

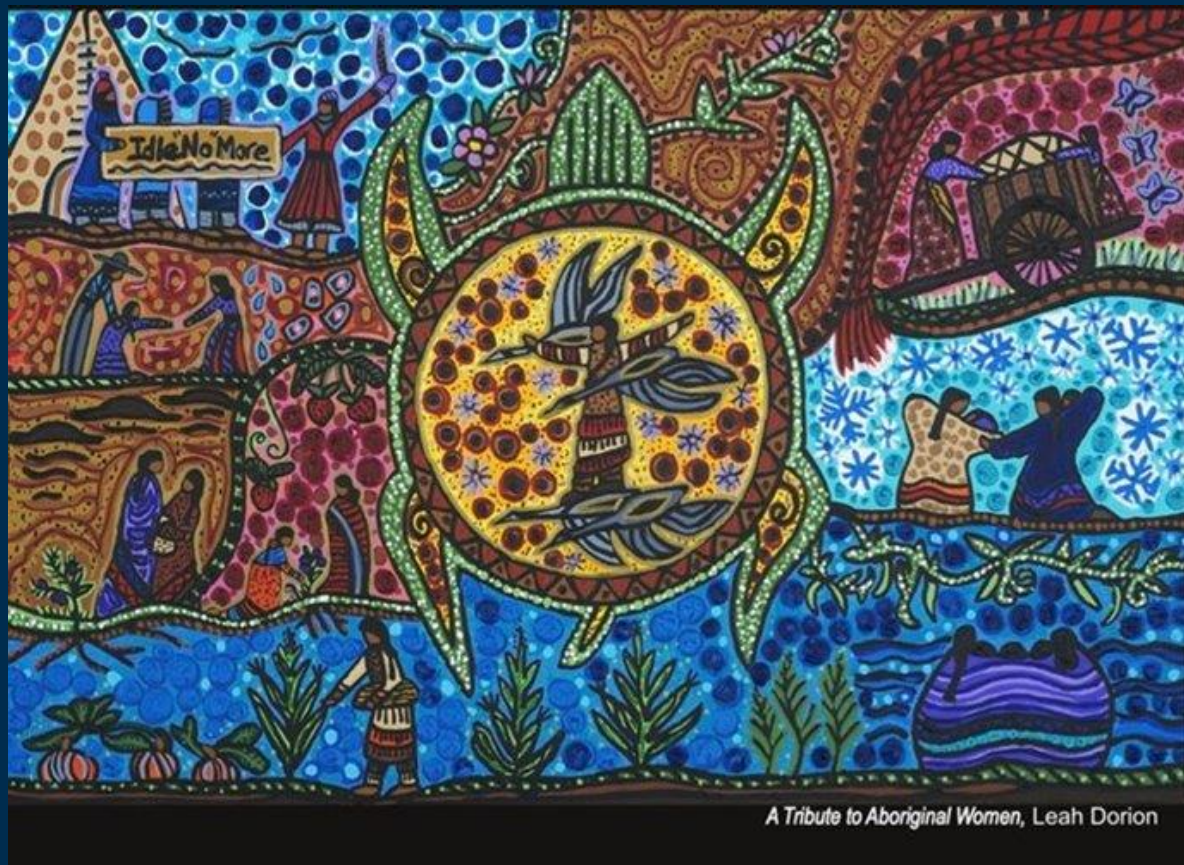
Ardley Reservoir Scoping and Feasibility Study

A wide-angle landscape photograph of the Ardley Reservoir. The reservoir is a large body of water, appearing calm and dark blue, curving through the middle of the frame. To the left of the reservoir is a large, flat, brownish field, possibly a dry lake bed or a harvested field. To the right, there is a steep, eroded bank with exposed light-colored soil and some sparse vegetation. In the foreground on the right, there is a dense thicket of tall, dry grasses and some bare, thin trees. The background shows rolling hills under a clear, bright blue sky.

Engagement Session

Environment and Protected Areas

16 July 2026



A Tribute to Aboriginal Women, Leah Dorion

Agenda

1. Session purpose and format
2. Study overview and option details
3. Question & Answer period
4. Next steps

Purpose and Format



Session Purpose

- Provide an overview of the Ardley Reservoir Scoping and Feasibility Study, including:
 - Purpose and objectives
 - Dam and reservoir options
- Gather input from participants, such as:
 - Potential environmental, social, cultural, and economic impacts
 - What is important to you

Session Format



- QA
 - Type your questions into the Q&A tool, located on the bottom of your screen
 - We will answer questions after the presentation
- Recording
 - Please be aware that we will be recoding today's presentation and capturing notes of the Q&A. We kindly request that you do not use any transcription or recording devices.
- AI
 - The use of any third party AI tool is strictly prohibited. This includes any AI transcription services, meeting summarizers, voice assistants or generative AI applications.

