following the clarification process, water is passed through four granular activated carbon filters, which remove any remaining particles and organic carbon. The next step in the process is to treat the water with ultraviolet disinfection to further treat *Giardia* and *Cryptosporidium*. The Wetaskiwin WTP uses free chlorine as the primary disinfectant, then adds ammonia to the water before the high lift pumps transfer it to the City's reservoir for distribution. Chloramines are used as a secondary disinfectant in the distribution system to control disinfection by-products. There is a transfer line to the Gwynne reservoir, where the water is maintained with a free chlorine residual.

Figure 8-4 summarizes the different unit processes within the Wetaskiwin WTP with their anticipated capacity and the required treatment capacity over the 25-year study horizon. Based on the water demand projections over that time, the Wetaskiwin WTP is not anticipated to require any capacity upgrades.

Figure 8-4 Wetaskiwin WTP Unit Process Capacity



Wetaskiwin WTP Asset Assessment

The existing Wetaskiwin WTP began construction in 1979; as of 2026, the facility is approximately 47 years old. The plant underwent various upgrades in 1982 and 2007. The raw water pumphouse was constructed in 1966. At this age, the plant requires upgrades to refurbish the existing system and replace aging infrastructure before failure occurs.

Associated completed a City of Wetaskiwin “Facilities Assessment – Water Treatment Plant” (December 2019), which looked at the asset condition of the existing raw water and treatment systems and identified the following asset issues:

Structural

- **Structural Frame:** Heavy corrosion is present at a column location near a treatment cell; it requires immediate cleaning and repainting.
- **Catwalks/Access:** Heavy corrosion exists on catwalk decking above treatment cells. The roof access platform, featuring a chain-supported deck, is a significant safety concern and requires a professional structural analysis or replacement with an engineered system.
- **Superstructure:** Heavy corrosion is present on the building's superstructure and will need to be replaced.
- **Fire Separation:** There is no fire damper on ventilation grills or fire stopping on cable tray penetrations between the Electrical Room and the Office.

- **Code Compliance:** The Fluoride Room uses combustible wood stud walls, and the mezzanine office has a vinyl window with no fire-resistance rating, both of which conflict with the building's non-combustible construction and rated doors.
- **Ceilings:** The fire-rated gypsum board ceiling in the Boiler Room has cracks, lacks fire taping at joints, and has unsealed pipe penetrations.

Building Mechanical

- **Safety Equipment:** The safety shower inside the Fluoride Room is severely corroded and must be replaced.
- **Heating:** Gas-fired, hydronic, and electric unit heaters are operational but nearing or at the end of their service life.
- **Ventilation:** Exhaust fans in the fluorine, ammonia, and chlorine rooms require replacement when they fail.

Process Mechanical

- **Filter Air Scour System:** Filter blower at the end of its useful life.
- **Ultraviolet Disinfection System:** UV system at the end of its useful life; replacement parts are difficult to source – a replacement system should be planned for.
- **Dissolved Air Flotation Refurbishment:** Dissolved air flotation internals will require refurbishment over the next 25 years as they approach the end of their useful life.
- **Granular Activated Carbon Filters:** Granular Activated Carbon filters' internals will require refurbishment over the next 25 years as they approach the end of their useful life.

9 GRANT FUNDING REVIEW

Funding availability is a key consideration in evaluating the feasibility of both the regional waterline and WTP upgrade options. In Alberta, several established provincial programs provide cost-shared funding for municipal water infrastructure, with varying alignment depending on project type.

Water for Life Program

Water for Life is the overarching government-wide strategy for water in Alberta. The Water for Life Program, which launched in 2006, provides cost-shared funding to regional commissions or groups of two or more municipalities and consists of two funding streams, for new or existing regional water systems.

Alberta Municipal Water/Wastewater Partnership

The AMWWP, which launched in 1991, provides cost-shared funding to eligible municipalities to help build municipal facilities for water supply and treatment, and wastewater treatment, conveyance, and disposal.

9.1 Regional Waterline

Regional waterline projects are strongly aligned with current provincial priorities focused on regionalization, system efficiency, and long-term water security. The primary funding source is the Water for Life Program, which entails the following:

- Provides cost-shared funding for new regional water systems and extensions to existing systems
- Available to regional commissions or groups of municipalities
- Can fund a significant portion of capital costs (up to ~90–100% for eligible components in some cases)
- Eligible costs include construction, engineering, land acquisition, and associated works
- Prioritizes projects that improve regional collaboration and long-term sustainability

It is understood from a meeting between Associated, the Commission, and TEC on September 4, 2026, that due to the value of this project, it is unlikely that the Water for Life Program would have sufficient capacity to fund 90% of the project. TEC advised that the Province is willing to work with the municipalities to determine project phasing and additional sources of funding, provincial and federal. For the purposes of this study, it has been assumed that contributions by the municipalities could be approximately one third of project costs, provided equal support from the provincial and federal governments.

Strategic Considerations

Provincial funding programs consistently support regional pipeline projects as they are viewed as more cost-effective and environmentally sustainable than standalone systems. The Province recognizes that implementation of regional pipelines generally come at a short-term cost premium but can save long-term costs. As a result, regional waterline projects typically benefit from strong funding availability and higher competitiveness in grant applications.

9.2 Water Treatment Plant Upgrade

Upgrades to existing water treatment and storage facilities are also eligible for funding but are generally considered lower priority relative to regional system development. The primary funding source is the AMWWP, which entails the following:

- Provides cost-shared funding (municipal water treatment and supply infrastructure upgrades based on a population-based cost share formula: $G = 35 - [0.001 \times (P - 10,000)]$, where G = Grant funding and P = Population.)
- Based on the estimated population of Wetaskiwin (13,703), grant funding would be 31.3% of project costs
- Based on the estimated population of Camrose (19,984), Grant funding would be 25.0% of project costs
- Eligible costs include construction, engineering, land acquisition, and associated works
- Applicable to both standalone municipal systems and regional facilities

Additionally, the Water for Life Program may provide funding support for upgrades to existing regional systems, subject to an eligibility review.

Strategic Considerations

While funding is available, WTP upgrades may be less competitive where projects do not address long-term supply security or regional integration objectives. Projects focused solely on treatment improvements without resolving source constraints and long-term benefits of regionalization may receive lower prioritization.

9.3 Funding Summary

The regional waterline option benefits from strong alignment with provincial policy objectives, access to higher funding contributions, and an emphasis on regional collaboration and long-term supply reliability.

The WTP upgrade option also remains eligible for funding; however, this option may be less aligned with funding priorities if source water limitations remain unresolved, and such projects typically receive moderate cost sharing support.

Overall, both options are eligible for provincial funding; however, the regional waterline option is more favourably positioned due to its alignment with Alberta's long-term water management strategy. This creates a higher likelihood of securing funding and achieving a greater level of cost sharing, further strengthening its feasibility from a financial and strategic perspective.

10 COSTS ANALYSIS

Given the conceptual nature of this study and the recognition that unknown variables lie beyond its scope, the opinion of probable cost (OPC) estimates presented here include a 30% contingency allowance on the total estimated capital costs. In the OPC, Associated have captured the major scopes of the probable cost estimate in 2026 dollars. However, we cannot guarantee that the actual price will not exceed this estimate due to variables outside Associated's and the communities' control, such as supply chain issues, long timelines, and labour availability. The actual final cost of the project will be determined through further refinement during later design phases and the bidding and construction process. Detailed cost breakdowns are provided in [Appendix C](#).

10.1 Regional Waterline Opinion of Probable Cost

This section presents a preliminary OPCs for the proposed regional waterline options, including estimated construction costs, a contingency allowance of 30%, and non-construction costs of 15%. Non-construction costs include items such as land acquisition, environmental permitting, and engineering services. All cost estimates are provided in 2026 dollars and are based on the assumptions outlined below.

Key Assumptions – Cost Estimation

The preliminary OPCs is based on the following key assumptions:

- **Alignment and Length** – The pipeline alignment and total length are based on the preliminary routing identified in this study and have not been finalized through detailed design.
- **Pipe Diameter and Material** – Pipeline diameter and material type are assumed based on preliminary hydraulic analysis and industry-standard materials suitable for regional transmission mains.
- **Construction Methodology** – Installation will primarily be completed by open cut methods, with trenchless installation (e.g., HDD or auger boring) applied at major crossings (e.g., highways, railways, watercourses).
- **Ground Conditions** – Subsurface conditions are assumed to be typical for the region, with no unusual geotechnical constraints (e.g., excessive rock, unstable soils, or contamination).
- **Utility Crossings** – Existing utility crossings are assumed to be manageable using standard construction practices without significant relocation requirements.
- **Land Acquisition** – Required easements and land access can be obtained at typical market rates and within a reasonable timeframe.
- **Environmental and Regulatory Approvals** – Environmental permits and regulatory approvals are assumed to be obtainable without significant delays or extraordinary mitigation measures.
- **Roadway and Surface Restoration** – Restoration requirements are assumed to be limited to typical conditions (e.g., gravel, asphalt, or agricultural lands) with urban reconstruction only within the Cities of Edmonton, Camrose, and Wetaskiwin.
- **Exclusions** – Costs associated with major unforeseen conditions (e.g., significant geotechnical challenges, extensive utility relocations, or regulatory changes) are not included. Costs for storage upgrades are also not included; it is assumed that the communities will undertake necessary storage expansion as required. Finally, while the pumping requirements in the upstream supply main are included, any pumping upgrades within EPCOR's system to provide this upstream supply main are not included.

The preliminary opinions of probable cost for the regional waterline alignment options are summarized in [Table 10-1](#).

Table 10-1 Regional Waterline Opinion of Probable Costs

Description	Option 1	Option 2	Option 3
Alignment Length	116km	135km	120km
New Upstream Supply Main	\$59,522,000	\$59,522,000	\$59,522,000
Regional Waterline	\$234,507,000	\$231,577,000	\$206,125,000
Contingency (30%)	\$88,209,000	\$87,330,000	\$79,694,000
Non-Construction Costs (15%)	\$57,336,000	\$56,764,000	\$51,801,000
Total Cost	\$439,574,000	\$435,193,000	\$397,142,000
Funding Split (33%)	\$146,524,000	\$145,065,000	\$132,380,000
Total Cost After Funding	\$146,524,000	\$145,065,000	\$132,380,000

10.2 Facility Upgrade & Refurbishment – Opinion of Probable Costs

The Camrose and Wetaskiwin WTPs together will require an estimated \$107,575,000 in capital costs to expand capacity and refurbish the existing treatment process to meet the communities' needs for the 25-year study period.

City of Camrose Opinion of Probable Projections

Table 10-2 summarizes the OPC in 2026 dollars, based on the physical and capacity assessments provided in the various documents reviewed. The following assets within the City of Camrose's water treatment systems require maintenance, repair, or refurbishment based on the high-level cost assessment. The assessments do not include any distribution or potable water storage assets that may require maintenance, repair, or refurbishment as part of these cost projections.

The City of Camrose could defer the major requirement of the pre-treatment system clarification and softener capacity expansion, by removing the practice of softening at the water plant, which can be used as a bridge to prevent a major upgrade if the regional waterline goes ahead. If the regional line could be completed within the next 5 years, the majority of these short-term upgrade or refurbishment items could be deferred or minimized to save additional cost.

Table 10-2 City of Camrose WTP Opinion of Probable Cost for Upgrades & Refurbishment

Timeline	Probable Costs
Short-Term (< 10 years)	
- Lime Silo Refurbishments - Plant Roof Refurbishment - MCC and Electrical Subsystems Refurbishments - Miscellaneous Process Refurbishments - Chlorination System Refurbishment and Capacity Expansion - Pre-treatment System Clarification and Softener Capacity Expansion	\$34,700,000

Timeline	Probable Costs
Medium-Term (10 -25 years) - Raw Water Intake and Pipeline Refurbishments - Granular Activated Carbon Filter Capacity Expansion - Ultraviolet Disinfection Capacity Upgrades - Granular Activated Carbon Pump Capacity Upgrades - High Lift Pump Refurbishment	\$18,325,000
Long-Term (25-35 years) - Dual Media Filter Capacity Expansion - Aeration Expansion	\$15,150,000
Total Cost	\$68,175,000
Provincial Funding (25.0%)	\$17,044,000
Total Cost After Funding	\$51,131,000

City of Wetaskiwin Opinion of Probable Cost Projections

Table 10-3 summarizes the opinion of probable cost in 2026 dollars, based on the physical and capacity assessments provided in the various documents reviewed. The following process assets within the City of Wetaskiwin water treatment systems require maintenance, repair, or refurbishment based on the high-level cost assessment. The assessments do not include any distribution or potable water storage assets that may require maintenance, repair, or refurbishment as part of these cost projections. The existing Central Reservoir is in poor condition and requires refurbishment or replacement. If the regional line could be completed within the next 5 years, the majority of these short-term upgrade or refurbishment items could be deferred or minimized to save additional cost.

Table 10-3 City of Wetaskiwin WTP Opinion of Probable Cost for Upgrades & Refurbishment

Timeline	Probable Costs
Short -Term (< 10 years) - Raw Water Pumphouse Refurbishment - UV Replacement - Residual Management Handling - Structural and Building Mechanical Refurbishments	\$18,900,000
Medium-Term (10 -25 years) - Dissolved Air Flotation Refurbishment - Granular Activated Carbon Filter Refurbishment - High Lift Pump Replacement	\$11,000,000
Long-Term (25-35 years) Granular Activated Carbon Filter Expansion	\$9,500,000
Total Cost	\$39,400,000
Potential Funding (31.3%)	\$12,332,000
Total Costs After Funding	\$27,068,000

10.2.1 Operational & Maintenance Cost

Operation and maintenance costs for the proposed regional waterline and the upgraded WTPs include the ongoing expenses required to operate, monitor, and maintain the system over its service life. At the feasibility stage, these costs are estimated at a high-level based on typical industry practices for both regional transmission pipelines and WTP operation.

To accurately forecast the total lifetime cost of an operational strategy or a capital upgrade, engineers and utility managers rely on Net Present Value (NPV). NPV translates a future stream of annual O&M expenditures into a single, equivalent dollar amount in today's currency. This allows decision-makers to directly compare options with different upfront capital costs and long-term operational burdens on an apples-to-apples basis. NPV was determined using an inflation rate of 3.5% (average of the 6-year data) and 3.5% discount rate.

Pipeline Opinion of Probable Operations and Maintenance Costs

Key components of O&M costs include:

Operation Costs

- Energy consumption associated with pumping (if applicable), including booster stations and pressure management.
- Routine system monitoring and control (e.g., SCADA systems, telemetry, and communications).
- Labour for system operation, administration, and regulatory compliance.
- Water purchase costs, based on projected demands and the water rates identified in the 2025 Master Plan.

Routine Maintenance

- Regular inspection and exercising of valves and appurtenances (e.g., isolation valves, air release/vacuum valves, blow-offs).
- Flushing and cleaning of the pipeline to maintain water quality.
- General upkeep of chambers, access points, and related infrastructure.

Repairs and Corrective Maintenance

- Minor repairs such as leak detection and repair, valve replacement, and fitting adjustments.
- Emergency response and repair activities associated with pipe breaks or system failures.

Asset Management and Monitoring

- Condition assessment programs, including periodic inspections and monitoring of pipeline performance.
- Implementation of asset management systems to track maintenance activities and support long-term planning.

Surface and Access Maintenance

- Maintenance of access routes, easements, and ROW areas, including vegetation control and minor restoration works.

At this stage, O&M costs are expected to be relatively low compared to the initial capital investment, as regional waterlines typically require limited maintenance when properly designed and constructed. However, ongoing

maintenance and proactive asset management are essential to ensure system reliability, maintain water quality, and maximize service life. **Table 10-4** details the estimated O&M costs for each alignment alternative for the proposed regional waterline.

Table 10-4 Regional Waterline O&M Costs

Alignment	O&M Costs
Alignment Option 1	\$134,819,000
Alignment Option 2	\$135,020,000
Alignment Option 3	\$134,856,000

WTP Opinion of Probable Operations and Maintenance Costs

The evaluation of the long-term economics of WTP or pipeline operations and maintenance, analyzing a single year's budget is rarely enough. Chemical costs fluctuate, energy demands shift, and infrastructure ages.

The following key assumptions are typically applied when estimating O&M costs for a WTP at the feasibility stage:

Treatment Capacity and Utilization

- The plant operates within its design capacity, with average and peak flows consistent with projected demand.
- Allowance for partial loading in early years and full utilization over the planning horizon.

Treatment Process

- Conventional treatment processes are assumed (e.g., coagulation, flocculation, filtration, disinfection), unless otherwise specified.
- Treatment complexity (e.g., advanced processes such as membrane filtration or GAC) is reflected in higher chemical, energy, and maintenance costs.

Staffing Requirements

- Staffing levels are based on typical requirements for each facility, including certified operators, maintenance personnel, and administrative support.

Chemical Usage

- Chemical consumption (e.g., coagulants, disinfectants, pH adjustment) is based on typical raw water quality and standard dosing rates.

Energy Consumption

- Power usage is based on typical energy demands for pumping, treatment processes, and building systems.
- Standard utility rates for Alberta are applied, with no allowance for significant price volatility.

Maintenance and Repairs

- Preventative maintenance programs are implemented in accordance with manufacturer recommendations and industry best practices.

- Annual maintenance costs are estimated as a percentage of capital cost, with periodic major maintenance for mechanical and electrical equipment.

Asset Renewal

- Major equipment (e.g., pumps, valves, instrumentation, electrical systems) will require periodic replacement within typical service life ranges (15–30 years).
- No major structural rehabilitation is assumed within the planning horizon.

Automation and Control

- A standard SCADA system is in place to support monitoring and control, reducing manual intervention.
- Instrumentation and control systems are assumed to be reliable with routine calibration and maintenance.

The Camrose and Wetaskiwin annual WTP cost projections were gathered using publicly available data and discussions with the municipalities' public works department. **Table 10-5** summarizes the O&M costs for the next 35 years of operation.

Table 10-5 WTP O&M Costs

WTP	O&M Costs
Camrose	\$77,700,000
Wetaskiwin	\$48,659,086

10.3 Life Cycle Cost Estimate

Table 10-6 summarizes the total life cycles cost for the operation of the WTPs and pipelines for the next 35 years, presented as NPV.

Table 10-6 Opinion of Probable Life Cycle Cost (NPV)

Option	Capital Cost	Remainder After Funding	O&M Cost	Life Cycle Cost
WTP Upgrades				
Camrose WTP	\$68,175,000	\$51,131,000	\$77,700,000	\$128,931,000
Wetaskiwin WTP	\$39,400,000	\$27,068,000	\$48,659,086	\$88,059,086
Total WTP	\$107,575,000	\$78,199,000	\$126,359,086	\$216,990,086
Regional Pipeline				
Option 1	\$439,574,000	\$146,524,000	\$134,819,000	\$574,393,000
Option 2 (Preferred Option)	\$435,193,000	\$145,065,000	\$135,020,000	\$570,213,000
Option 3	\$397,142,000	\$132,380,000	\$134,856,000	\$531,998,000

Based on the alignment options analysis, **Alignment Option 2** is the preferred alignment for the regional waterline:

- The majority of the Option 2 alignment can follow existing road ROW, with the least highway and roadway crossings.
- The hydraulic benefits to the Commission's existing system in Option 2 are the greatest – lowest pumping requirements at the Nisku Booster Station, additional supply capacity to Beaumont, greatest flexibility, and capacity for future growth along the Armena line, and the ability to service Miquelon Lake.
- The environmental analysis shows Option 2 likely require less disturbance and reclamation of agricultural soils, fewer crossings of waterbodies, and avoids intersecting with the congested corridor along Highway 2, EIA lands, or Telford Lake.

11 RISK ASSESSMENT

A comparative risk assessment was completed to evaluate the relative risks associated with:

- Construction of a new regional water transmission pipeline
- Upgrades to an existing standalone WTP

Table 11-1 details the regional waterline risks, and **Table 11-2** details the WTP upgrade risks.

Table 11-1 Regional Waterline Installation Risks

Risk	Description
Geotechnical and Subsurface Conditions	Variable soils, groundwater, and obstructions affecting trenching and HDD feasibility
Land Approvals and Right-of-Way	Requires easements, utility crossings, and multi-jurisdictional approvals
Environmental Impacts	Surface disturbance (open cut) and frac-out risk (HDD)
Design Complexity	Hydraulic design, surge analysis, and alignment optimization over long distances
Construction Risk	Large diameter installation (500–1,050 mm), contractor capability, staging logistics
Capital Cost	High upfront cost for transmission infrastructure
Funding Availability	Strong alignment with Water for Life funding for regional systems (up to ~90–100% eligible costs in some cases)
Stakeholder Coordination	Multiple municipalities and agencies involved
Climate Change and Resilience	Provides access to diversified/regional water sources, improving long-term resilience
Long-Term Operations	Low operational risk once constructed

Table 11-2 Water Treatment Plan Upgrade Risks

Risk	Description
Source Water Availability	Existing raw water supply is declining and may not meet future demand
Construction Risk	Integration with aging infrastructure while maintaining operations
Regulatory and Water Quality	Changing standards or raw water variability may require additional treatment
Land and Site Constraints	Limited expansion space at existing water treatment sites
Design Complexity	Upgrades within existing footprint and maintaining operations during construction

Risk	Description
Construction Phasing	Sequencing upgrades while maintaining continuous treatment
Capital Cost Efficiency	Upgrades may not provide long-term value if supply is constrained
Funding Availability	Eligible under AMWWP (typically up to ~75% cost share), but often lower priority vs regionalization
Operational Complexity	Ongoing treatment and maintenance requirements; Potential future lack of qualified operators
Climate Change and Source Risk	Increased variability in source water quality/quantity (drought sensitivity)
Residual Asset Life	Existing infrastructure may limit upgrade effectiveness

The comparative risk assessment matrix provided in **Table 11-3** summarizes the relative likelihood, impact, and overall risk associated with the regional waterline and standalone WTP upgrade alternatives.

The assessment considers technical, environmental, operational, and long-term service risks. Risk ratings incorporate both likelihood and impact severity, defined as follows:

- **Low:** Minor impact to cost, schedule, or operations; manageable within existing contingencies
- **Moderate:** Noticeable impact requiring management effort; may affect budget or schedule
- **High:** Significant impact to project delivery, cost, or service levels
- **Critical:** Fundamental risk to system viability, regulatory compliance, or long-term service delivery

Table 11-3 Comparative Risk Assessment

Risk Category	Regional Waterline			WTP Upgrade		
	Likelihood	Impact	Overall Risk	Likelihood	Impact	Overall Risk
Geotechnical & Subsurface Conditions	Moderate	High	High	Low	Moderate	Low-Moderate
Land & Site Approvals & Constraints	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Environmental Impacts	Moderate	Moderate	Moderate	Low	Moderate	Low-Moderate
Design Complexity	Moderate	Moderate	Moderate	High	High	High
Construction Complexity	Moderate	Moderate-High	Moderate-High	High	High	High
Construction Phasing & Maintaining Operations	Low	Low	Low	High	High	High

Risk Category	Regional Waterline			WTP Upgrade		
	Likelihood	Impact	Overall Risk	Likelihood	Impact	Overall Risk
Regulatory & Water Quality Compliance	Low	Moderate	Low–Moderate	Moderate	High	High
Capital Cost Exposure	High	High	High	Moderate	High	High
Funding Availability	Low	Moderate	Low–Moderate	Moderate	Moderate	Moderate
Stakeholder Coordination	Moderate	Moderate	Moderate	Low	Low	Low
Climate Change & Drought Resilience	Low	Low	Low	High	Critical	Critical
Source Water Availability	Low	Low	Low	High	Critical	Critical
Residual Asset Life & Long-Term Reliability	Low	Moderate	Low–Moderate	High	High	High
Long-Term Operations	Low	Low	Low	Moderate	Moderate	Moderate

The risk assessment of the two options highlights a clear distinction between short-term project delivery risks and long-term system reliability risks. While both alternatives present manageable design and construction considerations, the key differentiator lies in long-term water supply security, funding alignment, and resilience to future uncertainty.

Regional Waterline

- High design and construction risks (**Moderate-High**)
- Lower long-term and strategic risk
- Favourable funding environment due to strong provincial support for regionalization
- Improves climate resilience and long-term supply security

WTP Upgrade

- Higher construction complexity risk and significant long-term risks
- Includes a **Critical Risk** (source water availability) that cannot be mitigated through treatment upgrades alone
- Funding is available but generally less aligned with long-term provincial priorities compared to regional systems
- More vulnerable to climate-driven supply variability

Overall, while the regional waterline option presents moderate-to-high construction-related risks, these are generally manageable and limited to the project delivery phase. In contrast, the standalone WTP upgrade option is subject to a high-likelihood, critical-impact risk associated with declining source water availability, representing a fundamental constraint to long-term system reliability. From a lifecycle and strategic perspective, the regional waterline is therefore considered the lower risk and more sustainable solution.

12 OPTIONS COMPARISON

An option comparison was undertaken to assess the key benefits and trade-offs of the regional waterline and WTP upgrade options, shown in **Table 12-1**. The assessment considers capital cost, constructability, risk, funding alignment, and long-term system performance.

Table 12-1 Options Comparison

Criteria	Regional Waterline	WTP Upgrade
Capital Cost	High upfront capital cost for transmission infrastructure	Lower capital cost for plant upgrades
O&M Costs	Lower Annual O&M Costs	Higher Annual O&M Costs
Constructability	Moderate-High complexity due to pipeline length, diameter, and crossings	High complexity; constrained by working within an active facility
Construction Risk	Moderate-High short-term risk (geotechnical conditions, HDD, staging, construction duration)	High risk related to sequencing and maintaining operations
Long-Term Risk	Provides reliable long-term water supply	Constrained by source water availability and existing infrastructure
Source Water Security	Accesses regional supply and diversifies sources	Critical risk due to declining or limited source water
Funding Alignment	Strong; supported by provincial programs favouring regionalization	Moderate; eligible for funding but generally lower priority
Environmental Impact	Moderate (open cut disturbance; localized HDD benefits)	Low-Moderate; limited new disturbance but ongoing source impacts
Land & Approvals	Requires easements and multi-jurisdictional coordination	Minimal land impacts; work within existing site
Climate Resilience	Improves drought resilience and long-term reliability	Vulnerable to climate-driven source variability
Operational Complexity	Simple conveyance system once constructed	Ongoing treatment and maintenance requirements; Potential future lack of qualified operators
Future Growth	Supports regional expansion and future demand	Limited; constrained by plant capacity and source availability

Summary of Comparison

- The regional waterline option is characterized by higher upfront cost and certain construction-related risks such as geotechnical conditions and construction duration but provides significant long-term advantages, including secure water supply, strong funding alignment, and improved climate resilience.
- The standalone WTP upgrade option offers lower initial disruption but higher risk with maintaining operations during upgrades, and is constrained by long-term risks, particularly the critical limitation of source water availability, which cannot be resolved through treatment improvements alone.

While both options are technically feasible, the comparison indicates that the regional waterline provides a more robust, scalable, and sustainable solution. Despite short-term construction risks, it mitigates the most significant long-term constraint—reliable access to sufficient source water—and aligns more closely with provincial infrastructure funding priorities and regional water management strategies.

13 CONCLUSION & RECOMMENDATIONS

- The feasibility assessment confirms that a regional water supply from the Commission to the City of Camrose, City of Wetaskiwin, and the County of Wetaskiwin is technically feasible, subject to required upstream infrastructure upgrades requiring coordination with EPCOR.
- The proposed system is capable of meeting projected water demands to the 2061 planning horizon, based on established growth rates and design criteria.
- Alignment options connecting through Beaumont provide operational and hydraulic advantages, including additional capacity provided to Beaumont, reduced system head losses, and improved system efficiency.
- Existing water treatment plants in Camrose and Wetaskiwin will require significant capital upgrades (approximately \$107 million) to maintain and expand capacity over the planning horizon. However, expanding plant capacity may not be a viable long-term solution for servicing population growth due to the uncertainty of the available raw water supply, as discussed below.
- The projected life cycle cost of the regional solutions is comparable to the stand alone WTP needs over a 35-year term.
- Continued reliance on existing raw water sources presents long-term risks related to both water quality and supply reliability. Challenges associated with algae growth, elevated organic levels, and increasing climate variability are expected to place additional pressure on these sources over time. These concerns are compounded by ongoing hydrologic constraints within the Battle River Basin, which has remained under a provincial water shortage advisory since May 31, 2023.
- The regional water supply alternative provides a more reliable, resilient, and sustainable long-term solution, reducing dependence on vulnerable local water sources and improving regional system integration.
- Alignment Option 2 is identified as the preferred option based on environmental considerations, constructability, and overall system performance.

Recommendations

If the Commission is supportive of further developing a regional water supply project, it is recommended that the Commission support the City of Wetaskiwin, the City of Camrose, and County of Wetaskiwin in proceeding with provincial funding support and advance the preferred regional servicing option. Based on the findings of this feasibility assessment, the following next steps are recommended:

- Submit an application for grant funding through the Alberta Water for Life Program to support the next phase of project development.
- Proceed with the regional water supply option, with Alignment Option 2 identified as the preferred alignment, subject to confirmation during future design phases.
- Work collaboratively with the municipalities to determine a preferred governance and financial framework for the regional system extension.
- Advance the project into the preliminary and detailed design phase, including refinement of the preferred alignment, hydraulic modelling, geotechnical investigations, utility coordination, and environmental approvals, subject to funding approval.
- Continue coordination with EPCOR and other stakeholders to confirm upstream infrastructure requirements, system capacity, implementation timing, and integration with planned regional system upgrades.

- Complete additional permitting, land acquisition, and ROW coordination activities as required for the preferred alignment.
- Refine capital cost estimates, project phasing, and implementation scheduling as part of the detailed design process.
- Work with the municipalities to defer major capital upgrades to the existing standalone water treatment plants, where feasible, pending confirmation of the regional servicing approach, in order to avoid redundant or potentially stranded infrastructure investments.

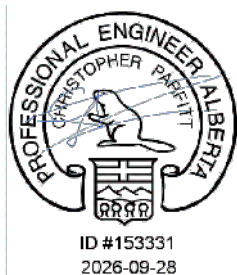
Advancing to preliminary and detailed design and securing external funding are critical next steps to confirm project costs, reduce risk, and position the project for implementation. With the deteriorating water supply and imminent decision required on WTP investments, proceeding with the initial phases of the project, including land acquisition as quickly as possible is critical to ensure no communities are left without safe water supply. The regional water supply system represents a strategic investment for the impacted municipalities and the Province that will enhance long-term water security, operational reliability, and regional collaboration for all participating municipalities and the Commission.

CLOSURE

This report was prepared for the Capital Region Southwest Water Services Commission to investigate the feasibility of regional water supply to the City of Camrose and Wetaskiwin and the County of Wetaskiwin.

The services provided by Associated Engineering Alberta Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions. No other warranty expressed or implied is made.

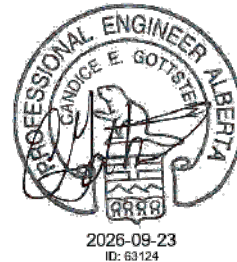
Respectfully submitted,
Associated Engineering Alberta Ltd.



Chris Parfitt, P.Eng.
Project Manager

A handwritten signature in black ink, appearing to read "Emma Knapik".

Emma Knapik, E.I.T.
Project Engineer-In-Training



Candice Gottstein, P.Eng.
Technical Specialist, Water Modelling



Nicholai Kristal, P.Eng.
Process Engineer

A handwritten signature in black ink, appearing to read "Lauren Dombroski".

Lauren Dombroski, B.I.T.
Environmental Scientist

PERMIT TO PRACTICE ASSOCIATED ENGINEERING ALBERTA LTD.	
RM Signature:	
RM APEGA ID #:	72575
Date:	2026-09-28
PERMIT NUMBER: P 03979 The Association of Professional Engineers and Geoscientists of Alberta (APEGA)	

APPENDIX A - ENVIRONMENTAL OVERVIEW REPORT

REPORT

Capital Region Southwest Water Services Commission

Camrose and Wetaskiwin Feasibility Study Environmental Overview 2025-3300



JUNE 2026

CONFIDENTIALITY AND © COPYRIGHT FOR THIS REPORT

This document is for the sole use of the addressee and Associated Engineering Alberta Ltd. The document contains proprietary and confidential information that shall not be reproduced in any manner or disclosed to or discussed with any other parties without the express written permission of Associated Engineering Alberta Ltd. Information in this document is to be considered the intellectual property of Associated Engineering Alberta Ltd. in accordance with Canadian copyright law.

This report was prepared by Associated Engineering Alberta Ltd. for the account of Capital Region Southwest Water Services Commission . The material in it reflects Associated Engineering Alberta Ltd.'s best judgement, in the light of the information available to it, at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Associated Engineering Alberta Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

TABLE OF CONTENTS

SECTION	PAGE NO.
Table of Contents	i
List of Tables	ii
List of Figures	iii
1 Introduction	1
2 Desktop Review Methods	1
3 Baseline Environmental Features	2
3.1 Land Use	4
3.2 Soils and Topography	5
3.3 Surface Water and Aquatic Resources	5
3.4 Vegetation	7
3.5 Wildlife	8
3.6 Historical and Cultural Resources	10
3.7 Potential Contamination	11
4 Regulatory Framework	11
5 Option Comparison	19
6 Planning Recommendations	21
Closure	
References	
Appendix A – Soils	
Appendix B – Surface Water and Aquatic Resources	
Appendix C – Wildlife	

LIST OF TABLES

	PAGE NO.
Table 1-1 Alignment Options	1
Table 3-1 Crown Land Reservations	4
Table 3-2 Topography	5
Table 3-3 Waterbody Crossings	6
Table 3-4 Wetland Crossings	6
Table 3-5 Historic Resource Value 1h Listings Intersected by the Project	10
Table 3-6 Number of Pipeline Crossings and Long-Term Management Cases for Each Alignment Option	11
Table 4-1 Anticipated Regulatory Permits	12
Table 4-2 Regulatory Compliance Recommendations	16
Table 5-1 Summary of Environmental Sensitivities for Alignment Options	19

LIST OF FIGURES

PAGE NO.

Figure 3-1 Environmental Overview

3

1 INTRODUCTION

The City of Camrose (Camrose), the City of Wetaskiwin (Wetaskiwin), and the County of Wetaskiwin have approached the Capital Region Southwest Water Services Commission (CRSWSC) regarding receiving regional water supply to each of the municipalities. CRSWSC is supportive of supplying water to the municipalities, but further study is required to confirm the feasibility and cost.

Associated Engineering Alberta Ltd (Associated), provides this environmental overview for CRSWSC in support of the feasibility study by identifying environmental sensitivities and anticipated regulatory requirements for three water transmission line alignment options (Table 1-1). As the project is currently in the feasibility stage, the design and construction methods have not yet been determined.

Table 1-1 Alignment Options

Alignment Option	Length (km)	ATS Start	ATS End	Description
1	90.5	SW-17-51-24-W4M	NW-34-46-20-W4M	Twinned line from Nisku booster station to Millet, new line to Wetaskiwin, new line to Camrose
2	106.1	NW-22-50-24-W4M	SW-25-46-24-W4M	New line from future second feed line in Beaumont, twinned line to Armena, new line to Camrose, new line to Wetaskiwin
3	96.1	SE-16-50-24-W4M	NW-34-46-20-W4M	New line from future second feed line in Beaumont, twinned line to Millet, new line to Wetaskiwin, new line to Camrose

2 DESKTOP REVIEW METHODS

Associated reviewed the following resources in preparing this report:

- AbaData3 (AbaData Inc. 2026);
- Agricultural Region of Alberta Soil Inventory Database (Government of Alberta 2026b);
- Alberta Conservation Information Management Systems (ACIMS) (Government of Alberta 2026a);
- Alberta Register of Historic Places (Government of Alberta 2026g);
- Early Detection and Distribution Mapping System (EDDMapS) (University of Georgia 2026);
- Environmental records viewer (Government of Alberta 2026d);
- Fisheries and Wildlife Management Information System (FWMIS) (Government of Alberta 2026e); and
- GeoDiscover Alberta (Government of Alberta 2026f).

The following information was documented from these resources, where available:

- Land use;
- Soils and topography;
- Surface water and aquatic resources (including waterbodies, wetlands, and fish);
- Vegetation;
- Wildlife;
- Historic and cultural resources; and
- Potential contamination.

The sensitivities identified were used to compile the anticipated regulatory requirements and compliance considerations.

This report was completed at a desktop level only. No field surveys (e.g., rare plant surveys, wildlife surveys) were completed, and no desktop or field wetland delineations were completed.

3 BASELINE ENVIRONMENTAL FEATURES

The environmental sensitivities identified for each alignment are summarized in Figure 3-1. The data presented in this overview are based on the alignment options as shown in Figure 3-1 and are subject to change.

3.1 Land Use

Alberta is divided into two broad land management areas: the Green Area, which is generally forested Crown land, and the White Area, which is generally privately owned developed/settled land. All alignments are within the White Area.

All alignments intersect primarily agricultural land use and some country residential (Camrose County 2025, County of Wetaskiwin 2024, Leduc County 2025). Options 1 and 3 intersect agricultural land outside the road right-of-way between Leduc and Millet. Option 3 also intersects agricultural land outside the road right-of-way between Beaumont and Leduc. These stretches will likely require greater temporary access considerations. The twinning of the existing waterline for Option 1 between Nisku and Leduc intersects Edmonton International Airport lands, which are owned by Transport Canada.

All alignments intersect Crown land reservations (Alberta Environment and Protected Areas 2026) between Wetaskiwin and Camrose. A Crown land reservation is a “record within the public land registry that identifies and provides notice to users that a specified management intent as supported by policy and government programs applies to a parcel of crown land” (Government of Alberta 2026h). Table 3-1 presents the details of the Crown land reservations.

Table 3-1 Crown Land Reservations

Reservation Number	Reservation Holder	Purpose	Reason	Effective Date
CLR780086	Department of Environment and Water	Water management	Infrastructure protection	March 1, 1978
CLR850010	Red Deer Office – Fish and Wildlife Department of Sustainable Resource Development	Fish and wildlife resources	Multi-species habitat conservation	April 22, 1985
CLR900321	Department of Environment and Water	Water management	Infrastructure protection	November 27, 1990
CLR920229	Vermilion Office – Fish and Wildlife Department of Sustainable Resource Development	Fish and wildlife resources	Waterfowl habitat and population conservation	October 27, 1992

3.2 Soils and Topography

Government soil databases provide cursory information on the soil types that intersect the alignment options. Soil polygons from the Agricultural Region of Alberta Soil Inventory Database are detailed in Appendix A. Option 1 primarily intersects Chernozemic soils, with some Solonetzic soils from south Edmonton to Wetaskiwin. Option 2 primarily intersects Chernozemic soils from Beaumont to Highway 21 north of Township Road 480 and Solonetzic soils from south of Township Road 480 to Camrose. Option 3 primarily intersects Chernozemic soils, with some Gleysolic and Solonetzic soils between Beaumont and Wetaskiwin. All three options primarily intersect Chernozemic soils, with some Solonetzic and Gleysolic soils between Wetaskiwin and Camrose.

All options primarily intersect previously disturbed soils in existing roads and agricultural areas. Options 1 and 3 will likely involve more considerations for handling of agricultural soils than Option 2. The maximum and average slopes for each option were determined using the elevation profile in Google Earth Pro V. 7.3.6.9285 (2024) and are detailed in Table 3-2.

Table 3-2 Topography

Alignment Option	Maximum Slope	Average Slope
1	8.6%	0.7%
2	14.2%	2.1%
3	8.9%	0.8%

Clubroot (*Plasmodiophora brassicae*) is a known agricultural pest in Alberta. Field infestations have been documented in Edmonton, Leduc County, the County of Wetaskiwin, and Camrose County, based on 2024 surveyor results (Government of Alberta 2026c). Clubroot is anticipated to be a concern for all options.

