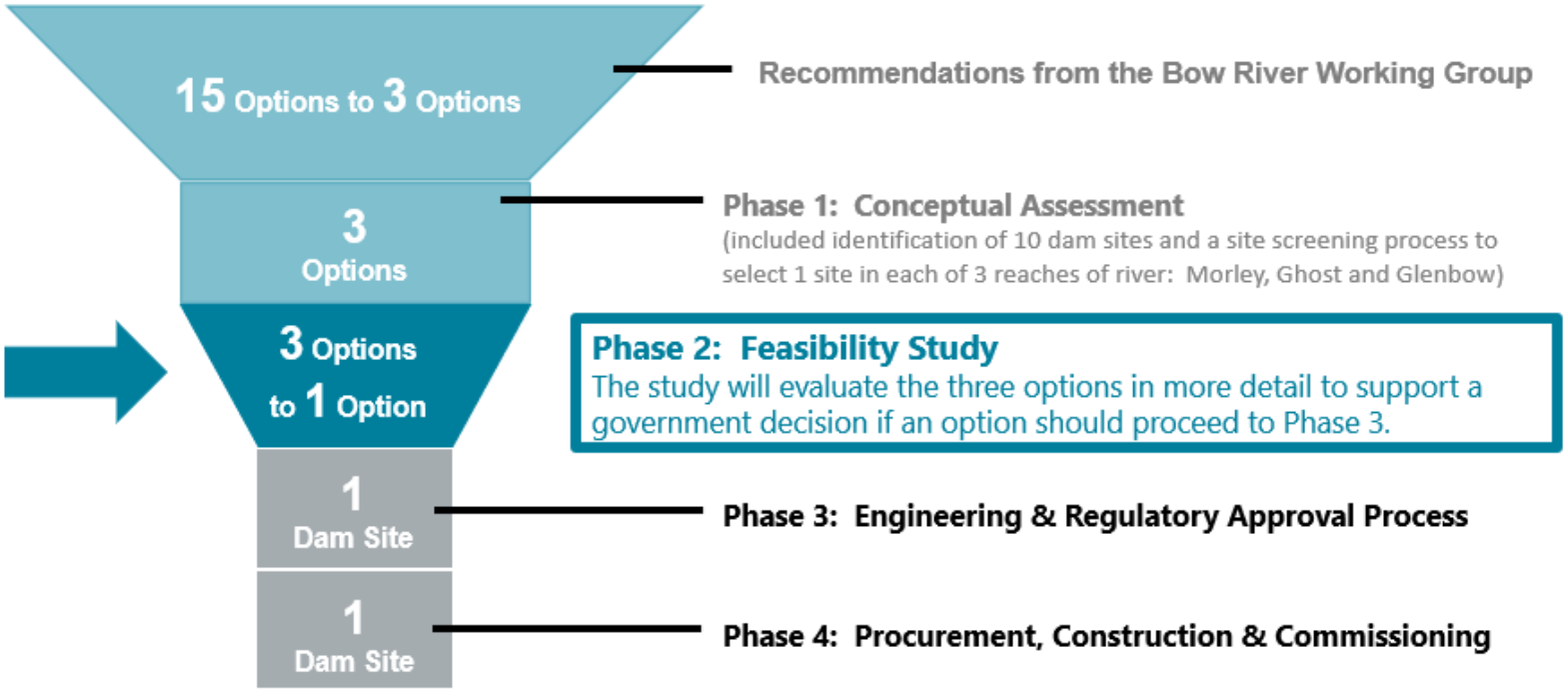
Bow River Reservoir Options Background

Purpose:

To consider options for additional flood and drought storage capacity on the Bow River to reduce the impact of severe weather on Albertans and the economy.