Study Overview



Purpose and objectives

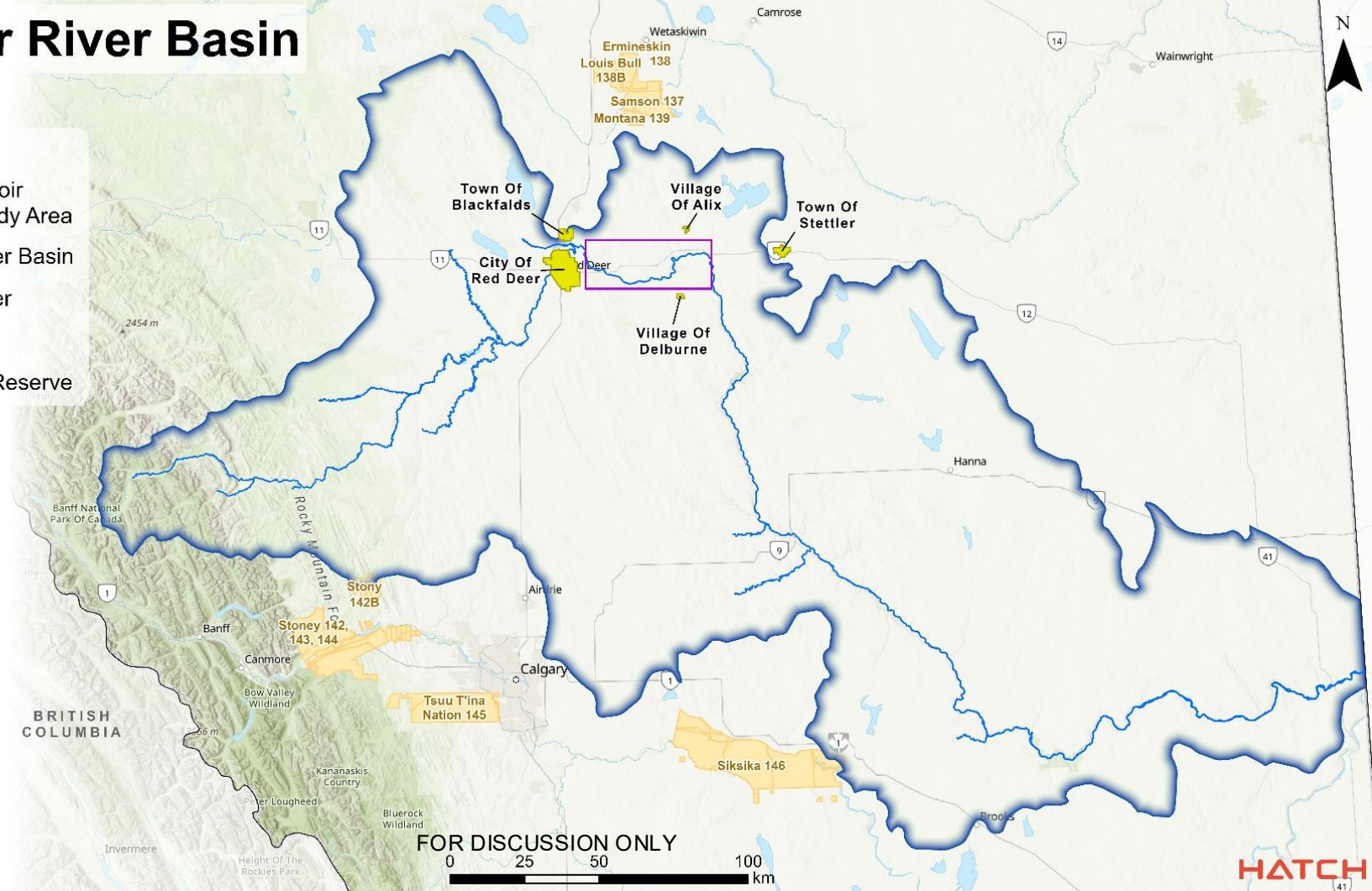
- Exploring options to increase water storage capacity and enhance water security in the Red Deer River Basin.
- Assess the feasibility of constructing a dam and reservoir on the Red Deer River near the Hamlet of Ardley.
- Key economic and environmental benefits:
 - drought resilience
 - flood mitigation
 - irrigation support
 - municipal and industrial water supply



