

Meridian Dam Preliminary Feasibility Study Backgrounder

Introduction

The intent of the Meridian Dam Preliminary Feasibility Study is to take a conceptual look at the benefits and costs of building a dam and water supply project on the South Saskatchewan River near the Saskatchewan-Alberta border. Organized groups in Alberta and Saskatchewan have proposed the Meridian Dam for many years. There have been a number of investigations undertaken by a variety of government agencies and by groups themselves on individual aspects of the project. However, there has never been a comprehensive investigation of the preliminary feasibility of this project. The findings generated in this study will provide the Alberta and Saskatchewan Governments with preliminary information so they can determine whether further investigation is warranted.

The goal of this meeting is to get the public's help to identify topics and issues that may have been missed in preparing the framework for the study, but need to be included in the study. The current topics to be addressed in the study are:

- Hydrology and Water Supply
- Conceptual Design of Dam and Reservoir to Current CDA Dam Safety Guidelines
- Conceptual Delivery Systems
- Conceptual Hydroelectric Infrastructure
- Environmental Issues
- Analysis of Benefits and Costs
- Other Issues
 - Legislative Requirements
 - Environmental Impact Assessment
 - Aboriginal Issues

Hydrology and Water Supply

When considering the construction of a dam and reservoir, it is important to know whether enough water is available for a project. For this project, the available water in Alberta is the remainder after Alberta has met its obligations to the Master Agreement on Apportionment, the rights of upstream licensed water users and instream flow requirements.

Broadly speaking, under the Apportionment Agreement, Alberta is required to pass half the natural flow of the South Saskatchewan River, including the Red Deer River into Saskatchewan. More specifically, Alberta is entitled to use a minimum of 2,100,000 acre-feet per year provided that a minimum flow of 1500 cubic feet per second passes into Saskatchewan.

Alberta Environment has a computer model that can simulate the flows of the South Saskatchewan River system. The model has the capability of adding a theoretical dam on the system, while still accounting for apportionment, the rights of upstream licensed water users and instream flow requirements.

The study required an estimate of the probable maximum flood (PMF) for conceptual design purposes of the dam. The PMF is defined as the physical upper limit to the runoff from a given basin. Under current dam design standards the spillway of the dam must be able to pass the PMF. The PMF has been estimated at 20844 cubic metres per second, which is 46% greater than the 1970 PMF estimate used in the conceptual design of a dam prepared by the Prairie Farm Rehabilitation Administration (PFRA).

Conceptual Design of Dam and Reservoir to Current CDA Dam Safety Guidelines

The study will include a conceptual design of a dam and reservoir located at the Meridian site. Using available information, which includes a conceptual design that was prepared by the PFRA in 1970 and preliminary site information, a conceptual design will be prepared that reflects current design practice and CDA Dam Safety Guidelines. The study will identify any construction considerations that may impact the cost of the project and will identify maintenance and operational requirements. Because a dam failure has loss of life potential, current design standards requires the dam to pass an extremely unlikely flood. The 46% larger PMF will have a significant impact on the design of the dam.

Conceptual Delivery Systems

The study will include a description of a conceptual delivery system for irrigation and other consumptive uses in Alberta and Saskatchewan. This concept will include the entire delivery system to the end user's property and a separate description of the on-farm system. To achieve this, the suitability of the soil for irrigation will be assessed.

Conceptual Hydroelectric Infrastructure

The study will include a conceptual design of the infrastructure that will be required for a hydroelectric generating plant at the dam.

Environmental Issues

The study will provide a broad understanding of the potential environmental issues associated with the construction and operation of a dam and reservoir. The study will do the following:

- identify all environmental issues
- describe each issue
- provide an overview for each issue
- where mitigation or compensation is identified for an issue, include a cost estimate
- identify what studies would be required to fully assess each issue, should a decision be made to move to the next level.

The study will deal with all environmental issues. The current topics are:

- Fishery Issues
- Wildlife Issues
- Native Grassland Issues
- Protected Areas Issues
- Reservoir Issues
- Water Quality Issues
- Groundwater Issues
- Historical Resources Issues (e.g. prehistoric/archaeological/ historical period)
- Land Use/Social Issues

Analysis of Benefits and Costs

Much of the study effort will be pulled together in the economic analysis to provide one basis for deciding whether to move to the next level of study. The economic analysis is a convenient basis for project assessment because it integrates the various benefits and costs, including the cost of mitigating or compensating negative environmental issues.

The economic analysis will involve the following steps:

- baseline data collection/tabulation/synthesis
- quantification of projected costs and benefits
- discounted cash flow analysis: (data summary and simulations)
- sensitivity analysis and Benefit/Cost distribution

The economic analysis will include the following:

- Dam and Reservoir Costs
- Land Acquisition
- Road and Utilities Relocation
- Irrigation Development
- Other Agriculture
- Hydroelectric Power Generation
- Other Water Uses
- Recreational Benefits
- Flood Control
- Environmental Assessment and Mitigation Costs
- Impacts on Lake Diefenbaker and Downstream
- Other Benefits and Costs
- Summary of Benefits and Costs

Other Issues

A cursory understanding of the other issues associated with the construction and operation of a dam and reservoir is part of the study. The study will provide a description of the potential requirements of these issues should the proposal move to the next level. Other issues include the following:

Legislative Requirements
Environmental Impact Assessment
Aboriginal Issues

Summary

A major deliverable of the study will be a clear listing of all benefits, costs, positive impacts, negative impacts and associated mitigation measures, regulatory constraints and other potential issues. The summary will clearly outline this information, the assumptions used in all assessments and the range of potential influence of these assumptions. No recommendations and conclusions regarding the feasibility of the project will be included as part of the study.

Where We Go From Here

The report will be made available to the public. The Alberta and Saskatchewan Governments will be reviewing the report to determine whether further investigation of this project should proceed.