3.3 Surface Water and Aquatic Resources

All options are within the North Saskatchewan River basin. The basin hydrology includes the North Saskatchewan River, starting in the ice fields of Banff National Park and flowing eastward across Alberta. Inflow to the North Saskatchewan River is from the Clearwater, Sturgeon, and Vermilion Rivers. The basin covers around 80, 000 km², approximately 9% of Alberta by area (Canada Water Portal 2012). The options are located in the Hydrologic Unit Code (HUC) 6 watershed boundaries of Whitemud–Blackmud Creeks and Upper Battle River–Pigeon Lake (Government of Alberta 2020e).

3.3.1 Waterbody Crossings

Associated searched FWMIS to identify waterbody crossings for the alignment options. Option 2 involves fewer waterbody crossings than Options 1 and 3 (Table 3-3). The waterbodies and their respective *Water Act* Code of Practice classifications are listed in Table B-1 of Appendix B. The alignment options may involve multiple crossings of the same waterbody within the same Alberta Township System quarter section due to stream morphology.

Shallow open water and lake crossings are concentrated along Highway 13 between Camrose and Wetaskiwin for all options. The twinning of Option 1 intersects Telford Lake for approximately 500 m.

There is evidence of recreational watercraft use of Pipestone Creek (Barnetson 2022, Adventure Alberta 2025), which will be crossed by all alignments. Pipestone Creek may be considered navigable under the *Canadian Navigable Waters Act* (RSC 1985, c. N-22).

Table 3-3 Waterbody Crossings

Alignment Option	Number of Waterbody Crossings
1	31
2	26
3	31

3.3.2 Wetlands

Associated searched AbaData3 using the Alberta Biodiversity Monitoring Institute Wetland Inventory map layer to identify the potential for impacts to wetlands. Option 3 involves fewer crossings of mapped wetlands than Options 1 and 2. Most of the mapped wetlands are marshes, which are concentrated south of Hay Lakes for Option 2 and along Highway 13 between Camrose and Wetaskiwin for all three options. Wetland information is summarized in Table 3-4.

Table 3-4 Wetland Crossings

Wetland Type	Option 1	Option 2	Option 3
Marsh	25	32	22
Swamp	10	9	8
Shallow open water	12	9	10
Total	47	50	40

3.3.3 Fish and Fish Habitat

Associated searched FWMIS to identify the fish species that have been documented in the impacted waterbodies. Fish have been documented at several of the anticipated waterbody crossings, including Blackmud Creek, Clearwater Creek, Pipestone Creek, and several unnamed tributaries. Telford Lake is also documented to be fish-bearing, with records of brook stickleback (*Culaea inconstans*) and fathead minnow (*Pimephales promelas*). No provincially or federally listed fish species have been identified in the anticipated waterbody crossings. The full listing of fish species in the identified waterbody crossings is provided in Table B-2 of Appendix B. Instream work is not anticipated per the current project understanding.

Two invasive species have been documented at the anticipated waterbody crossings. Prussian carp (*Carassius gibelio*) have been documented in Pipestone Creek and northern crayfish (*Faxonius virilis*) have been documented in Blackmud Creek. Prussian carp are thought to have been introduced through illegal transfer and live release and are associated with declines of native fish, benthic invertebrates, and plankton (Alberta Invasive Species Council 2025). Northern crayfish are native to the Beaver River watershed in Alberta but have spread into other river drainages through bait bucket releases and may further the decline of native species by competing for resources and altering habitat (Alberta Invasive Species Council 2024).

The Whitemud–Blackmud Creeks HUC6 is in the Yellow zone for whirling disease, indicating high to moderate risk for transferring the pathogen. The Upper Battle River–Pigeon Lake HUC6 is in the White zone for whirling disease, indicating low risk (Government of Alberta 2020c). All options intersect both zones.

3.4 Vegetation

All alignment options are in the Central Parkland natural subregion of the Parkland natural region. This subregion is characterized by cultivated lands, with a mosaic of aspen and prairie vegetation in remnant native parkland areas. Only an estimated 5% of the region remains in natural vegetation. Croplands of wheat, barley, and canola cover about 80% of the plains, and grasslands dominated by smooth brome and Kentucky bluegrass are common. Native grasslands are rare; western porcupine grass (*Hesperostipa curtiseta*), June grass (*Bromus tectorum*), blue grama (*Bouteloua gracilis*), and pasture sagewort (*Artemisia frigida*) occur on dry, sandy soils, and cover of plains rough fescue (*Festuca hallii*), slender wheatgrass (*Elymus trachycaulus*), and forbs increases as soil moisture increases. Common cattail (*Typha latifolia*), sedge (*Carex* sp.), or bulrush (*Scirpus* sp.) marshes with willow (*Salix* sp.) shrublands are common on wet, poorly drained soils (Natural Regions Committee 2006, Alberta Parks 2015).

Trembling aspen (*Populus tremuloides*) forests are generally found in the upland areas, with a diverse understorey of snowberry (*Symphoricarpos albus*), saskatoon (*Amelanchier alnifolia*), beaked hazelnut (*Corylus cornuta*), choke cherry (*Prunus virginiana*), bunchberry (*Cornus canadensis*), and wild lily-of-the-valley (*Maianthemum canadense*). Balsam poplar (*Populus balsamifera*) forests are present on moister sites and in depressions, often with white spruce (*Picea glauca*) and trembling aspen, and a diverse understorey that includes red osier dogwood (*Cornus sericea*), pussy willow (*Salix discolor*), northern gooseberry (*Ribes oxycanthoides*), green alder (*Alnus alnobetula*), bracted honeysuckle (*Lonicera involucrata*), tall lungwort (*Mertensia paniculata*), mitrewort (*Mitella nuda*), and red baneberry (*Actaea rubra*). Shrub communities, including buckbrush (*Symphoricarpos occidentalis*), silverberry (*Elaeagnus commutata*), prickly rose (*Rosa acicularis*), choke cherry, and saskatoon, occur on moderately well drained sites in moister locations (Natural Regions Committee 2006, Alberta Parks 2015).

Associated searched the ACIMS database for records of rare plant species along the alignment options. ACIMS contains data on elements of biodiversity for conservation planning purposes, including information on vertebrates, invertebrates, plants (vascular and non-vascular), lichens, fungi, landforms, and ecological communities, and assigns elements a subnational rank (S-Rank) to describe the element's conservation status. One non-sensitive element occurrence, long-leaved bluets (*Houstonia longifolia*), last observed in 2007, was returned for Option 1. Long-leaved bluets are designated S-Rank S3 in Alberta, indicating a moderate risk of extirpation. No sensitive or non-sensitive element occurrences of vegetation were returned for Options 2 or 3.

While a comprehensive list of noxious and prohibited noxious weed species along the alignments is not available, a search of EDDMapS shows reported occurrences of Canada thistle (*Cirsium arvense*), common tansy (*Tanacetum vulgare*), and yellow toadflax (*Linaria vulgaris*) in Leduc County, Camrose County, and the County of Wetaskiwin. Leafy spurge (*Euphorbia virgata*) has also been reported in Camrose County and the County of Wetaskiwin.

3.5 Wildlife

Associated searched AbaData3 and FWMIS to identify the presence of sensitive wildlife zones and wildlife species. A full listing of species observations returned through FWMIS is provided in Table C-1, in Appendix C.

3.5.1 Mammals

The alignment options are not located within any sensitive wildlife zones for mammals; however, wildlife may be present near or in the project area at any time. FWMIS indicates three mammal species within 2 km of all options. Of these species, two are federally listed in Schedule 1 of the *Species at Risk Act* (SARA) (SC 2002, c. 29).

The American badger, *taxus* subspecies (*Taxidea taxus taxus*), found in Alberta, is listed as Special Concern on Schedule 1 of SARA due to habitat loss and degradation and roadkill (Government of Canada, 2026b). It should be noted that the *taxus* subspecies has been de-activated by COSEWIC and merged into the Kootenay/Prairies/Rainy River population; the Kootenay/Prairies/Rainy River population is under consideration for addition to Schedule 1 of SARA (Government of Canada 2026a). Individuals of this population remain listed in Schedule 1 under the *taxus* subspecies (Government of Canada 2026a). Utility corridors, including pipelines, are not considered a threat to the species (COSEWIC 2012).

The little brown bat (*Myotis lucifugus*) is listed as Endangered in Schedule 1 of SARA and under the provincial *Wildlife Act* (RSA 2000, c. W-10) largely due to the threat of white nose syndrome. Additional threats include destruction of maternal colonies, chemical contamination, and change in forest structure. This species overwinters in mines and caves and establishes summer maternity colonies in large-diameter trees or in buildings (Government of Canada 2026d). Overwintering habitat is unlikely to be found within 2 km of the alignment options. Maternal colonies are unlikely to be found along road allowances or in agricultural fields, but there are several tree stands that may contain suitable trees and should be investigated further, as follows: between Leduc and Wetaskiwin (Options 1 and 3), between Hay Lakes and Millet (Option 2), and near Camrose (all options). Under the *Wildlife Act*, birthing roosts of bats may not be removed between June 1 and August 31.

3.5.2 Birds

The FWMIS database returned previous observations of 33 bird species within 2 km of the proposed alignments. Of these species, seven are listed in Schedule 1 of SARA:

- Bank swallow (*Riparia riparia*): Threatened
- Barn swallow (*Hirundo rustica*): Threatened
- Bobolink (*Dolichonyx oryzivorus*): Threatened

- Canada warbler (*Wilsonia canadensis*): Threatened
- Horned grebe (*Podiceps auritus*): Special Concern
- Short-eared owl (*Asio flammeus*): Special Concern
- Western grebe (*Aechmophorus occidentalis*): Special Concern (also listed as Threatened under the Alberta *Wildlife Act*)

The project is located within the sensitive raptor range for bald eagles (*Haliaeetus leucocephalus*) and in the sharp-tailed grouse (*Tympanuchus phasianellus*) survey zone. The FWMIS database returned records of bald eagle and sharp-tailed grouse within 2 km of all alignment options. The alignments generally follow road rights-of-way, which are unlikely to contain preferred habitat for bald eagles or sharp-tailed grouse. This may be confirmed before construction.

All options intersect the 200 m piping plover (*Charadrius melodus*) buffer on the south end of Bittern Lake, between Wetaskiwin and Camrose. Piping plover nesting typically occurs on gravel substrate in habitats with wide, sparsely vegetated beaches (Alberta Piping Plover Recovery Team 2010). The sensitive timing window for piping plover nesting sites is April 15 to July 31. Intersection of the alignments with nesting habitat for piping plovers may be confirmed before construction.

All options are located in the B4 migratory bird nesting zone, with a general annual nesting period from April 14 to August 28 (Environment and Climate Change Canada 2025a). Vegetation clearing and ground disturbance activities may impact migratory birds, particularly during the breeding season. Migratory birds and their nests and eggs are protected federally under the *Migratory Birds Convention Act, 1994* (SC 1994, c. 22). Other sensitive species, such as raptors, may nest as early as March and are protected provincially under the *Wildlife Act* (Government of Alberta 2011). Restrictions are generally triggered by the habitat, species type, activity type, and potential for disturbance during construction. Table C-2, in Appendix C, summarizes the sensitive timing windows and recommended setbacks for the species identified within 2 km of the alignment options.

3.5.3 Amphibians

The FWMIS database returned previous records of Canadian toad (*Anaxyrus hemiophrys*) within 2 km of Options 1 and 3 and boreal toad (*Anaxyrus boreas*) within 2 km of Option 2. The boreal toad is listed as Special Concern in Schedule 1 of SARA due to the threat of chytrid fungus and the species' vulnerability to habitat fragmentation and degradation (Environment and Climate Change Canada 2020). The shallow open waters between Camrose and Wetaskiwin may provide suitable breeding habitat for boreal toads.

3.5.4 Reptiles

The FWMIS database returned previous observations of plains garter snakes (*Thamnophis radix*) within 2 km of all options. Although this species is not federally or provincially listed as a species at risk, the dens (hibernacula) of snakes are protected year-round under the *Wildlife Act*. Hibernacula have been found in slump banks, meander scrapes and fissures, sinkholes, rocky outcrops, and mammal burrows. These features are often associated with river valleys and are often located on south- to southeast-facing slopes (Government of Alberta 2020b). Garter snakes may also overwinter in anthropogenic structures, including rock piles, building foundations, bridges, and underground spaces around buried utilities and pipelines (Alberta Conservation Association 2019). Hibernacula may be found within the project area.

3.5.5 Invertebrates

The ACIMS spatial data indicates two sensitive element occurrences of monarch butterflies (*Danaus plexippus*) near Wetaskiwin. Monarchs are listed as Endangered in Schedule 1 of SARA (Government of Canada 2026e), with the use of pesticides and herbicides identified as a primary threat (Environment and Climate Change Canada 2016). One non-sensitive element occurrence of umbilicate sprite (*Promenetus umbilicatellus*) is reported in a tributary of Pipestone Creek, within 2 km of all alignment options between Camrose and Wetaskiwin. Another non-sensitive element occurrence of ochre dagger moth (*Acronicta morula*) was reported within 2 km of Option 1 in south Edmonton. The umbilicate sprite and ochre dagger moth are both designated S-Rank SU, indicating that the species are currently unrankable due to lack of information or substantially conflicting information.

Option 2 intersects critical habitat for the gypsy cuckoo bumble bee (*Bombus bohemicus*) (Government of Canada 2026c), which is listed as Endangered in Schedule 1 of SARA (Government of Canada 2026e). The decline in host species, the introduction of pathogens and invasive species, and the use of pesticides, herbicides, and fungicides have been identified as the primary threats to the gypsy cuckoo bumble bee. The development of utilities is not considered an activity likely to result in the destruction of critical habitat, though herbicides used to control invasive weeds may destroy foraging habitat (Environment and Climate Change Canada 2025b).

3.6 Historical and Cultural Resources

3.6.1 Historic Resource Value Listings

This project will require a clearance under the *Historical Resources Act* (RSA 2000, c. H-9) as it is a major pipeline project. All options will cross land with provincially designated historic resource value (HRV) listings of 5a,p (high potential for archaeological or paleontological historic resources) and 4a (contains an archaeological historic resource that may require avoidance or assessment). All options also intersect HRV 1h sites. A value of HRV 1 indicates a World Heritage Site or a site designated under the *Historical Resources Act* as a Provincial Historic Resource, and work on land designated as HRV 1 requires ministerial approval. The HRV 1h listings intersected by the project are detailed in Table 3-5. These features will likely require avoidance.

Table 3-5 Historic Resource Value 1h Listings Intersected by the Project

Alignment Option	ATS Location	Provincial Historic Resource
1, 3	SW-2-47-20-W4M	Camrose Public Library
1, 3	NW-34-46-20-W4M	Camrose Normal School/Rosehaven
1, 3	NW-34-46-20-W4M	Canadian Northern railway station
2	NW-32-48-21-W4M	Hay Lakes telegraph station

3.6.2 Cultural Considerations

Environmental impacts from pipeline construction may affect First Nations Treaty Rights and traditional land uses. The alignment options are on Treaty 6 territory and in Region 10 of the Metis Nation of Alberta Association.

The following First Nations reserves are near the alignment options in Treaty 6:

- Enoch Cree Nation Reserve No. 135, in Parkland County, northwest of Option 3;
- Pigeon Lake Reserve No. 138A, in the County of Wetaskiwin, west of the endpoint of the alignments in Wetaskiwin; and
- Louis Bull Reserve No. 138B and Ermineskin Reserve No. 138, both in the County of Wetaskiwin and Ponoka County, southwest of the endpoint of the alignments in Wetaskiwin.

3.7 Potential Contamination

Associated searched AbaData for active oil and gas wells and pipelines, and the Alberta environmental records viewer for open long-term management cases within the project area. AbaData showed no active oil or gas wells within 200 m of the alignment options. Table 3-6 shows the approximate number of active pipeline crossings and active long-term management cases within 200 m for all options. Most of the long-term management cases for Options 1 and 3 are along 48 Ave. in Camrose. The most recent incident date is February 11, 2013, for DLTM0012478, located at the junction of Highway 13 and Highway 21 for all alignments. The overall potential for environmental contamination is considered low.

Table 3-6 Number of Pipeline Crossings and Long-Term Management Cases for Each Alignment Option

Alignment	Number of Crossings	Number of Cases
1	69	14
2	67	1
3	66	14

4 REGULATORY FRAMEWORK

The anticipated regulatory permitting considerations are outlined in Table 4-1, which are based on current legislation. The compliance considerations for specific regulations are outlined in Table 4-2. The permit and regulatory requirements should be revisited when the preferred alignment for the project is selected and the designs progress.

Table 4-1 Anticipated Regulatory Permits

Legislation and Permit	Application Trigger	Anticipated Project-Specific Requirements	Regulatory Agency and Timeline
Federal			
<i>Fisheries Act</i> (RSC 1985, c. F-14) Request for review	Work that may impact fish and fish habitat, or work completed below the high-water mark of a fish-bearing waterbody	Where trenchless methods (such as horizontal directional drilling are used near water, the Fisheries and Oceans Canada measures to protect fish and fish habitat (Fisheries and Oceans Canada, 2025) can be followed, and no request for review is required. If open cut or trenched methods are used near water, a request for review may be required.	Fisheries and Oceans Canada N/A (3–4 months if request for review is required)
<i>Impact Assessment Act</i> (SC 2019, c. 28, s. 1) Environmental effects evaluation	Specific to Option 1 Work that may cause adverse environmental impacts on federally owned land	Twinning of the existing waterline from Edmonton to Millet for Option 1 passes through Transport Canada–owned land, leased by the ERAA, and may trigger federal review. The requirements will be determined through consultation with the ERAA.	ERAA Timeline at ERAA discretion
<i>Canadian Navigable Waters Act</i> (RSC 1985, c. N-22) Approval	Construction of a work under a non-scheduled navigable water	Pipestone Creek may be considered navigable under the Act. Where trenchless methods are used (e.g., horizontal directional drilling), an approval will not be required.	Transport Canada N/A (3 months if approval is required)

Legislation and Permit	Application Trigger	Anticipated Project-Specific Requirements	Regulatory Agency and Timeline
Provincial			
<i>Environmental Protection and Enhancement Act</i> (RSA 2000, c. E-12) <i>Conservation and Reclamation Regulation</i> (Alberta Reg. 115/1993) Conservation and reclamation approval	Construction of a Class I pipeline	It is expected that a conservation and reclamation approval will be required for all options due to the length of each option, regardless of the pipe diameter.	Alberta Environment and Protected Areas 3–6 months
<i>Historical Resources Act</i> (RSA 2000, c. H-9) Approval	Ground disturbance within a provincially designated historic resource value area	Extensive ground disturbance projects require an approval for the proposed project works. Applications for approval are submitted to the Historic Resources Management Branch of Alberta Arts, Culture and Status of Women for assessment of resources within the project area. A historic resources impact assessment may be required as part of this project, following direction provided by Alberta Culture.	Alberta Culture 3–4 months An extended time frame will be required if a historic resources impact assessment is required.
<i>Public Lands Act</i> (RSA 2000, c. P-40) Temporary field authorization	Temporary occupation of Crown-claimed lands	Pipeline crossings under existing permissions (e.g., within the road right-of-way) should not require an approval under this Act. Temporary/short-term use (e.g., laydowns) may require a temporary field authorization. Applications for a temporary field authorization are submitted to Alberta Forestry and Parks via email.	Alberta Forestry and Parks 1 month

Legislation and Permit	Application Trigger	Anticipated Project-Specific Requirements	Regulatory Agency and Timeline
<i>Water Act</i> (RSA 2000, c. W-3) Approval	Utility installation where the conditions of the Code of Practice cannot be met	Where the project's waterbody crossings (including wetland crossings) cannot follow the Code of Practice for Pipelines and Telecommunication Lines Crossing Waterbodies (Government of Alberta 2013), an approval will be required. Twinning of the existing waterline below Telford Lake for Option 1 will require approval. Approvals may be required for the waterbody crossings along Highway 13 between Camrose and Wetaskiwin for all options. Applications for an approval will be submitted through DRAS, supplemented by the design drawings. Additional project details may be required, including the construction specifications and schedule. A pre-consultation assessment request must be submitted to the Aboriginal Consultation Office in support of this application. The results of the Indigenous consultation process are required before the licence may be issued.	Alberta Environment and Protected Areas 3–4 months
Code of Practice for Pipelines and Telecommunication Lines Crossing a Water Body Notification	Utility installation where the conditions of the Code of Practice can be met	Where the project's watercourse crossings (including wetland crossings) can follow the Code of Practice for Pipelines and Telecommunication Lines Crossing Waterbodies (Government of Alberta 2013), a Code of Practice notification will be required for all watercourse and wetland crossings. Notifications must be submitted through DRAS at least 14 days before work begins and require stamped and signed engineering drawings of the crossings. For crossings of Class A, B, or C watercourses, recommendations from a qualified aquatic environmental specialist may be required.	Alberta Environment and Protected Areas At least 14 days before the activity begins

Legislation and Permit	Application Trigger	Anticipated Project-Specific Requirements	Regulatory Agency and Timeline
		Wetland crossings have additional submission requirements where temporary or permanent impacts occur. For temporary impacts associated with pipeline construction, a wetland impact assessment form will need to be submitted. The project must meet all the conditions in the applicable Code of Practice. If the conditions cannot be met, an approval will be required.	
Water Act Licence	Operation of a “works” as defined in the <i>Water (Ministerial) Regulation</i> (Alberta Reg. 43/1997)	The application will be submitted through DRAS and will be supplemented by project design drawings and a hydrological assessment. Complex projects may require additional project details, including the construction specifications, schedule, operational plans, water requirements, and method of operation. The Government of Alberta requires a fee for a licence, depending on the volume of water applied for. A pre-consultation assessment request must be submitted to the Aboriginal Consultation Office in support of this application. The results of the Indigenous consultation process are required before the licence is issued.	Alberta Environment and Protected Areas 3–4 months

Table 4-2 Regulatory Compliance Recommendations

Legislation and Description	General Practices for Complying with the Act
Federal	
<i>Migratory Birds Convention Act, 1994</i> (SC 1994, c. 22) This Act protects migratory birds, their eggs, and their active nests.	Consider whether any activities that may disturb migratory birds, their eggs, or active nests (e.g., vegetation clearing) will occur in the project area. Vegetation clearing may impact migratory birds, especially during the breeding season. Vegetation clearing should therefore be scheduled to occur outside the migratory bird nesting period (as defined by the federal government), as this period is associated the greatest likelihood of encountering/impacting nesting birds. If vegetation clearing cannot be avoided during the migratory bird nesting period, a qualified environmental professional should evaluate the site and determine whether any active nests are present that may be impacted by the proposed activities. This evaluation may involve surveys (with appropriate provincial permits) that are species-appropriate and vegetation-appropriate. The environmental professional may provide recommendations for operating around migratory birds and may establish appropriate buffers (i.e., zones in which no construction activities, equipment, or personnel are permitted) around nests. Project specific: The project area is located in migratory bird nesting zone B4, with a general migratory bird breeding period of April 14 to August 28 (Environment and Climate Change Canada, 2025a).
<i>Species at Risk Act</i> (SC 2002, c. 29) This Act regulates activities that may impact species at risk or species of concern, and/or their habitat.	Consider whether any species listed in Schedule 1 of the Act are known to occur in the project area. If any wildlife are encountered during project construction, they should not be harassed or disturbed, as per federal and provincial legislation. Project specific: Schedule 1 species have been documented in the project area previously. Refer to Table C-1, in Appendix C, for a full listing. Option 2 intersects critical habitat for the gypsy cuckoo bumblebee (<i>Bombus bohemicus</i>). The destruction of the critical habitat of a protected species is prohibited under Section 61(1) of the Act.

Legislation and Description	General Practices for Complying with the Act
Provincial	
<i>Agricultural Pests Act</i> (RSA 2000, c. A-8) This Act regulates species that may interfere with agricultural productivity.	Appropriate measures to mitigate the spread of agricultural pests should be used. Project specific: The project area is within an area with known occurrences of clubroot (<i>Plasmodiophora brassicae</i>). Mitigation measures should be incorporated and best management practices followed. For example, equipment and tools should be disinfected before entering worksites.
<i>Soil Conservation Act</i> (RSA 2000, c. S-15) This Act mandates that landholders prevent soil loss or deterioration from occurring or from continuing.	Appropriate measures to prevent soil loss or deterioration must taken. If soil loss or deterioration is taking place, the loss or deterioration must be stopped from continuing. Project specific: Appropriate best management practices for soil conservation (e.g., control wind and water erosion of soil during construction) must be used in all areas affected by soil disturbance during construction.
<i>Weed Control Act</i> (RSA 2008, c. W-5.1) This Act regulates weed species listed in Schedule 1 (prohibited noxious weeds) and Schedule 2 (noxious weeds).	The prohibited noxious weed species listed in Schedule 1 of the Act shall be destroyed and the spread of the noxious weed species listed in Schedule 2 shall be controlled/prevented. Project specific: A comprehensive list of weed species in the project area is not available. Canada thistle (<i>Cirsium arvense</i>), common tansy (<i>Tanacetum vulgare</i>), leafy spurge (<i>Euphorbia virgata</i>), and yellow toadflax (<i>Linaria vulgaris</i>) have been reported in the County of Wetaskiwin and Camrose County. During construction, any prohibited noxious weeds encountered must be destroyed, and any noxious weeds encountered must be controlled (consult an environmental professional). Mitigation measures to prevent the spread of weeds typically involve routine and specific cleaning of equipment before entering the project site and before operation at a subsequent site.
<i>Wildlife Act</i> (RSA 2000, c. W-10) This Act prohibits the wilful molestation, disruption, or destruction of wildlife or a house, nest, or den of wildlife.	Consider whether any wildlife, their nests, or dens will be disturbed as part of the project activities. Sensitive raptors may nest as early as March (Government of Alberta 2011). Project specific: Tree clearing after March 15 should account for potential impacts to nesting sensitive raptors if trees to be cleared contain appropriate raptor habitat. Implications similar to those in the <i>Migratory Birds Convention Act, 1994</i> apply. If bird surveys are planned as a mitigation measure during the migratory bird nesting period, a permit under this Act will be required by the qualified environmental professional conducting the study.

Legislation and Description	General Practices for Complying with the Act
	Plains garter snakes (<i>Thamnophis radix</i>) have been documented within 2 km of the project area, and suitable habitat for snake hibernacula may exist in the project area. Little brown bats (<i>Myotis lucifugus</i>) have been documented within 2 km of the project area, and all options intersect tree stands that may contain suitable habitat for maternal roosts. Tree stands intersected by the preferred alignment should be assessed for maternal roosts before construction. Under the <i>Wildlife Regulation</i> (Alberta Reg. 143/1997), maternal roosts must not be removed between June 1 and August 31.
Municipal	
Bylaw 796 (Camrose County 1988)	Removing topsoil from Camrose County is prohibited without a permit.
This Bylaw controls the removal of topsoil in Camrose County.	Project specific: Consider whether topsoil will be removed from Camrose County within the project area. If topsoil is removed as part of the project, a permit will be required.
Policy 11.34 – Clubroot of Canola (Camrose County 2014)	
This policy aims to prevent the establishment and spread of clubroot in Camrose County.	Sanitation measures and best management practices should be followed to prevent the spread of clubroot.
Policy 62.2.3 – Control of Clubroot Disease in Canola (County of Wetaskiwin 2022)	Project specific: The project area is within an area with known occurrences of clubroot. Sanitation practices should be developed for personnel, vehicles, and equipment that will be involved in soil disturbance. Best management practices should be adhered to.
This policy aims to prevent the growth and spread of clubroot in canola crops in the County of Wetaskiwin.	

5 OPTION COMPARISON

The baseline environmental features reviewed for the alignment options are summarized in Table 5-1. Each option was compared based on the presence or absence of environmental features and was given a score:

- 0 – considered to have a lesser environmental impact; and
- 1 – considered to have a greater environmental impact.

Where two or more options are assigned the same score, the environmental impacts are anticipated to be similar between the options. Additional permitting requirements were also considered in making the overall recommendation.

Table 5-1 Summary of Environmental Sensitivities for Alignment Options

Environmental Factor	Option 1	Option 2	Option 3	Summary	Recommendation
Land use	1	0	1	All options intersect similar land uses. Option 1 passes through federally owned lands.	Option 2. The agricultural lands between Leduc and Millet intersected by Options 1 and 3 may require greater temporary access considerations. Option 1 may trigger additional permitting requirements under the <i>Impact Assessment Act</i> (SC 2019, c. 28, s. 1).
Soils	1	0	1	All options traverse primarily pre-disturbed soils along road allowances or agricultural areas. Options 1 and 3 will likely require greater disturbance and reclamation of agricultural soils.	Option 2. Option 2 will intersect primarily disturbed soils within road allowances, which will allow reclamation to pre-existing conditions.
Vegetation	1	0	0	All options are in the Central Parkland natural subregion. Vegetation is anticipated to be similar along all options.	Option 2 or 3. Option 1 may intersect with rare plant species. No rare plant species are reported for Options 2 and 3.

Environmental Factor	Option 1	Option 2	Option 3	Summary	Recommendation
Surface water and aquatic resources	1	0	1	Option 1 intersects Telford Lake. Options 1 and 3 involve the greatest number of waterbody crossings. All options may require approval under the <i>Water Act</i> (RSA 2000, c. W-3) for waterbody crossings between Camrose and Wetaskiwin.	Option 2. Option 1 will require approval under the <i>Water Act</i> for twinning the waterline under Telford Lake. Option 2 involves the fewest waterbody crossings.
Wildlife	0	1	0	All options affect wildlife habitat.	Options 1 or 3. Option 2 intersects critical habitat for the gypsy cuckoo bumblebee (<i>Bombus bohemicus</i>), which is listed as Endangered in Schedule 1 of the <i>Species at Risk Act</i> (SC 2002, c. 29).
Historic resources	1	1	1	All options will require approval under the <i>Historical Resources Act</i> (RSA 2000, c. H-9). All options will intersect HRV 1h listings.	All options. The selected option will require avoidance of HRV 1h listings.
Cultural resources	0	0	0	All options are in proximity to reserves.	All options. All options may require First Nations consultation.
Contamination	1	0	1	All options intersect a similar number of pipelines. Options 1 and 3 are in proximity to more long-term management cases.	Option 2. Option 2 passes near fewer active long-term management cases, which reduces the potential of encountering contamination.
Scoring	6	2	5		
Overall recommendation					Option 2, if the HRV 1h in NW-32-48-21-W4M can be avoided.

HRV – historic resource value

6 PLANNING RECOMMENDATIONS

When the preferred alignment is selected, the permitting requirements should be revisited in the next stage of design. Regulatory permits and approvals should be obtained before construction begins, and during construction, all conditions must be followed. The following planning recommendations should also be considered during the project design:

Soils

- If open cut methods are used, salvage and stockpile topsoil and subsoil separately to prevent admixing.
- To prevent the spread of clubroot, incorporate the applicable best management practices outlined in the Alberta Clubroot Management Plan (Alberta Clubroot Management Committee 2014) into the project-specific environmental construction operations plan.
- Develop a conservation and reclamation plan for approval under the *Environmental Protection and Enhancement Act* (RSA 2000, c. E-12). The *Conservation and Reclamation Regulation* (Alberta Reg. 115/1993) under the Act requires that soils be restored to their equivalent land use capabilities after construction; this would require information on the soil conditions before disturbance, including topsoil and subsoil depth. Seasonal restrictions apply to pre-existing soil sampling, with fieldwork completed from May to October.

Surface Water and Aquatic Resources

- Consider trenchless construction techniques for the project and specifically for environmentally sensitive areas, such as wetlands and watercourse crossings.
- Consult a wetland professional during preliminary design to delineate wetlands in the project area and provide recommendations for mitigation and avoidance, and to support regulatory permitting. Seasonal restrictions apply to wetland delineation, with fieldwork completed from May to October.
- Consult a qualified environmental professional to assess watercourse crossings and potential impacts on fish and fish habitat, if trenchless construction cannot be used.
- Develop a plan to dispose of drilling fluids away from any surface water features, in accordance with the requirements under the *Environmental Protection and Enhancement Act*.
- Implement all applicable measures from the Decontamination Protocol for Work in or Near Water (Government of Alberta 2020a) to prevent the spread of whirling disease.

Vegetation

- Ensure tools and equipment arrive on site clean and free of soil and vegetation to reduce the risk of transfer of weeds and pathogens.
- Remove prohibited noxious weeds and control noxious weeds on the project site, in accordance with the *Weed Control Act* (SA 2008, c. W-5.1).

Wildlife

- When an alignment is selected, submit a detailed information request for location data for garter snake hibernacula to the provincial wildlife contact for the Spruce Grove district of the South region.
- Plan for the required vegetation clearing activities to take place outside the migratory bird nesting period. Land clearing activities proposed from March 15 to August 28 should be reviewed by a qualified

environmental professional to determine whether any due diligence actions are required (e.g., lek surveys, nest surveys).

- Work within the 200 m piping plover buffer (see Section 3.5.2) should occur outside the sensitive timing window of April 15 to July 31. Where possible, work within the buffer should follow existing disturbances.
- Any use of herbicides for weed control should be done in accordance with the latest Health Canada Pesticides Regulatory Directorate regulations and the *Pesticide (Ministerial) Regulation* (Alberta Reg. 43/1997) of the *Environmental Protection and Enhancement Act* to protect SARA-listed invertebrates. If Option 2 is selected, consult with Environment and Climate Change Canada for best practices to prevent destruction of critical habitat for the gypsy cuckoo bumble bee.

Historic Resources

- Incorporate avoidance measures for HRV 1h listings in the project design. If avoidance is not possible, consult with Alberta Arts, Culture and Status of Women early in the project design.

CLOSURE

This report was prepared for the Capital Region Southwest Water Services Commission to identify the baseline environmental features present along three waterline alignment options and to present regulatory requirements and planning recommendations for the proposed water transmission line.

The services provided by Associated Engineering Alberta Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

Associated Engineering Alberta Ltd.



Lauren Dombroski, BIT
Environmental Scientist



Deanna Joly, P.Ag.
Regulatory Planner

REFERENCES

- AbaData Inc. 2026. AbaData3. Available at: [AbaData 3](#). Accessed March 4, 2026.
- Adventure Alberta. 2025. Kayaking in the Edmonton Area – Places to Go Kayaking Near Edmonton. Available at: <https://adventurealberta.ca/kayaking-near-edmonton/>. Accessed March 18, 2026.
- Agricultural Pests Act*, RSA 2000, c. A-8.
- Alberta Clubroot Management Committee. 2014. Alberta Clubroot Management Plan. Available at: <https://open.alberta.ca/publications/7089438/resource/2883d945-9938-4655-906a-415744cb3314>. Accessed May 20, 2026.
- Alberta Conservation Association. 2019. Reptiles of Alberta. Available at: https://www.ab-conservation.com/downloads/avamp/aca_reptiles_of_alberta.pdf. Accessed March 6, 2026.
- Alberta Environment and Protected Areas. 2026. Crown Land Reservations. Available at: <https://geodiscover.alberta.ca/geoportal/rest/metadata/item/858dfab29e4f4361934095b312f1b5c9/html>. Accessed February 25, 2026.
- Alberta Invasive Species Council. 2024. Northern Crayfish. Available at: https://abinvasives.ca/wp-content/uploads/2024/04/UR_FS-NorthernCrayfish.pdf. Accessed March 6, 2026.
- Alberta Invasive Species Council. 2025. Prussian Carp. Available at: <https://abinvasives.ca/wp-content/uploads/2021/02/250814-FS-Prussian-Carp-1.pdf>. Accessed March 6, 2026.
- Alberta Parks. 2015. Natural Regions and Subregions of Alberta: A Framework for Alberta's Parks. Alberta Tourism, Parks and Recreation. Available at: <https://www.albertaparks.ca/media/6256258/natural-regions-subregions-of-alberta-a-framework-for-albertas-parks-booklet.pdf>. Accessed March 5, 2026.
- Alberta Piping Plover Recovery Team. 2010. Alberta Piping Plover Recovery Plan, 2010-2020. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Recovery Plan No. 18. Edmonton. Available at: <https://open.alberta.ca/dataset/9eae688e-e1dc-4a58-b9b9-de4834985c3c/resource/08bc6994-1cd1-4389-b2d5-b6a0848ccffa/download/2010-sar-albertapipingploverrecoveryplan2010-2020.pdf>. Accessed April 21, 2026.
- Barnetson, B. 2022. Pipestone Creek at Coal Lake. Available at: <https://edmontoncanoeing.blogspot.com/2022/06/pipestone-creek-at-coal-lake.html>. Accessed March 18, 2026.
- Camrose County. 1988. Bylaw No. 796. Available at: <camrosecounty.civicweb.net/document/198471/>. Accessed May 20, 2026.
- Camrose County. 2014. Policy No. 11.34, Clubroot of Canola. Available at: <camrosecounty.civicweb.net/document/27422/>. Accessed May 20, 2026.
- Camrose County. 2025. Land Use District Map. Available at: <https://county.camrose.ab.ca/wp-content/uploads/2025/05/2025-Land-Use-District-Map-Bylaw-1541-1.pdf>. Accessed May 20, 2026.
- Canada Water Portal. 2012. North Saskatchewan River Basin. Available at: <https://waterportal.ca/north-saskatchewan-river-basin/>. Accessed March 4, 2026.
- Canadian Navigable Waters Act*, RSC 1985, c. N-22.

Conservation and Reclamation Regulation, Alberta Reg. 115/1993.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2012. COSEWIC Assessment and Status Report on the American Badger *Taxidea taxus* in Canada. Available at: https://ecprccsarstacct.z9.web.core.windows.net/files/SARAFiles/legacy/cosewic/sr_blaireau_am_badger_1113_e.pdf. Accessed March 27, 2026.

County of Wetaskiwin 2022. Policy No. 62.2.3, Control of Clubroot Disease in Canola. Available at: <https://www.county.wetaskiwin.ab.ca/DocumentCenter/View/120/Control-of-Clubroot-Disease-in-Canola-Policy-6223>. Accessed May 20, 2026.

County of Wetaskiwin. 2024. Bylaw 2024/66, Land Use Bylaw. Available at: <https://www.county.wetaskiwin.ab.ca/DocumentCenter/View/444/Land-Use-Bylaw-2024-66?bidId=>. Accessed May 20, 2026.

Environment and Climate Change Canada. 2016. Management Plan for the Monarch (*Danaus plexippus*) in Canada. *Species at Risk* Management Plan Series. Available at: <https://ecprccsarstacct.z9.web.core.windows.net/files/SARAFiles/legacy/plans/mp-monarch-e-final.pdf>. Accessed April 14, 2026.

Environment and Climate Change Canada. 2020. Management Plan for the Western Toad (*Anaxyrus boreas*), Calling and Non-Calling Populations, in Canada. *Species at Risk* Management Plan Series. Available at: https://ecprccsarstacct.z9.web.core.windows.net/files/SARAFiles/legacy/plans/mp_western_toad_calling_no_n-calling%20_populations_final_e.pdf. Accessed May 19, 2026.

Environment and Climate Change Canada. 2025a. Nesting Periods. Available at: https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html#_zoneB_calendar. Accessed March 6, 2026.

Environment and Climate Change Canada. 2025b. Recovery Strategy for the Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*) in Canada. *Species at Risk* Act Recovery Strategy Series. Available at: https://ecprccsarstacct.z9.web.core.windows.net/files/SARAFiles/00020670-RECFIN_DT0102-en-rs_gypsy_cuckoo_bumble_bee_e_final.pdf. Accessed April 9, 2026.