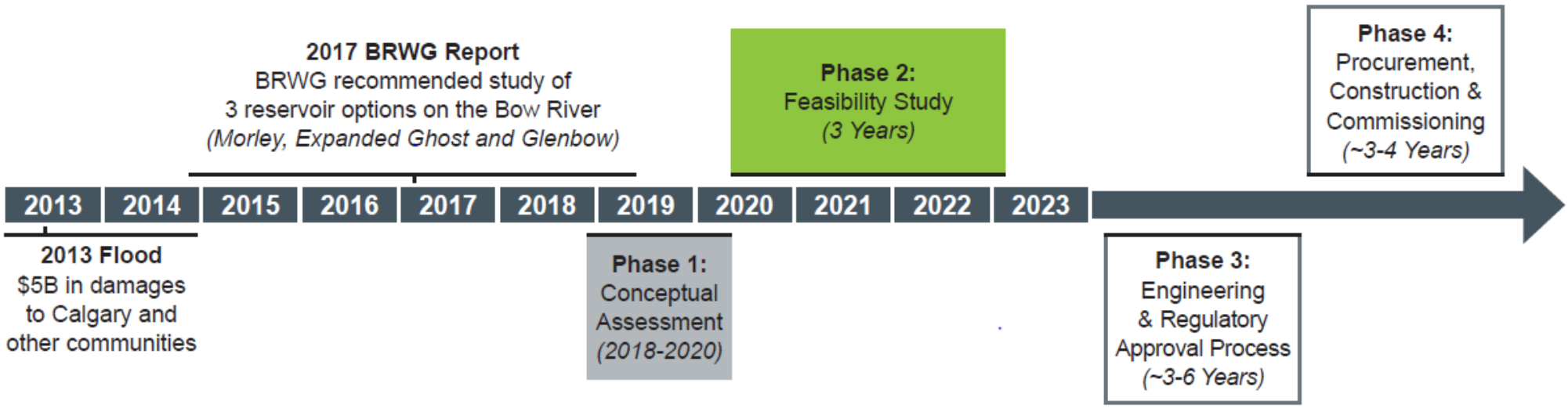
Having more reservoir water storage capacity on the Bow River would:

- Reduce the risk of future flood damage
- Improve the availability of water, including during droughts
- Protect the long-term health of the river



Findings of each project phase will be reviewed and evaluated to determine next steps, if any.

Bow River Reservoir Options Initiative Timeline



Phase 1: Conceptual Assessment

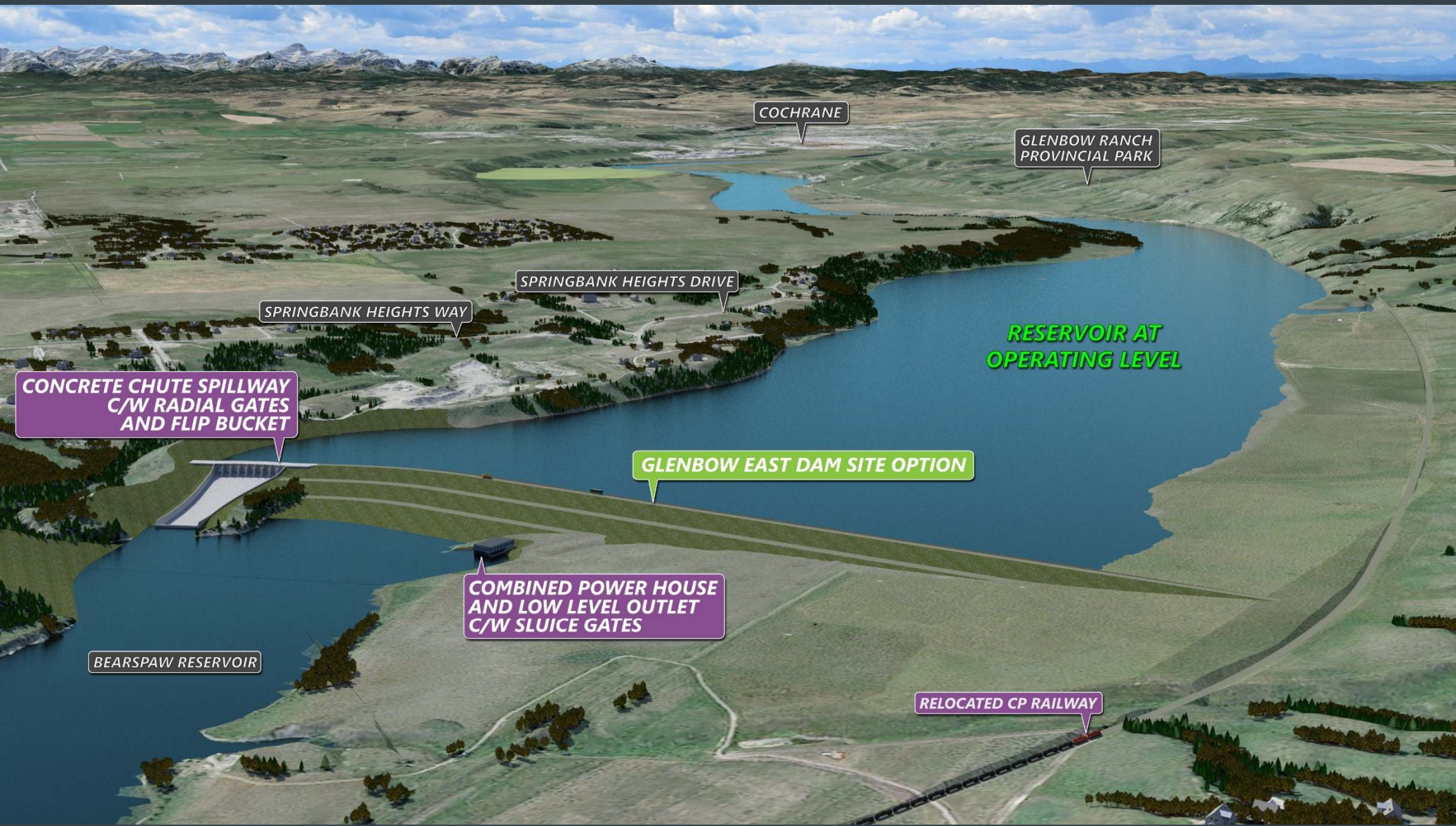
Objectives:

- Develop conceptual engineering designs for three reservoir storage options on the Bow River upstream of Calgary
- At a high level, identify potential traditional land use, social, cultural, environmental, engineering and economic factors
- Prepare high-level estimates of development costs

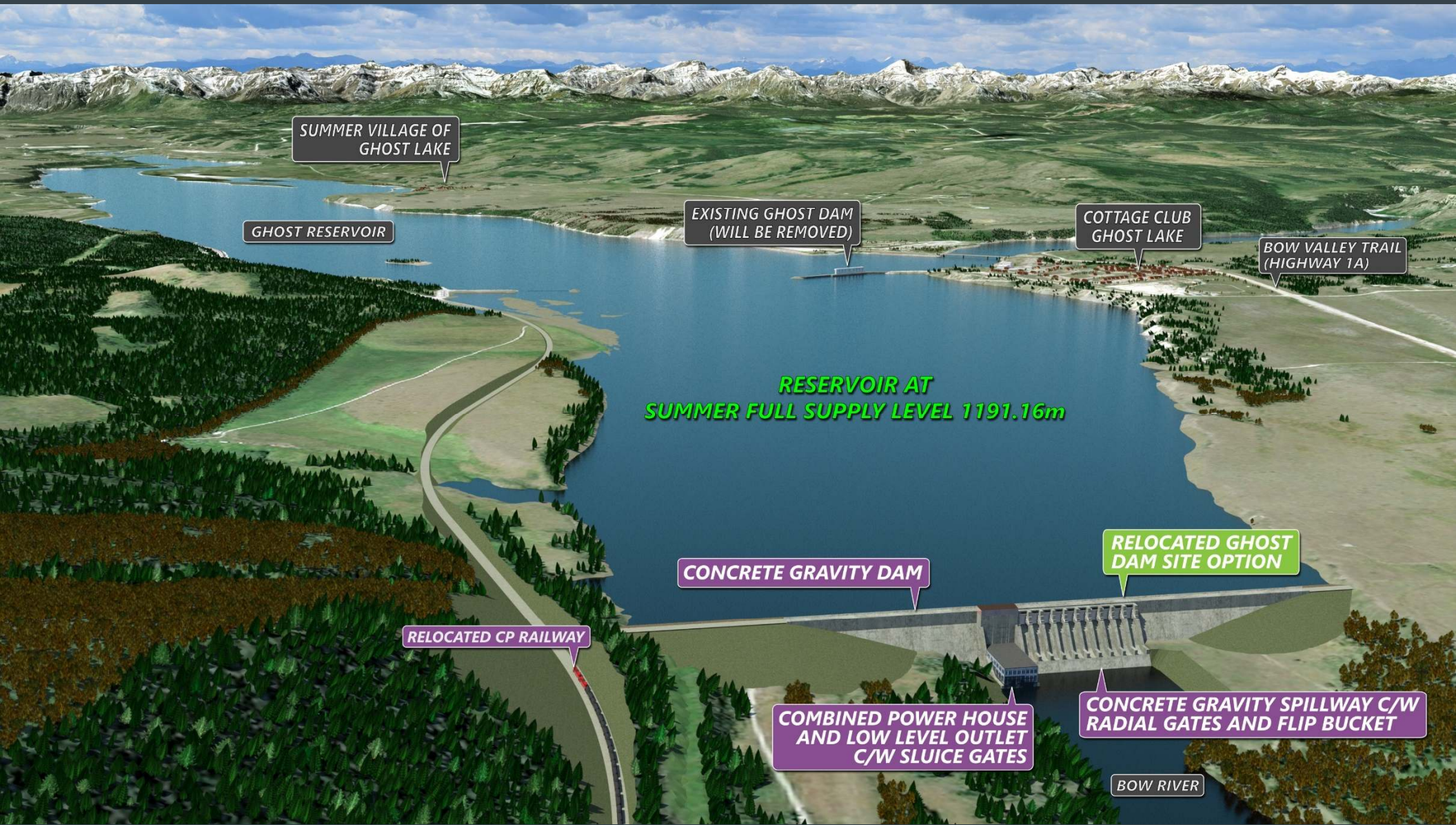
Scope of Work:

The Alberta government is also looking at flood mitigation on the Elbow River, upstream of where it joins the Bow River. This is a separate project called the Springbank Off-Stream Reservoir. Information can be found on their website at https://www.alberta.ca/Springbank-off-stream-reservoir.aspx

Glenbow East Option



Relocated Ghost Dam Option

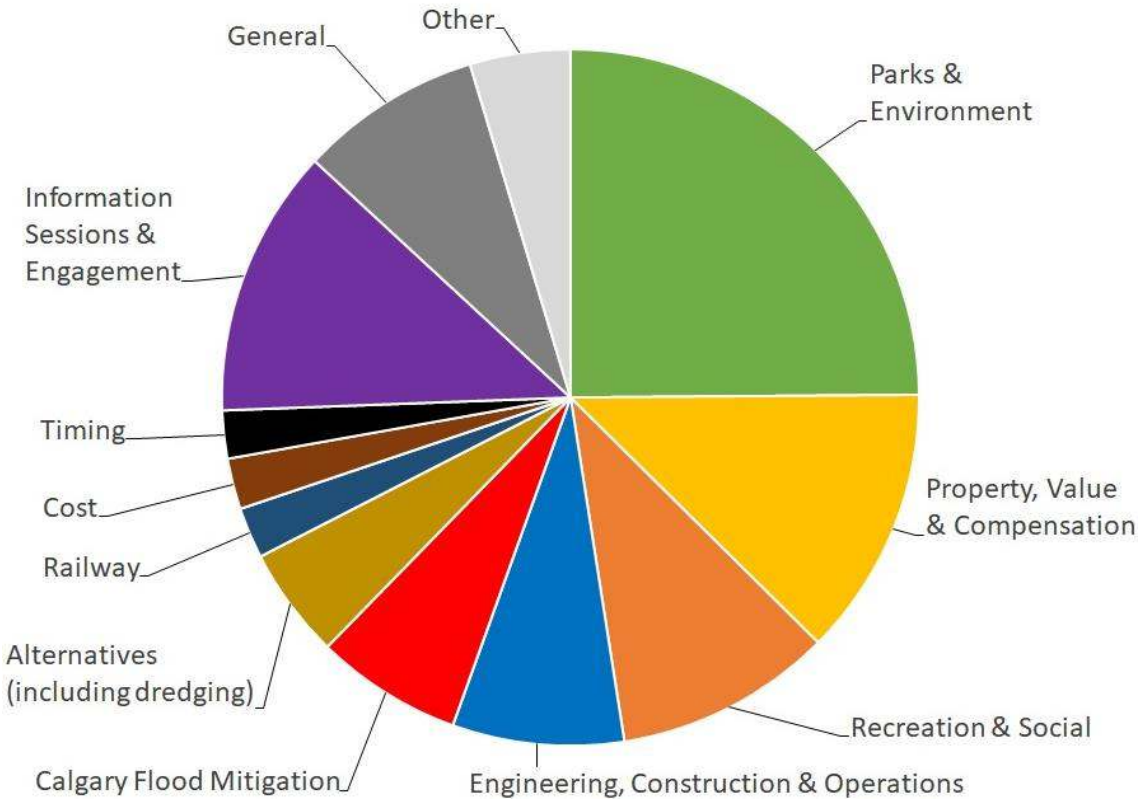


Morley Option

The Morley option information will be provided in the future.

Phase 1 – What We Heard

The pie chart shows the themes of the 1400 comments and questions received in Phase 1. Further information on the themes and specific comments is available in the Phase 1 report on the Document Table.



Key messages from the feedback:

- Protect the environment and park land
- Traditional land use studies are important
- Don't impact homes
- Operations of Ghost Reservoir affect recreational uses
- It could be challenging to move the CP rail line
- Provide additional advertising for information sessions and include additional venues so that more people are provided the opportunity to participate