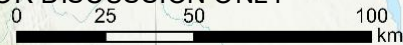
Red Deer River Basin

LEGEND

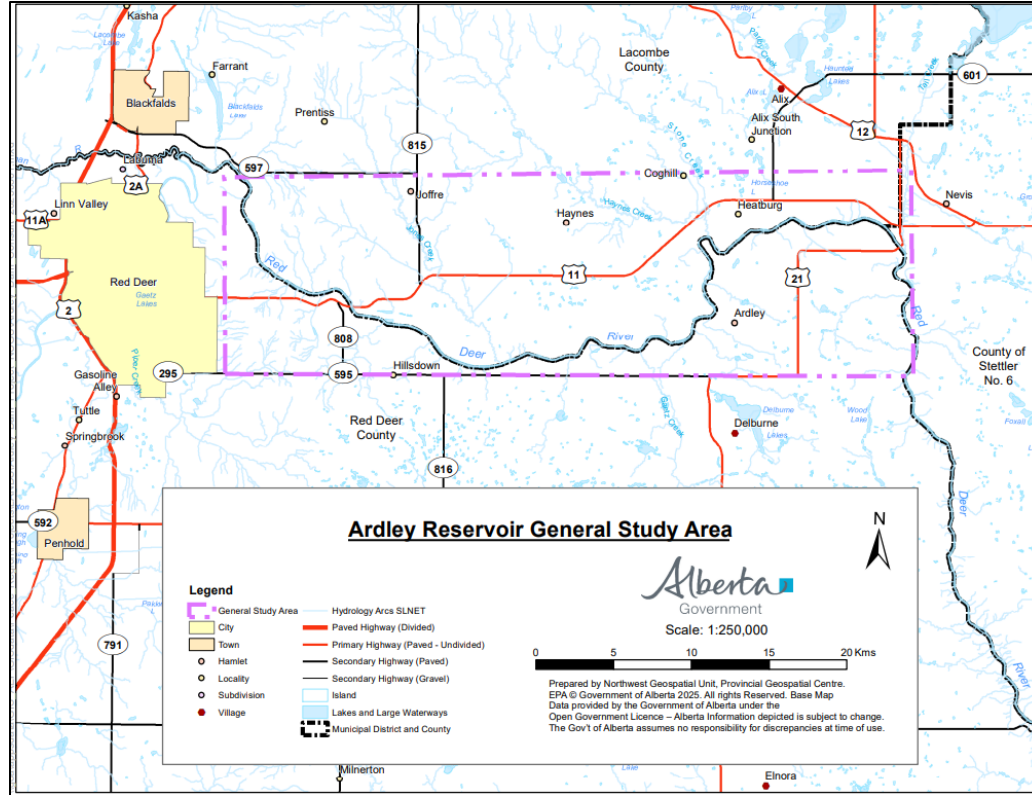
-  Ardley Reservoir Feasibility Study Area
-  Red Deer River Basin
-  Red Deer River
-  Built-Up Area
-  First Nations Reserve