Environmental Protection and Enhancement Act, RSA 2000, c. E-12.

Fisheries and Oceans Canada. 2025. Measures to protect fish and fish habitat. Available at: <https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html>. Accessed May 29, 2025.

Fisheries Act, RSC 1985, c. F-14.

Google Earth Pro V 7.3.6.9285. 2024. Leduc, Wetaskiwin, and Camrose, Alberta. 53°07'46.83" N 113°13'01.06" W, eye alt 34.88 km. Airbus 2026, Landsat/Copernicus, Maxar Technologies 2026. Accessed February 27, 2026.

Government of Alberta. 2011. Recommended Land Use Guidelines for Protection of Selected Wildlife Species and Habitat within Grassland and Parkland Natural Regions of Alberta. Available at: <https://open.alberta.ca/dataset/e269aad8-3664-402a-b7cb-77abe89e9617/resource/6195d2d4-9f7d-43e5-ada5-81a8210fae38/download/3054250-2011-recommended-land-use-guidelines-protection-wildlife-species-habitat.pdf>. Accessed May 29, 2026.

Government of Alberta. 2013. Code of Practice for Pipelines and Telecommunication Lines Crossing a Waterbody. Available at: <https://open.alberta.ca/publications/pipeline>. Accessed May 29, 2026.

- Government of Alberta. 2020a. Decontamination Protocol for Work in or Near Water. Available at: <https://open.alberta.ca/dataset/9b126cfd-b637-4dd2-838e-b43d12c8993a/resource/d89b106e-af61-4858-a991-12caadd0869d/download/aep-decontamination-protocol-for-work-in-or-near-water.pdf>. Accessed May 20, 2026.
- Government of Alberta. 2020b. Sensitive Snake Species and Hibernacula Range. Available at: <https://open.alberta.ca/dataset/856f23c2-0256-4c27-8b3b-14384996c179/resource/6a4bb00b-0c5e-4f10-b420-7f188de72471/download/aep-science-support-document-sensitive-snake-species-and-hibernacula-range.pdf>. Accessed March 6, 2026.
- Government of Alberta. 2020c. Whirling Disease Decontamination Risk Zone. Available at: <https://open.alberta.ca/dataset/c240b099-18cb-4037-91fa-4038de4012f7/resource/ac3a4e79-8fba-4a8c-ae91-7662134d7407/download/aep-whirling-disease-decontamination-risk-zone-map-2020-08.pdf>. Accessed May 20, 2026.
- Government of Alberta. 2026a. ACIMS Data Search Map. Available at: <https://geospatial.alberta.ca/portal/apps/webappviewer/index.html?id=9a78e3bb5a78474eba5a2844ff07fc7b>. Accessed March 4, 2026.
- Government of Alberta. 2026b. Alberta Soil Information Viewer. Available at: <https://soil.agric.gov.ab.ca/agrasidviewer/>. Accessed February 27, 2026.
- Government of Alberta. 2026c. Cumulative Clubroot Infestations in Alberta. Available at: <https://www.alberta.ca/cumulative-clubroot-infestations-in-alberta>. Accessed February 27, 2026.
- Government of Alberta. 2026d. ERV – Long Term Management. Available at: <https://geospatial.alberta.ca/erv-ltm/>. Accessed March 6, 2026.
- Government of Alberta. 2026e. Fish and Wildlife Internet Mapping Tool – Public. Available at: https://geospatial.alberta.ca/FWIMT_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT_Pub. Accessed March 4, 2026.
- Government of Alberta. 2026f. GeoDiscover Alberta. Available at: <https://geodiscover.alberta.ca/geoportal/>. Accessed February 25, 2026.
- Government of Alberta. 2026g. Alberta Register of Historic Places. Available at: <https://hermis.alberta.ca/ARHP/Default.aspx?DeptID=1>. Accessed May 20, 2026.
- Government of Alberta. 2026h. Land Use Reservation Program. Available at: <https://www.alberta.ca/land-use-reservation-program>. Accessed May 19, 2026.
- Government of Canada. 2026a. American Badger (*Taxidea taxus*), Kootenay/Prairies/Rainy River population. Available at: <https://species-registry.canada.ca/index-en.html#/species/3051-2554>. Accessed March 6, 2026.
- Government of Canada. 2026b. American Badger *taxus* subspecies (*Taxidea taxus taxus*). Available at: <https://species-registry.canada.ca/index-en.html#/species/623-880>. Accessed March 6, 2026.
- Government of Canada. 2026c. Critical Habitat for Species at Risk National Dataset – Canada. Available at: <https://open.canada.ca/data/en/dataset/47caa405-be2b-4e9e-8f53-c478ade2ca74>. Accessed March 6, 2026.
- Government of Canada. 2026d. Little Brown Myotis (*Myotis lucifugus*). Available at: <https://species-registry.canada.ca/index-en.html#/species/1173-848>. Accessed March 6, 2025.

- Government of Canada. 2026e. Species at risk public registry. Available at: <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>. Accessed March 5, 2026.
- Historical Resources Act*, RSA 2000, c. H-9.
- Impact Assessment Act*, SC 2019, c. 28, s. 1.
- Migratory Birds Convention Act*, 1994, SC 1994, c. 22.
- Natural Regions Committee. 2006. Natural Region and Subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852. Available at: <https://open.alberta.ca/dataset/dd01aa27-2c64-46ca-bc93-ca7ab5a145a4/resource/98f6a93e-c629-46fc-a025-114d79a0250d/download/2006-nrsrcomplete-may.pdf>. Accessed March 5, 2026.
- Leduc County. 2025. Bylaw No. 14-25, Leduc County Land Use Bylaw. Available at: <https://www.leduc-county.com/public/download/files/288918>. Accessed May 20, 2026.
- Pesticide (Ministerial) Regulation*, Alberta Reg. 43/1997.
- Public Lands Act*, RSA 2000, c. P-40.
- Soil Conservation Act*, RSA 2000, c. S-15.
- Species at Risk Act*, SC 2002, c. 29.
- University of Georgia - Center for Invasive Species and Ecosystem Health (University of Georgia). 2026. EDDMapS. Available at: <http://www.eddmaps.org/>. Accessed March 5, 2026.
- Water Act*, RSA 2000, c. W-3.
- Water (Ministerial) Regulation*, Alberta Reg. 43/1997.
- Weed Control Act*, SA 2008, c. W-5.1.
- Wildlife Act*, RSA 2000, c. W-10.
- Wildlife Regulation*, Alberta Reg. 143/1997

APPENDIX A – SOILS

Table A-1 Soil Types Intersected by the Alignment Options

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
1	South Edmonton	14364	MMO7/U1I Malmo (80%), Miscellaneous Solonetzic (20%)	Eluviated Black Chernozem on fine textured water-laid sediments.	Includes Solonetzic soils. Undulating, low relief landform with a limiting slope of 2%.
1	South Edmonton	14379	ZUN1/SC1I Miscellaneous Undifferentiated Mineral (100%)	Miscellaneous undifferentiated mineral soils.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. V-shaped valley landform with a limiting slope of 15%.
1	Between south Edmonton and Nisku	14407	KVG1/U1h Kavanagh (80%), Miscellaneous Solonetzic (20%)	Black Solodized Solonetz on medium textured softrock.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
1	Between south Edmonton and Nisku	14356	LOMM6/U1I Looma (40%), Malmo (40%), Angus Ridge (20%)	Orthic Dark Gray Chernozem on very fine textured materials (not till) over medium textured till. Eluviated Black Chernozem on fine textured water-laid sediments.	Includes soils that are coarser textured than the dominant or co-dominant soils. Undulating, low relief landform with a limiting slope of 2%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
1	Between Nisku and Leduc	14377	ZDL1/DL Miscellaneous Disturbed Land (100%)	Miscellaneous undifferentiated mineral soils.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Disturbed land (urban, open pit mines, gravel pits).
1	Between Nisku and Leduc	14375	POPOxp1/U1l Ponoka (40%) (Paralithic substrate at 30–99 cm), Ponoka (40%), Angus Ridge (20%)	Eluviated Black Chernozem on medium textured materials (not till) over softrock. Eluviated Black Chernozem on medium textured sediments deposited by wind and water.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, low relief landform with a limiting slope of 2%.
1	Leduc	14418	ZDL1/DL Miscellaneous Disturbed Land (100%)	Miscellaneous undifferentiated mineral soils.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Disturbed land (urban, open pit mines, gravel pits).
1	Telford Lake, Leduc	14419	ZWA1/W3 Miscellaneous Water (100%)	Miscellaneous water.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Large single water body.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
2	Range Rd. 243, between Beaumont and Hay Lakes Range Rd. 243, between Beaumont and Hay Lakes	14255	AG2s/U1h Angus Ridge (60%), Hobbema (20%), Miscellaneous Gleysol (20%)	Eluviated Black Chernozem on medium textured till.	Includes poorly drained soils. Undulating, high relief landform with a limiting slope of 4%.
2	Range Rd. 243, between Beaumont and Hay Lakes	14247	AGHB10/U1h Angus Ridge (35%), Hobbema (35%), Miscellaneous Solonetzic (15%), Miscellaneous Gleysol (15%)	Eluviated Black Chernozem on medium textured till. Eluviated Black Chernozem on medium textured materials over medium or fine textured till.	Includes poorly drained and Solonetzic soils Undulating, high relief landform with a limiting slope of 4%.
2	Range Rd. 243 and Township Rd. 500, between Beaumont and Hay Lakes	14253	AGS1/U1h Angus Ridge (80%), Hobbema (20%)	Eluviated Black Chernozem on medium textured till.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
2	Township Rd. 500, between Beaumont and Hay Lakes	14259	MMO6/U1h Malmo (60%), Ponoka (20%), Navarre (20%)	Eluviated Black Chernozem on fine textured water-laid sediments.	Includes soils that are coarser textured than the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
2	Township Rd. 500, between Beaumont and Hay Lakes	14261	ZGW1/U1I Miscellaneous Gleysol (100%)	Gleysolic soils on undifferentiated materials.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, low relief landform with a limiting slope of 2%.
2	Township Rd. 500, between Beaumont and Hay Lakes	14597	MCML9/U1h Macola (35%), Mico (35%), Looma (10%), Rolly View (10%), Misc Gleysol (10%)	Orthic Dark Gray Chernozem on very fine textured water-laid sediments. Dark Gray Luvisol on very fine textured water-laid sediments.	Includes poorly drained soils and soils that are coarser textured than the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
2	Township Rd. 500, between Beaumont and Hay Lakes	14609	RLV2/H1I Rolly View (60%), Uncas (20%), Miscellaneous Gleysol (20%)	Orthic Dark Gray Chernozem on medium textured till.	Includes poorly drained soils. Hummocky, low relief landform with a limiting slope of 6%.
2	Township Rd. 500, between Beaumont and Hay Lakes	14608	RLV2/H1I Rolly View (60%), Uncas (20%), Miscellaneous Gleysol (20%)	Orthic Dark Gray Chernozem on medium textured till.	Includes poorly drained soils. Hummocky, low relief landform with a limiting slope of 6%.
2	Township Rd. 500, between Beaumont and Hay Lakes	14428	CMDU1/U1h Camrose (50%), Duagh (50%)	Black Solodized Solonetz on medium textured till. Black Solonetz on fine textured water-laid sediments.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
2	Township Rd. 500, between Beaumont and Hay Lakes	14606	RLV1/H1I Rolly View (80%), Angus Ridge (20%)	Orthic Dark Gray Chernozem on medium textured till.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Hummocky, low relief landform with a limiting slope of 6%.
2	Township Rd. 500, between Beaumont and Hay Lakes	14605	RLUC2/U1h Rolly View (35%), Uncas (35%), Angus Ridge (15%), Miscellaneous Gleysol (15%)	Orthic Dark Gray Chernozem on medium textured till. Dark Gray Luvisol on medium textured till.	Includes poorly drained soils. Undulating, high relief landform with a limiting slope of 4%.
2	Range Rd. 222A, between Beaumont and Hay Lakes	14422	AGMM2/U1h Angus Ridge (35%), Malmo (35%), Navarre (15%), Miscellaneous Gleysol (15%)	Eluviated Black Chernozem on medium textured till. Eluviated Black Chernozem on fine textured water-laid sediments.	Includes poorly drained soils. Undulating, high relief landform with a limiting slope of 4%.
2	Between Range Rd. 222A and Range. Rd. 222, between Beaumont and Hay Lakes	14424	AGS2/H1I Angus Ridge (80%), Miscellaneous Gleysol (20%)	Eluviated Black Chernozem on medium textured till.	Includes poorly drained soils. Hummocky, low relief landform with a limiting slope of 6%.
2	Range Rd. 222, between Beaumont and Hay Lakes	14425	AGS1/U1h Angus Ridge (60%), Rolly View (20%), Camrose (20%)	Eluviated Black Chernozem on medium textured till.	Includes Solonetzic soils. Undulating, high relief landform with a limiting slope of 4%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
2	Range Rd. 222 and Township Rd. 492, between Beaumont and Hay Lakes	14429	CMO16/U1h Camrose (80%), Angus Ridge (20%)	Black Solodized Solonetz on medium textured till.	Includes Chernozemic soils. Undulating, high relief landform with a limiting slope of 4% (U1h).
2	Township Rd. 492, between Beaumont and Hay Lakes	14426	AGS7/U1h Angus Ridge (60%), Rolly View (20%), Camrose (20%)	Eluviated Black Chernozem on medium textured till.	Includes Solonetzic soils. Undulating, high relief landform with a limiting slope of 4%.
2	Range Rd. 215 and Township Rd. 492, between Beaumont and Hay Lakes	14431	DUWK19/U1l Duagh (35%), Wetaskiwin (35%), Malmo (15%), Miscellaneous Gleysol (15%)	Black Solonetz on fine textured water-laid sediments. Black Solodized Solonetz on fine textured water-laid sediments.	Includes poorly drained and Chernozemic soils. Undulating, low relief landform with a limiting slope of 2%.
2	Highway 21, between Hay Lakes and Camrose	14454	AGS2/H1l Angus Ridge (60%), Uncas (20%), Miscellaneous Gleysol (20%)	Eluviated Black Chernozem on medium textured till.	Includes poorly drained soils. Hummocky, low relief landform with a limiting slope of 6%.
2	Highway 21, between Hay Lakes and Camrose	14462	AGS7/U1h Angus Ridge (60%), Norma (20%), Camrose (20%)	Eluviated Black Chernozem on medium textured till.	Includes Solonetzic soils. Undulating, high relief landform with a limiting slope of 4%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
2	Highway 21, between Hay Lakes and Camrose	14443	AGRL18/H1I Angus Ridge (35%), Rolly View (35%), Morinville (10%), Camrose (10%), Miscellaneous Gleysol (10%)	Eluviated Black Chernozem on medium textured till. Orthic Dark Gray Chernozem on medium textured till.	Includes poorly drained soils and soils that are finer textured than the dominant or co-dominant soils. Hummocky, low relief landform with a limiting slope of 6%.
2	Highway 21, between Hay Lakes and Camrose	15017	CMO19/U1h Camrose (60%), Norma (20%), Miscellaneous Gleysol (20%)	Black Solodized Solonetz on medium textured till.	Includes poorly drained and Chernozemic soils. Undulating, high relief landform with a limiting slope of 4%.
2	Highway 21 and Township Rd. 480 between Hay Lakes and Camrose	15058	WKN2/U1h Wetaskiwin (60%), Duagh (20%), Miscellaneous Gleysol (20%)	Black Solodized Solonetz on fine textured water-laid sediments.	Includes poorly drained soils. Undulating, high relief landform with a limiting slope of 4%.
2	Highway 21, Township Rd. 480, and Range Rd. 205, between Hay Lakes and Camrose	15026	CMO19/U1h Camrose (60%), Norma (20%), Miscellaneous Gleysol (20%)	Black Solodized Solonetz on medium textured till.	Includes poorly drained and Chernozemic soils. Undulating, high relief landform with a limiting slope of 4%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
2	Range Rd. 205, between Hay Lakes and Camrose	14975	CMO16/H5I Camrose (60%), Norma (20%), Kavanaugh (20%)	Black Solodized Solonetz on medium textured till.	Includes Chernozemic soils. Hummocky over bedrock, low relief landform with a limiting slope of 6%.
2	Range Rd. 205, between Hay Lakes and Camrose	14946	ARM19/U1I Armena (60%), Miscellaneous Gleysol (20%), Camrose (10%), Looma (10%)	Black Solodized Solonetz on medium textured materials over medium (or fine textured till.	Includes poorly drained and Chernozemic soils. Undulating, low relief landform with a limiting slope of 2%.
2	Range Rd. 205, between Hay Lakes and Camrose	14962	CMNR2/U1h Norma (35%), Camrose (35%), Kavanaugh (15%), Miscellaneous Gleysol (15%)	Black Solodized Solonetz on medium textured till. Solonetzic Black Chernozem on medium textured till.	Includes poorly drained soils. Undulating, high relief landform with a limiting slope of 4%.
3	Township Rd. 562	11761	ZGW20/SC1I Miscellaneous Gleysol (80%), Miscellaneous Undifferentiated Mineral (20%)	Gleysolic soils on undifferentiated materials.	Includes rapidly to imperfectly drained soils. Valley with floodplain, low relief landform with slopes ranging from 1–5% on the floodplain and up to 15% on the side slopes.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
3	Township Rd. 562	11806	ZUN2/SC1h Miscellaneous Undiff. Mineral (60%), Miscellaneous Gleysol (20%)	Miscellaneous undifferentiated mineral soils.	Includes poorly drained soils. Valley (steep slopes) with floodplain landform with slopes ranging from 1–5% on the floodplain and up to 35% on the side slopes.
3	Township Rd. 562	14248	AGHB7/U1l Angus Ridge (40%), Hobbema (40%), Miscellaneous Solonetzic (20%)	Eluviated Black Chernozem on medium textured till. Eluviated Black Chernozem on medium textured materials over medium or fine textured till.	Includes Solonetzic soils. Undulating, low relief landform with a limiting slope of 2%.
3	Township Rd. 562	14253	AGS1/U1h Angus Ridge (80%), Hobbema (20%)	Eluviated Black Chernozem on medium textured till.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
1, 3	Leduc	14408	KVG16/U1h Kavanagh (80%), Angus Ridge (20%)	Black Solodized Solonetz on medium textured softrock.	Includes Chernozemic soils. Undulating, high relief landform with a limiting slope of 4%.
1, 3	Range Rd. 245, between Leduc and Millet	14411	KVG2/U1h Kavanagh (60%), Camrose (20%), Miscellaneous Gleysol (20%)	Black Solodized Solonetz on medium textured softrock.	Includes poorly drained soils. Undulating, high relief landform with a limiting slope of 4%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
1, 3	Range Rd. 245, between Leduc and Millet	14404	HBPO17/U1l Hobbema (30%), Ponoka (30%), Camrose (30%), Morinville (10%)	Eluviated Black Chernozem on medium textured materials over medium or fine textured till. Eluviated Black Chernozem on medium textured sediments deposited by wind and water.	Includes soils that are finer textured than the dominant or co-dominant soils and Solonetzic soils. Undulating, low relief landform with a limiting slope of 2%.
1, 3	Range Rd. 245, Range Rd. 244, between Leduc and Millet	14256	AGS2/U1h Angus Ridge (60%), Hobbema (20%), Miscellaneous Gleysol (20%)	Eluviated Black Chernozem on medium textured till.	Includes poorly drained soils. Undulating, high relief landform with a limiting slope of 4%.
1, 3	Range Rd. 244, between Leduc and Millet	14252	AGS1/U1h Angus Ridge (80%), Hobbema (20%)	Eluviated Black Chernozem on medium textured till.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
1, 3	Range Rd. 244, between Leduc and Millet, and Township Rd. 475, between Millet and Wetaskiwin	14479	PHS2/U1h Peace Hills (60%), Ukalta (20%), Miscellaneous Gleysol (20%)	Orthic Black Chernozem on moderately coarse textured sediments deposited by wind or water.	Includes poorly drained soils. Undulating, high relief landform with a limiting slope of 4%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
1, 3	Millet	14486	ZDL1/DL Miscellaneous Disturbed Land (100%)	Miscellaneous undifferentiated mineral soils.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Disturbed land (urban, open pit mines, gravel pits).
1, 3	Township Rd. 475 and Highway 814 between Millet and Wetaskiwin	14469	HLMD2/D21 Helliwell (40%), Mundare (40%), Miscellaneous Gleysol (20%)	Orthic Dark Gray Chernozem on very coarse textured sediments deposited by wind or water. Orthic Black Chernozem on very coarse textured sediments deposited by wind or water.	Includes poorly drained soils. Parabolic dune, low relief landform with a limiting slope of 6%.
1, 3	Township Rd. 475 and Highway 814 between Millet and Wetaskiwin	14482	POK18/U1h Ponoka (60%), Malmo (20%), Miscellaneous Gleysol (20%)	Eluviated Black Chernozem on medium textured sediments deposited by wind and water.	Includes poorly drained soils and soils that are finer textured than the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
1, 3	Highway 814, between Millet and Wetaskiwin	14470	KVG19/U1h Kavanagh (60%), Ferintosh (20%), Miscellaneous Gleysol (20%)	Black Solodized Solonetz on medium textured softrock.	Includes poorly drained and Chernozemic soils. Undulating, high relief landform with a limiting slope of 4%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
1, 3	Highway 814, between Millet and Wetaskiwin	14477	PHS1/U1h Peace Hills (80%), Mundare (20%)	Orthic Black Chernozem on moderately coarse textured sediments deposited by wind or water.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
1, 3	Highway 814, between Millet and Wetaskiwin	14487	ZUN2/SC1h Miscellaneous Undiff. Mineral (80%), Miscellaneous Gleysol (20%)	Miscellaneous undifferentiated mineral soils.	Includes poorly drained soils. Valley (steep slopes) with floodplain landform with slopes ranging from 1–5% on the floodplain and up to 35% on the side slopes.
1, 3	Highway 814, between Millet and Wetaskiwin	14532	NVR10/U1I Navarre (60%), Wetaskiwin (20%), Malmo (10%), Miscellaneous Gleysol (10%)	Gleyed Black Chernozem on fine textured water-laid sediments.	Includes poorly drained and Solonetzic soils. Undulating, low relief landform with a limiting slope of 2%.
All	Camrose	15063	ZDL1/DL Miscellaneous Disturbed Land	Miscellaneous undifferentiated mineral soils.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Disturbed land (urban, open pit mines, gravel pits).

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
All	Highway 13, Camrose to Wetaskiwin	11762	ZGW20/SC2 Miscellaneous Gleysol (80%), Miscellaneous Undifferentiated Mineral (20%)	Gleysolic soils on undifferentiated materials.	Includes rapidly to imperfectly drained soils. Valley with terraces landform with slopes ranging from 1–5% on terraces and up to 35% on the side slopes.
All	Highway 13, Camrose to Wetaskiwin	14481	PHS6/U1h Peace Hills (80%), Ferintosh (20%)	Orthic Black Chernozem on moderately coarse textured sediments deposited by wind or water.	Includes soils that are coarser textured than the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
All	Highway 13, Camrose to Wetaskiwin	14526	MMWK1/U1I Malmo (40%), Wetaskiwin (40%), Navarre (20%)	Eluviated Black Chernozem on fine textured water-laid sediments. Black Solodized Solonetz on fine Both textured water-laid sediments.	May include soils that are not strongly contrasting from the dominant or co-dominant soils. Undulating, low relief landform with a limiting slope of 2%.
All	Highway 13, Camrose to Wetaskiwin	14464	CMKV19/H1I Peace Hills (30%), Camrose (30%), Kavanagh (30%), Miscellaneous Water (10%)	Black Solodized Solonetz on medium textured till. Black Solodized Solonetz on medium textured softrock.	Includes poorly drained and Chernozemic soils. Hummocky, low relief landform with a limiting slope of 6%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
All	Highway 13, Camrose to Wetaskiwin	14450	AGS10/H1I Angus Ridge (60%), Camrose (20%), Norma (10%), Miscellaneous Gleysol (10%)	Eluviated Black Chernozem on medium textured till.	Includes poorly drained and Solonetzic soils. Hummocky, low relief landform with a limiting slope of 6%.
All	Highway 13, Camrose to Wetaskiwin	14453	AGS18/U1h Angus Ridge (60%), Looma (20%), Miscellaneous Gleysol (20%)	Eluviated Black Chernozem on medium textured till.	Includes poorly drained soils and soils that are finer textured than the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
All	Highway 13, Camrose to Wetaskiwin	14455	AGS2/H1I Angus Ridge (60%), Uncas (20%), Miscellaneous Gleysol (20%)	Eluviated Black Chernozem on medium textured till.	Includes poorly drained soils. Hummocky, low relief landform with a limiting slope of 6%.
All	Highway 13, Camrose to Wetaskiwin	14999	CMO16/U1h Camrose (80%), Norma (20%)	Black Solodized Solonetz on medium textured till.	Includes Chernozemic soils. Undulating, high relief landform with a limiting slope of 4%.
All	Highway 13, Camrose to Wetaskiwin	14461	AGS7/H1I Angus Ridge (80%), Camrose (20%)	Eluviated Black Chernozem on medium textured till.	Includes Solonetzic soils. Hummocky, low relief landform with a limiting slope of 6%.

Alignment Option	Location	Soil Polygon	Soil Landscape Model/Series	Soil Type	Description
All	Highway 13, Camrose to Wetaskiwin	14484	POK5/U1h Ponoka (60%), Malmo (20%), Angus Ridge (10%), Hobbema (10%)	Eluviated Black Chernozem on medium textured sediments deposited by wind and water.	Includes soils that are finer textured than the dominant or co-dominant soils. Undulating, high relief landform with a limiting slope of 4%.
All	Highway 13, Camrose to Wetaskiwin	15027	CMO19/U1h Camrose (60%), Norma (20%), Miscellaneous Gleysol (20%)	Black Solodized Solonetz on medium textured till.	Includes poorly drained and Chernozemic soils. Undulating, high relief landform with a limiting slope of 4%.
All	Highway 13, Camrose to Wetaskiwin	14532	NVR10/U1l Navarre (60%), Wetaskiwin (20%), Malmo (10%), Miscellaneous Gleysol (10%)	Gleyed Black Chernozem on fine textured water-laid sediments.	Includes poorly drained and Solonetzic soils. Undulating, low relief landform with a limiting slope of 2%.

APPENDIX B – SURFACE WATER AND AQUATIC RESOURCES

Table B-1 Watercourse Crossings for the Alignment Options

Alignment	ATS Location	Watercourse ID/Common Name	Fish Sampled to Date	Strahler Order	Class	Restricted Activity Period (RAP)
1	NW-8-51-24-W4M	ID 153 Blackmud Creek	BRST, FTMN, LKCH, LNDC, LNSC, NOCY, WHSC	5	C	April 16 to June 30
1	NW-8-51-24-W4M	ID 153 Blackmud Creek	BRST, FTMN, LKCH, LNDC, LNSC, NOCY, WHSC	5	C	April 16 to June 30
1	NW-8-51-24-W4M	ID 153 Blackmud Creek	BRST, FTMN, LKCH, LNDC, LNSC, NOCY, WHSC	5	C	April 16 to June 30
1	NW-8-51-24-W4M	ID 153 Blackmud Creek	BRST, FTMN, LKCH, LNDC, LNSC, NOCY, WHSC	5	C	April 16 to June 30
1	NE-7-51-24-W4M	ID 153 Blackmud Creek	BRST, FTMN, LKCH, LNDC, LNSC, NOCY, WHSC	5	C	April 16 to June 30
1	SE-7-51-24-W4M	ID 153 Blackmud Creek	BRST, FTMN, LKCH, LNDC, LNSC, NOCY, WHSC	5	C	April 16 to June 30
1	SE-7-51-24-W4M	ID 153 Blackmud Creek	BRST, FTMN, LKCH, LNDC, LNSC, NOCY, WHSC	5	C	April 16 to June 30
1	SW-14-48-21-W4M	ID 314481 unnamed lake	No fish sampled to date	N/A	N/A**	N/A

Alignment	ATS Location	Watercourse ID/Common Name	Fish Sampled to Date	Strahler Order	Class	Restricted Activity Period (RAP)
1	SE-2-50-25-W4M	ID 24420 unnamed watercourse	BRST, FTMN	1	C	April 16 to June 30
1	SE-36-49-25-W4M	ID 47226 unnamed tributary to Saunders Lake	No fish sampled to date	1	C	April 16 to June 30
1	SE-36-49-25-W4M	ID 5975 Telford Lake	BRST, FTMN	N/A	N/A**	N/A
2	NW-10-50-24-W4M	ID 46835 unnamed tributary to Clearwater Creek	No fish sampled to date	1	D	N/A
2	NW-10-50-24-W4M	ID 323 Clearwater Creek	BRST, LKCH	4	D	N/A
2	SW-2-50-24-W4M	ID 47529 unnamed tributary to Clearwater Creek	No fish sampled to date	3	D	N/A
2	NW-34-49-23-W4M	ID 323 Clearwater Creek	BRST, LKCH	3	D	N/A
2	NE-32-49-22-W4M	ID 47074 Unnamed tributary to Clearwater Creek	No fish sampled to date	1	C	April 16 to June 30
2	NE-33-49-22-W4M	ID 62696 Unnamed tributary to Clearwater Creek	No fish sampled to date	2	C	April 16 to June 30
2	SW-26-49-22-W4M	ID 323 Clearwater Creek	BRST, LKCH	3	D	N/A
2	NE-12-49-22-W4M	ID 31253 tributary to unnamed watercourse	No fish sampled to date	2	Unclassified*	N/A

Alignment	ATS Location	Watercourse ID/Common Name	Fish Sampled to Date	Strahler Order	Class	Restricted Activity Period (RAP)
2	NW-7-49-21-W4M	ID 31294 tributary to unnamed watercourse	No fish sampled to date	1	Unclassified*	N/A
2	NW-8-49-21-W4M	ID 31253 unnamed watercourse	No fish sampled to date	3	Unclassified*	N/A
2	SW-5-49-21-W4M	ID 31253 unnamed watercourse	No fish sampled to date	3	Unclassified*	N/A
2	NW-14-48-21-W4M	ID 303147 unnamed lake	No fish sampled to date	N/A	N/A**	N/A
2	NE-11-48-21-W4M	ID 31654 unnamed tributary to Camrose Creek	BRST	3	D	N/A
2	SW-29-47-20-W4M	ID 31835 unnamed tributary to Camrose Creek	No fish sampled to date	3	C	April 16 to June 30
2	NW-8-47-20-W4M	ID 25167 unnamed tributary to Camrose Creek	BRST, FTMN	2	C	April 16 to June 30
3	SE-16-50-24-W4M	ID 323 Clearwater Creek	BRST, LKCH	4	D	N/A
3	SE-17-50-24-W4M	ID 323 Clearwater Creek	BRST, LKCH	4	D	N/A
3	SE-18-50-24-W4M	ID 153 Blackmud Creek	BRST, FTMN, LKCH, LNDC, LNSC, NOCY, WHSC	5	C	April 16 to June 30
3	NW-7-50-24-W4M	ID 46912 unnamed tributary to Blackmud Creek	No fish sampled to date	1	C	April 16 to June 30

Alignment	ATS Location	Watercourse ID/Common Name	Fish Sampled to Date	Strahler Order	Class	Restricted Activity Period (RAP)
3	SW-7-50-24-W4M	ID 46962 unnamed tributary to Blackmud Creek	BRST, FTMN, LKCH	1	C	April 16 to June 30
3	SW-7-50-24-W4M	ID 47006 unnamed tributary to Saunders Lake	No fish sampled to date	1	C	April 16 to June 30
3	SE-6-50-24-W4M	ID 47098 unnamed watercourse	No fish sampled to sate	1	C	April 16 to June 30
3	NE-31-49-24-W4M	ID 47098 unnamed tributary to Saunders Lake	No fish sampled to date	2	C	April 16 to June 30
3	NE-31-49-24-W4M	ID 47226 unnamed tributary to Saunders Lake	No fish sampled to date	1	C	April 16 to June 30
3	NE-30-49-24-W4M	ID 47350 unnamed tributary to Saunders Lake	No fish sampled to date	2	C	April 16 to June 30
3	SE-30-49-24-W4M	ID 47382 unnamed tributary to Saunders Lake	No fish sampled to date	1	C	April 16 to June 30
1, 3	NE-17-48-24-W4M	ID 31759 unnamed tributary to Pipestone Creek	No fish sampled to date	1	D	N/A
1, 3	SE-35-47-24-W4M	ID 303531 unnamed lake	No fish sampled to date	N/A	N/A**	N/A

Alignment	ATS Location	Watercourse ID/Common Name	Fish Sampled to Date	Strahler Order	Class	Restricted Activity Period (RAP)
1, 3	SW-30-47-23-W4M	ID 32172 unnamed tributary to Coal Lake	No fish sampled to date	1	C	April 16 to June 30
1, 3	NW-18-47-23-W4M	ID 32445 unnamed tributary to Pipestone Creek	No fish sampled to date	1	C	April 16 to June 30
1, 3	NW-7-47-23-W4M	ID 1348 Pipestone Creek	BRST, FTMN, LKCH, PRCR, WHSC	5	C	April 16 to June 30
1, 3	SW-36-46-24-W4M	ID 32746 unnamed tributary to Pipestone Creek	No fish sampled to date	1	C	April 16 to June 30
1, 3	NW-25-46-24-W4M	ID 304278 unnamed lake	No fish sampled to date	N/A	N/A**	N/A
1, 3	NW-34-46-20-W4M	ID 253 Camrose Creek	BRST, FTMN	5	D	N/A
1, 3	NE-34-46-20-W4M	ID 303990 unnamed lake	BRST, FTMN	N/A	N/A**	N/A
All	SE-30-46-23-W4M	ID 26310 unnamed tributary to Pipestone Creek	BRST, FTMN	2	C	April 16 to June 30
All	SE-30-46-23-W4M	ID 26310 unnamed tributary to Pipestone Creek	BRST, FTMN	2	C	April 16 to June 30
All	SW-25-46-23-W4M	ID 1348 Pipestone Creek	BRST, FTMN, LKCH, PRCR, WHSC	5	C	April 16 to June 30
All	SE-25-46-23-W4M	ID 32895 unnamed tributary to Pipestone Creek	No fish sampled to date	1	C	April 16 to June 30

Alignment	ATS Location	Watercourse ID/Common Name	Fish Sampled to Date	Strahler Order	Class	Restricted Activity Period (RAP)
All	SE-30-46-22-W4M	ID 32952 unnamed tributary to Pipestone Creek	No fish sampled to date	1	C	April 16 to June 30
All	SE-28-46-22-W4M	ID 304356 unnamed lake	No fish sampled to date	N/A	N/A**	N/A
All	NW-26-46-22-W4M	ID 304103 unnamed lake	No fish sampled to date	N/A	N/A**	N/A
All	SE-35-46-22-W4M	ID 304124 unnamed lake	No fish sampled to date	N/A	N/A**	N/A
All	SW-32-46-21-W4M	ID 304102 unnamed lake	No fish sampled to date	N/A	N/A**	N/A
All	SW-1-47-21-W4M	ID 303947 unnamed lake	No fish sampled to date	N/A	N/A**	N/A
All	SE-1-47-21-W4M	ID 303947 unnamed lake	No fish sampled to date	N/A	N/A**	N/A

* – Watercourse is unmapped and not connected to any mapped waterbodies. Confirm classification and requirements with Alberta Environment and Protected Areas. ** – Identified as a lake on the Fisheries and Wildlife Management Information System and is unclassified under the *Water Act* Code of Practice for Pipelines and Telecommunication Lines. Additional applications may be required under other regulations. BRST – brook stickleback; FTMN – fathead minnow; LKCH – lake chub; LNDC – longnose dace; LNSC – longnose sucker; NOCY – northern crayfish; PRCR – Prussian carp; WHSC – white sucker

Table B-2 Fish Species Previously Recorded in the Identified Waterbody Crossings

Common Name	Scientific Name	Species At Risk Status ¹	Alberta Wild Species General Status ²	Preferred Habitat
Brook stickleback	<i>Culaea inconstans</i>	NL	Secure	Streams, ponds, and lakes in or near vegetation ³
Fathead minnow	<i>Pimephales promelas</i>	NL	Secure	Streams, lakes, and ponds in aquatic vegetation ³
Lake chub	<i>Couesius plumbeus</i>	NL	Secure	Rivers, streams, and lakes ³
Longnose dace	<i>Rhinichthys cataractae</i>	NL	Secure	Rivers and streams with fast flowing water ³
Longnose sucker	<i>Catostomus catostomus</i>	NL	Secure	Bottoms of rivers, streams, and lakes ³
Northern crayfish	<i>Faxonius virilis</i>	NL	NL	Slow, warm streams with vegetation, logs, and rocks ⁴
Prussian carp	<i>Carassius gibelio</i>	NL	Exotic/Alien	Still water or slow-flowing rivers with submerged vegetation ⁵
Rainbow trout	<i>Oncorhynchus mykiss</i>	NL	Secure	Open meadow streams in cool, oxygen-rich waters; introduced in shallow pothole lakes ⁶
White sucker	<i>Catostomus commersoni</i>	NL	Secure	Bottoms of rivers, streams, and lakes ³

¹ Government of Canada. 2026. Species at risk public registry. Available from: <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>. Accessed March 5, 2026.² Government of Alberta. 2025. Wild Species Status Search. Available from: <https://www.alberta.ca/lookup/wild-species-status-search.aspx>. Accessed March 5, 2026.³ Derlukewich, S., and Critchley, D. 2017. *Fishes of Alberta Field Identification*, 4th Ed. School of Fish.

