

Okanagan Basin Water Supply and Demand Analysis Phase 2 Prospectus

Background

The availability of water in the Okanagan Basin has been a long standing issue due to agricultural and industrial demands, rapid population growth and its location in a semi-arid region. Numerous water supply studies have been conducted in the area, particularly in the past three decades. However, with the exception of the 1974 Okanagan Basin study and the 1994 water supply study, none have been basin-wide in scope.

The goal of the Okanagan Basin Water Supply and Demand Analysis is to determine the best estimate of the current and future available water supply and demand in the Okanagan Basin, taking in to account the influence of growth, climate, land use changes, preservation of the quality of the environment, and other relevant factors.

Specifically, the supply component will determine the amount of water that is available for consumptive and non-consumptive uses and the demand component will evaluate how much water is currently used, on a permissible extent, from the main lakes and tributaries within the Basin and what the projections are for increase in demand.

The Need:

A credible scientific study is needed to establish current water availability, water use, and future potential influences on both the supply and demand for the following reasons:

Allocation Status

- Currently, there are 301 restrictions on surface sources in the Okanagan Basin.
- Water allocation decisions continue to be made on an application-specific basis, based on historical streamflow data and existing licensed amounts. Since individual licences are not monitored, there may be a large discrepancy between the amount used and licensed right by a considerable amount.
- Some larger water licence applications are on hold pending the completion of the Okanagan Water Supply & Demand Study.
- As groundwater is not regulated, uncertainty exists regarding the supply and utilization of that water source, and the impacts of aquifer withdrawals on surface water sources.

For allocation purposes, there is a need to determine the current and future quantity of available water in the Basin and the demands on that supply.

Economy

- The identity of the Okanagan region has long been linked to its agricultural activities, including crops, fruit trees, and most recently vineyards.
- Approximately 70% of the water licensed for consumptive use in the Basin is for irrigation purposes.

- Limited supplies during a growing season can not only damage that particular season's crop, but can also cause a loss of years of investment for fruit trees and vineyards that do not mature and produce valuable fruit for years.
- Tourism and recreation growth and development is occurring rapidly in the region, with an increasing number of wineries, golf courses, and provincial parks.

As a result of the agricultural and tourism activities, the local economy is highly dependent on reliable water supplies.

Cost-Benefit

- Utilizing tributaries for water supply is preferable as it minimizes pumping costs.
- Since many sources have reached, or are approaching a fully allocated status, and most of the cost-effective storage sites have already been developed, Okanagan Lake and groundwater resources are being exploited as an alternative water supply.

In order to ensure that these increasing demands can be met by Okanagan Lake and groundwater supplies and the cost-effectiveness of this approach, an accurate estimate of the supply and demands need to be determined.

Climate Variability and Climate Change

- A long term research project lead by UBC, Environment Canada, and Agriculture Canada has been examining the impacts of climate change in the Okanagan Basin. The results indicate that the Basin may be particularly vulnerable to the warmer, wetter winters, and longer, drier summers that are projected for Western Canada by climate modelers (Cohen *et al.*, 2004).
- In a semi-arid environment that has specific crop cycles relying on irrigation, even small changes in the amount *or* timing of precipitation can have a significant impact.
- In recent years, the area has experienced severe droughts, with flows in some streams dropping below levels required to meet minimum survival requirements for some aquatic species.

Understanding the influence that climate change or variability may have on water sources in the future is critical for well-informed management decisions.

Population growth

The Okanagan Basin is the most densely populated area of the province outside of the Greater Vancouver-Lower Mainland area. Currently, the population in the Okanagan is approximately 323 000 (BC Stats, 2004). However, in 2004, BC Stats projected that by 2015 the population will have increased by 15%, another 50 000 people—a rapid rate of growth and development for an agriculture area and rural region of BC.

The uncertainty about the water remaining for allocation combined with the population growth, the shifts in agriculture, and the potential for climate variability and climate change, highlights the challenges to water management in the Okanagan Basin and reinforces the need to update the water supply and demand estimates.