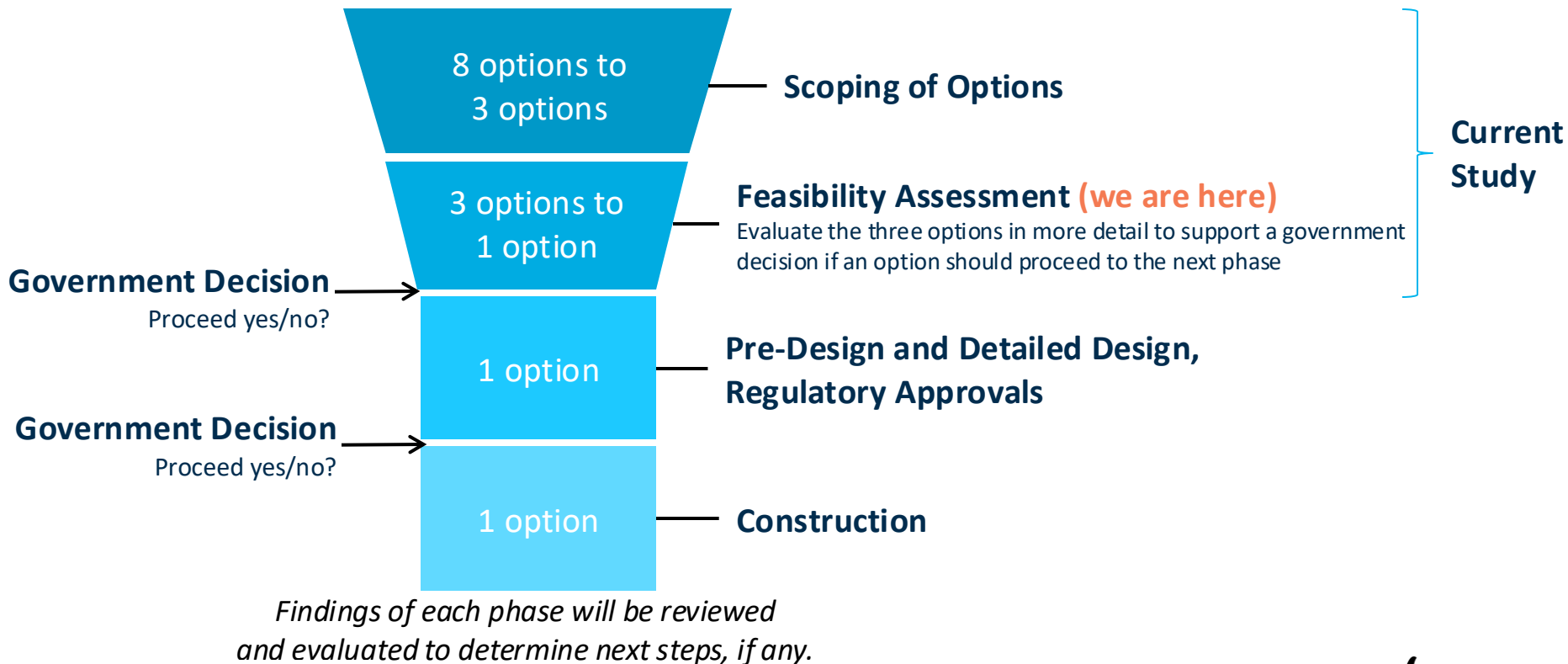
FOR DISCUSSION ONLY



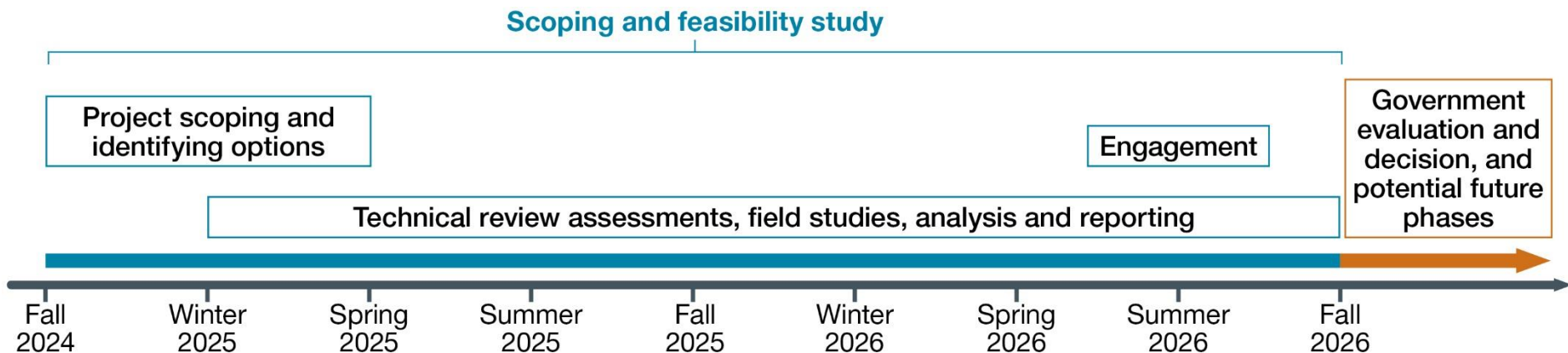
Study area



Study approach

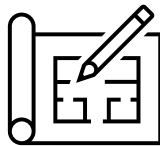


Study timeline (may be adapted)



Study scope

Deliver an evaluation that supports a comparison of the dam and reservoir options and contributes to an informed decision on whether one option offers enough value to proceed to the next step.



Engineering Component

Represents factors like structural designs, geotechnical analysis, and hydrotechnical modeling essential for understanding engineering feasibility and construction costs.



Environment Component

Focuses on ecological and regulatory elements including vegetation and wildlife presence, potential impacts, and government permits and approvals processes.



People Component

Includes social and economic factors such as community impacts, mitigative measures, and cultural considerations.

Current status

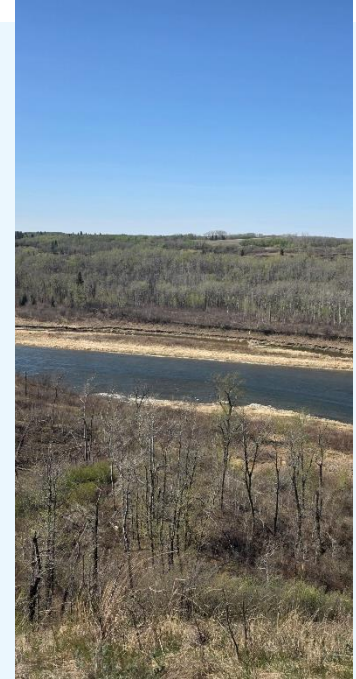
- Three options selected based on a desktop evaluation using existing data and information
- Field activities and assessments:
 - Water balance modelling for reservoir inflow and capacity assessment, hydrology and hydraulic design is completed
 - Geotechnical and geophysical investigations complete
 - Most environmental surveys complete, late vegetation surveys to occur late July to early August
 - Dam consequence classification developed
 - 60% of feasibility level design phase
 - *Thank you to the property owners that provided land access!*
- Engagement underway to obtain input
 - Indigenous, public and stakeholder sessions, online survey