⁴ Alberta Invasive Species Council. 2024. Northern Crayfish. Available from: https://abinvasives.ca/wp-content/uploads/2024/04/UR_FS-NorthernCrayfish.pdf. Accessed March 6, 2026.⁵ Alberta Invasive Species Council. 2025. Prussian Carp. Available from: <https://abinvasives.ca/wp-content/uploads/2021/02/250814-FS-Prussian-Carp-1.pdf>. Accessed March 6, 2026.⁶ Joynt, A., and Sullivan, M. G. 2016. *Fish of Alberta*. Lone Pine Publishing, Edmonton, AB. NL – not listed; Secure – not at risk, may be at risk, or sensitive; Exotic/Alien – introduced as a result of human activities

APPENDIX C – WILDLIFE

Table C-1 Wildlife Species Previously Identified within 2 km of the Alignment Options

Common Name	Scientific Name	Species At Risk Status ¹	Alberta Wild Species General Status ²	Option 1 (Y/N)	Option 2 (Y/N)	Option 3 (Y/N)	Preferred Habitat
Amphibians							
Canadian toad	<i>Anaxyrus hemiophrys</i>	NL	May be at risk	Y	N	Y	River valleys or lakes with sandy borders, requires wetlands for breeding ³
Boreal toad	<i>Anaxyrus boreas</i>	Special Concern	Sensitive	N	Y	N	Wetlands, riparian areas, and upland sites including forests and meadows; breeds in shallow, sandy margins of lakes, ponds, and streams ⁴
Reptiles							
Plains garter snake	<i>Thamnophis radix</i>	NL	Sensitive	Y	Y	Y	Meadows and prairies near sources of water ⁵
Birds							
American bittern	<i>Botaurus lentiginosus</i>	NL	Sensitive	N	Y	N	Marshes with tall vegetation ⁶
American kestrel	<i>Falco sparverius</i>	NL	Sensitive	Y	Y	Y	Open areas ⁶

Common Name	Scientific Name	Species At Risk Status ¹	Alberta Wild Species General Status ²	Option 1 (Y/N)	Option 2 (Y/N)	Option 3 (Y/N)	Preferred Habitat
American white pelican	<i>Pelecanus erythrorhynchos</i>	NL	Sensitive	Y	Y	Y	Forages in shallow protected waters, nests on islands in large lakes ⁶
Bald eagle	<i>Haliaeetus leucocephalus</i>	NL	Sensitive	Y	Y	Y	Near lakes and rivers ⁶
Bank swallow	<i>Riparia riparia</i>	Threatened	Sensitive	Y	Y	Y	Forages over marshes, meadows, and water; nests colonially in vertical sandbanks ⁶
Barn swallow	<i>Hirundo rustica</i>	Threatened	May be at risk	Y	Y	Y	Forages over fields and ponds; nests on anthropogenic structures ⁶
Barred owl	<i>Strix varia</i>	NL	Sensitive	Y	Y	Y	Mature forest, particularly hardwood swamps ⁶
Black tern	<i>Chlidonias niger</i>	NL	Sensitive	Y	Y	Y	Over water; nests on marshy ponds with emergent vegetation ⁶
Black-throated green warbler	<i>Dendroica virens</i>	NL	Sensitive	Y	N	N	Riparian deciduous trees ⁶
Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened	Sensitive	Y	Y	Y	Nests in open fields and damp meadows; forages in weedy fields ⁶

Common Name	Scientific Name	Species At Risk Status ¹	Alberta Wild Species General Status ²	Option 1 (Y/N)	Option 2 (Y/N)	Option 3 (Y/N)	Preferred Habitat
Broad-winged hawk	<i>Buteo platypterus</i>	NL	Sensitive	Y	N	Y	Wooded areas ⁶
Brown creeper	<i>Certhia americana</i>	NL	Sensitive	Y	N	N	Mature woods ⁶
Canada warbler	<i>Wilsonia canadensis</i>	Threatened	May be at risk	Y	N	N	Deciduous undergrowth of mature forests, often near streams or low areas ⁶
Cape May warbler	<i>Dendroica tigrina</i>	NL	Sensitive	Y	N	Y	Mature coniferous forests ⁶
Common yellowthroat	<i>Geothlypis trichas</i>	NL	Sensitive	Y	N	Y	Weedy and marshy habitats in low, wet areas ⁶
Eared grebe	<i>Podiceps nigricollis</i>	NL	Sensitive	Y	Y	Y	Nests on shallow ponds and lakes with emergent vegetation, forages on open water ⁶
Eastern kingbird	<i>Tyrannus tyrannus</i>	NL	Sensitive	Y	Y	Y	Semi-open habitats with a mix of grassy fields and trees, often near water ⁶
Eastern phoebe	<i>Sayornis phoebe</i>	NL	Sensitive	Y	Y	Y	Open woods and woodland edges, near buildings and water ⁶

Common Name	Scientific Name	Species At Risk Status ¹	Alberta Wild Species General Status ²	Option 1 (Y/N)	Option 2 (Y/N)	Option 3 (Y/N)	Preferred Habitat
Great blue heron	<i>Ardea herodias</i>	NL	Sensitive	Y	Y	Y	Forages in open habitats from fields to shallow water; nests colonially in trees in standing water ⁶
Great gray owl	<i>Strix nebulosa</i>	NL	Sensitive	Y	Y	Y	Mixed forests ⁶
Horned grebe	<i>Podiceps auritus</i>	Special Concern	Sensitive	Y	Y	Y	Nests on ponds with emergent vegetation ⁶
Northern goshawk	<i>Accipiter gentilis</i>	NL	Sensitive	Y	N	Y	Mixed forests with wetlands or other openings ⁶
Northern pygmy owl	<i>Glaucidium gnoma</i>	NL	Sensitive	Y	N	N	Broken mixedwood forests with clearings or patches of brush ⁶
Pied-billed grebe	<i>Podilymbus podiceps</i>	NL	Sensitive	Y	Y	Y	Shallow ponds and marshes with emergent vegetation ⁶
Pileated woodpecker	<i>Dryocopus pileatus</i>	NL	Sensitive	Y	Y	Y	Mature hardwood and coniferous forests ⁶
Purple martin	<i>Progne subis</i>	NL	Sensitive	Y	Y	Y	Nests in manmade martin houses near open water; forages over any open habitat ⁶

Common Name	Scientific Name	Species At Risk Status ¹	Alberta Wild Species General Status ²	Option 1 (Y/N)	Option 2 (Y/N)	Option 3 (Y/N)	Preferred Habitat
Sharp-tailed grouse	<i>Tympanuchus phasianellus</i>	NL	Sensitive	Y	Y	Y	Grassy habitat where prairie and woodland mix ⁶
Short-eared owl	<i>Asio flammeus</i>	Special Concern	May be at risk	Y	Y	Y	Open fields, grasslands, or marshes ⁶
Sora	<i>Porzana carolina</i>	NL	Sensitive	Y	Y	Y	Wet marshy habitats ⁶
Trumpeter swan	<i>Cygnus buccinator</i>	NL	Sensitive	Y	Y	Y	Shallow marshy ponds or lakes surrounded by trees ⁶
Western grebe	<i>Aechmophorus occidentalis</i>	Special Concern	At risk	Y	Y	Y	Shallow lakes with emergent vegetation ⁶
Western wood-pewee	<i>Contopus sordidulus</i>	NL	May be at risk	Y	Y	Y	Mature deciduous and mixedwoods forests and forest edges ⁶
White-winged scoter	<i>Melanitta deglandi</i>	NL	Sensitive	Y	Y	Y	Nests on large lakes in the boreal forest ⁶
Mammals							
American badger	<i>Taxidea taxus</i>	Special Concern	Sensitive	Y	Y	Y	Non-forested grassland and shrubland ⁷
Little brown bat	<i>Myotis lucifugus</i>	Endangered	May be at risk	Y	Y	Y	Forages mainly over water, females establish summer maternity colonies in buildings or large-diameter trees ⁸

Common Name	Scientific Name	Species At Risk Status ¹	Alberta Wild Species General Status ²	Option 1 (Y/N)	Option 2 (Y/N)	Option 3 (Y/N)	Preferred Habitat
Long-tailed weasel	<i>Mustela frenata</i>	NL	May be at risk	N	Y	N	Crop fields and small wooded areas; nest in hollow logs, under rock piles, or under structures ⁹

¹ Government of Canada. 2026. Species at risk public registry. Available from: <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>. Accessed March 5, 2026. ² Government of Alberta. 2025. Wild Species Status Search. Available from: <https://www.alberta.ca/lookup/wild-species-status-search.aspx>. Accessed March 5, 2026. ³ Government of Alberta. 2002. Alberta's Canadian toad. Available from: <https://open.alberta.ca/dataset/417892dc-d442-4640-9e5c-5976194cb679/resource/2e410353-85a6-454f-ae82-ef1852f9d2aa/download/sar-canadiantoad-factsheet-mar2002.pdf>. Accessed March 5, 2026. ⁴ COSEWIC. 2012. COSEWIC assessment and status report on the Western Toad *Anaxyrus boreas* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiv + 71 pp. Available from: https://ecprccsarstacct.z9.web.core.windows.net/files/SARAFiles/legacy/cosewic/sr_Western%20Toad%20_2013_e.pdf. Accessed March 5, 2026. ⁵ Dewey, T. 2011. *Thamnophis radix*, Animal Diversity Web. Available from: https://animaldiversity.org/accounts/Thamnophis_radix/. Accessed March 5, 2026. ⁶ Sibley, D. A. 2016. Sibley Birds West, 2nd Ed. Alfred A. Knopf, New York. ⁷ Government of Canada. 2026. American Badger *taxus* subspecies (*Taxidea taxus taxus*). Available from: <https://species-registry.canada.ca/index-en.html#/species/623-880>. Accessed March 6, 2026. ⁸ Government of Canada. 2026. Little Brown Myotis (*Myotis lucifugus*). Available from: <https://species-registry.canada.ca/index-en.html#/species/1173-848>. Accessed March 6, 2026. ⁹ Newell, T. 2002. *Mustela frenata*, Animal Diversity Web. Available from: https://animaldiversity.org/accounts/Mustela_frenata/. Accessed March 6, 2026. NL – not listed; Special concern – may become threatened or endangered due to a combination of biological traits and identified threats; Threatened – Likely to become endangered; Endangered – facing imminent extirpation or extinction; Sensitive – not at risk but may require special attention to prevent the species from becoming so; May be at risk – may be at risk of extinction or extirpation; At risk – known to be at risk, legal designation as threatened or endangered in Alberta.

Table C-2 Sensitive Timing Windows and Recommended Setback Distances

Species	Location	Time of Year	Low Disturbance	Medium Disturbance	High Disturbance
Sharp-tailed grouse	Leks	March 15 – June 15	500 m	500 m	500 m
		June 16 – March 14	100 m	100 m	500 m
Sensitive raptor species (Bald eagle)	Nesting sites	March 15 – July 15	1000 m	1000 m	1000 m
		July 16 – March 14	50 m	100 m	100 m
Short-eared owl	Active nest and surrounding habitat	April 1 – July 15	100 m	100 m	100 m
Piping plover waterbodies	Nesting sites	April 15 – July 31	100 m	200 m	200 m
		August 1 – April 14	100 m	100 m	200 m

APPENDIX B - DESKTOP GEOTECHNICAL STUDY



Camrose and Wetaskiwin Regional Water Supply Feasibility Desktop Study

**Capital Region Southwest Water Services Commission
County of Camrose and Wetaskiwin, Alberta**

Client Name: Associated Engineering Alberta Ltd.

Date: July 2, 2026

File: 85418

TABLE OF CONTENTS

1.	INTRODUCTION.....	1
2.	PROJECT DESCRIPTION.....	1
3.	METHODS OF ASSESSMENT.....	2
4.	TOPOGRAPHY.....	2
5.	GEOLOGY.....	3
5.1	Surficial Geology.....	3
5.2	Bedrock Geology.....	5
5.3	Water Course Crossing Locations.....	5
6.	PRELIMINARY GEOTECHNICAL ASSESSMENT.....	6
6.1	General.....	6
6.2	Preliminary Evaluation and Recommendations.....	7
7.	FURTHER WORK.....	9
8.	CLOSURE.....	11

REFERENCES

STATEMENT FOR USE AND INTERPRETATION OF REPORT

APPENDICES

APPENDIX A

Preliminary Alignments Drawing (by AE)

Drawings 85418-1a to 85418-1c

Drawings 85418-2a to 85418-2n

Drawings 85418-3a to 85418-3c

1. INTRODUCTION

This report presents the results of a preliminary geotechnical desktop study carried out by Thurber Engineering Ltd. (Thurber) for the Capital Region Southwest Water Services Commission (CRSWSC) regional water supply to the City of Camrose, City of Wetaskiwin, and portions of the County of Wetaskiwin.

The study was carried out in general accordance with our proposal to Mr. Chris Parfitt, P.Eng., of Associated Engineering Alberta Ltd. (AE), dated December 18, 2025.

It is a condition of this report that Thurber's performance of its professional services will be subject to the attached Statement for Use and Interpretation of Report.

2. PROJECT DESCRIPTION

We understand that AE is conducting a feasibility study for CRSWSC to supply potable water to the City of Camrose, City of Wetaskiwin, and portions of the County of Wetaskiwin. The CRSWSC sources its water from EPCOR, with the transfer point located just outside Nisku city limits.

AE is currently considering three alignments as shown in the AE preliminary alignment drawing, provided in Appendix A:

- Alignment 1: Begins in Beaumont, extends southeast to Camrose, and then continues southwest to Wetaskiwin.
- Alignment 3: Starts in Edmonton, runs south towards Leduc and Wetaskiwin, and then northeast to Camrose.
- Alignment 6: Begins in Beaumont, proceeds southwest to Leduc, continues south to Wetaskiwin, and then northeast to Camrose.

The drawing also indicates the existing CRSWSC pipelines along the proposed alignments and highlights the new alignments. The new alignments are located:

- Between Beaumont and Leduc.
- From Millet going south towards Wetaskiwin and then northeast towards Camrose.
- In Camrose County along Highway 21, going north from Camrose.

The proposed alignment is expected to occupy an approximately 10 m wide right-of-way (ROW). Pipeline construction is anticipated to use either open-cut or trenchless methods, with trenchless construction being the preferred approach.

3. METHODS OF ASSESSMENT

The assessment included the following activities:

- Collect and summarize geological information from publicly available sources.
- Review publicly available water well data.
- Review available satellite imagery to identify geological constraints such as locations where weak slope colluvium and muskeg deposits (if any) may be present.
- Review of LiDAR 15 data, to identify topographic features and help delineate locations of potential instability within the river and creek valley slopes.

We understand that the proposed alignments will be installed near or within road ROWs and will follow existing CRSWSC pipelines where feasible. Accordingly, this study focuses primarily on the new alignment segments where no existing CRSWSC pipelines are present.

The overall site plan containing the proposed alignments is shown on Drawing 85418-1a, in Appendix A. The bedrock surface topography and surficial deposit thickness maps are shown in Drawing 85418-1b, and the surficial geology map is shown in Drawing 85418-1c, both of which are also included in Appendix A. The bedrock topography is taken from the published bedrock topography (Slattery and Barker, 2008).

To facilitate the presentation of the new alignments, the study area is divided into two areas: the North Study Area and the South Study Area. The South Study Area is further subdivided into five blocks: Blocks A through E. Drawings 85418-2a to 85418-2n highlight the South Study Area, and Drawings 85418-3a to 85418-3c highlight the North Study Area.

The bedrock topography was refined following the review of lithology information from available water well records. The surficial geology shown on the drawings was updated based on interpretation of LiDAR and satellite imagery.

A total of 1,068 water well records were reviewed for the North Study Area, and 3,526 water well records were reviewed for the South Study Area. The water well locations are shown on the drawings.

4. TOPOGRAPHY

Drawing 85418-1a shows the general geography and topography of the entire study area. The area in the northwest corner is a low relief where the large proglacial lake named “Glacial Lake Edmonton” existed during the retreat of the continental Laurentide ice sheet. The rest of the area is a flat plateau with small ridges and depressions. This area was covered by mostly stagnant ice sheet, which produced most of today's surficial deposits. A large, dominant channel

extends from the northwest to the southeast corners of the study area, which was created by water draining from the Glacial Lake Edmonton. As the ice retreated and the North Saskatchewan River Valley became unblocked, water from the lake was drained through this valley, leaving an abandoned channel in the study area. At present, this abandoned channel is a chain of narrow lakes and small waterways.

The South Study Area is located on the plateau on which the abandoned valley and one abandoned tributary valley were incised. The South Study Area alignment and topography are shown on Drawings 85418-2a and -2b in Appendix A.

The North Study Area is mostly located at the southeastern edge of the former Glacial Lake Edmonton and at the beginning of the dry valley. One tributary valley exists on the east side of the dry valley. The North Study Area alignment and topography are shown on Drawing 85418-3a.

Drawings 85418-2f, -2h, -2l, -2n, and -3c, included in Appendix A, show the ground surface slopes along the new alignments. Most of the terrain along the proposed new alignments is flat, with ground slope angles less than five degrees. The terrain steepens at valleys of the water crossings, indicated in Blocks A, B of the South Study Area, and the North Study Area, with ground slope angles greater than 10 degrees. There are some areas along the alignment that have ground slope angles greater than 10 degrees that are not within a valley, though these are more local, as shown in the north portion of Block A of the South Study Area.

5. GEOLOGY

5.1 Surficial Geology

A regional surficial geology map is presented on Drawing No. 85418-1c. Surficial deposits are glacial deposits formed during the last glaciation. Only limited Quaternary deposits at the channel bottom are interpreted to be non-glacial in origin. In some areas along the alignments, surficial deposits are thin or locally absent, particularly on the channel slopes.

Based on interpretation from the Surficial Geology of Alberta (Fenton et al., 2013), the following descriptions are provided for each of the surficial deposit units encountered along the proposed alignments:

- **Moraine:** till with gravel and boulders, some contorted bedrock. Till is unsorted sediment deposited directly from glacial ice. Till consists mainly of local bedrock material with a significant amount of igneous and metamorphic rocks derived from the Canadian Shield. The till contains approximately equal proportions of sand, silt, and clay, with approximately 10 percent gravel. The moraine deposits are present in the majority of the

study area, and they overlie the bedrock and underlie other surficial deposit units except in the areas at the channel slopes where the bedrock is exposed.

- **Glaciofluvial Deposits:** Glaciofluvial deposits are material deposited by glacial meltwater streams and sheets as glacial outwash. The glaciofluvial deposits include sand and gravel, commonly stratified with minor silt, but dominantly sand. The glaciofluvial deposits are present in small areas in Blocks A and D of the South Study Area.
- **Glaciolacustrine Deposits:** sand, silt and clay, with local ice-rafted stones. The glaciolacustrine sediments were deposited in proglacial lakes during the last retreat of the ice sheet. The glaciolacustrine deposits consist of layers of silt, clay, and fine sand. During the life of Glacial Lake Edmonton, melting icebergs brought till and other glaciolacustrine ice-rafted deposits. The glaciolacustrine deposits are underlain by moraine deposits and, where present, overlain by eolian deposits. The glaciolacustrine deposits are present in Blocks A and B of the South Study Area.
- **Eolian Deposits:** fine-grained sand and silt. The eolian deposits are derived from outwash sand and glaciolacustrine deposits, and they are usually located over the source material or at a short distance from the source material. Because the source material is glaciolacustrine deposits, the eolian deposits are deposited over the glaciolacustrine deposits or over the moraine deposits in close proximity to the glaciolacustrine deposits. The eolian deposits are present Blocks A and B of the South Study Area.
- **Fluvial Deposits:** In the study area, the fluvial deposits are a mixture of fluvial and lacustrine deposits. Fluvial deposits are recent sediments deposited by streams and lakes. Most of those sediments are deposited in the channel or the south tributary. Because of the origin of the fluvial deposits in the channel, the deeper portion of the deposits is typically composed of coarser material or meltwater and outwash sand and some gravel, overlain by a mixture of fluvial sand, silt and clay and lacustrine clay and silt. In the uppermost portion of the fluvial deposits, we expect a significant portion of lacustrine clay and silt with organic material.
- **Colluvium Deposits:** Colluvial deposits (material) are formed on the channel slopes and tributary slopes. The colluvial deposits result from gravitational movement and occur as slope and slump deposits. Some deposits may shift seasonally due to freezing and thawing, causing creeping. The colluvium can also move as slumps or landslides. Most of the colluvium deposits are in the North Study Area and in Blocks B and C of the South Study Area.
- **Wetland-Organic Deposits.** Organic deposits form in the channel and on flat areas with poor drainage. The organic deposits are mostly undifferentiated peat layers (woody to fibrous) formed in wetlands. The organic deposits in the channel are closely connected

with the fluvial deposits. The wetland-organic deposits are present around the Bittern Lake in Block C of the South Study Area.

The thickness of the surficial deposits is the difference between the bedrock surface and the ground surface elevations. The processes that created the bedrock surface were preglacial, mostly fluvial erosion, glacial erosion during the last glaciations, and meltwater erosion, mostly during the retreat of the Laurentide ice sheet. The ground surface is the result of glacial depositions and postglacial erosion by different processes. The surficial deposits are shown on the surficial deposits isopach maps (Drawings 85418-1b, -2c, and -3b) and in the elevation profiles shown in Drawings 85418-2f, -2h, -2j, -2l, -2n, -3c, included in Appendix A.

5.2 Bedrock Geology

Drawings 85418-1b, -2c, and -3b, included in Appendix A, presents the bedrock surface topography map within the study area.

The entire study area is underlain by a single bedrock unit, the Horseshoe Canyon Formation, according to the Bedrock Geology of Alberta (Prior et al., 2013).

The Horseshoe Canyon Formation is composed of deltaic and fluvial deposits of interbedded and interlensed sandstone, siltstone and shale. Most of the sediments consist of grey and white fine-grained, bentonitic, feldspathic sandstone with numerous coal seams and zones. Most beds contain some bentonite, but some contain a large amount. The bentonitic seams or beds are the major cause of slope instability. The bedrock is overlain by surficial deposits, except on the channel slopes, where it may be exposed or covered by a colluvial veneer.

5.3 Water Course Crossing Locations

Three crossing locations over water courses and adjacent to steep valley slopes were noted along the proposed alignments. The locations are shown on Drawing 85418-2f (Block A, South Study Area), Drawing 85418-2h (Block B, South Study Area), and Drawing 85418-3c (North Study Area), included in Appendix A.

Most of the noted crossings will be through the channel valley and tributary valley and with ground surface slopes greater than 10 degrees. These locations typically have thinner surficial deposits and indicate signs of potential instabilities (i.e. colluvium, valley disturbance).

6. PRELIMINARY GEOTECHNICAL ASSESSMENT

6.1 General

It is anticipated that a significant portion of the water line alignment will be installed using open trench techniques. However, a suitable trenchless method such as Horizontal Directional Drilling (HDD) will likely be required to install the line below watercourses and pipeline crossings (subject to pipeline depth at the crossing location). Shallow trenchless installation technologies such as Horizontal Auger Boring (HAB) or Pipe Ramming (PR) may also be used to install the line below the highways or local roads.

The stratigraphy is anticipated to vary along the alignment and may consist of sand, clay and/or silt or clay till. Bedrock elevation varies along the alignment and will likely be encountered when deep installations are completed for major crossings, in particular in the North Study Area where shallow bedrock was more prevalent. The groundwater table is expected to be encountered between 1 to 5 m below existing ground, based on general knowledge of terrain since there were no available test hole information or enough data from water well records.

The main geotechnical constraints/considerations along the alignments include the following:

- Glaciolacustrine and eolian deposits with high groundwater table, mostly present in Blocks A and B of the South Study Area.
- Potential slope instability at water course crossing locations (North Study Area, and Blocks A and B of South Study Area,) and presence of nearby top of valley slopes to the south of the proposed alignment (Block B of South Study Area).
- Pipeline and creek/river crossings. Pipeline companies should be contacted to confirm the depth of cover above the pipelines at potential crossing locations.
- Wetlands and organic deposits present to the north of the proposed alignment (Block C of South Study Area).

Specific to the proposed alignments, the main geotechnical constraints/considerations include:

- Alignment 1: Begins in Beaumont, extends southeast to Camrose, and then continues southwest to Wetaskiwin.
 - Mostly glaciolacustrine and adjacent eolian deposits present with high groundwater table (Block B, South Study Area).
 - Water course crossing location (Block B, South Study Area).
- Alignment 3: Starts in Edmonton, runs south towards Leduc and Wetaskiwin, and then northeast to Camrose.

- Eolian and glaciolacustrine deposits present with high groundwater table (Block A, South Study Area).
- Mostly glaciolacustrine and adjacent eolian deposits present with high groundwater table (Block B, South Study Area).
- Two water course crossing locations (Blocks A and B, South Study Area).
- **Alignment 6:** Begins in Beaumont, proceeds southwest to Leduc, continues south to Wetaskiwin, and then northeast to Camrose.
 - Eolian and glaciolacustrine deposits present with high groundwater table (Block A, South Study Area).
 - Mostly glaciolacustrine and adjacent eolian deposits present with high groundwater table (Block B, South Study Area).
 - Three water course crossing locations (North Study Area, and Blocks A and B of South Study Area).

6.2 Preliminary Evaluation and Recommendations

In general, all underground utilities should be constructed below 3.5 m depth or alternatively be insulated to provide protection against frost heave. The insulation should be designed and installed as per the manufacturer/supplier's recommendations. The design of the pipes will also need to consider buoyancy where the depth of installation is shallow, and the groundwater table is high.

Open cut method is deemed suitable to construct most of the alignment outside potential crossing locations. However, high groundwater may be encountered along the alignment that spans the eolian and glaciolacustrine deposits. Temporary dewatering may be required during excavation and continuous dewatering will likely be required when sand is encountered within the depth of excavation. The dewatering of water bearing sand/gravel in eolian and sands of the glaciolacustrine deposits is anticipated to be difficult and will likely require dewatering points. If groundwater seepage is encountered in the clay moraine it should be handled with typical sumps and pumps. An experienced contractor with dewatering schemes should be consulted during the detailed design stage. A temporary shoring including trench boxes should be considered where space does not allow for open excavations. The temporary shoring should be designed and stamped by a Professional Engineer.

Temporary excavation side slopes are anticipated to be stable at slopes of 1H:1V and 1.5H:1V or flatter for clay and sand, respectively, assuming dry conditions. Cobbles or boulders may be present in the till deposits, and this may hinder the installation of the pipe.

Prior to installing utility pipes or bedding material, the base of the trench should be inspected. Any loose or disturbed material should be removed. If the trench base is situated in soft clays or saturated sands below the water table where the pipe support conditions may be poor, special bedding procedures may be required to improve pipe support conditions and reduce future settlement of the pipes. Such special bedding requirements may consist of sub-excavation and placement of a 500 mm thick layer of washed rock wrapped in a geotextile fabric in the base of the trench for support of the pipe bedding. This technique has been found to provide a better working surface in the trench base and facilitates trench drainage during pipe installation. However, it is important to note that the special bedding procedures do not eliminate the need to adequately dewater the base as pipes installed on a wet disturbed trench base could settle and distort once the trench is backfilled.

If native sand or silt is present at the base of trench level, it is important that it is dewatered to at least 1 m below the base of the trench before installing the pipe to avoid placing the pipe on a loose disturbed base which could settle and distort the pipe after the trench backfill is placed.

The pipe should be bedded and installed according to the manufacturer's specifications. Care should be taken such that the pipe is not in contact with rigid objects such as cobbles, rocks or hard bedrock pieces as this will cause a stress concentration in the pipe and may result in breakage.

Excavated inorganic native materials from the trenches may need to be re-worked to meet the compaction standards. However, silty sand is anticipated to be difficult to rework and place and imported fill may have to be placed at locations where eolian or glaciolacustrine deposits are encountered. If it is decided to use silty sand to backfill trenches, it should not be used in the upper 1 m of the trenches, particularly below roadways to reduce frost heave issues. Imported gravel should ideally be used to backfill trenches, particularly where the lines are installed below existing roadways and adjacent to pipelines, to reduce long term settlement issues and future maintenance plans.

HDD should be feasible to install the proposed pipeline below identified watercourse crossings. A specific "No-Drill zone" may have to be established at identified crossing locations and particularly at crossings with potential slope stability issues. For preliminary design purposes, it is recommended that the entry and exist points be located at least 20 m away from the crest of the valley slope or bridge approach fill. The pipe should be located at least 10 m below stream bed for valleys less than 4 m in height and 15 to 20 m for valleys greater than 4 m in height.

HDD may also be used to install the line at pipeline crossings and the entire alignment. However, HDD is anticipated to be difficult in saturated eolian or glaciolacustrine deposits and the likelihood of borehole collapse and frac-out is high.

Hydro-fracture analyses should be undertaken during the detailed design to confirm the bore path and the minimum depth of cover below stream beds and pipelines.

Shallow trenchless installation technologies such as HAB and PR may be used to complete shallow installations below roadways (if any). It should be noted that PR is more favorable than HAB when sand under high groundwater table is encountered along the drilling path. Temporary shoring and dewatering will likely be required when sand under high groundwater conditions is encountered at the entry and exit pits. A survey monitoring program should be established during construction to assess the impact of installation on roadways.

A contractor experienced with trenchless methods should be contacted during the detailed design stage to confirm the most suitable installation methods and quantify construction risks and mitigative measures. Regardless of the selected installation method, it should be designed to reduce the likelihood of:

- Damage to existing utility lines.
- Subsidence or heave of existing roadways.
- Frac-out or mud loss below existing roadways and watercourses.

Slope stability analyses should be undertaken at locations where potential or signs of instability are identified (based on the LiDAR data). This includes water course crossing locations and locations where the stream top of bank exists in the general vicinity of the proposed alignment. This is to determine a safe setback for the pipe from the top of the bank.

Permanent underground structures (e.g. manholes) founded below groundwater table will need to be designed to sustain buoyancy forces. Alternatively, a permanent sub-drainage system could be considered below the base of the structure to reduce the hydrostatic forces on the structure.

Consideration should be given for vibration monitoring during construction, particularly in the proximity of sensitive structures along the alignment.

7. FURTHER WORK

A detailed geotechnical investigation should be undertaken to provide more specific recommendations for the design and the construction of the proposed line.

The detailed geotechnical investigation should include the following:

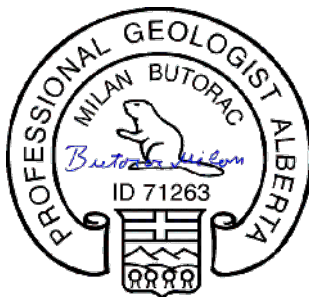
- Site reconnaissance to assess any instability at watercourse crossing locations or potential instability locations identified during this study.

- Further desktop review specific to the selected watercourse crossing locations.
- Drilling shallow test holes at a minimum spacing of approximately 400 m along the alignment. The recommended minimum spacing is to capture variability in ground conditions along the proposed alignment. If the investigation reveals that the subsurface conditions are more variable than anticipated, additional test holes could be advanced between selected test holes to reduce uncertainty. The test holes should be terminated at least 2 m below the anticipated depth of the pipe.
- Where trenchless methods are to be used at watercourse crossing locations, drilling two test holes at each of the identified watercourse crossing locations to assess potential slope stability issues (if any) and provide recommendations for trenchless excavation. The test holes should be terminated 10 to 20 m below the base of the valley, depending on the crossing details and type.
- Where trenchless methods are to be used at deeper pipeline crossings, drilling one test hole at each side of the pipeline crossing locations to provide recommendations for trenchless excavations, if it is decided to install the line below the pipeline. The test holes should be terminated at least 10 m below the invert of the existing pipeline.

8. CLOSURE

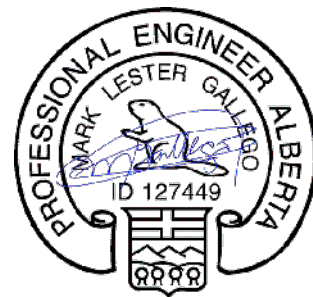
This desktop study is based on available existing information and a general knowledge of subsurface conditions within the study area. Hence, the evaluations and recommendations presented within are preliminary in nature and only intended to help guide AE in selecting a preferred method and alignment for installation of the water line.

We trust this information meets your present needs. If you have any questions, please contact the undersigned at your convenience.



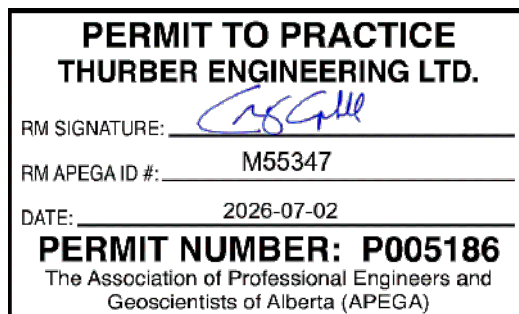
July 2, 2026

Milan Butorac, B.Sc., P.Geol.
Hydrogeologist



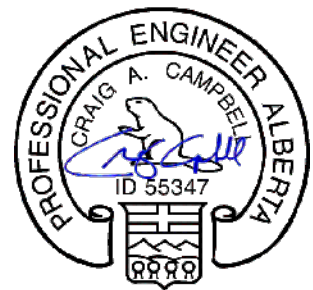
July 2, 2026

Mark Gallego, M.Eng., P.Eng.
Associate | Geotechnical Engineer



Date: July 2, 2026

File: 85418



2026-07-02

Craig Campbell, M.Eng., P.Eng.
Partner | Senior Environmental Engineer

REFERENCES

- Slattery, S.R. and Barker, A.A, 2008. Thickness of Quaternary and Neogene Sediments in the Edmonton-Calgary Corridor. *Alberta Geological Survey*. MAP 548.
- Fenton, M.M, Waters, E.J., Pawley, S.M., Atkinson, N, Utting, D.J., Mckay, K, 2013. Surficial Geology of Alberta. *Alberta Geological Survey*. MAP 601.
- Prior, G.J., Hatway, B., Glombick, P.M., Pana, D.I., Banks, C.J., Hay, D.C., Schneider, C.L., Grobe, M., Elgr, R., Weiss, J.A., 2013. Bedrock Geology of Alberta. *Alberta Geological Survey*. Map 600.

STATEMENT FOR USE AND INTERPRETATION OF REPORT

1. STANDARD OF CARE

This Report has been prepared in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality and in compliance with all applicable laws.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment, including this Statement For Use and Interpretation of Report, are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT, AS DESCRIBED ABOVE. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE OF THE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives, and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client for the development, design objectives, and/or purposes described to Thurber by the Client. **NO OTHER PARTY MAY USE OR RELY ON THE REPORT OR ANY PORTION THEREOF FOR OTHER THAN THE CLIENT'S BENEFIT IN CONNECTION WITH THE PURPOSES DESCRIBED IN THE REPORT.** Any use which a third party makes of the Report is the sole responsibility of such third party and is always subject to this Statement for Use and Interpretation of Report. Thurber accepts no liability or responsibility for damages suffered by any third party resulting from use of the Report for purposes outside the reasonable contemplation of Thurber at the time it was prepared or in any manner unintended by Thurber.

5. INTERPRETATION OF THE REPORT

- a) **Nature and Exactness of Soil and Contaminant Description:** Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors is inherently judgement-based. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other parties making use of such documents or records with or without our express written consent need to be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other parties. Some conditions are subject to change over time and those making use of the Report need to be aware of this possibility and understand that the Report only presents the interpreted conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client must disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.
- b) **Reliance on Provided Information:** The evaluation and conclusions contained in the Report have been prepared based on conditions in evidence at the time of site inspections and based on information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report resulting from misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other parties providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- c) **Design Services:** The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber is recommended to be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design need to be reported to Thurber immediately so that Thurber can address potential conflicts.
- d) **Construction Services:** During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions to confirm and document that the site conditions do not materially differ from those conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or other parties who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes, but is not limited to, decisions made to develop, purchase, or sell land, unless such decisions expressly form part of the stated purpose of the Report as described in Paragraph 3.

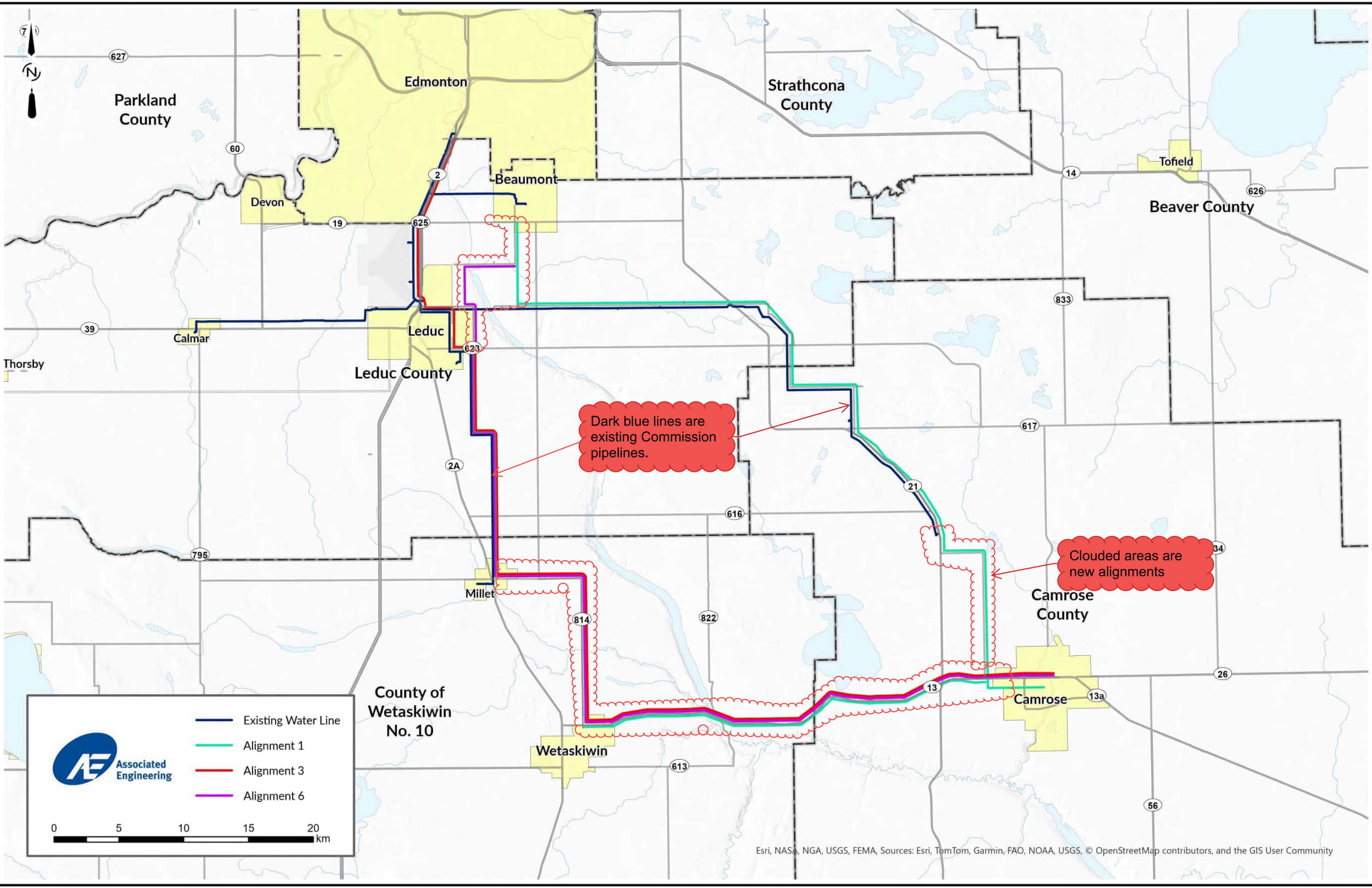
APPENDIX A

Preliminary Alignments Drawing (by AE)

Drawings 85418-1a to 85418-1c

Drawings 85418-2a to 85418-2n

Drawings 85418-3a to 85418-3c



Dark blue lines are existing Commission pipelines.