Information gathered through engagement with Indigenous groups, stakeholders and the public on social, environmental and cultural considerations, and traditional land uses, as well as engineering and economic information, was used to help inform the conceptual assessment.

Phase 1 – Results

A number of criteria were used in the Phase 1 assessment, including:

- Impact on communities
- Impact on First Nation reserve lands
- Impact on park land
- Reservoir storage
- Flood protection effectiveness
- Estimated energy production
- Impact on major infrastructure

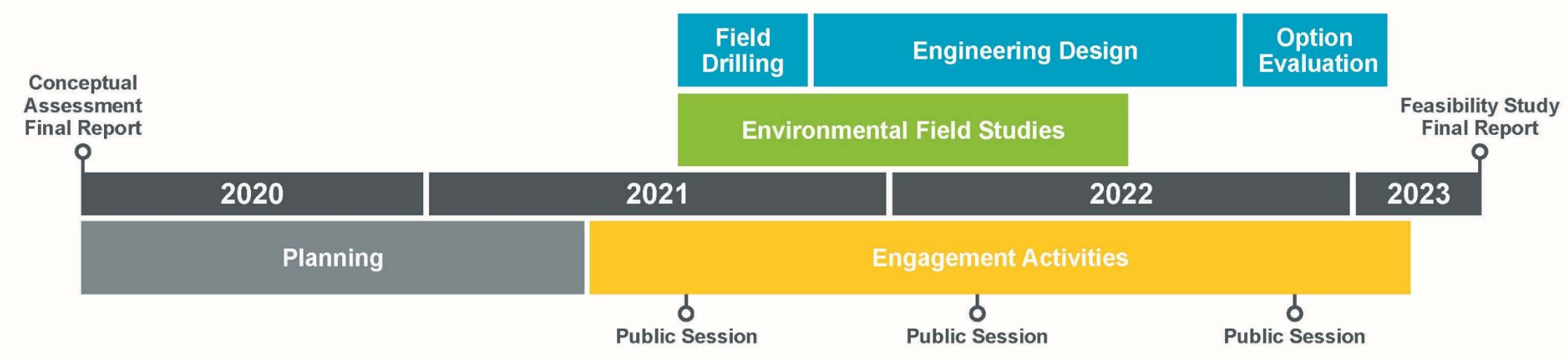
These criteria will be the starting point for developing the Phase 2 decision criteria.

The assessment confirmed that all three options could provide flood and drought storage. No comparisons between the reservoir options were made during this assessment. The Phase 1 report can be found on the Document Table or on the Bow River Reservoir Options website (https://www.alberta.ca/bow-river-reservoir-options.aspx).