Alberta

Next steps

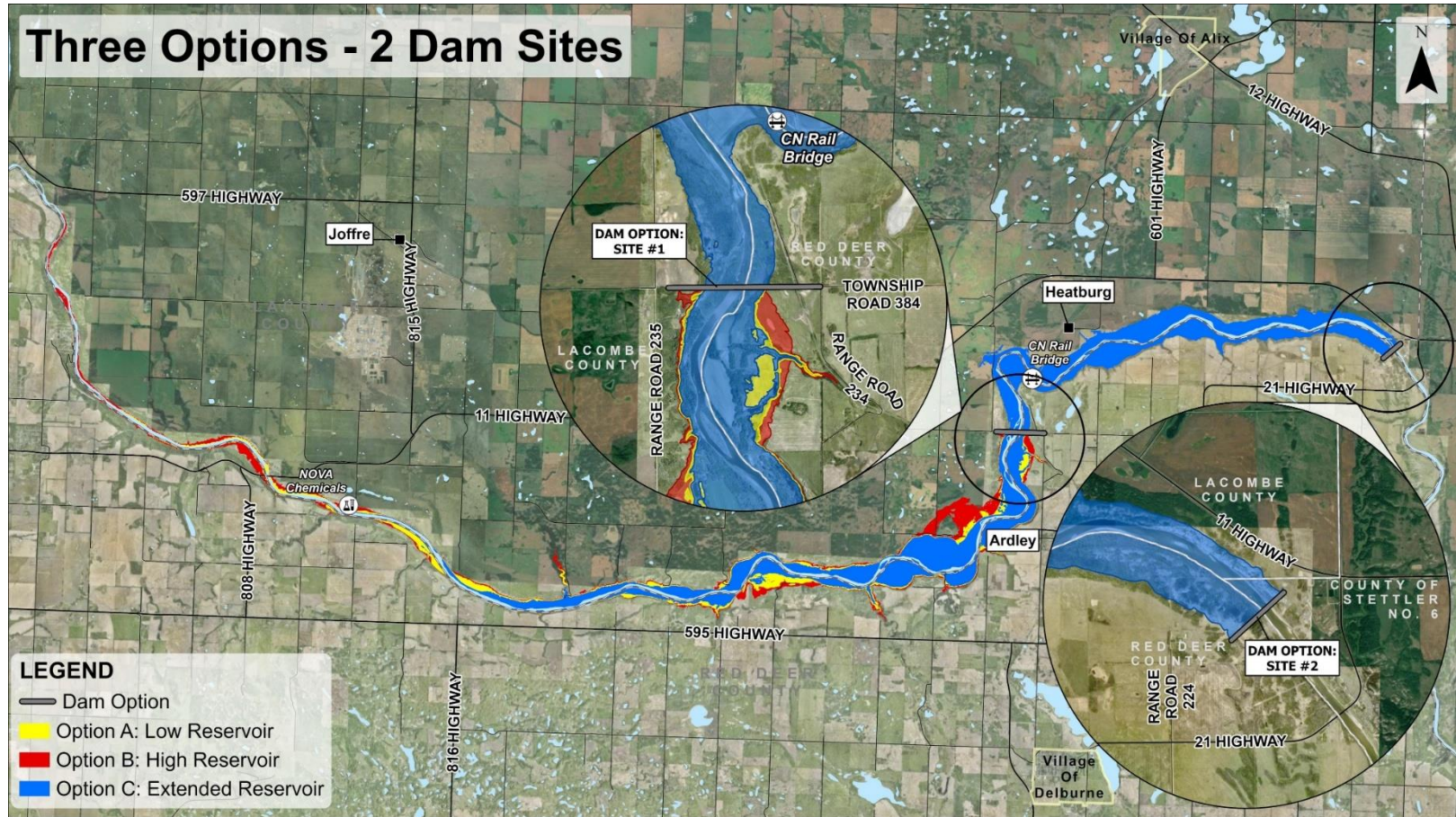
- Prepare feasibility level design report presenting the methodologies, analyses and results, including:
 - Engineering analyses (hydrotechnical, structural, geotechnical, etc.)
 - Engagement input
 - Potential environmental, social, cultural and economic impacts
 - Feasibility level design of options
 - Construction cost and schedule
 - Cost Benefit analysis
 - Assessment of potential environmental and regulatory requirements
 - Recommendations for next steps
- Final report expected in fall/winter 2026 for government review (timelines may shift)
- Government decision to proceed to design and regulatory approvals
 - Not a decision to construct



Dam and Reservoir Option Details



Three Options - 2 Dam Sites



Definitions of terms

- **Full Supply Level (FSL)**
 - The water level that we expect the reservoir to reach following the spring melt each year. Normal (non-flood) operations will not allow the water level to exceed this value.
- **Inflow Design Flood (IDF)**
 - The highest water level we would expect in the reservoir during the very rare flood event that we have designed the dam to be able to pass. This is a very rare event, and the level is not expected to happen more than once every 10,000 years or more.
- **Temporary Diversion Licenses (TDL)**
 - One possibility with a reservoir is that these TDLs can be converted to permanent licenses because there will be more water available for everyone more regularly.

Dam and reservoir options at-a-glance

Option	Dam Site	Dam Height (metres)	Full Supply Level (metres)	Storage Volume (cubic decameters)	Relative Footprint
Option A Low Reservoir	Site 1	41	808.6	290,000	Smallest
Option B High Reservoir	Site 1	47	815.0	350,000 to 415,000*	> Option A < Option C
Option C Extended Reservoir	Site 2	55	801.0	480,000	Largest