Clouded areas are new alignments

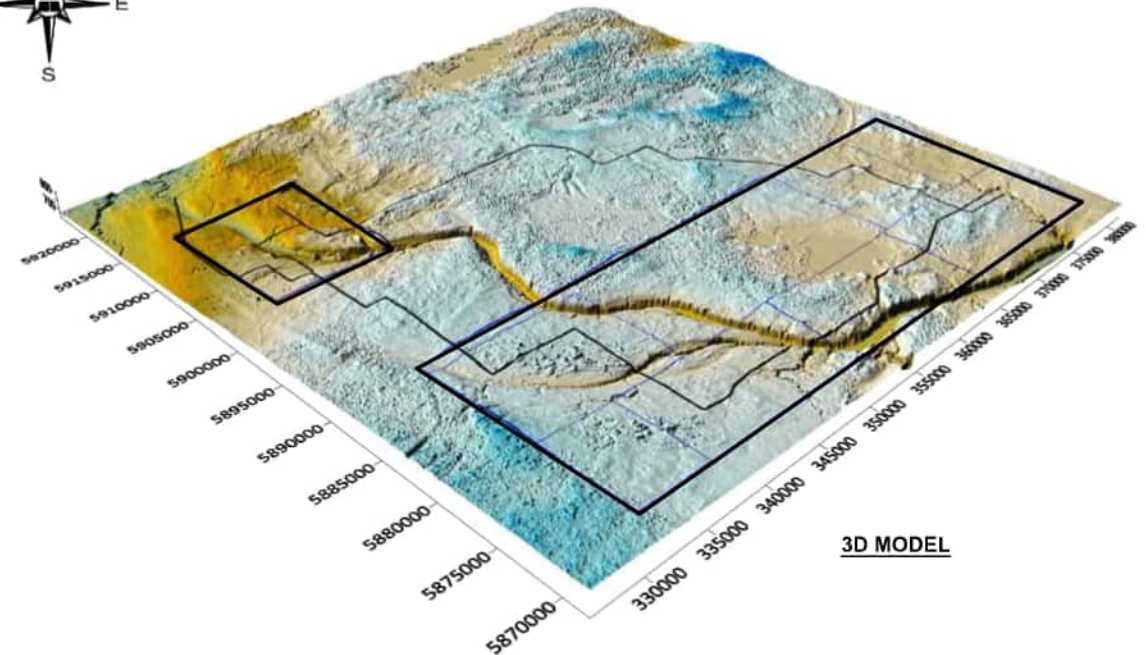
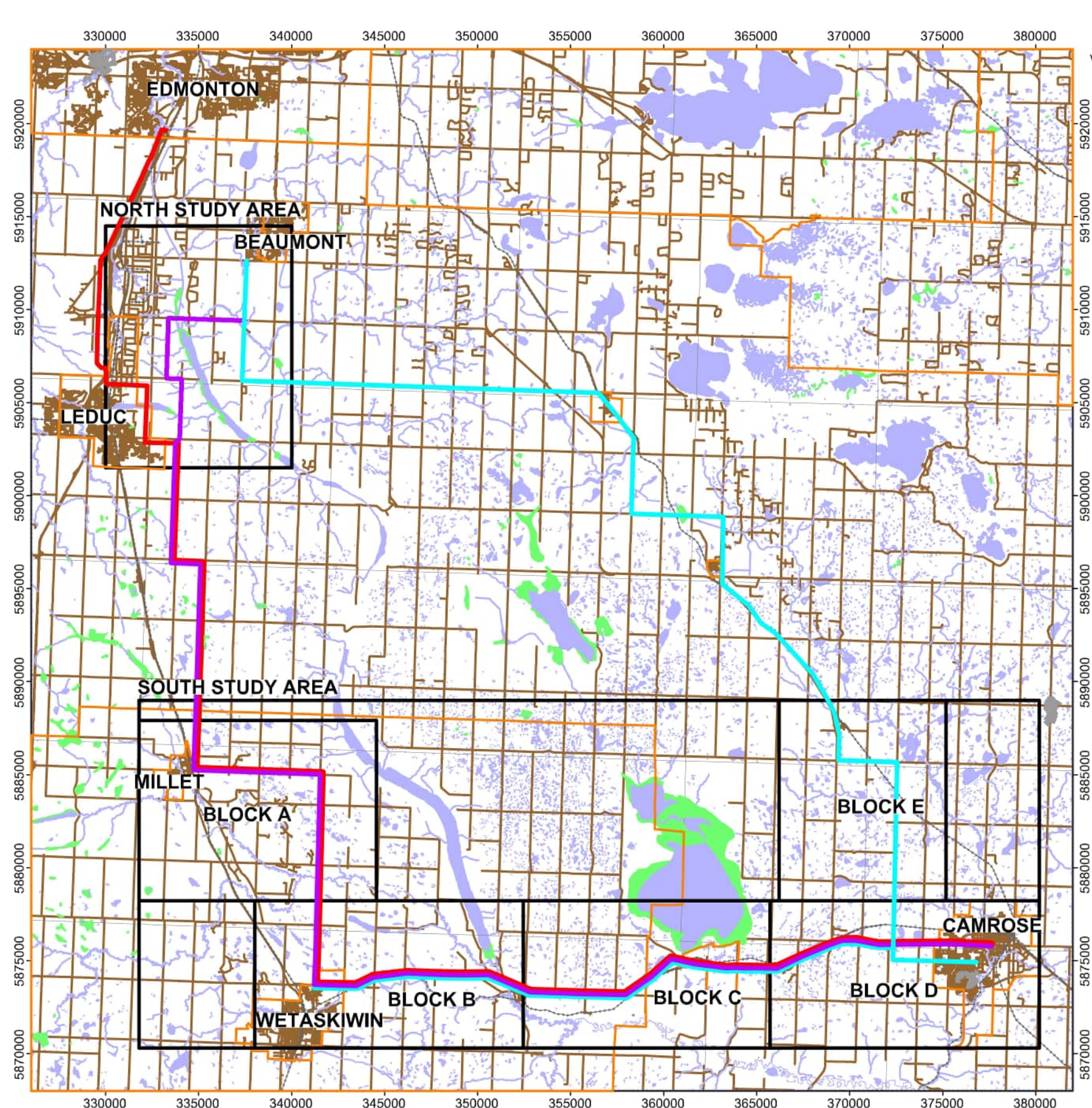


Associated Engineering

- Existing Water Line
- Alignment 1
- Alignment 3
- Alignment 6

0 5 10 15 20 km

G:\85000\85418 CRSWSC - Camrose & Wetaskiwin Regional Water Supply - Feasibility Study\CAD\85418-1a May 5, 2026.dwg - 1 - May 07, 2026



LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- APPROXIMATE STUDY BOUNDARY
- MUNICIPAL BOUNDARY
- ROAD
- MAPPED WATER BODY
- MAPPED WETLAND AREA

NOTE:
COORDINATES ARE IN UTM 12, NAD 83

0 2.5 5 7.5 10 12.5 15km

SCALE 1:250 000



CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

REGIONAL SITE PLAN

DWG No. 85418-1a

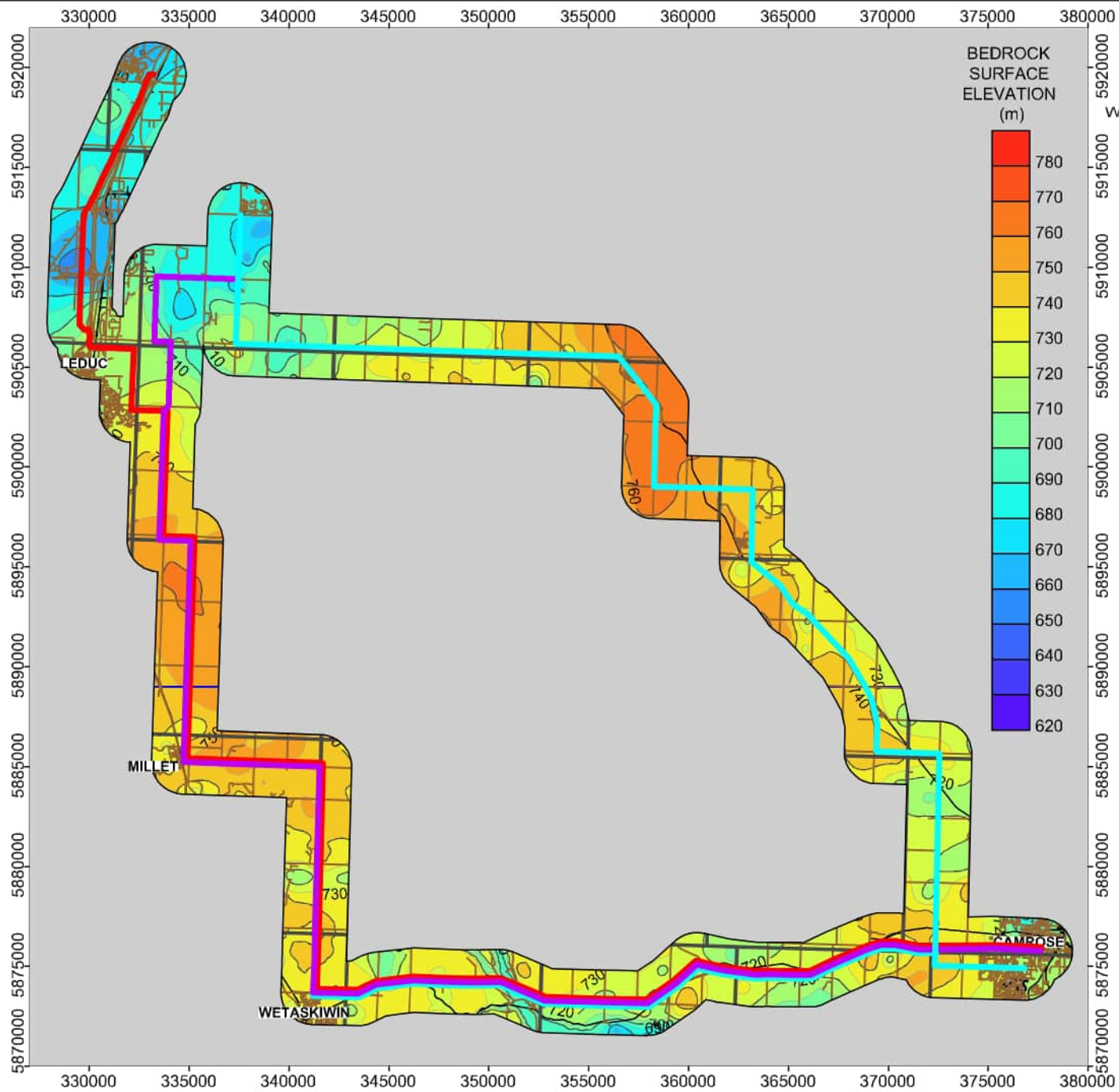
DRAWN BY ML

DESIGNED BY MJB / MG

APPROVED BY CAC

SCALE





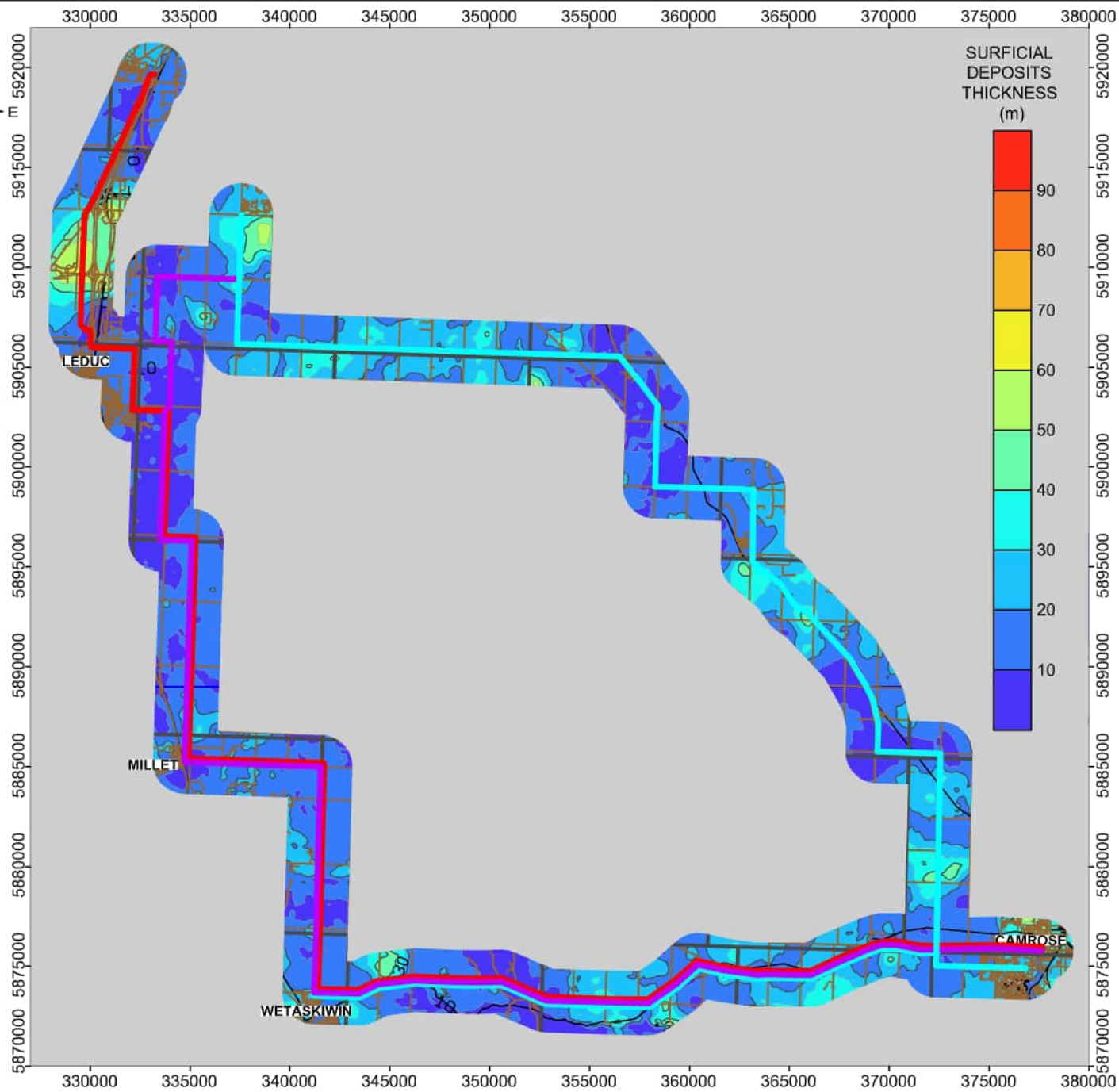
BEDROCK TOPOGRAPHY

LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- ROAD
- COAL MINE

REFERENCE MAP:
SLATTERY, S.R. AND BARKER, A.A. THICKNESS OF QUATERNARY AND
NEOGENE SEDIMENTS IN THE EDMONTON-CALGARY CORRIDOR.
ALBERTA GEOLOGICAL SURVEY. MAP 548. PUBLISHED 2008.

NOTE:
COORDINATES ARE IN UTM 12, NAD 83



SURFICIAL DEPOSITS ISOPACH

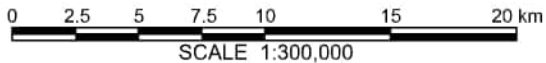


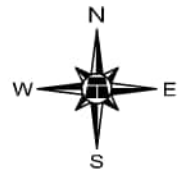
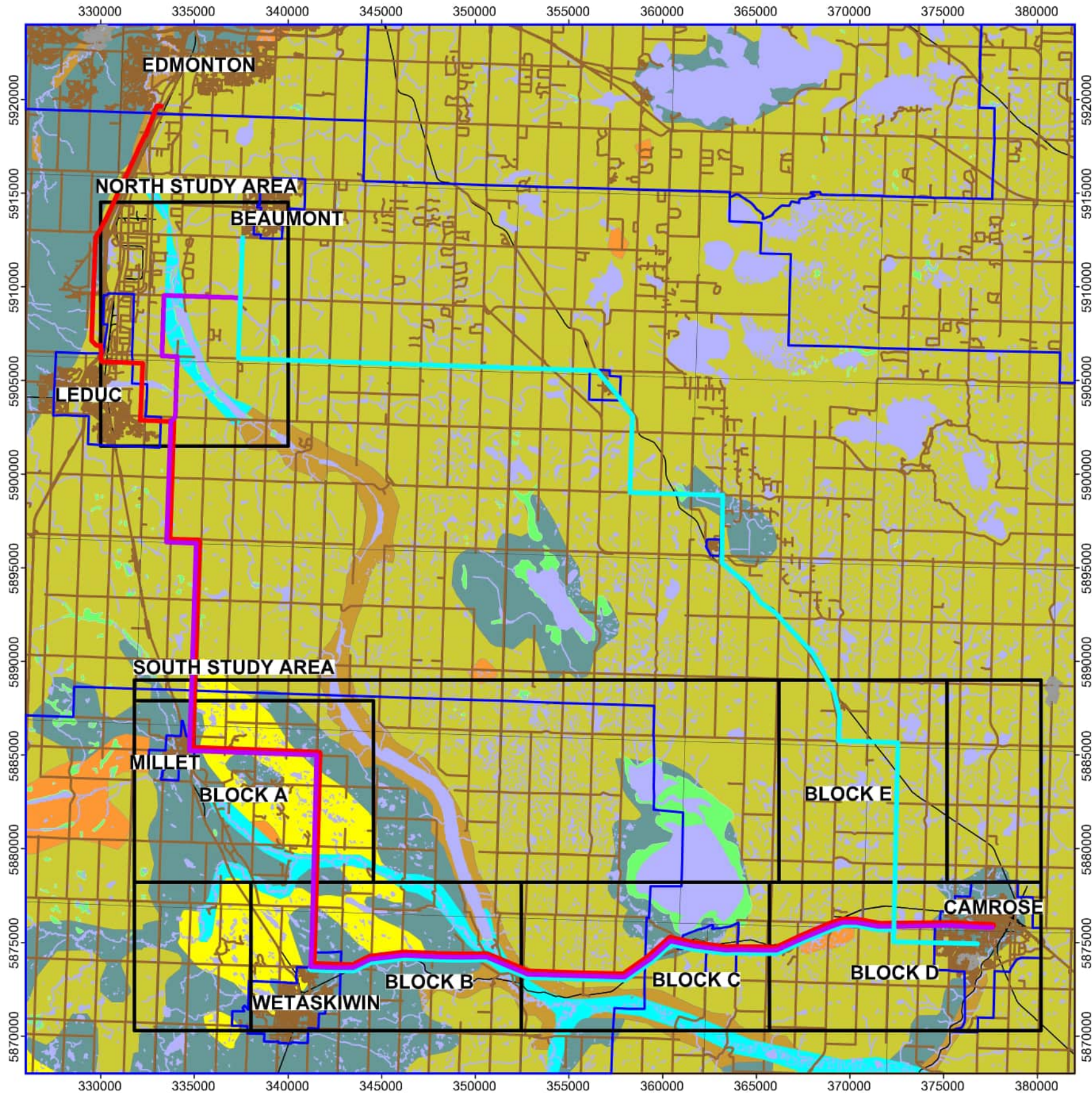
**CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY**

REGIONAL BEDROCK SURFACE TOPOGRAPHY

DWG No. 85418-1b

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:300 000
DATE	MAY 2026
FILE No.	85418





- LEGEND**
- PROPOSED WATER LINE ALIGNMENT 1
 - PROPOSED WATER LINE ALIGNMENT 3
 - PROPOSED WATER LINE ALIGNMENT 6
 - APPROXIMATE STUDY BOUNDARY
 - MUNICIPAL BOUNDARY
 - ROAD
 - MAPPED WATER BODY
 - MAPPED WETLAND AREA
 - FLUVIAL
 - COLLUVIUM
 - EOLIAN
 - GLACIOLACUSTRINE
 - GLACIOFLUVIAL
 - MORaine
 - COAL MINE

REFERENCE MAP:
M.M.FENTON, E.J.WATERS, S.M.PAWLEY, N.ATKINSON,
D.J.UTTING, AND K.MCKAY. SURFICIAL GEOLOGY OF ALBERTA.
MAP 601. ALBERTA GEOLOGICAL SURVEY. PUBLISHED 2013.

NOTE:
COORDINATES ARE IN UTM 12, NAD 83

0 2.5 5 7.5 10 12.5 15km
SCALE 1:250 000



Associated Engineering

**CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY**

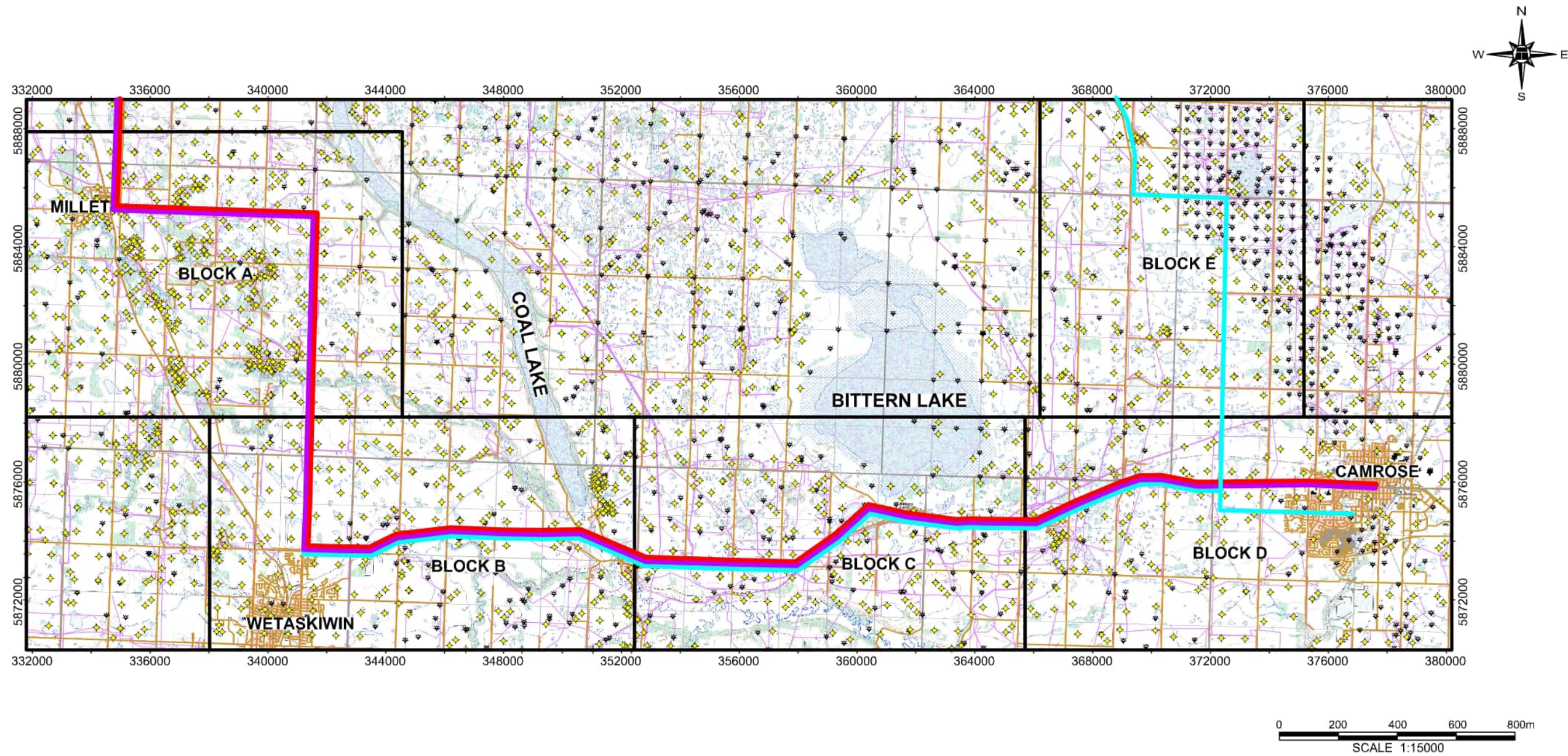
REGIONAL SURFICIAL GEOLOGY MAP

DWG No. 85418-1c

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:250 000
DATE	MAY 2026
FILE No.	85418



THURBER



LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- APPROXIMATE STUDY BOUNDARY
- AER PIPELINE
- ROAD
- WATERLINE
- WATER WELL
- OIL AND GAS WELL



CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WETASKIWIN,
GEOTECHNICAL DESKTOP STUDY

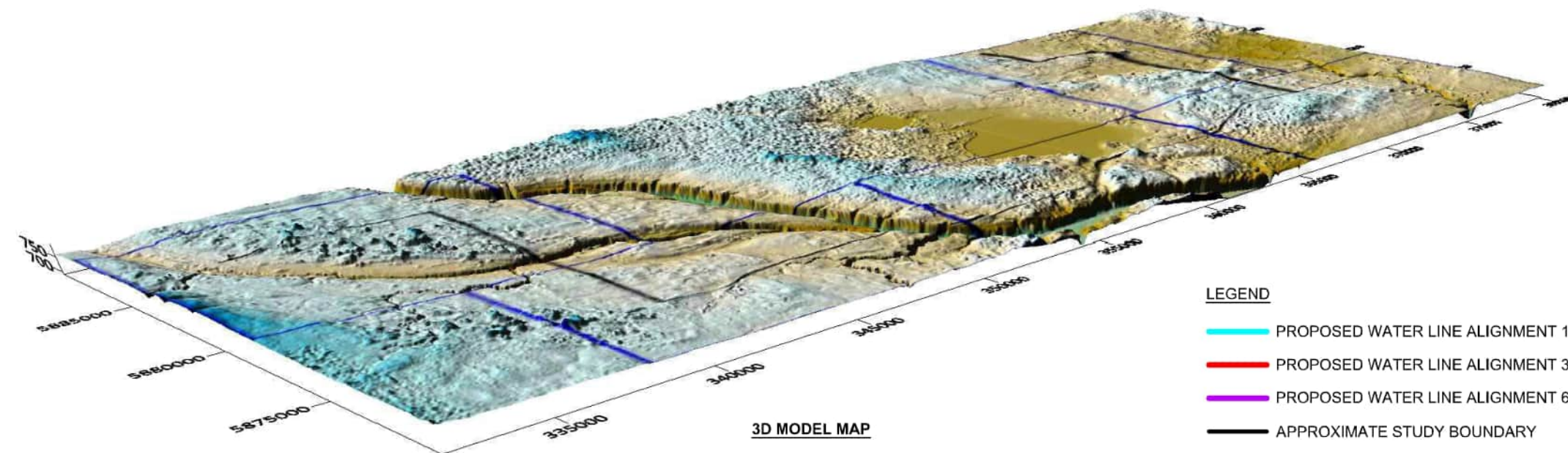
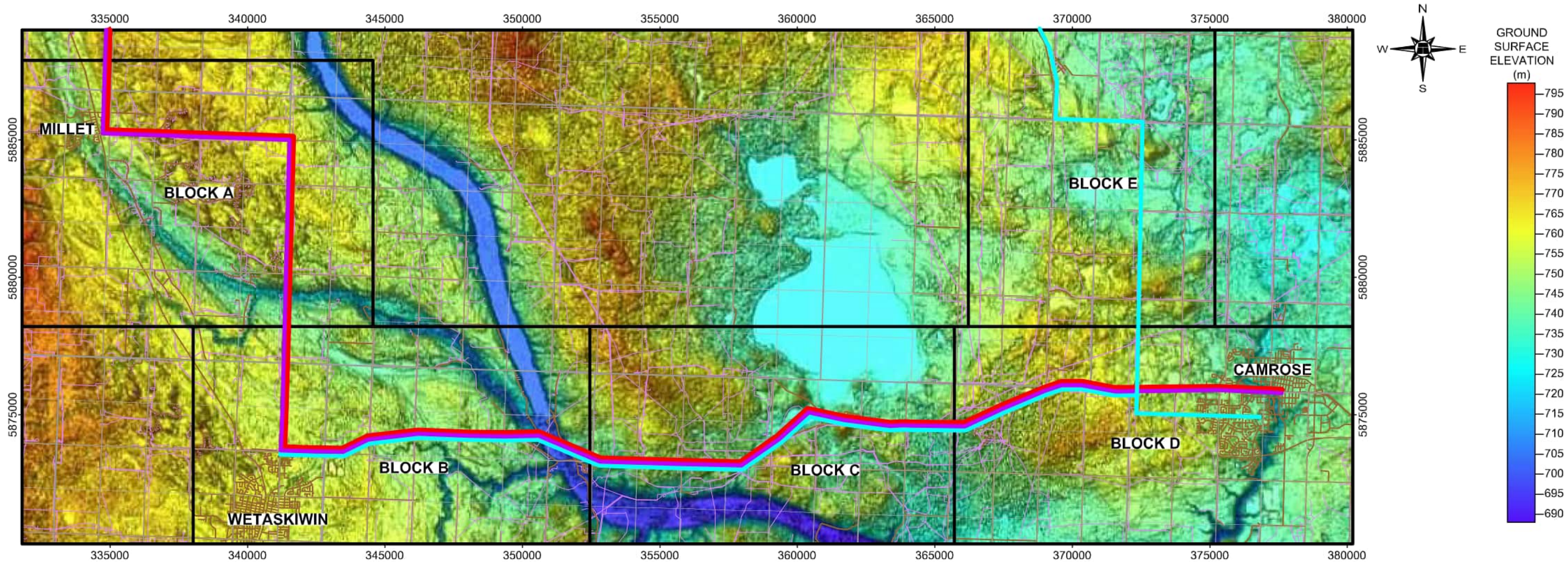
SITE MAP
(SOUTH STUDY AREA)

DWG No. 85418-2a

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:150 000
DATE	MAY 2026
FILE No.	85418



G:\155000\85418 CRSWSC - Camrose & Wetaskiwin Regional Water Supply - Feasibility Study\CAD\185418-2b May 5, 2026.dwg - 1 - May, 07, 2026



LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- APPROXIMATE STUDY BOUNDARY
- AER PIPELINE
- ROAD



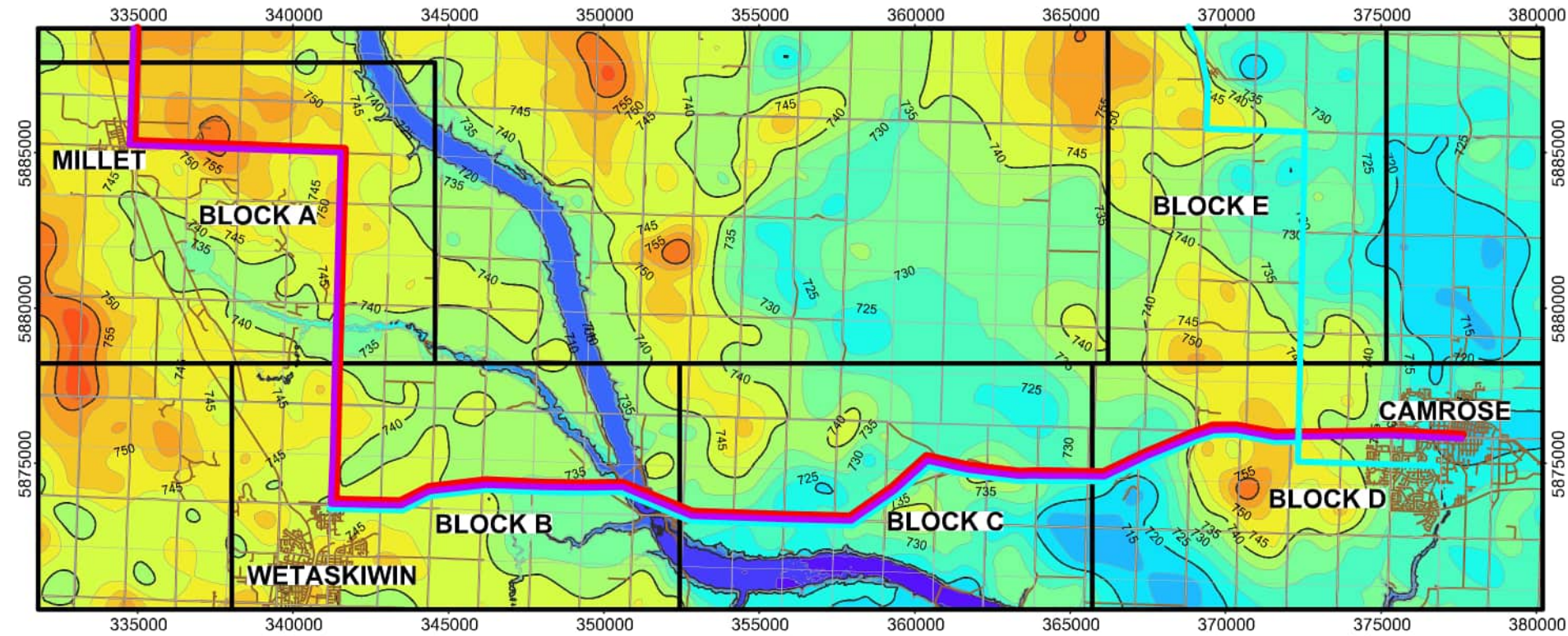
CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

TOPOGRAPHY MAP
(SOUTH STUDY AREA)

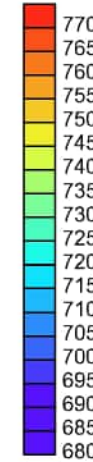
DWG No. 85418-2b

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:150 000
DATE	MAY 2026
FILE No.	85418





BEDROCK
SURFACE
ELEVATION (m)
(CONTOUR
INTERVAL 5 m)



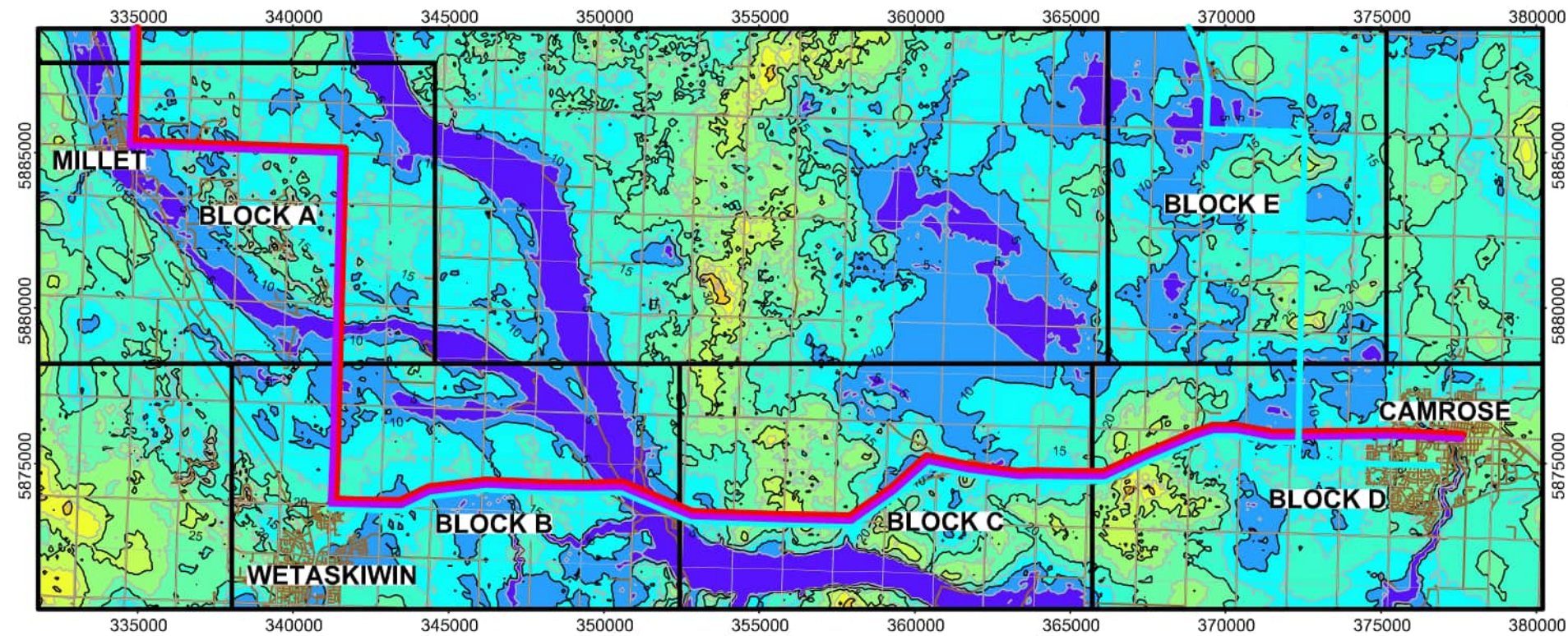
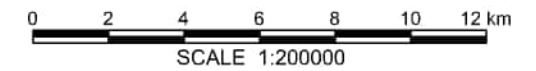
LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- APPROXIMATE STUDY BOUNDARY
- ROAD

REFERENCES:

1. THE BEDROCK TOPOGRAPHY SURFACE IS GENERATED FROM LITHOLOGY DATA EXTRACTED FROM THE ALBERTA GOVERNMENT GROUNDWATER DATABASE.
2. THE SURFICIAL DEPOSITS ISOPACH MAP IS CONSTRUCTED AS THE DIFFERENCE BETWEEN THE GROUND SURFACE TOPOGRAPHY AND THE BEDROCK TOPOGRAPHY SURFACE.