Phase 2: Feasibility Study

Objectives:

- Confirm technical viability of the three previously identified sites:
  - **"Morley"**
  - **"Relocated Ghost Dam"**
  - **"Glenbow East"**
- Assess socio-economic and environmental impacts to determine if there is a preferred single option that should proceed to Phase 3, the engineering & regulatory approval process



Phase 2 – Scope of Work

ENGINEERING

- Existing Data Collection
- Geological and Geotechnical
- Hydrotechnical
- Hazard Assessments
- Feasibility Design
- Reservoir Impacts
- Downstream Impacts
- Inclusion of Engagement & Environmental Information
- Cost Estimates

ENVIRONMENT

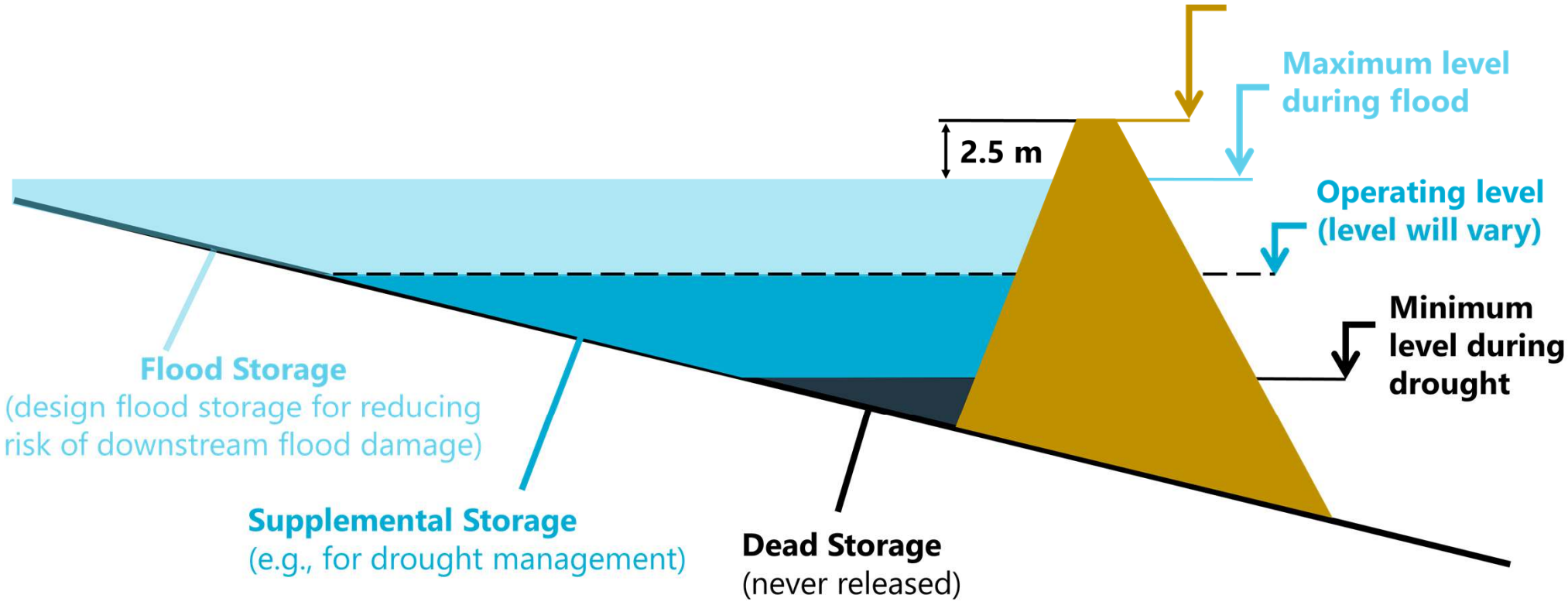
- Phase 1 Study Review
- Field Programs
- Soils
- Vegetation
- Wildlife
- Wetlands
- Fisheries
- Water Quality
- Groundwater
- Historical & Cultural Resources
- Traditional Knowledge / Traditional Land Use Studies
- Socio-Economic
- Regulatory