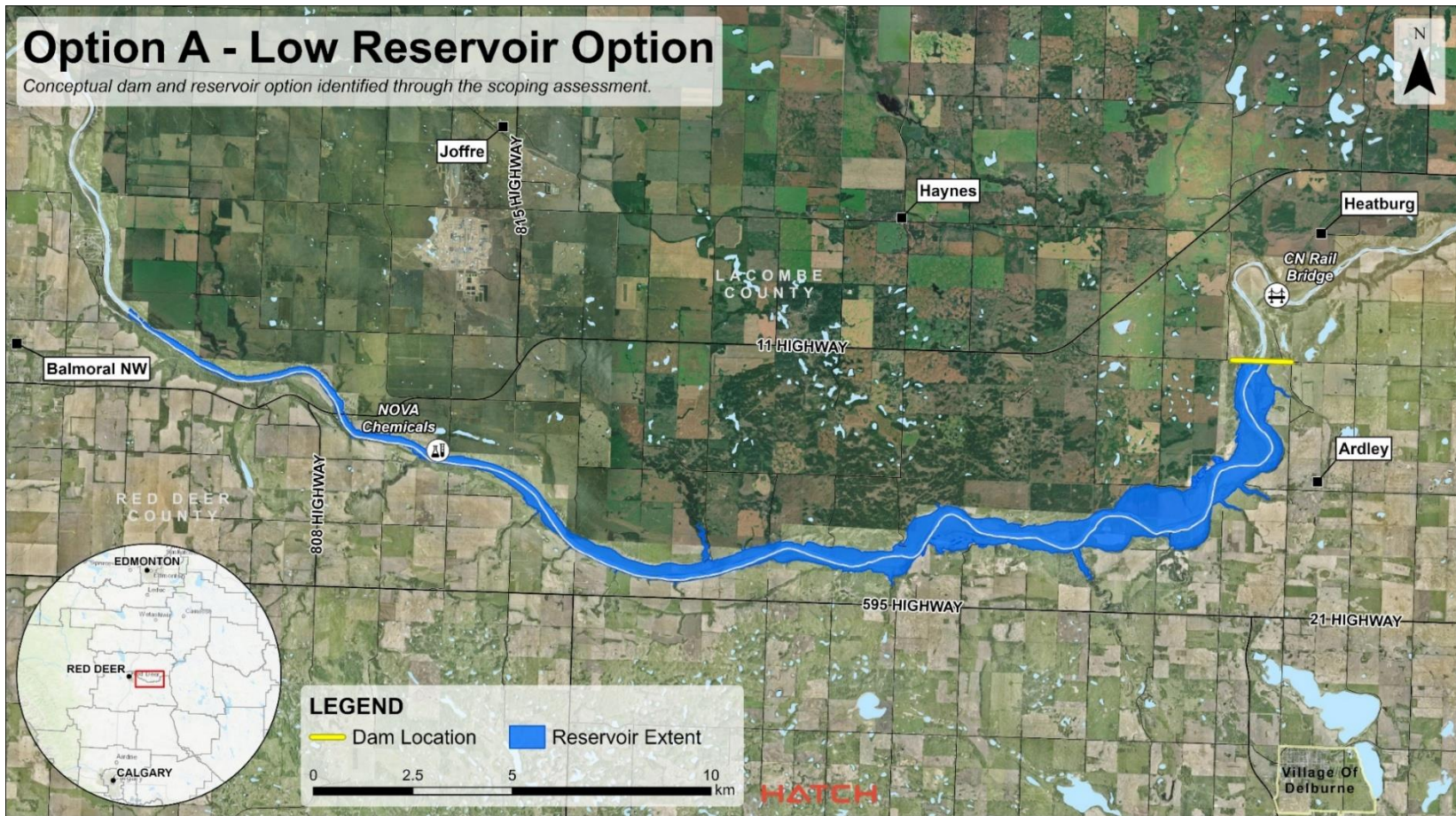
**Option B includes drawing the reservoir down from 815 m to 812 m or below during the winter period to mitigate potential ice jams at the City of Red Deer*

- Note that these are all approximate values and could change.

Water Balance Modeling

- Modelling incorporated existing and future conditions when evaluating reservoir options.
 - Water flow – historic, affected by climate change
 - Water demand – current, increased due to expanded growth
 - Water management infrastructure – current, additional (projects underway or probable)
 - Dickson Dam operations – existing, modified
- Results – all options enhance future storage reliability and system resilience.
- Increases water security for agriculture, municipal and industrial use
 - Reduces or eliminates existing irrigation, municipal (TDLs) and industrial (TDL/other) shortages
- Provides additional assurance that Alberta can meet water flow requirements for environmental purposes and commitments to water sharing with other jurisdictions
 - Reduces or eliminates violations for Water Conservation Objectives and Instream Objectives
 - Improves minimum flows and positively augments environmental base flows

Option A – Low Reservoir



Low Reservoir Option

- Earthfill dam with lower reservoir operating level at Site 1
- Potential for:
 - Reduced effects to Indigenous and cultural areas
 - Shorter construction period
 - Less properties impacted
 - Lowest cost option
- Other considerations (at full supply level):
 - Bank limitations with feasible space for dam alignment
 - Right – rail line and coal mines
 - Left – open pit mines, shorter approach and discharge channels
 - Potential demand exceeds storage capacity in multiyear drought
 - Inundation of low-lying banks, trails at Joffre day use area
 - Possible modifications to Joffre Bridge required due to change in hydraulic conditions
 - Potential impacts to NOVA Chemicals treatment facility