NOTE:
COORDINATES ARE IN UTM 12, NAD 83



SURFICIAL
DEPOSITS
THICKNESS (m)
(CONTOUR
INTERVAL 5m)



CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

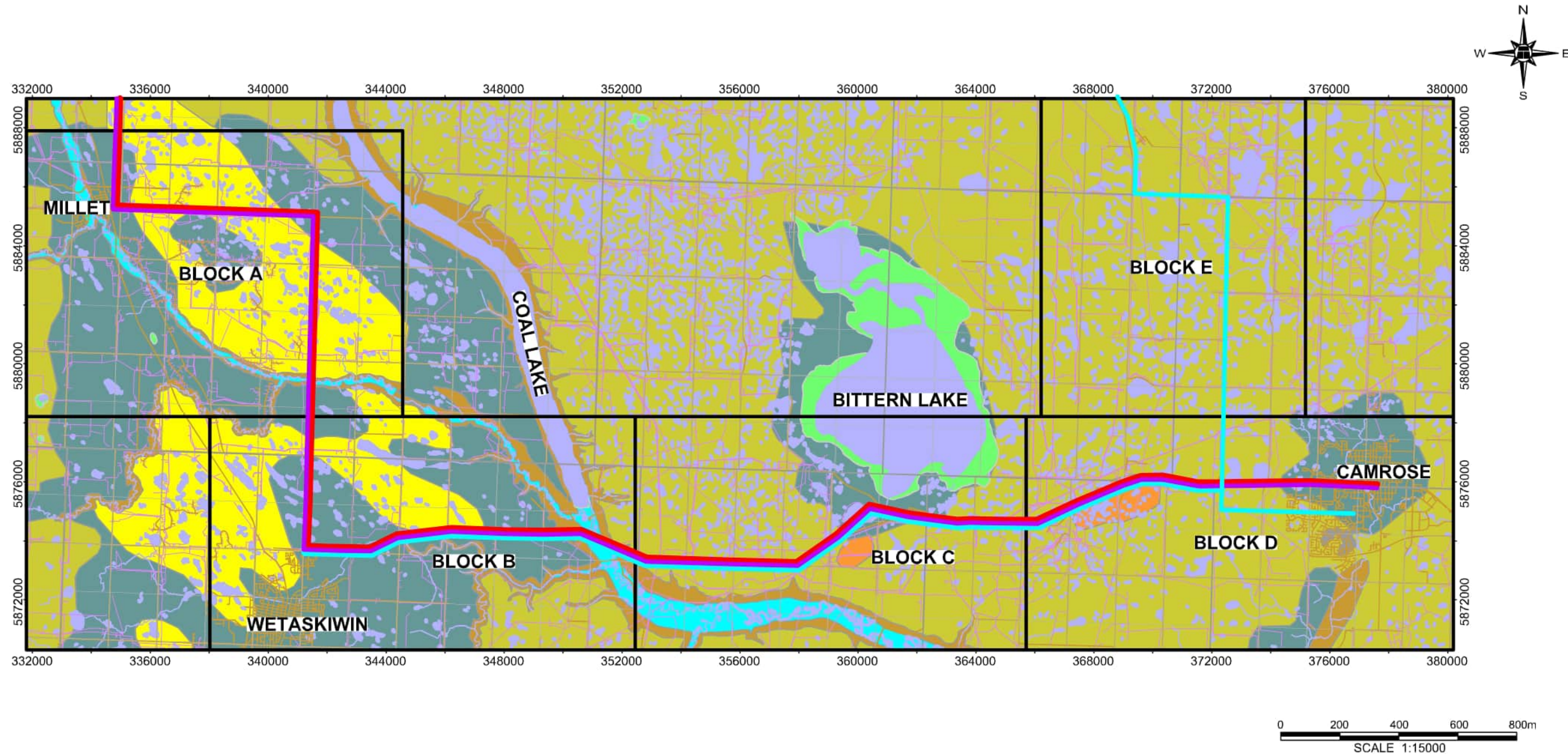
BEDROCK SURFACE TOPOGRAPHY
(SOUTH STUDY AREA)

DWG No. 85418-2c

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:200 000
DATE	MAY 2026
FILE No.	85418



G:\05000\085418 CRSWSC - Camrose & Wetaskiwin Regional Water Supply - Feasibility Study\CAD\085418-2d May 5, 2026.dwg - 1 - May, 07, 2026



LEGEND

- | | |
|---------------------------------|---------------------|
| PROPOSED WATER LINE ALIGNMENT 1 | MAPPED WATER BODY |
| PROPOSED WATER LINE ALIGNMENT 3 | MAPPED WETLAND AREA |
| PROPOSED WATER LINE ALIGNMENT 6 | FLUVIAL |
| APPROXIMATE STUDY BOUNDARY | COLLUVIUM |
| AER PIPELINE | EOLIAN |
| ROAD | GLACIOLACUSTRINE |
| | GLACIOFLUVIAL |
| | MORAINE |
| | COAL MINE |



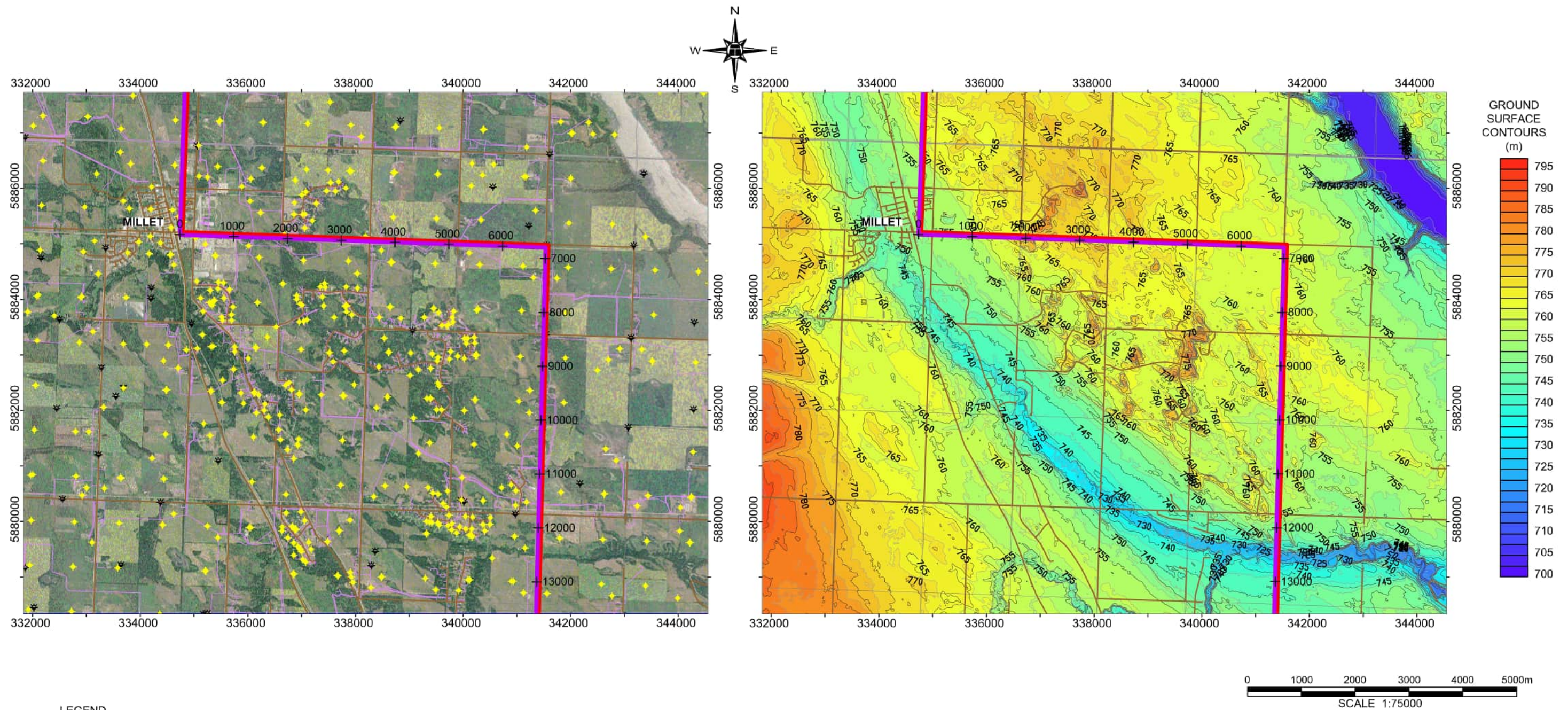
CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

SURFICIAL GEOLOGY MAP
(SOUTH STUDY AREA)

DWG No. 85418-2d

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:150 000
DATE	MAY 2026
FILE No.	85418





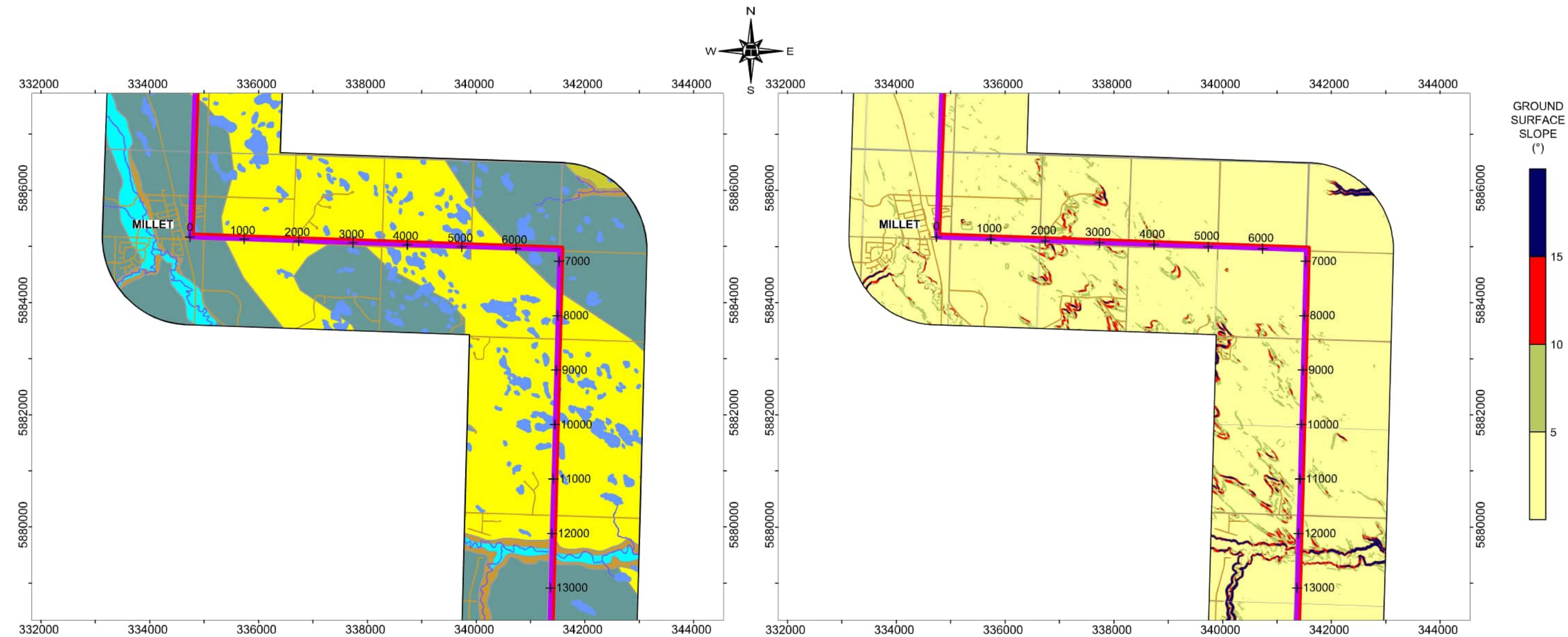
CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

SITE MAP
(SOUTH STUDY AREA - BLOCK A)

DWG No. 85418-2e

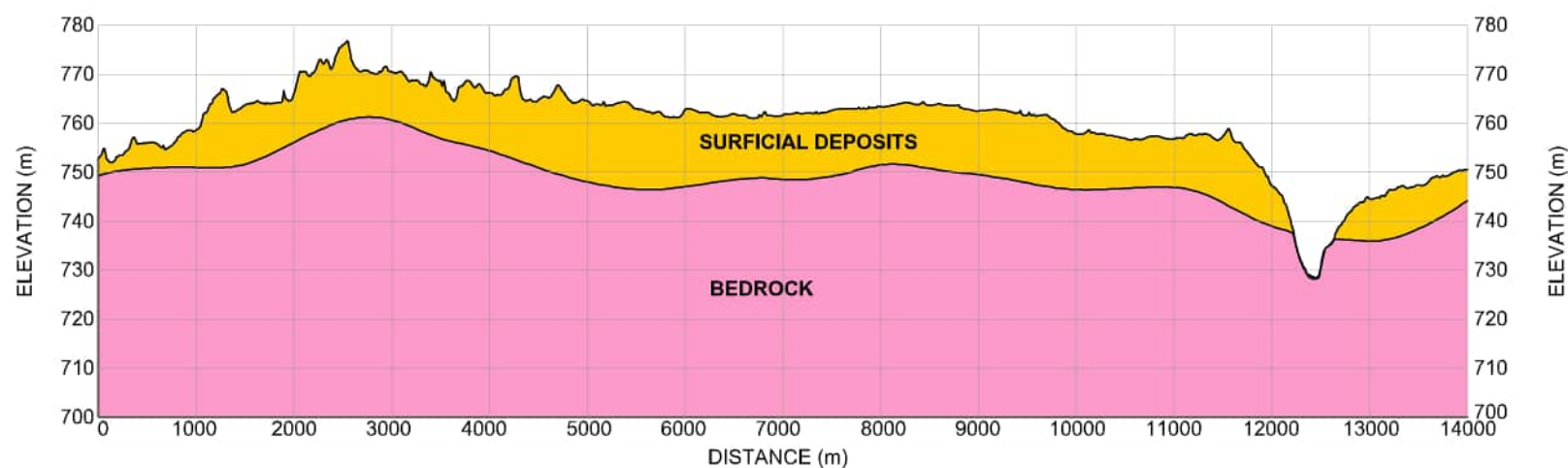
DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418





LEGEND

- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- ROAD
- MAPPED WATER BODY
- FLUVIAL
- COLLUVIUM
- EOLIAN
- GLACIOLACUSTRINE
- MORaine



PROFILE
SCALE: H 1:75000 V 1:15000

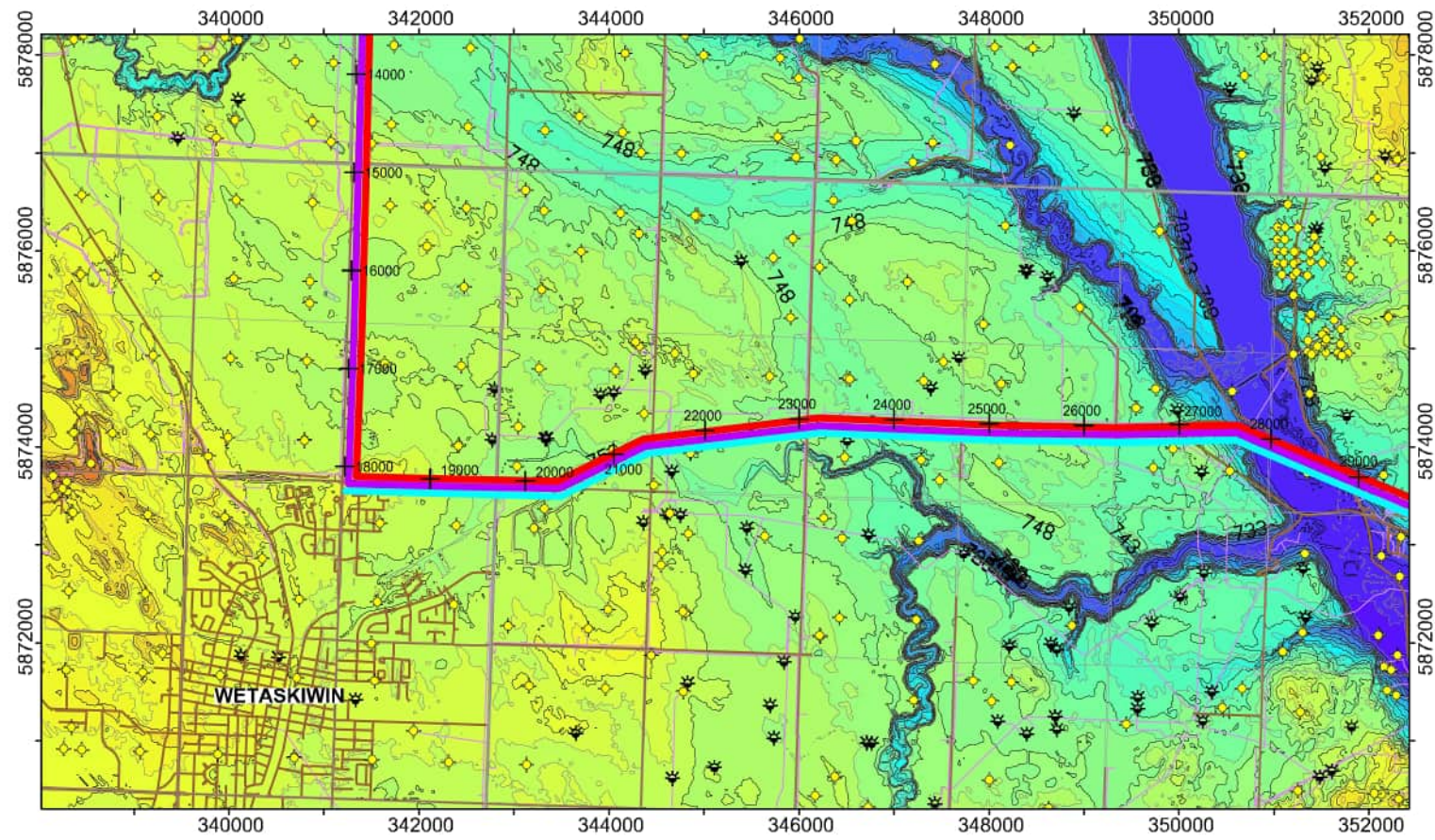
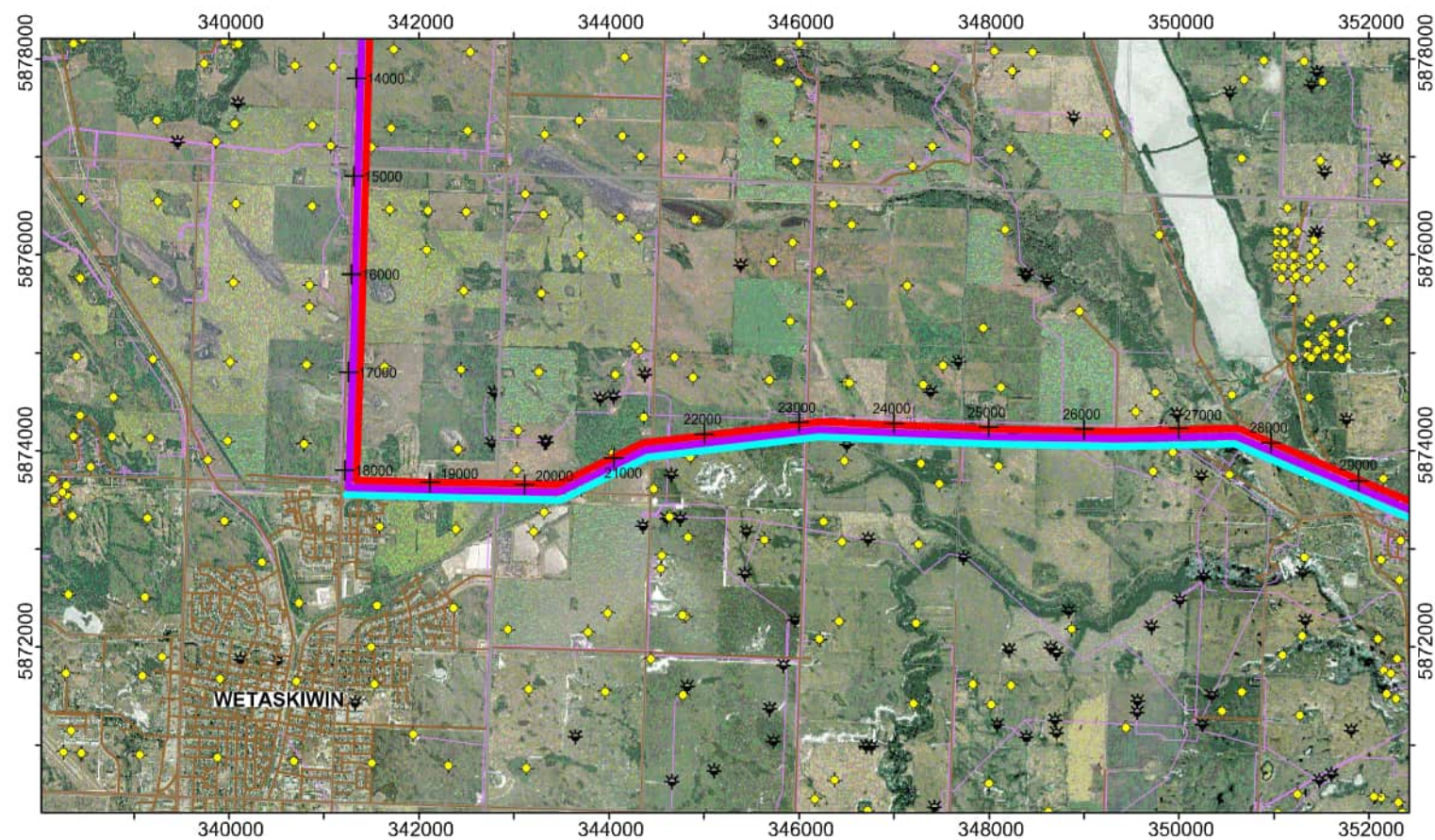


CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY
SURFICIAL GEOLOGY AND GROUND SURFACE
SLOPE MAPS WITH ELEVATION PROFILE
(SOUTH STUDY AREA - BLOCK A)

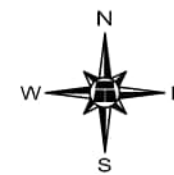
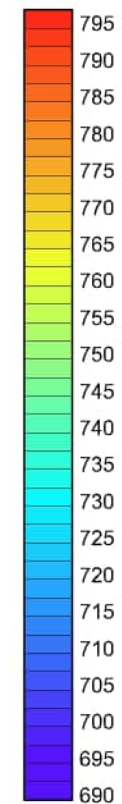
DWG No. 85418-2f

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418



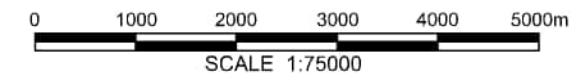


GROUND
SURFACE
CONTOURS
(m)



LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- AER PIPELINE
- ROAD
- WATER WELL
- OIL AND GAS WELL



CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

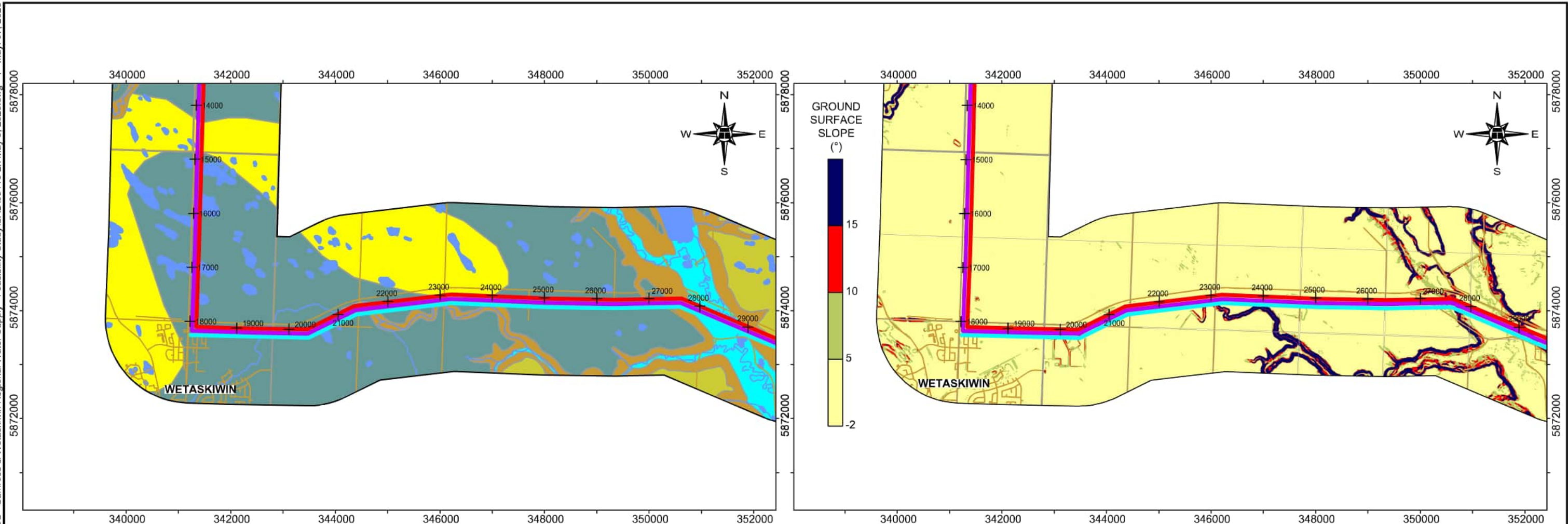
SITE MAP
(SOUTH STUDY AREA - BLOCK B)

DWG No. 85418-2g

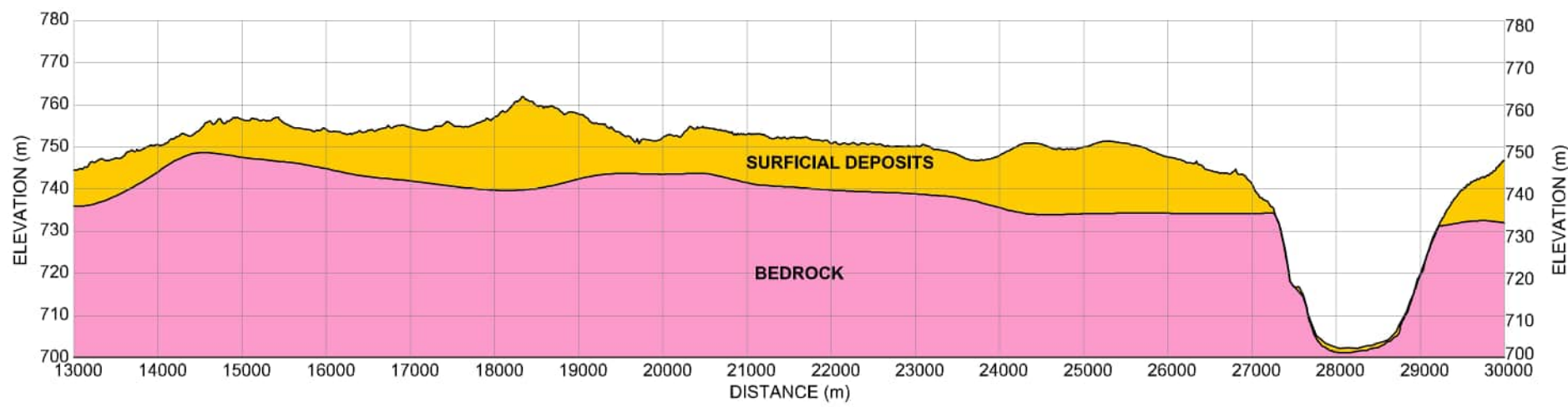
DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418



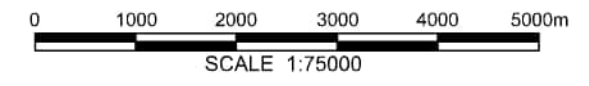
G:\155000\85418 CRSWSC - Camrose & Wetaskiwin Regional Water Supply - Feasibility Study\CAD\85418-2h May 5, 2026.dwg - 1 - May 07, 2026



- LEGEND**
- PROPOSED WATER LINE ALIGNMENT 1
 - PROPOSED WATER LINE ALIGNMENT 3
 - PROPOSED WATER LINE ALIGNMENT 6
 - ROAD
 - MAPPED WATER BODY
 - FLUVIAL
 - COLLUVIUM
 - EOLIAN
 - GLACIOLACUSTRINE
 - MORAINE



PROFILE
SCALE: H 1:75000 V 1:15000

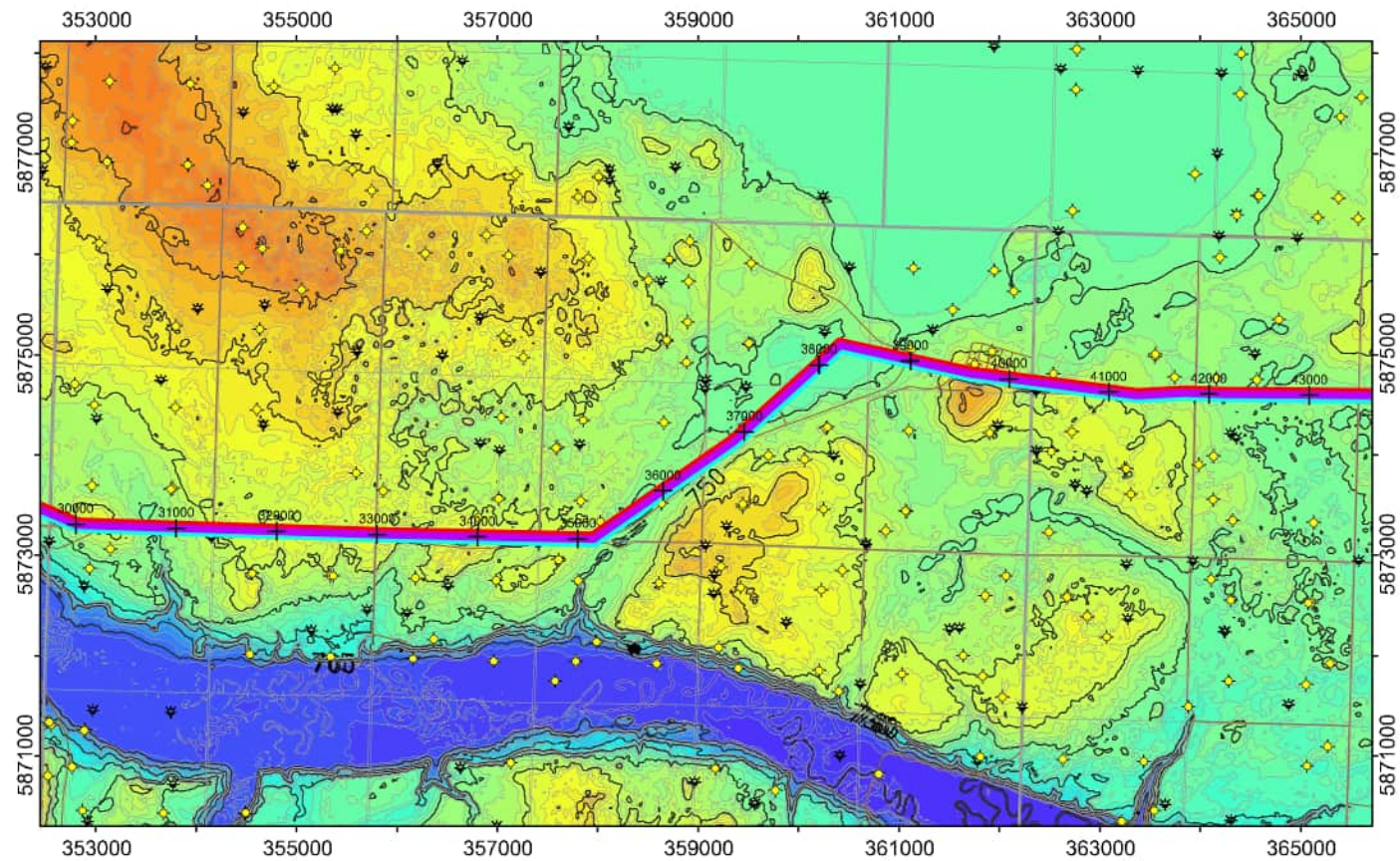
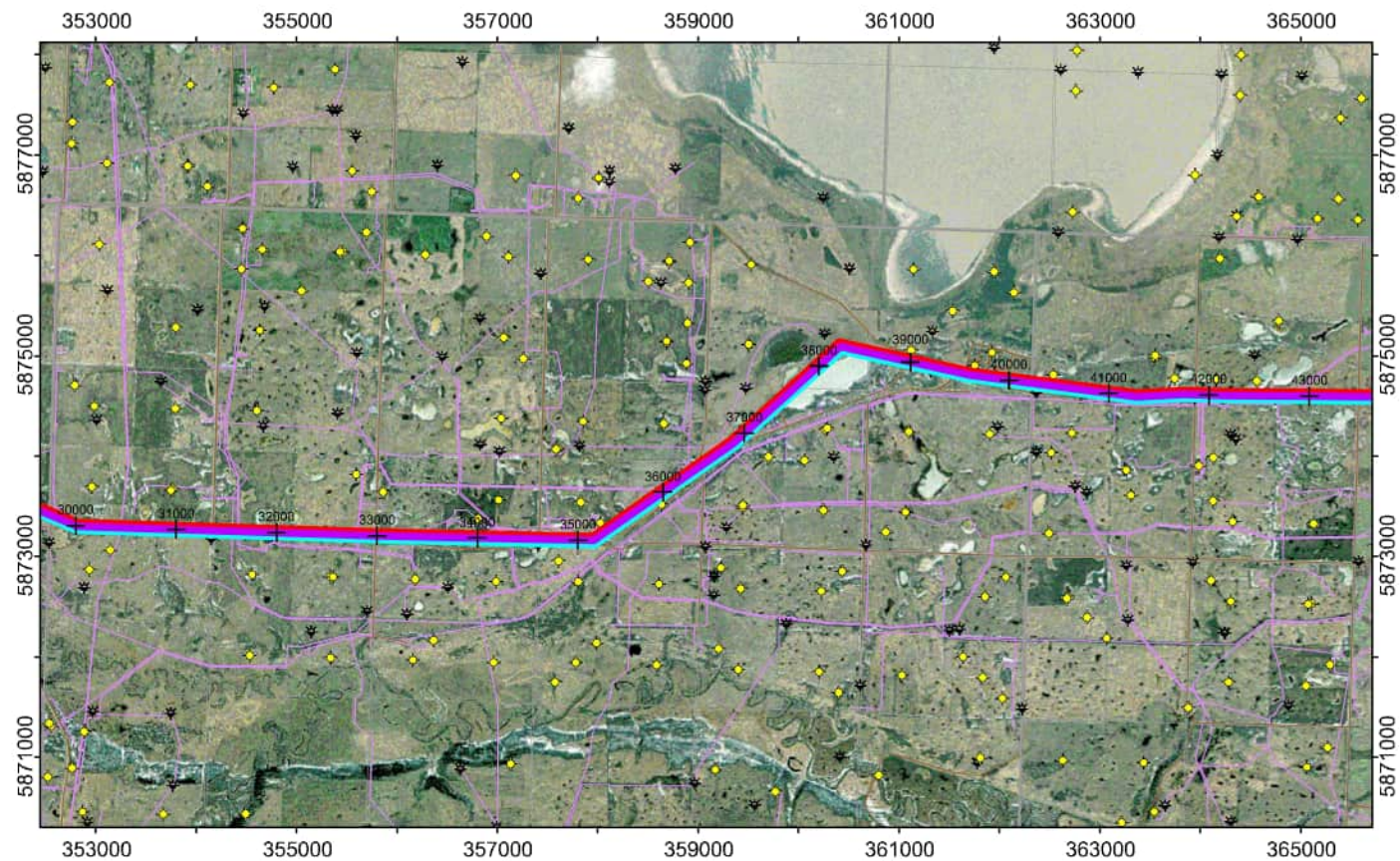




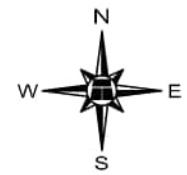
CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WETASKIWIN,
GEOTECHNICAL DESKTOP STUDY
SURFICIAL GEOLOGY AND GROUND SURFACE
SLOPE MAPS WITH ELEVATION PROFILE
(SOUTH STUDY AREA - BLOCK B)
DWG No. 85418-2h

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418



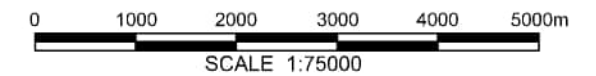


GROUND
SURFACE
CONTOURS
(m)



LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- AER PIPELINE
- ROAD
- WATER WELL
- OIL AND GAS WELL



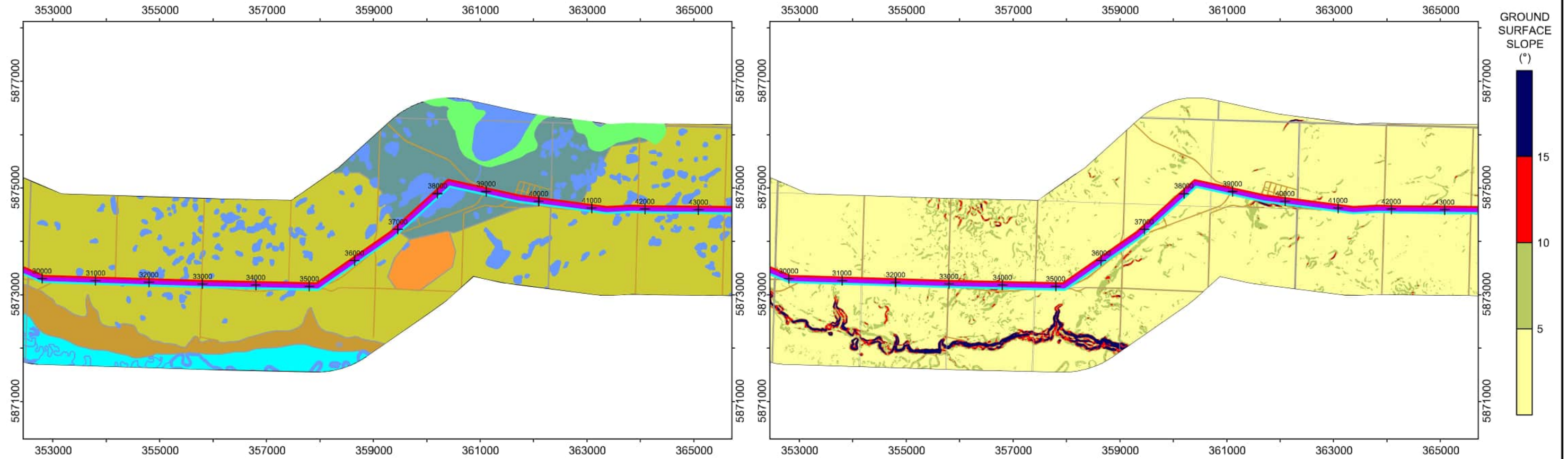
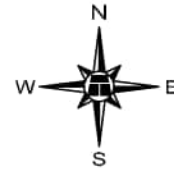
CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

SITE MAP
(SOUTH STUDY AREA - BLOCK C)

DWG No. 85418-2i

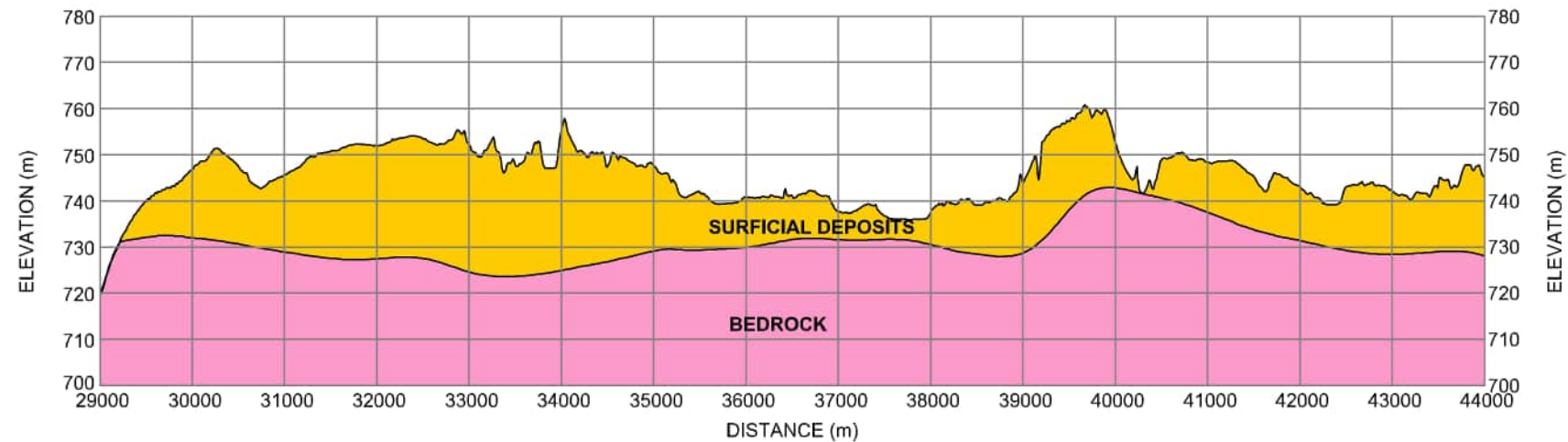
DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418



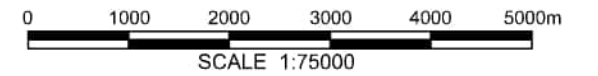


LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- ROAD
- MAPPED WATERBODY
- WET LAND
- FLUVIAL
- COLLUVIUM
- GLACIOLACUSTRINE
- GLACIOFLUVIAL
- MORAINE
- COAL MINE