Project Scope

Phase 1 Review (Completed in 2005)

Led by Land and Water British Columbia, Inc. in collaboration with the Okanagan Basin Water Board, Environment Canada, and the ministries of Water, Land and Air Protection, Sustainable Resource Management, and Agriculture, Food and Fisheries, the project was divided into separate phases. Phase 1 included a review by Summit Environmental Consultants Ltd of the information and data currently available that is relevant to the evaluation of the supply and the demands. A draft strategy for Phase 2 was also proposed as part of the final Phase 1 report, and a workshop was held with representatives from federal, provincial, and local government, as well as First Nations and user groups, to discuss the information review and the Phase 2 strategy.

The project team involved a Steering Committee with members from the Okanagan Basin Water Board, Environment Canada, Land and Water British Columbia, Inc., and the ministries of Agriculture, Food and Fisheries, Sustainable Resource Management, and Water, Land and Air Protection. The responsibility of this group was to oversee the management of the project and deal with any key concerns of the Working Group. The Working Group was comprised of federal and provincial government staff from the aforementioned ministries to manage the progress of the contract, and the consultant team, made up of Summit Environmental Consultants Ltd staff as well as a representative from the Okanagan Nation Alliance, a communications expert, and modeling experts.

Phase 2

The approach to Phase 2 includes the analysis of the current and future water supply and demand in the Basin. The analysis is expected to be completed through a water balance modeling exercise that will automate the calculation of a monthly water balance for the Basin at specific points of interest, and can be used to examine future scenarios. The model will include information for surface water, groundwater, water use or licensed use, population, and will take into account factors such as population growth, climate change, land use change, and economic drivers. The model will be developed to ensure that data can be updated and added over time.

In their Phase 1 report, Summit Environmental Consultants Ltd proposed additional data collection and the development of a new model specifically for the Okanagan as part of Phase 2. Environment Canada has since expressed interest in using the Water Use Analysis Model (WUAM) for the Okanagan Basin. Therefore, an early step in Phase 2 is to determine if the WUAM is appropriate or if new model development is required.

Phase 2 is also expected to have a significant public process to ensure that First Nations, local water managers, user groups, and the public are informed about the technical aspects of the study, the results, and the logic that will support the recommendations.

Phase 2 will not include the broad range of issues that were included in the 1974 report and will focus exclusively on water supply and demand in the Basin. It will not include water quality studies, allocation decisions, policy, or negotiations between levels of government, First Nations, or other interested parties. The study will focus on the technical aspects of the supply and demand analysis only, and will provide recommendations based on those results to inform future decision-makers.

PROJECT OBJECTIVES AND PERFORMANCE MEASURES

| OBJECTIVE | PERFORMANCE MEASURE |
|---|--|
| 1) To have an accurate estimate of the current water supply in the Okanagan Basin. | <ul style="list-style-type: none"> • Updated Water Information database (MS Access) • A high quality, user-friendly, adaptable model that is populated with all available, useful data. • A report for the Okanagan Basin that accurately documents existing water supply, water licences, water use and related data and knowledge gaps. |
| 2) To have an accurate estimate of allocated water within the Okanagan Basin. | |
| 3) To estimate current water use within the Okanagan Basin. | |
| 2) To project future scenarios to understand the influence that climate change, population growth, land use changes, and other factors may have on water supply and demand in the Okanagan Basin. | <ul style="list-style-type: none"> • Completed scenarios and analysis for specific time periods that have included all appropriate data. • Clear explanations on the sensitivities of those scenarios, and the significance of the results for the Basin. |
| 3) The model outputs must be appropriate to inform allocation decisions, be scientifically defensible and capable of being updated and re-run with new and additional data as needed. | |
| 4) To inform the public about the information available, the gaps in the data and the reasons those gaps exist, and the process followed to complete the study. | <ul style="list-style-type: none"> • A high quality, adaptable model that is populated with all available, useful data and is capable of being modified to incorporate new data as it is made available. • Final report to contain a summary of available water supplies, existing water licences, water demand and use and will be available for First Nations, stakeholders, and the public. • A completed public process for the technical aspects of the study, including workshops or public meetings, and written communications (news releases, information on websites, e-mails). |

PROJECT PLAN AND APPROACH

The study will be completed through the existing partnership between the Okanagan Basin Water Board and the Ministry of Environment and conducted in collaboration with the Federal government, other Provincial ministries, First Nations and other key stakeholders. Environment Canada or other agencies may join with the Board and the Ministry of Environment as partners. All contract work will be advertised on BC Bid and locally and will be awarded through an equal opportunity, competitive bid process.