Proposed dam location: where river and
Township Road 384 intersect

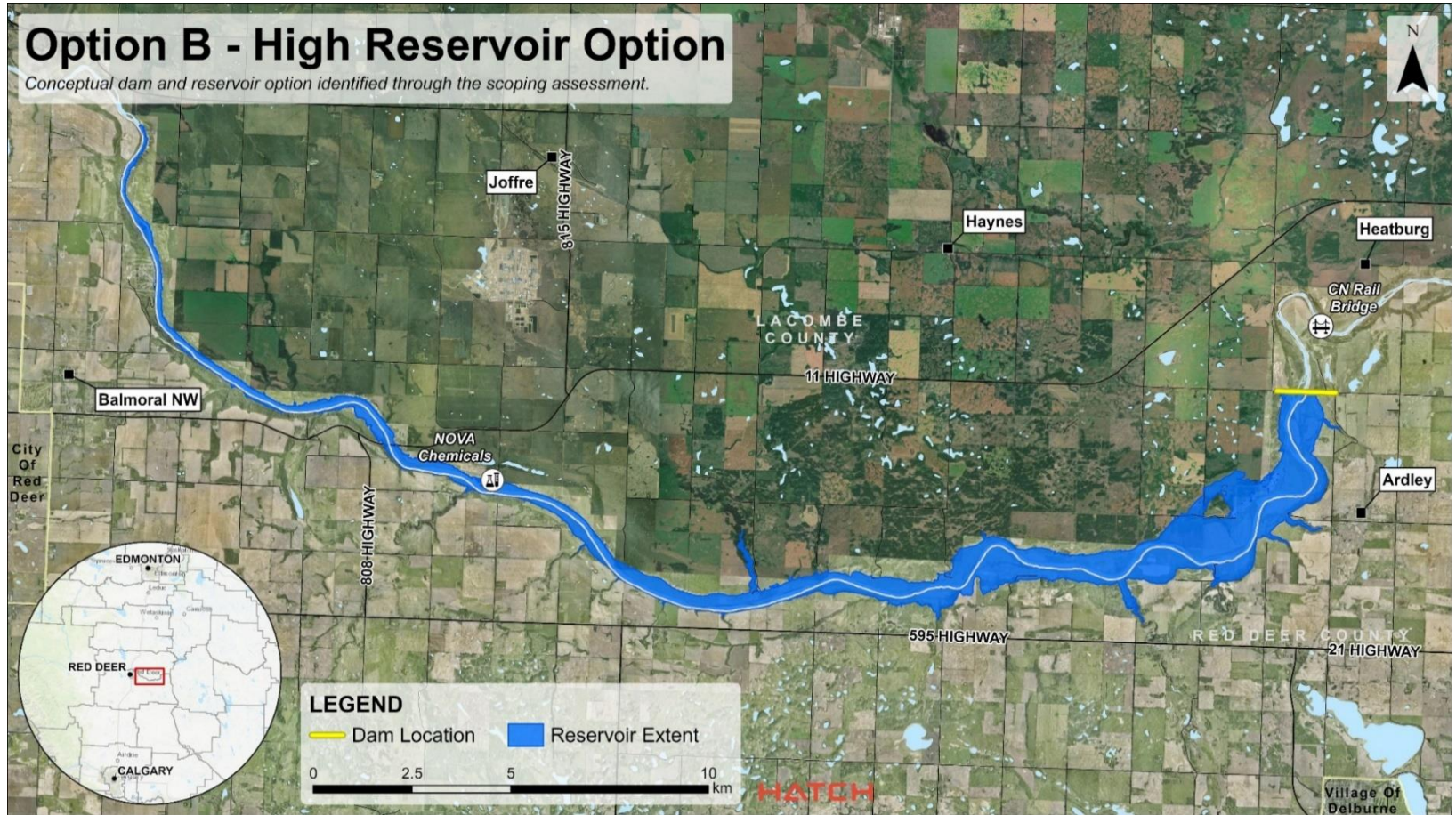


Approximate storage volume: **290,000 dam³**
Full supply water level: **808.6 m**

Option B – High Reservoir

Option B - High Reservoir Option

Conceptual dam and reservoir option identified through the scoping assessment.



High Reservoir Option

- Earthfill dam with a higher reservoir operating level at Site 1
- Potential for:
 - Increased effects to Indigenous and cultural areas
 - Larger construction period and footprint
 - More properties impacted
 - Larger area of riparian and terrestrial habitat affected
 - Increased water storage
- Other considerations (at full supply level):
 - Same bank limitations as Option A
 - Better system resilience than Option A
 - Limited by need to mitigate ice jam risk to Red Deer by managing water levels
 - Potential new NOVA Chemicals facility construction
 - Inundation of low-lying banks, trails at Joffre day use area
 - Possible significant modifications required at Joffre Bridge due to overtopping
 - Potential erosion protection and/or access modifications at Canyon Ski Hill