PROFILE
SCALE: H 1:75000 V 1:15000



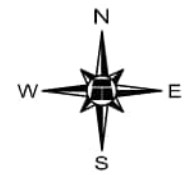
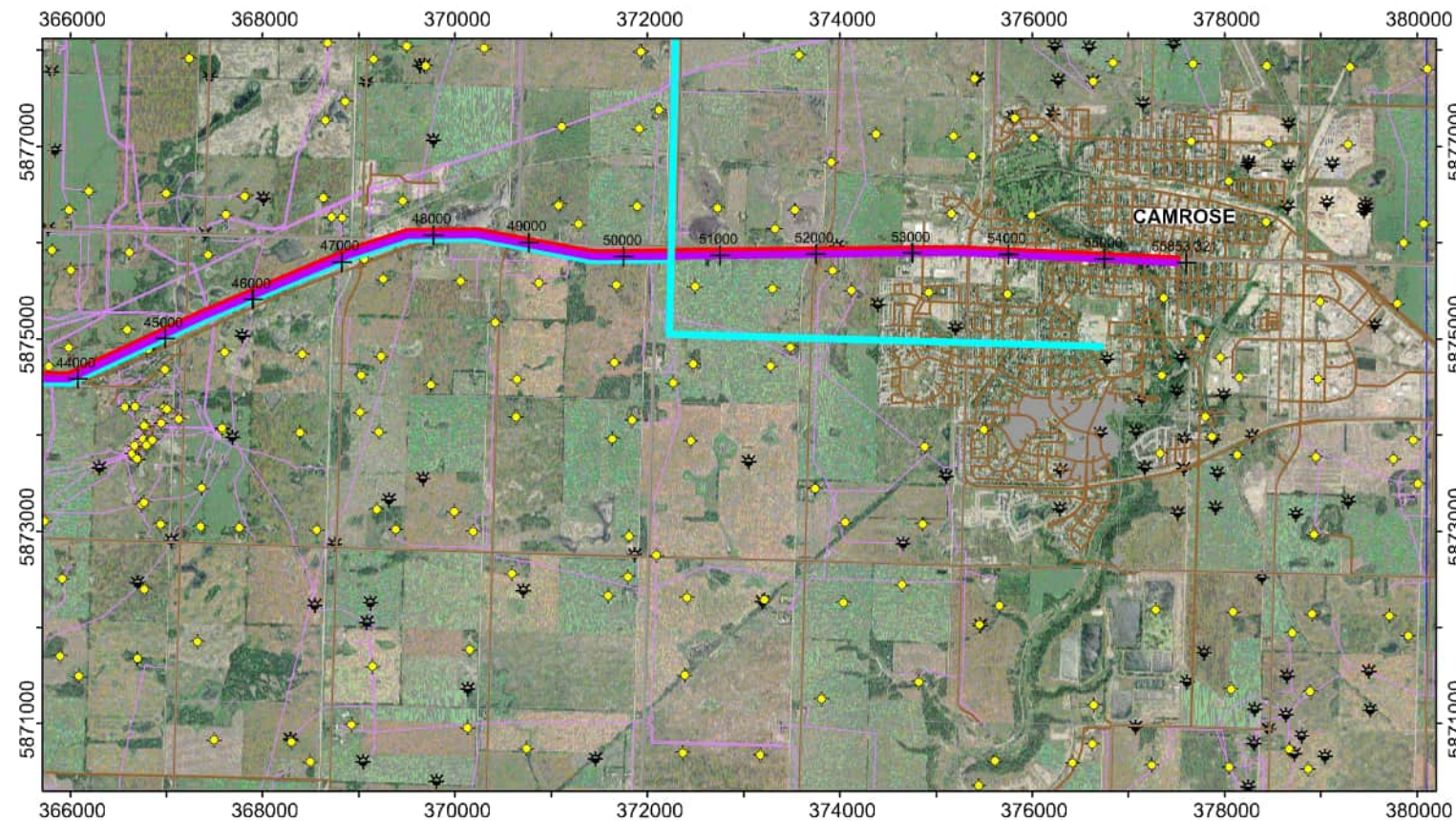
**CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY
SURFICIAL GEOLOGY AND GROUND SURFACE
SLOPE MAPS WITH ELEVATION PROFILE
(SOUTH STUDY AREA - BLOCK C)**

DWG No. 85418-2j

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418

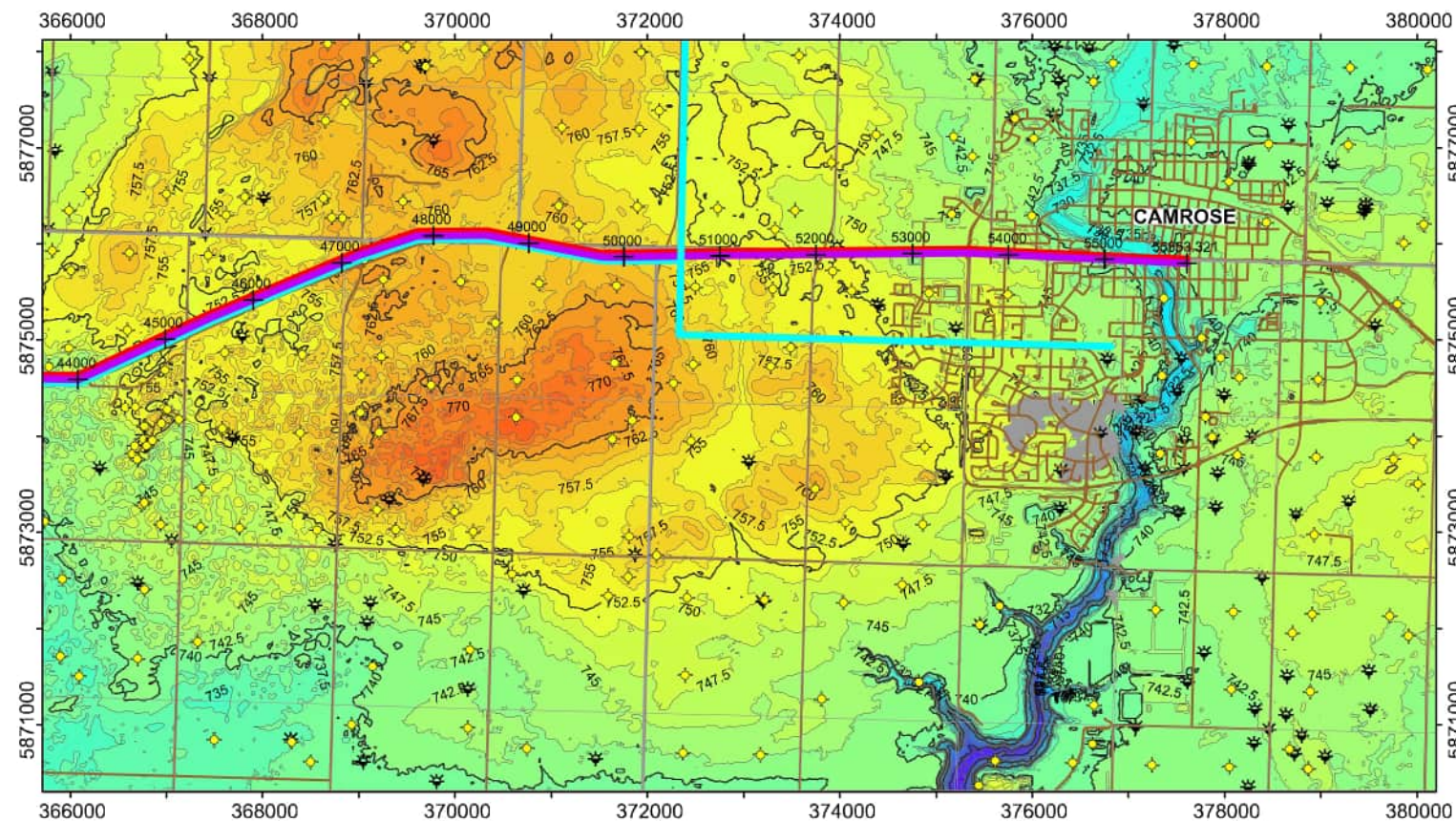


G:\85000\85418 CRSWSC - Camrose & Wetaskiwin Regional Water Supply - Feasibility Study\CAD\85418-2kMay 5, 2026.dwg - 1 - May, 07, 2026

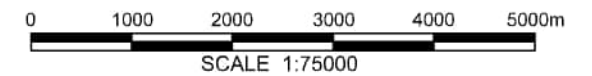
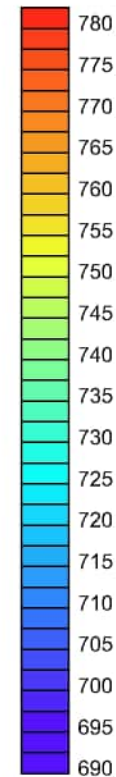


LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- AER PIPELINE
- ROAD
- WATER WELL
- OIL AND GAS WELL
- COAL MINE



GROUND
SURFACE
CONTOURS
(m)



**CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY**

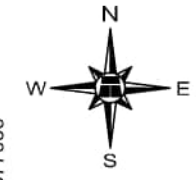
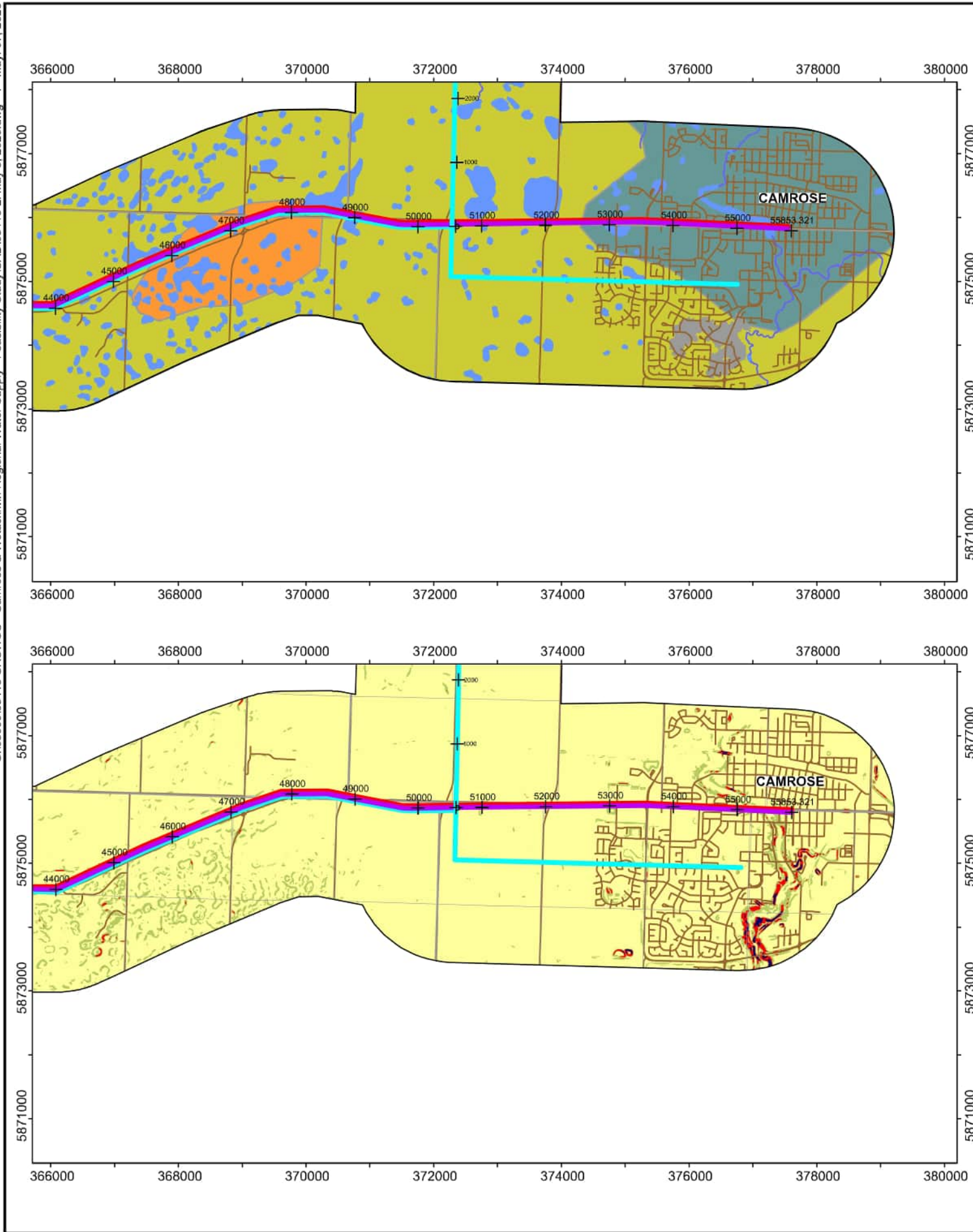
**SITE MAP
(SOUTH STUDY AREA - BLOCK D)**

DWG No. 85418-2k

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418



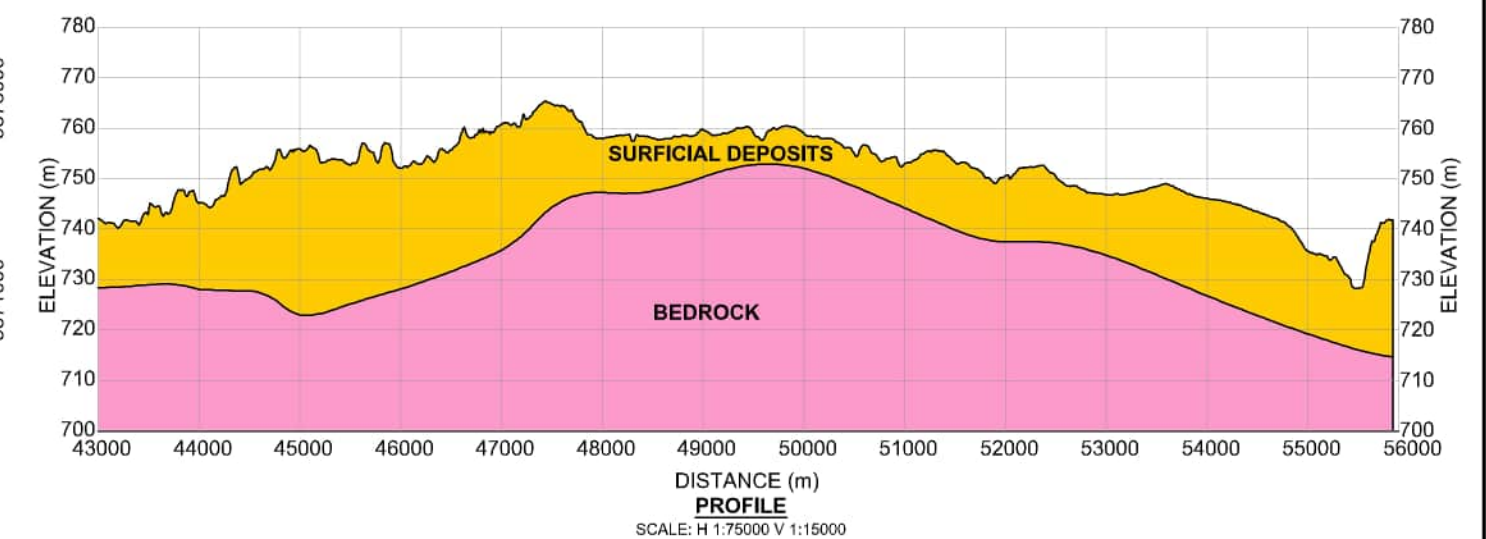
G:\185000\185418 CRSWSC - Camrose & Wetaskiwin Regional Water Supply - Feasibility Study\CAD\185418-21 May 5, 2026.dwg - 1 - May, 07, 2026



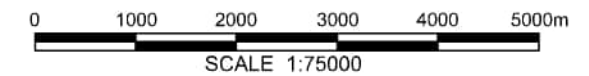
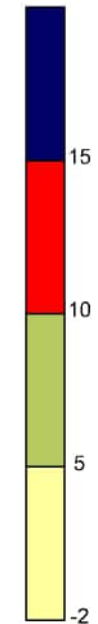
LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- ROAD

- MAPPED WATERBODY
- COLLUVIUM
- GLACIOLACUSTRINE
- GLACIOFLUVIAL
- MORaine
- COAL MINE



GROUND SURFACE SLOPE (°)

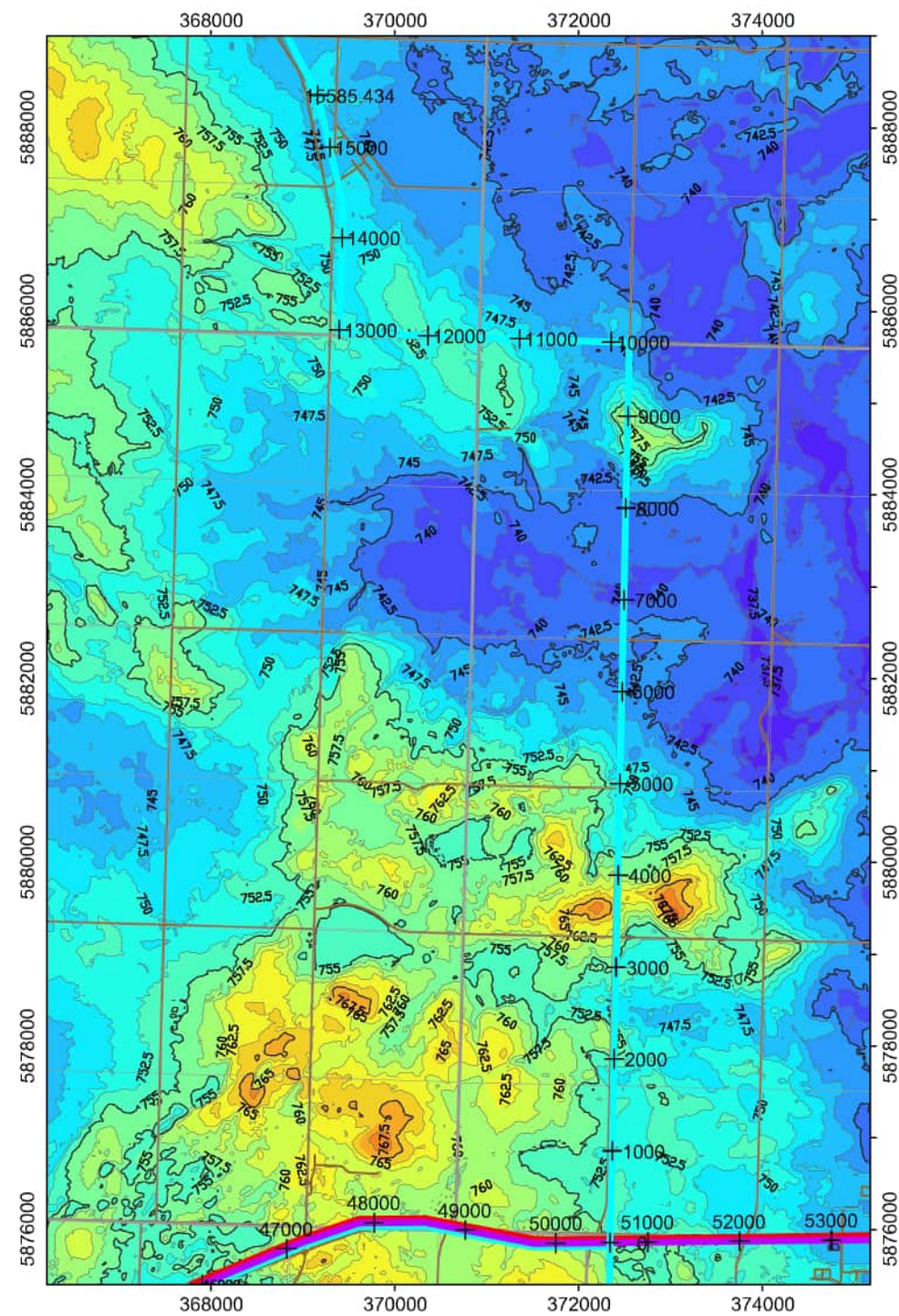
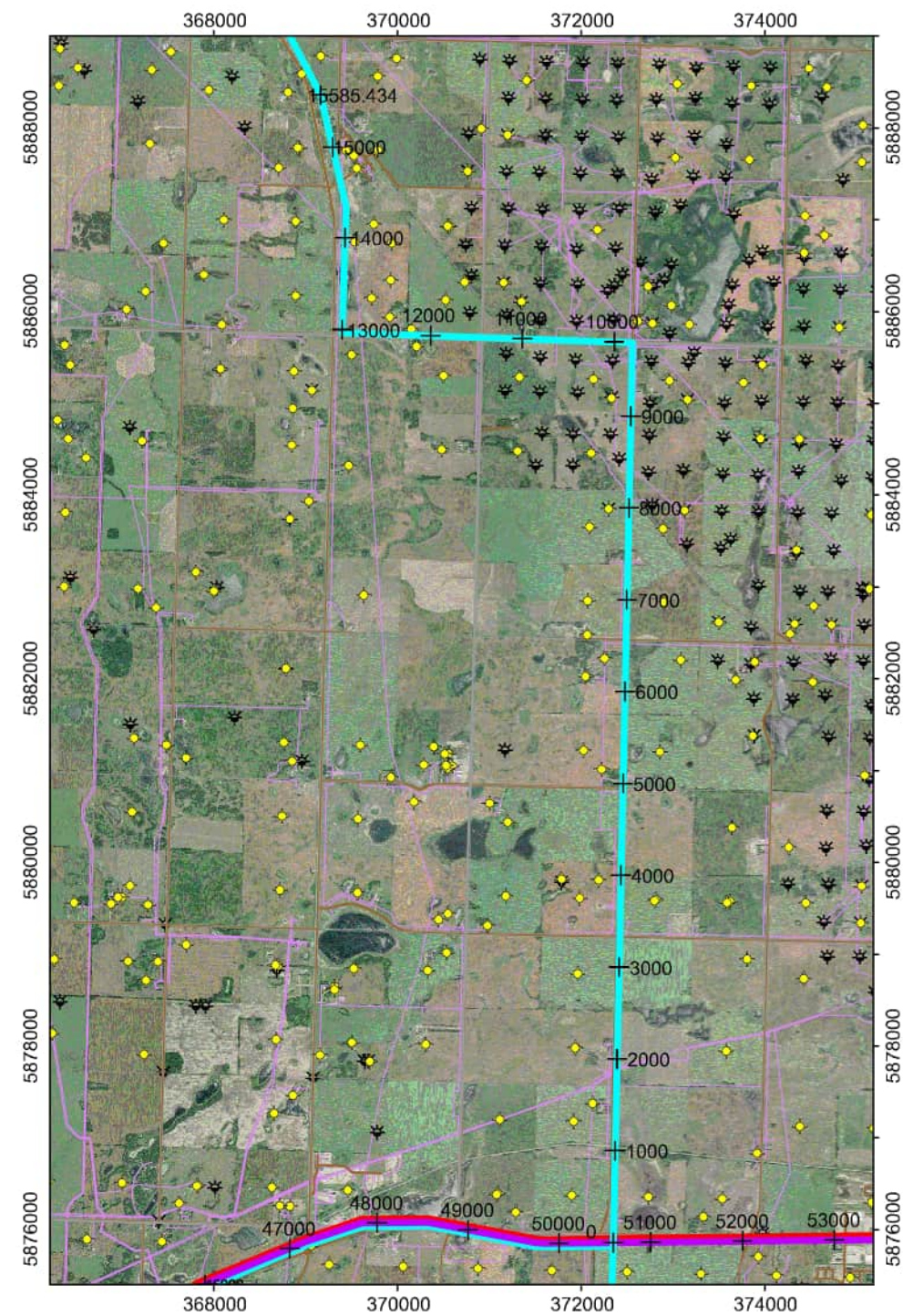


CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY
SURFICIAL GEOLOGY AND GROUND SURFACE
SLOPE MAPS WITH ELEVATION PROFILE
(SOUTH STUDY AREA - BLOCK D)

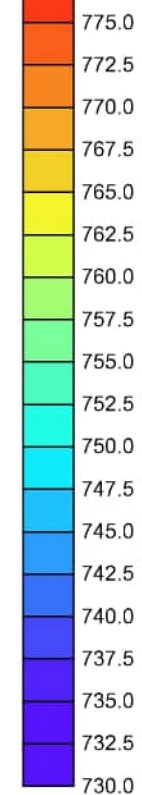
DWG No. 85418-21

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418



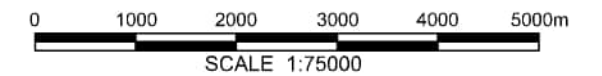


GROUND
SURFACE
CONTOURS
(m)



LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- AER PIPELINE
- ROAD
- WATER WELL
- OIL AND GAS WELL



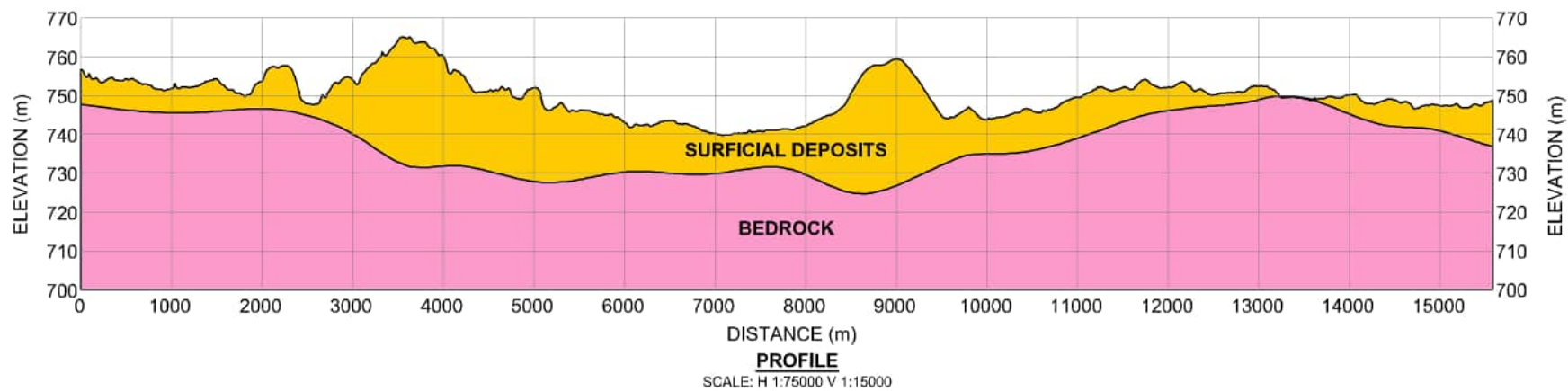
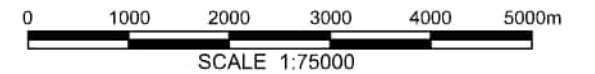
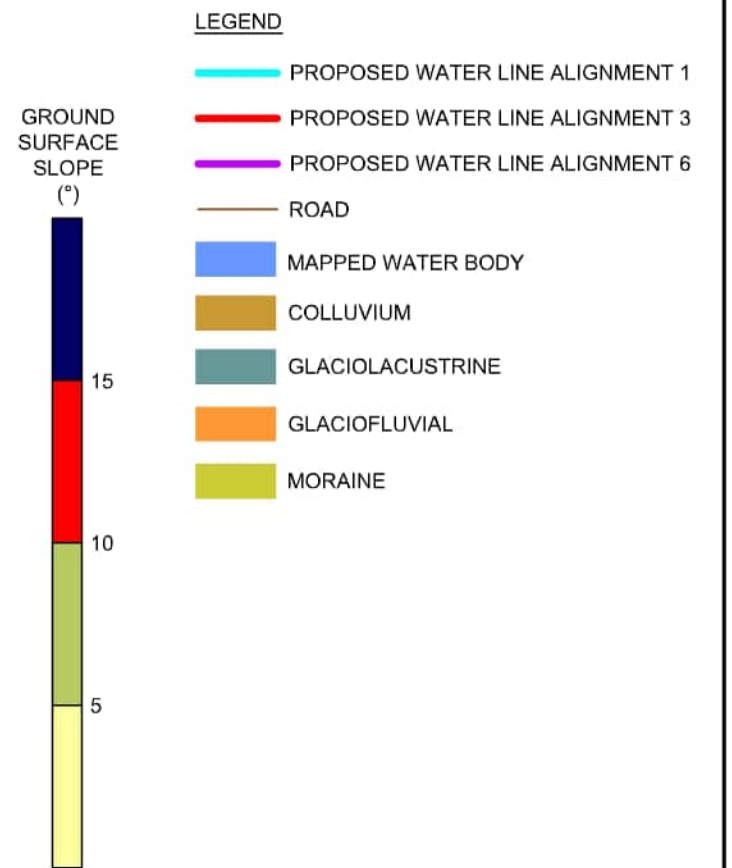
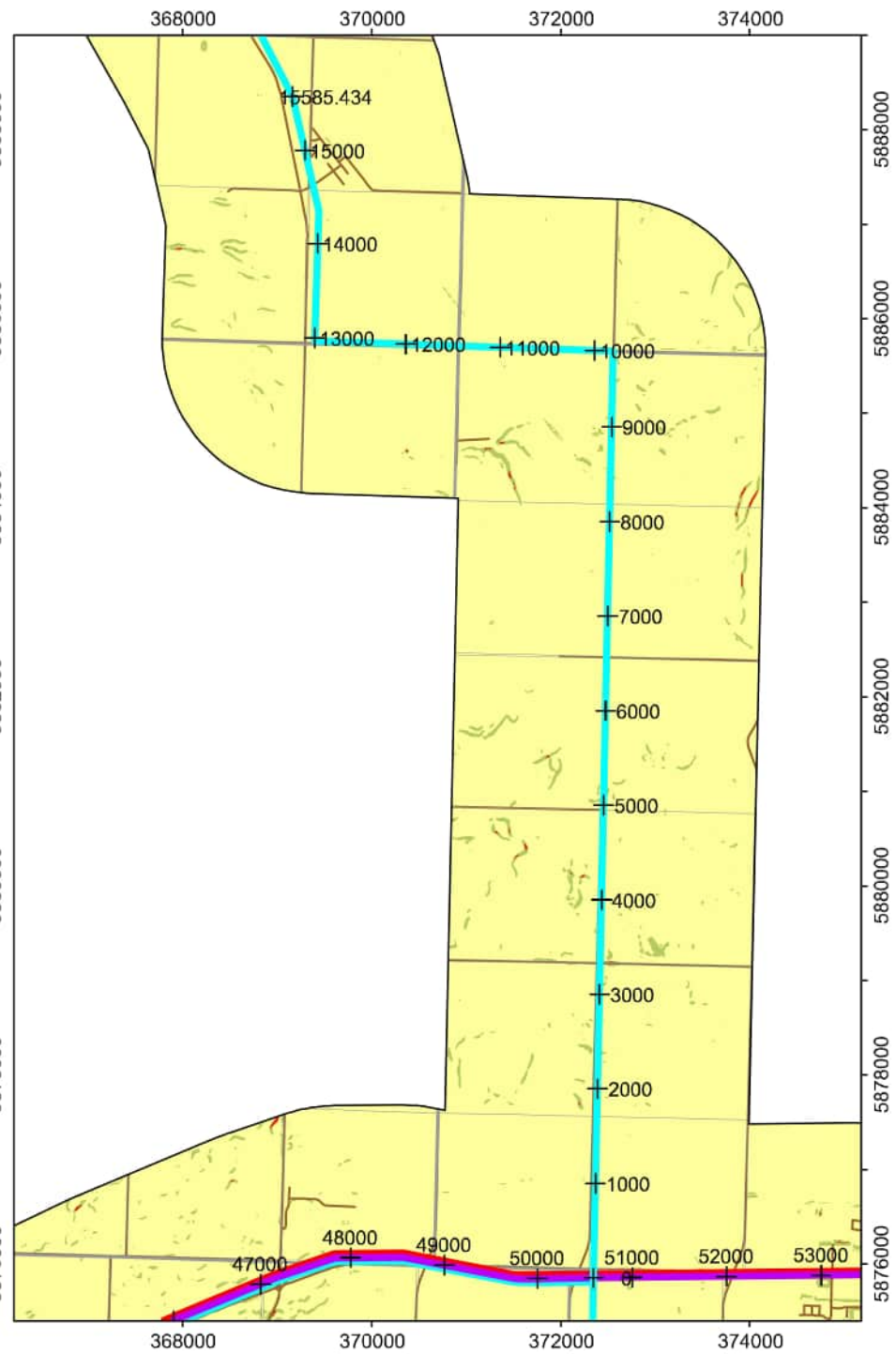
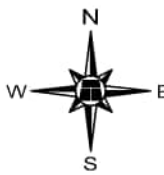
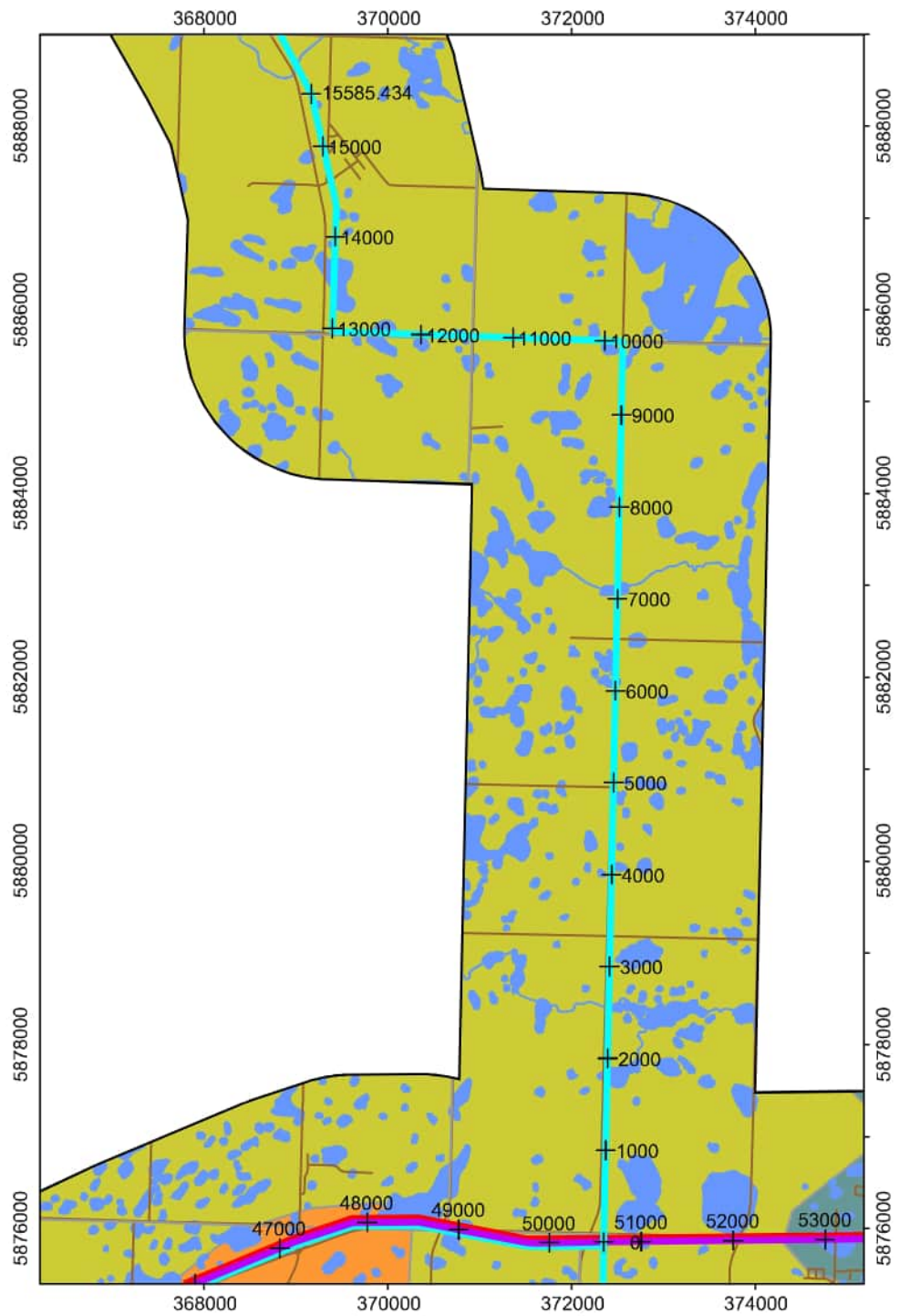
CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

SITE MAP
(SOUTH STUDY AREA - BLOCK E)

DWG No. 85418-2m

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418

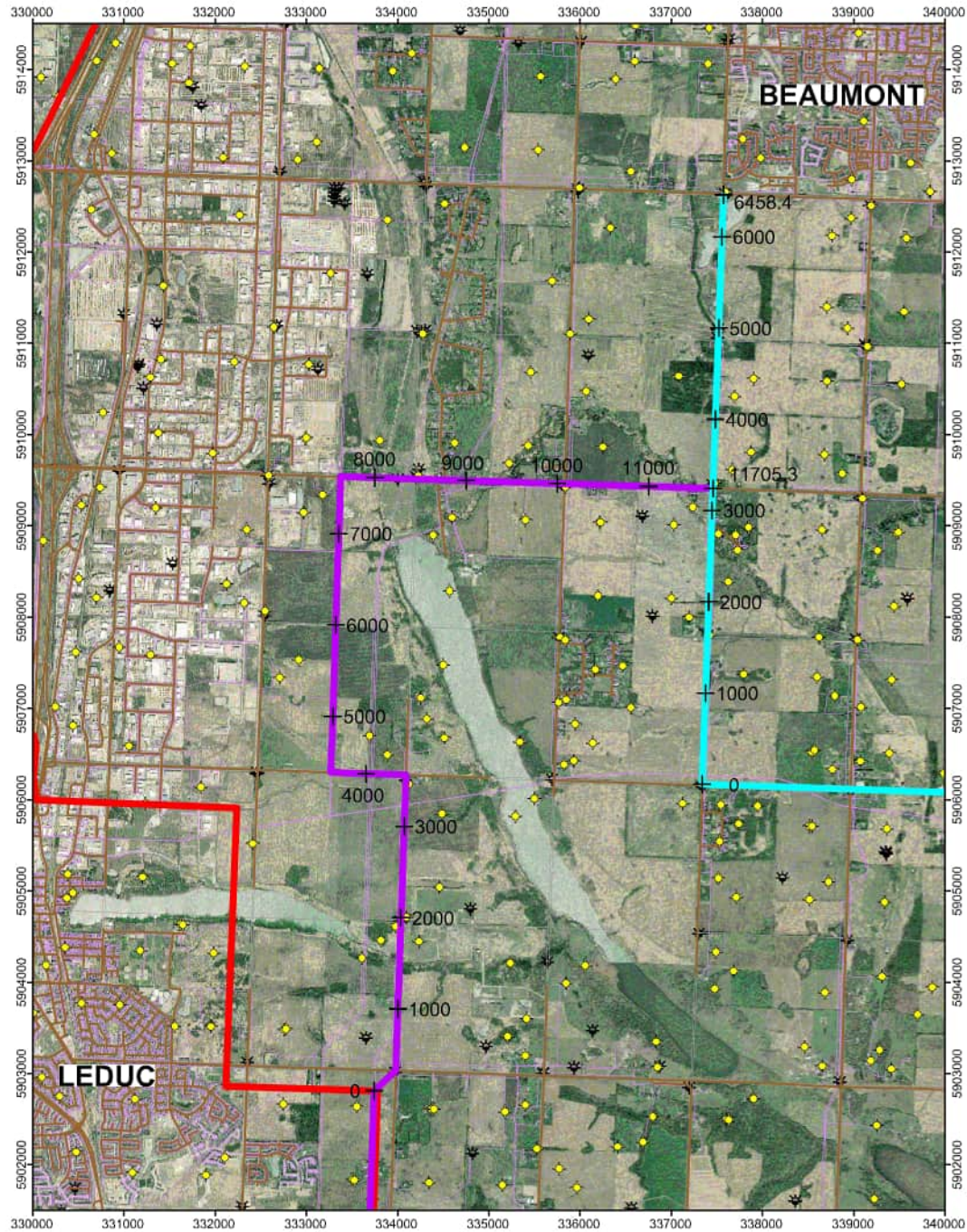




CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY
SURFICIAL GEOLOGY AND GROUND SURFACE
SLOPE MAPS WITH ELEVATION PROFILE
(SOUTH STUDY AREA - BLOCK E)
DWG No. 85418-2n