ENGAGEMENT

- Stakeholder & Situation Analysis
- Strategic Engagement Planning
- Online & In-person Engagement Design & Implementation
- Engagement Material Content Development
- Engagement Meeting Facilitation
- Engagement Evaluation
- Indigenous, Stakeholder & Public Input Collection
- Comment Management & Tracking
- Comment Analysis
- Engagement Reporting

Typical Dam Components

Reservoir Storage Schematic



- Reservoir level will vary seasonally dependent on flood and drought risk. Details have not yet been established.
- Live Storage = Flood Storage + Supplemental Storage

Environmental Considerations

Environmental considerations include how the initiative could affect the environment and the people who use it. Environmental disciplines that will be studied include:

- The study team will undertake a detailed "desktop" review of existing information to add to the information collected in Phase 1
- Field studies will help the study team verify the existing collected information and to collect new information about the study area
- These tasks will build on the information collected in Phase 1 and help the study team understand how building a dam and reservoir could affect the environment and people in the study area

Environmental Field Studies

Environmental field studies will establish and document the current environmental site conditions and help the study team evaluate potential impacts. They will look at:

- Vegetation and wetlands
- Wildlife
- Soils
- Groundwater
- Fisheries

Further information on these activities can be found in the Field Program Information Document on the Document Table.

Permission will be required from landowners before field program teams access any land (Indigenous, private or Crown).

Land and Resource Use

- **Traditional Land Use** – Indigenous groups will be asked to contribute their knowledge on how the study area is used now and how it has been used in the past for traditional activities (like hunting, fishing and gathering) and cultural activities (like ceremonies and burials)

- **Nontraditional Land Use** – Through "desktop" research and conversations with stakeholders, the study team will learn more about the recreational, agricultural, industrial and other activities in the study area

- Understanding how the area is used will help the study team understand the potential effects that building a dam and reservoir will have on the activities and people who use the area

Social Impacts

Social impact studies will look at how building a dam and reservoir could affect the people in the study area. Here are some of the types of questions the study team will look at when determining social impacts.

- How will a reservoir affect the well-being of the communities and people who live in or use the study area?
- How will a reservoir affect people's homes and lifestyles in the study area?
- How will a reservoir, or expanding a reservoir, change the activities that take place in the study area, or how people access those activities?

The Alberta government recognizes that all the options will have impacts on homes and properties. In addition, the new minimum water level for the Relocated Ghost Dam option may have impacts on recreational activities. The study team will look for ways to reduce these impacts.

Historical Resources

The study team needs to understand how the study area is used now, but it is also important to understand how the area has been used in the past so that history can be preserved. They do this by:

- Understanding historical resources that have already been recorded in the area
- Looking for signs of past use as part of the environmental field studies