Proposed dam location: where River and
Township Road 384 intersect

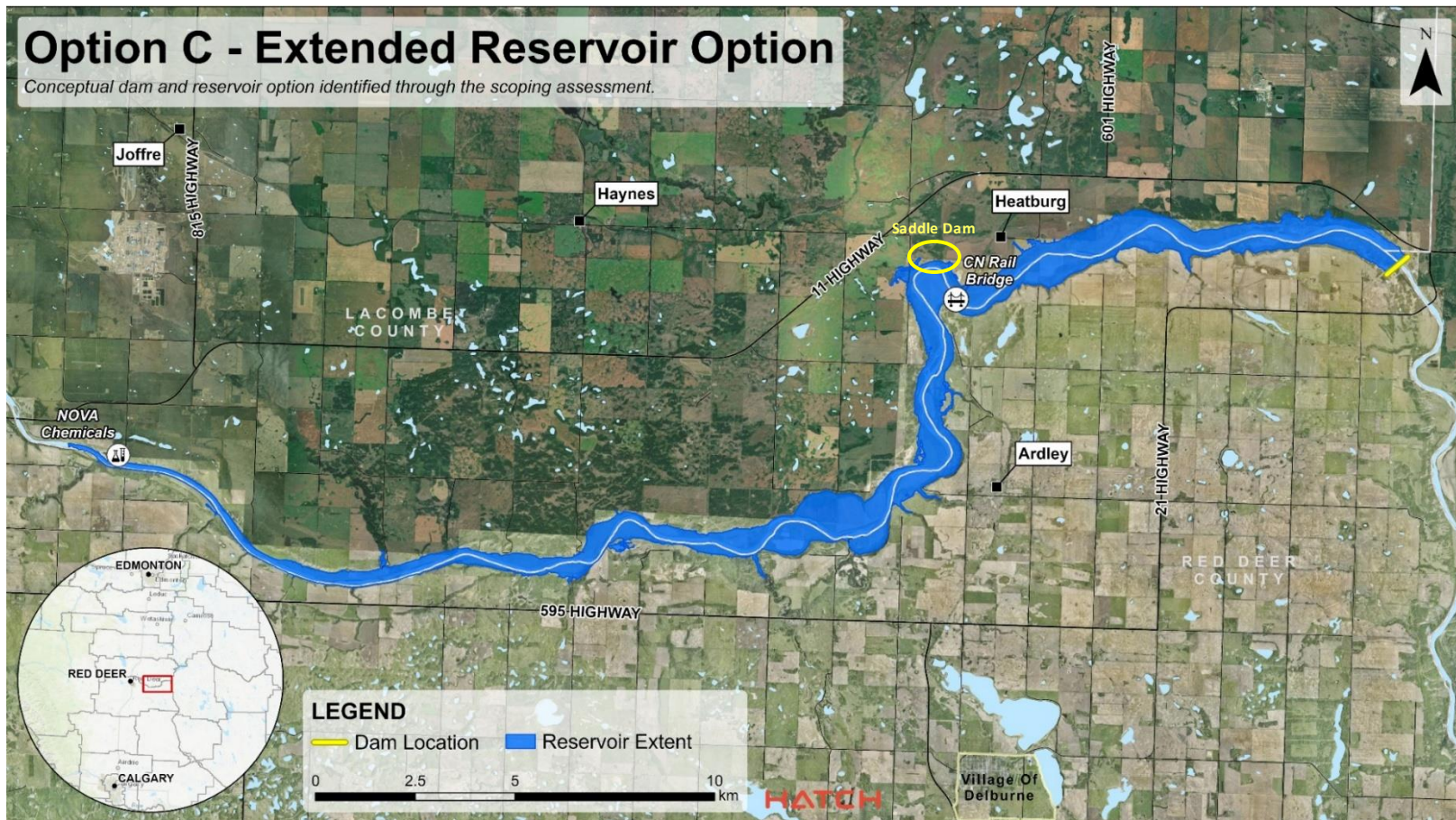


Approximate storage volume: **350,000 dam³**
to 415,000 dam³
Full supply level: **815 m**

Option C – Extended Reservoir

Option C - Extended Reservoir Option

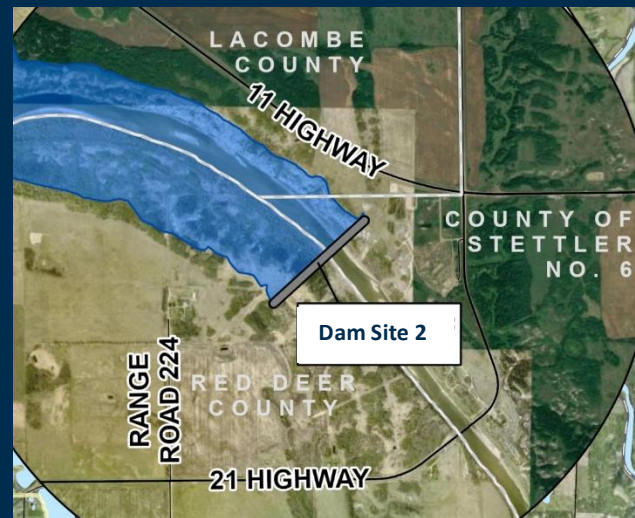
Conceptual dam and reservoir option identified through the scoping assessment.



Extended Reservoir Option

- Earthfill dam with extended upstream storage extent at Site 2. Saddle dam is required to contain reservoir within valley.
- Potential for:
 - Increased effects to Indigenous and cultural areas
 - More properties impacted compared other options
 - Larger area of riparian and terrestrial habitat affected
 - Smaller embankment compared to Option B may result in construction period and footprint similar to Option A
- Other considerations (at full supply level):
 - Limitations with feasible space for dam alignment
 - Left bank has significant infrastructure
 - Provides the most flexibility to accommodate growing demands and resilience in year-to-year storage
 - CN Bridge piers are partially inundated
 - Potential new facility construction at Buffalo Lake Pump Station
 - Potential mitigable impacts to NOVA Chemicals facility
 - Saddle dam mitigates potential Highway 11 inundation

Proposed dam location: Site 2 – 1.5 km upstream of Content bridge



Approximate storage volume: **480,000 dam³**
Full supply level: **801 m**

Q&A

Find more information

- Share your feedback through our online survey by **July 30, 2026**
 - To learn more, scan the QR code and visit:
alberta.ca/Ardley-reservoir-study-engagement
- Visit our project webpage
 - Alberta.ca/ardley-reservoir-scoping-and-feasibility-study
- Receive email updates
 - Sign up on our webpage
- Contact the study team
 - Email: epa.ardley@gov.ab.ca



Adjourn