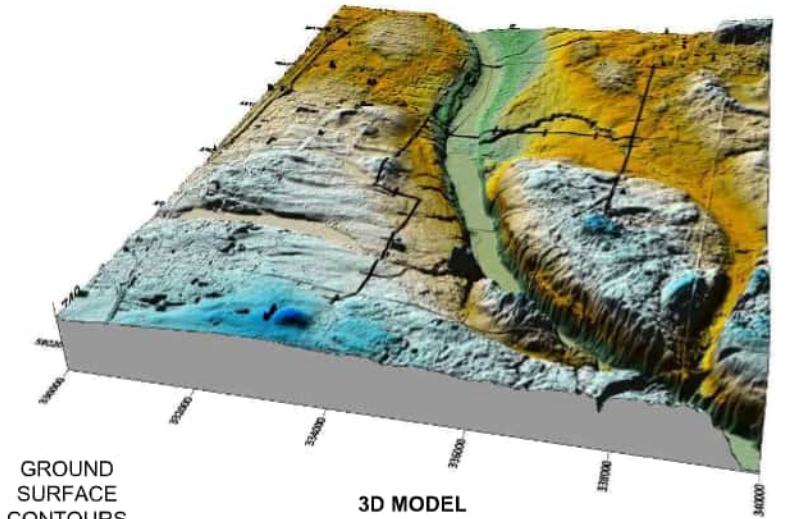
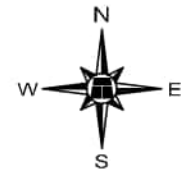
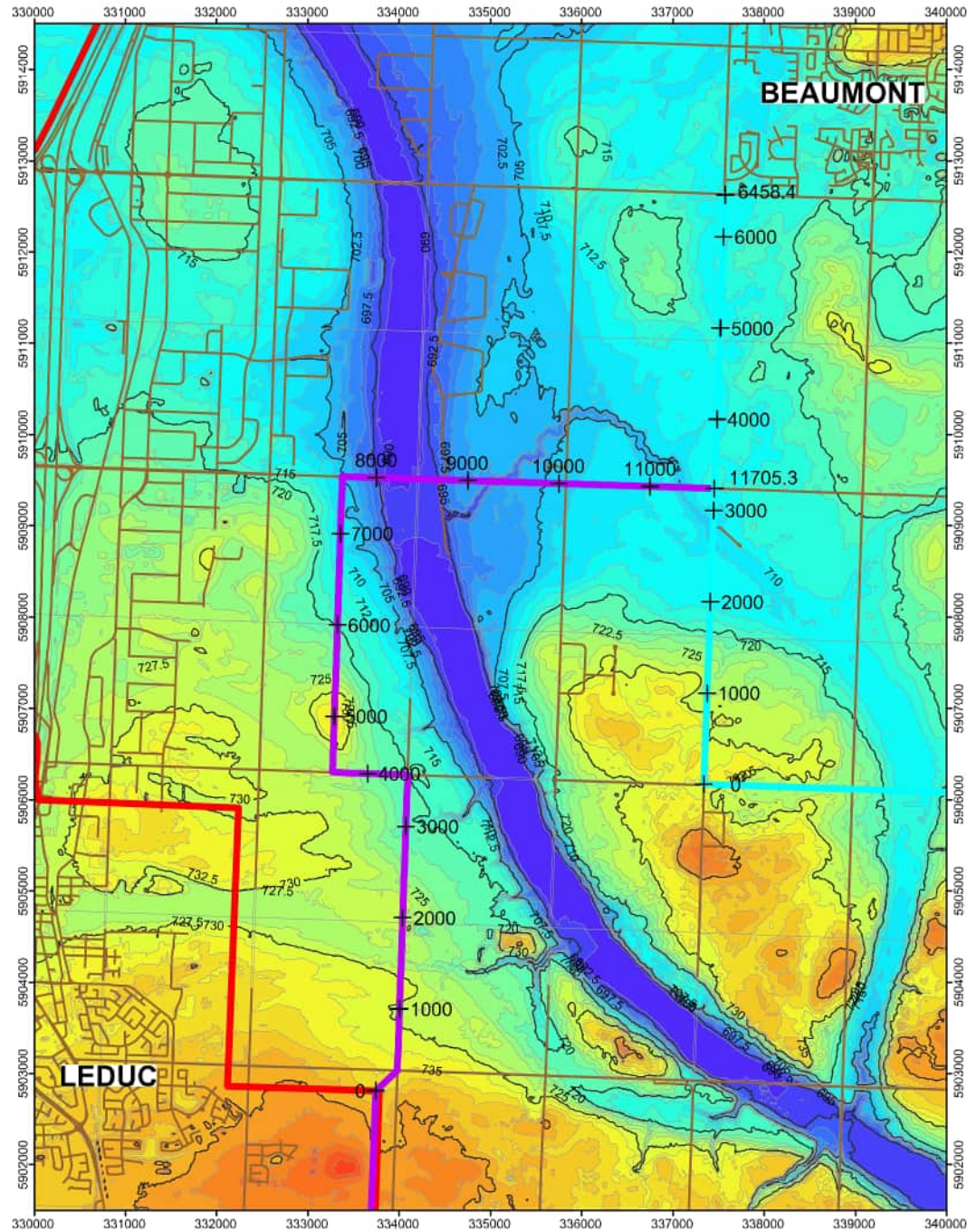
DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418



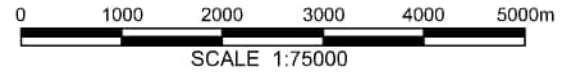
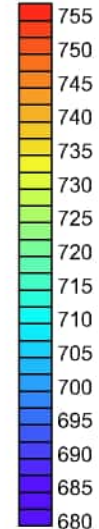


LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- PER PIPELINE
- ROAD
- WATER WELL
- OIL AND GAS WELL



GROUND
SURFACE
CONTOURS
(m)



SCALE 1:75000



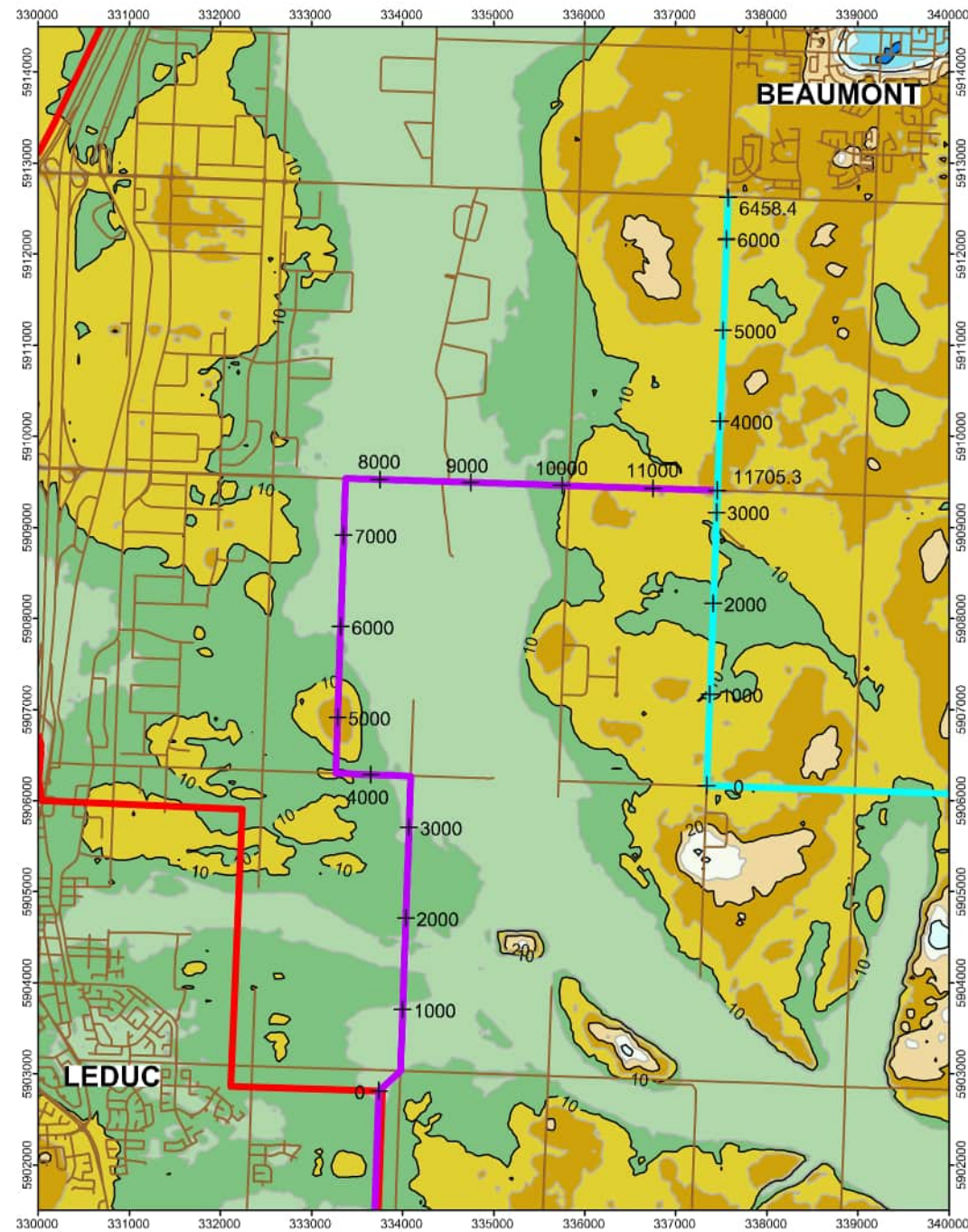
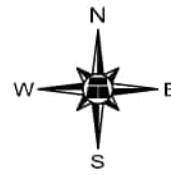
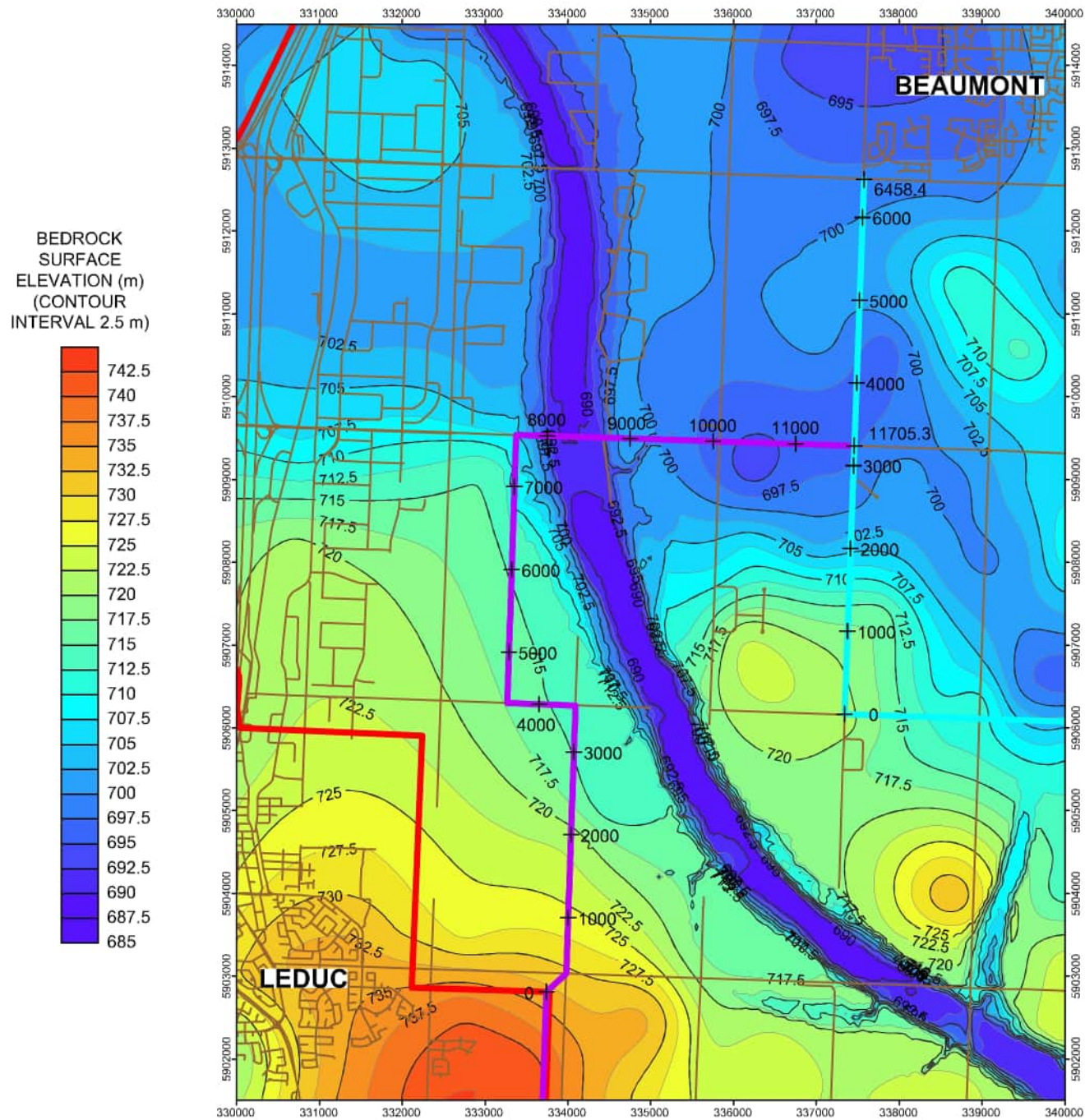
CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

SITE MAP
(NORTH STUDY AREA)

DWG No. 85418-3a

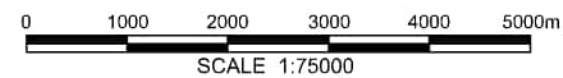
DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418





LEGEND

- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- ROAD
- WATER WELL
- OIL AND GAS WELL



CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY

BEDROCK SURFACE TOPOGRAPHY
(NORTH STUDY AREA)

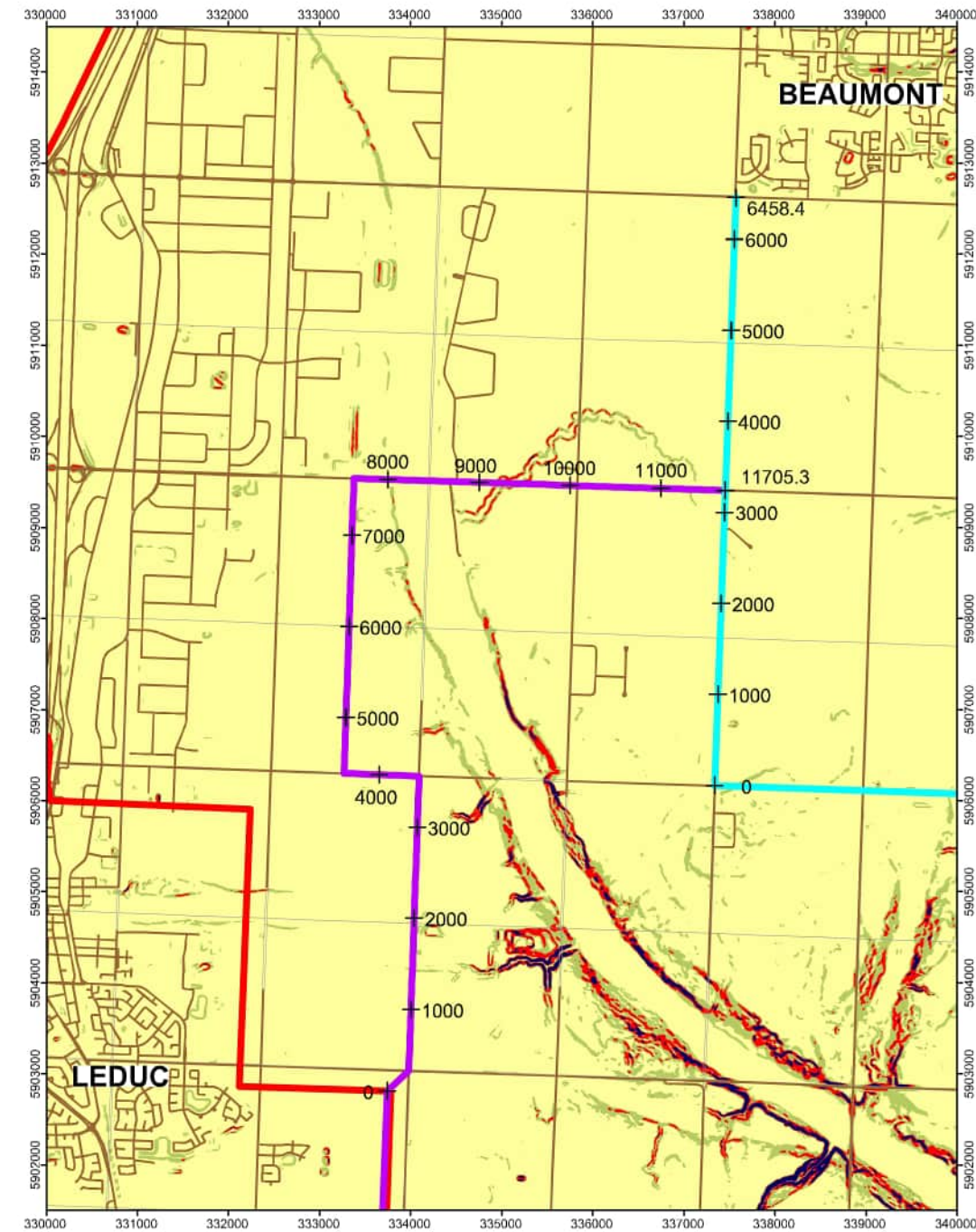
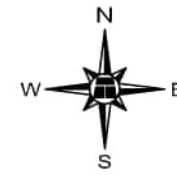
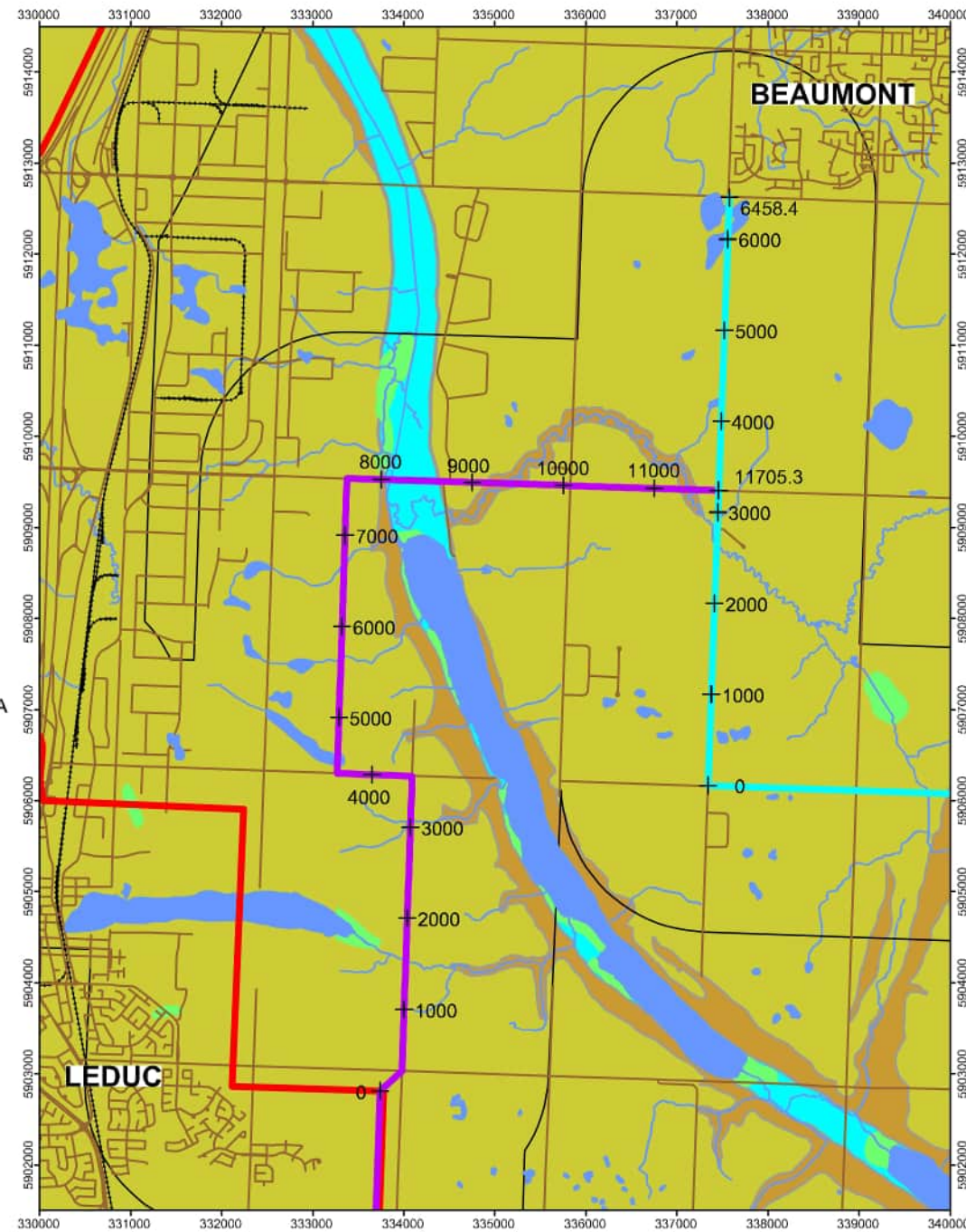
DWG No. 85418-3b

DRAWN BY	ML
DESIGNED BY	MJB / MG
APPROVED BY	CAC
SCALE	1:75 000
DATE	MAY 2026
FILE No.	85418

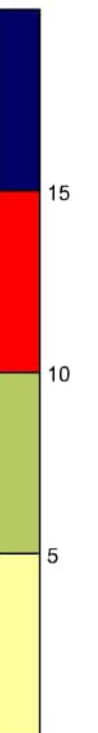


LEGEND

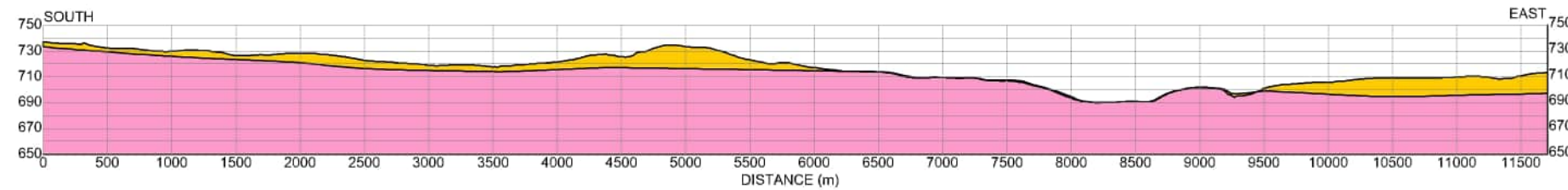
- PROPOSED WATER LINE ALIGNMENT 1
- PROPOSED WATER LINE ALIGNMENT 3
- PROPOSED WATER LINE ALIGNMENT 6
- ROAD
- MAPPED WATER BODY
- MAPPED WETLAND AREA
- FLUVIAL
- COLLUVIUM
- MORaine



GROUND SURFACE SLOPE (°)

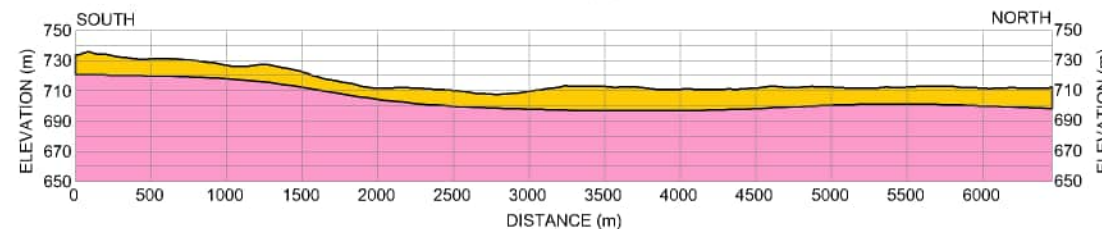


0 1000 2000 3000 4000 5000m
SCALE 1:75000



LEGEND

- SURFICIAL DEPOSITS
- BEDROCK



PROFILES
SCALE: H 1:50000 V 1:5000



CAPITAL REGION SOUTHWEST WATER SERVICES COMMISSION
CAMROSE AND WETASKIWIN REGIONAL WATER SUPPLY
COUNTY OF CAMROSE AND WESTASKIWIN,
GEOTECHNICAL DESKTOP STUDY
SURFICIAL GEOLOGY AND GROUND SURFACE
SLOPE MAPS WITH ELEVATION PROFILE
(NORTH STUDY AREA)

DWG No. 85418-3c

DRAWN BY ML
DESIGNED BY MJB / MG
APPROVED BY CAC
SCALE 1:75 000
DATE MAY 2026
FILE No. 85418



APPENDIX C - DETAILED COST BREAKDOWN

Quantities And Prices



Client:
CRSWSC
Project:
Camrose & Wetaskiwin Feasibility Study
Subject:
Cost Estimate

Proj. No.

2025-3300

June 2026

Alignment 1

Item	Description	Unit	Quantity	Rate	Extension
1.0	Water Supply Line				
1.1	General Requirements	LS	1	\$ 13,950,000	\$ 13,950,000
2.0	Camrose & Wetaskiwin Supply Line				
2.3	1,050 mm Dia. Pipe (Highway 2)	m	7,100	\$ 5,000	\$ 35,500,000
2.1	900 mm Dia. pipe (Edmonton Urban)	m	5,800	\$ 3,000	\$ 17,400,000
2.2	900 mm Dia. pipe (Edmonton AHD)	m	5,200	\$ 4,500	\$ 23,400,000
2.3	900 mm Dia. pipe (Rural)	m	5,400	\$ 2,400	\$ 12,960,000
2.4	750 mm Dia. Pipe	m	45,200	\$ 1,850	\$ 83,620,000
2.5	600 mm Dia. Pipe	m	44,400	\$ 1,600	\$ 71,040,000
2.6	Trenchless Crossings	m	3,000	\$ 3,500	\$ 10,500,000
3.0	Nisku Booster Station Reconstruction	LS	1	\$ 18,500,000	\$ 18,500,000
4.0	Telford Lake Booster Station Decommissioning	LS	1	\$ 50,000	\$ 50,000
5.0	New Booster Station	LS	3	\$ 1,500,000	\$ 4,500,000
6.0	Commissioning	LS	1	\$ 1,500,000	\$ 1,500,000
	Total - Water Supply				\$ 292,920,000
			Construction		\$ 292,920,000
			Contingency (30%)		\$ 87,876,000
			Non-Construction (15%)		\$ 57,119,000
			Total Cost		\$ 437,915,000

Quantities And Prices



Client:
CRSWSC
Project:
Camrose & Wetaskiwin Feasibility Study
Subject:
Cost Estimate

Proj. No.

2025-3300

June 2026

Alignment 2

Item	Description	Unit	Quantity	Rate	Extension
1.0	Water Supply Line				
1.1	General Requirements	LS	1	\$ 13,810,000	\$ 13,810,000
2.0	Camrose & Wetaskiwin Supply Line				
2.1	900 mm Dia. Pipe (Edmonton Urban)	m	5800	\$ 3,000	\$ 17,400,000
2.2	900 mm Dia. Pipe (Edmonton AHD)	m	5200	\$ 4,500	\$ 23,400,000
2.3	900 mm Dia Pipe (Rural)	m	12100	\$ 2,400	\$ 29,040,000
2.4	750 mm Dia. Pipe	m	68900	\$ 1,850	\$ 127,465,000
2.5	500 mm Dia. Pipe	m	37700	\$ 1,500	\$ 56,550,000
2.6	Trenchless Crossings	m	4650	\$ 3,500	\$ 16,275,000
					\$ -
3.0	Highway 21 Booster Station Decommissioning	LS	1	\$ 50,000	\$ 50,000
					\$ -
4.0	New Booster Station	LS	3	\$ 1,500,000	\$ 4,500,000
					\$ -
5.0	Commissioning	LS	1	\$ 1,500,000	\$ 1,500,000
					\$ -
	Total - Water Supply				\$ 289,990,000
			Construction:		\$ 289,990,000
			Contingency (30%):		\$ 86,997,000
			Non-Construction (15%)		\$ 56,548,000
			Total Cost:		\$ 433,535,000

Quantities And Prices



Client:
CRSWSC
Project:
Camrose & Wetaskiwin Feasibility Study
Subject:
Cost Estimate

Proj. No.

2025-3300

June 2026

Alignment 3

Item	Description	Unit	Quantity	Rate	Extension
1.0	Water Supply Line				
1.1	General Requirements	LS	1	\$ 12,600,000	\$ 12,600,000
2.0	Camrose & Wetaskiwin Supply Line				
2.1	900 mm Dia. Pipe (Edmonton Urban)	m	5800	\$ 3,000	\$ 17,400,000
	900 mm Dia. Pipe (Edmonton AHD)	m	5200	\$ 4,500	\$ 23,400,000
2.2	900 mm Dia. Pipe (Rural)	m	12100	\$ 2,400	\$ 29,040,000
2.3	750 mm Dia. Pipe	m	54300	\$ 1,850	\$ 100,455,000
2.4	600 mm Dia. Pipe	m	37730	\$ 1,600	\$ 60,368,000
2.5	Trenchless Crossings	m	4350	\$ 3,500	\$ 15,225,000
3.0	Telford Lake Booster Station Decommissioning	LS	1	\$ 50,000	\$ 50,000.00
3.1					
4.0	New Booster Station	LS	3	\$ 1,500,000	\$ 4,500,000
3.3					\$ -
5.0	Commissioning	LS	1	\$ 1,500,000	\$ 1,500,000
4.1					
4.2					
	Total - Water Supply				\$ 264,538,000
			Construction:		\$ 264,538,000
			Contingency (30%):		\$ 79,361,000
			Non-Construction (15%)		\$ 51,585,000
			Total Cost:		\$ 395,484,000

APPENDIX D - COMMENT REVIEW LOG

Client		CRSWSC			Comment Types	Description				
Project:	Camrose & Wetaskiwin Regional Waterline Feasibility Study				Information	Additional information for consideration.				
Project Number:	2025-3300				Addition	Additional work requested by the client.				
Deliverable:	Feasibility Study Report				Error	Error in the work provided.				
Description:	Comments on draft report				Clarification	Additional information requested.				
Date Log Updated:	September 22, 2026				Editorial	Editorial mistake (grammar, spelling, etc.)				
Comment #	Comment By	Comment Type	Reference Page (PDF)	Reference Section	Date	Comment	Response	Action	Response Author	Status
1	Camrose	Information	1	NA	09-03-2026	Given the age of HLPS #2 reservoir and pump station, the City should consider replacing those facilities around the same time as when a regional waterline is extended to Camrose.	this can be discussed further during detailed design.	Acknowledged	Emma Knapik	Closed
2	Camrose	Clarification	1	NA	09-03-2026	Will the Water for Life grant could be extended to pay for 90% of the reservoir/PS construction?	Grant funding will be applied for in stages - covered costs will be confirmed in future stages.	Acknowledged	Emma Knapik	Closed
3	Camrose	Information	1	NA	09-03-2026	Location options for a new reservoir? Either at the west/NW/SW end of the City, or at / near the WTP site.	Receiving reservoir details will be confirmed during detailed design.	Acknowledged	Emma Knapik	Closed
4	Camrose	Clarification	1	NA	09-03-2026	Where is the handoff point between the Commission and the City?	Terminus location will be determined during detailed design.	Acknowledged	Emma Knapik	Closed
5	Camrose	Error	5	ES	09-03-2026	See notes on later section. Believe that these calculations are incorrect, and the percentages should be 31.3% and 25.0%.	Calculations will be checked and results updated.	Report updated.	Emma Knapik	Closed
6	Camrose	Error	6	ES	09-03-2026	These numbers are incorrect too.	Calculations will be checked and results updated.	Report updated.	Emma Knapik	Closed
7	Camrose	Clarification	6	ES	09-03-2026	What about potential future staff shortages for certified operators. This would also be a long-term risk for the standalone WTP upgrade option.	Risk will be added based on suggestion.	Report updated.	Emma Knapik	Closed
8	Camrose	Information	17	3.2	09-03-2026	For all three options, we should put some thought toward the handoff location. Is this into HLPS #3, or into a new reservoir (to replace HLPS #2) located either at the west end of the City, or at / near the WTP site. - Option to decommission the aging HLPS #2 reservoir & pump station and take advantage of Water for Life (90%) funding. Even if the City could only get AMWWP funding (25%) it would probably still make sense. - Proximity to the City's higher pressure zone in Duggan Park (west end of City). - City's growth pattern is generally south, southwest and southeast, so placement at west or southwest could also support future growth. - A new reservoir at / near the WTP would take advantage of existing water feed lines between the WTP and HLPS #3.G20	Reservoir details and hand-off location will be determined during detailed design.	Acknowledged	Emma Knapik	Closed
9	Camrose	Clarification	18	3.2	09-03-2026	Maybe the report should include a comment noting that the terminus point within Camrose is shown conceptually, and will be confirmed during detailed design.	Clarification will be added in the report.	Report updated.	Emma Knapik	Closed
10	Camrose	Clarification	19	3.3	09-03-2026	City's preference for terminus location (including possible location of new reservoir) may impact the alignment options, especially for Option 2.	Terminus location and alignment within municipal boundaries will be determined during detailed design.	Acknowledged	Emma Knapik	Closed
11	Camrose	Clarification	24	3.3	09-03-2026	See prior comments regarding possible location of new reservoir (west / NW / SW ends of the City, or at the WTP). Not sure what the study is including in estimates in terms of length of watermain within the City. We expect, however, that the report does not include any costs for new reservoirs / pump stations though within the City. Is this a City cost?	Watermain length within municipal boundaries is conceptual at this stage. Alignment will be confirmed during detailed design and reviewed with stakeholders.	Acknowledged	Emma Knapik	Closed
12	Camrose	Clarification	44	8.1	09-03-2026	15% total seemed high. Confirmed with our WTP Operations that in-plant losses are about 7.3% (using data from Jan 2023 to present)	Report will be edited for clarity.	Report updated.	Nicholai Kritsel	Closed
13	Camrose	Information	44	8.1	09-03-2026	Plant generally runs 24/7, other than random shutdowns for scheduled maintenance. Would expect the average daily downtime for the year to be a lot less than 2 hours/day.	Report will be edited for clarity.	Report updated.	Nicholai Kritsel	Closed
14	Camrose	Clarification	42	8..1	09-03-2026	Filtration?	Figure will be edited for clarity.	Report updated.	Nicholai Kritsel	Closed
15	Camrose	Error	49	8.3	09-03-2026	As per the new WDMP, the City's total storage capacity is 25,680 m3. HLPS #2 should be corrected to 4,680 m3. The condition and age of the reservoir at HLPS #2 should be mentioned in this report.	Clarification will be added in the report.	Report updated.	Emma Knapik	Closed
16	Camrose	Information	52	8.4	09-03-2026	Mainly an MCC upgrade, not a full electrical system replacement.	Clarification will be added in the report.	Report updated.	Emma Knapik	Closed
17	Camrose	Clarification	54	8.4	09-03-2026	Suggest adding a section regarding Facility Classification / Operator Certification requirements. While the City of Camrose is currently able to meet its requirements for WTP operators, this presents a long-term risk if Camrose / Wetaskiwin continue their own WTP operations.	Risk will be added based on suggestion.	Report updated.	Emma Knapik	Closed
18	Camrose	Error	55, 59, 62	9.2, 10.2, 10.3	09-03-2026	These calculations are not correct. They should be 31.3% and 25.0% respectively.	Calculations will be checked and results updated.	Report updated.	Emma Knapik	Closed
19	Camrose	Editorial	62	10.2	09-03-2026	Should say Table 10-5.	Report will be edited for clarity.	Report updated.	Emma Knapik	Closed
20	Camrose	Clarification	62	10.2	09-03-2026	How did AE come up with these O&M numbers?	Reviewed O&M number with City staff; update the numbers from \$1.48 per m³ to \$1 per m³	Report updated.	Nicholai Kritsel	Closed
21	Camrose	Clarification	65	11	09-03-2026	Add long-term risks related to operator certification for Camrose / Wetaskiwin.	Risk will be added based on suggestion.	Report updated.	Emma Knapik	Closed

22	Camrose	Clarification	66	11	09-03-2026	Does the report speak the benefit of reducing the volume of water that is withdrawn from the Battle River (Camrose) and Coal Lake (Wetaskiwin)? If the regional waterline option proceeds, then Camrose will no longer be pulling as much water from the Battle, but we will still be returning that water (after the WWTP) back to the Battle. This is something that should be listed as a benefit in this report.	This benefit has not been considered at the feasibility stage.	Acknowledged.	Emma Knapik	Closed
23	Camrose	Clarification	67	12	09-03-2026	plus potential future risk of lack of qualified operators.	Risk will be added based on suggestion.	Report updated.	Emma Knapik	Closed
24	Camrose	Clarification	177	A3	09-03-2026	Using a single unit rate for all 500mm dia. pipe, including within the City of Camrose. There will be some higher costs for installing the 500mm water pipe in developed / urban areas of Camrose, which would support the option of having the termination / tie-in location at a new reservoir / pump station at the West / NW / SW section of the City. Not included in the scope of this study would be the construction of a new reservoir / pump station. While the City should realistically pay the non-grant funded portion of costs for this work, would it be possible for the scope to be included in the grant application, so that we could get up to 90% funding for this work if under Water for Life (or up to 25% under AMWWP)? Expect that Wetaskiwin may have similar needs. Similar comment would also apply to Options 1 and 3.	Pipeline costs will be split between rural and within municipal limits. Grant funding will be applied for in stages - covered costs will be confirmed in future stages.	Pipeline costs updated in the report.	Emma Knapik	Closed
25	County of Leduc	Information	18	3.2	09-03-2026	The TR510 alignment of Option 2 needs to be carefully considered, This is a busy corridor with the existing telecommunications infrastructure and municipal utilities – we are planning on adding a forcemain along this corridor as well. There is a high probability of it getting more congested with the planned development in the Township Road 510 ASP. TR510 has been identified as a regionally significant road within ATEC’s ERNS, and with this the future planned construction of an interchange at TR510/QE2, this corridor will likely require significant widening of this road (6-8 lanes approaching the interchange). For the above reasons, alignment and R/W protection will be key and will need to be identified very soon.	Alignment will be reviewed during preliminary design with all stakeholders.	Acknowledged	Emma Knapik	Closed
26	County of Wetaskiwin	Information	16	2.2	09-04-2026	The Future demand identified in table 2-3 only addresses a small portion of the County serviced by "Regional" water at the Gwynne Truckfill. Larger growth areas not identified in this report, which could be significant ,would not be able to be serviced by the alignment referenced as "Option 2"	The Gwynne truckfill is the only data that was provided by the County. For additional service areas, more data would need to be provided	Acknowledged	Emma Knapik	Closed
27	County of Wetaskiwin	Information	19	3	09-04-2026	Option 2 provides a reduced benefit to the County compared to option 1 or option 3. Option 2 would not address additional growth potential along Hwy 2 or in the region South of Leduc along Hwy 2A both North and South of Millet. These are both "areas" the County believes could potentially have increased future water needs, which would support an extension of the CRSWSC into this zone and ultimately service a future customer base not identified in this report. This growth "could" entail not only residential connections but significant larger demand addressing commercial and industrial needs. Option 1 or Option 3 could assist in addressing potential County of Wetaskiwin growth and allow for the ultimate connections into Camrose and Wetaskiwin.	For future growth to be accomodated in the report, detailed projections would need to be provided.	Acknowledged	Emma Knapik	Closed
28	EPCOR	Clarification	14, 17	1.2, 3.2	09-15-2026	References to the Beaumont 2nd Feed Line: Through the review, a visual representation of the Beaumont 2nd feed line was not found in alignment mapping. Section 1.2.2 seems to refer to the 50 Street Beaumont 2nd feed line currently being planned in EPCOR's 2032-2035 budge cycle, but it is unclear if section 3.2's comments regarding "Beaumont 2nd Feed Line" are the 50 street proposal or refer to the section of alignment between HWY #2 and Beaumont.	Clarification will be added in the report.	Report updated.	Emma Knapik	Closed

Status	
Open	0
In-Progress	0
Closed	28
Total Comments	28