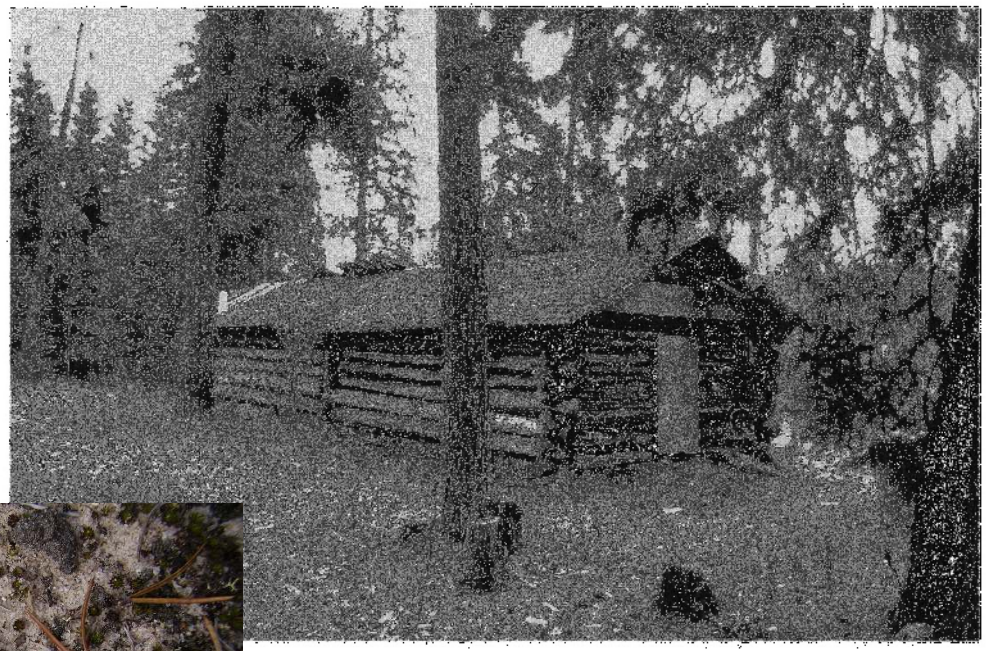


Photo credits: Wood

Engineering Considerations

The engineering team will collect a variety of information and complete some analyses, including:

- Geological and geotechnical
- Hydrotechnical
- Reservoir and downstream impacts
- Hazards and risks
- Potential design
- Cost

Assessing this information, as well as the environmental information and engagement feedback collected, will help the engineering team determine the best dam and reservoir design for each of the three options.

Geological and Geotechnical Studies

Work completed as part of the studies will include:

- "Desktop" review of existing information to add to information collected in the conceptual assessment
- Visiting dam sites to assess conditions, and identify any access or physical challenges
- Completing geotechnical, geological and geophysical field programs
- Completing geological terrain and bedrock mapping
- Determining potential sources of borrow materials (soil, gravel, clay)
- Completing a bathymetric survey of the Ghost Reservoir to measure the depth of the existing reservoir and map the existing underwater features

The studies will allow the study team to refine the best dam location and reservoir design.

Field Programs – Geotechnical Drilling and Geological Field Mapping

- Geotechnical drilling and testing results will help establish geotechnical design parameters and contribute to the overall evaluation of the feasibility of each reservoir option
- Types of studies:
  - Geotechnical drilling – Provides information about the subsurface soil, bedrock and groundwater conditions by drilling small boreholes at select locations
  - Geological field mapping – Provides information about the visible soils and bedrock at the ground surface and in the river valley walls, as well as information about topographical features of interest such as previous landslides
  - Geophysical – Seismic investigation to obtain continuous information about subsurface soils, groundwater levels and depth to bedrock between geotechnical boreholes
- Locations: Potential sites include private land, Stoney Nakoda Nations reserve land and Crown land
- Access:
  - Permission from landowners will be required before any field program can proceed on their lands
  - Regulatory permits will be in place and historical resources potential for program areas will be reviewed before access

Hydrotechnical Studies

Hydrotechnical studies will look at how past and future water flow will affect the size and type of dam and reservoir that are needed. This will include information on:

- The size of past floods and how big future floods might be
- Flood and drought storage requirements
- Modelling of how the dam would be operated
- Hydropower potential, including hydropower facility design and the resulting power generation revenue

Indigenous, Stakeholder & Public Engagement

The Bow River Reservoir Options study team wants to hear from anyone that lives, works or plays in the study area. We are interested in your input on what should be considered when evaluating the three reservoir options.

Engagement opportunities will be provided to Indigenous groups, stakeholders and the public in three rounds:

- **Spring 2021**
  - What should be considered when evaluating the options?
- **Spring 2022**
  - Feasibility study findings & how they will be used
- **Fall 2022**
  - Results of the evaluation & how input was considered

How Input from Phase 2 Engagement will be Used

Input from engagement will be used in Phase 2 to:

- Develop and prioritize the criteria for evaluating the reservoir options
- Evaluate the options to support a Government of Alberta decision if an option should move forward to the next phase
- Enhance communication and engagement activities

Input received may also be used in future phases, if any, to:

- Inform engineering design
- Mitigate any concerns about the preferred option
- Design communication and engagement activities

For More Information

Attend a live virtual session

- Tuesday, June 22, 7 to 9 pm
- Thursday, June 24, 2 to 4 pm
- Saturday, June 26, 10 am to noon

Click on in this Information Centre or go to our website to register (https://www.alberta.ca/bow-river-reservoir-options-engagement.aspx)

Receive email updates

- Go to our website to sign up for the email updates

Give us a call or send us an email

- 310-3773 (toll free)
- aep.bowbasin@gov.ab.ca