The project is expected to take up to two years to complete. Initial activities include:

| ACTIVITY | TIMELINES |
|---|------------------|
| Establishment of Steering Committee & Working Group | June 2006 |
| Steering Committee & Working Group workshop to review the Phase 1 report and strategy for proceeding. | June - July 2006 |
| Hire Project Manager to oversee project components | December 2006 |

Subsequent activities that need to be incorporated into the detailed work plan include:

| ACTIVITY | |
|---|------------------------------|
| Develop detailed work plan and cost estimate | January – April 2007 |
| Complete Phase 1 data identification | April – June 2007 |
| User Needs Assessment | February – April 2007 |
| Develop water balance model for Okanagan Basin including consideration of Environment Canada’s Water Use Analysis Model and other existing models | March – December 2007 |
| Calibrate & develop model documentation | March 2008 – October 2008 |
| Develop information to calibrate Water Balance Model | May – March 2008 |
| Sub-basin hydrologic modelling | March 2007 – October 2008 |
| Phase 2 scenarios | October 2007 – February 2008 |
| Communication & consultation | January 2007 – April 2009 |
| Project Management | January 2007 – April 2009 |
| Overall Study Reporting | October 2008 – April 2009 |

TEAM STRUCTURE

The project management team for Phase 2 will include:

Steering Committee: The purpose of the Steering Committee for Phase 2 is to oversee the long term planning and success of the project and make major project-related decisions in the best interest of the Okanagan Basin while representing the interests of the agencies involved. The following groups will be represented: Okanagan Basin Water Board, the Province, the Federal Government, the Okanagan Nation Alliance and the University of British Columbia. John Slater and Jim Mattison will co-chair the Steering Committee. The Province will provide secretariat functions.

Project Director: The Province will provide a Project Director to give leadership, liaise among participating agencies, obtain resources and oversee the general progress and administration of the project and provide secretariat functions to the Steering Committee.

Working Group: The purpose of the Working Group is to provide technical leadership, financial management and communication with funding agencies and stakeholders and to ensure that the objectives of the Phase 2 study are achieved on time and on budget. Members will include Okanagan Basin Water Board, Ministry of Environment, Ministry of Agriculture and Lands, Ministry of Health, Ministry of Forests and Range, Ministry of Community Services, Okanagan Nation Alliance, Environment Canada, Agriculture Canada and Agri-Food, Fisheries and Oceans Canada, the Water Supply Association of BC, an agriculture industry representative, and a representative of urban planners. The Working Group will create Technical Committee’s to deal with specific components of the study and maintain a “Core Team” to act in an executive capacity to the Working Group. The Working Group may invite additional participants and

technical experts on an 'as needed' basis. The working group will be co-chaired by representatives of the Okanagan Basin Water Board and the Province.

Core Team: The Core Team acts in an executive capacity to the Working Group and manages administrative issues, including contracting processes. Participants are from the Working Group and include representatives of the Okanagan Basin Water Board, the Province, the Federal Government and the Project Manager.

Technical Committee's: Technical Committee's will be created by the Working Group to deal with specific components of the study. Membership of each committee will be comprised of members of the Working Group as well as technical specialists who are invited as experts. Technical Committee's could include, but are not limited to: Water Use, Water Balance and Hydrologic Modelling, Groundwater, Instream flows, Lake evaporation, and Communication. The Technical Committee's provide advice and recommendations on specific aspects of the study to the Working Group and Project Manager, assist with the development of work scopes and participate in contracting processes. Each Technical Committee is chaired by a member of the Committee or the Project Manager.

Project Manager and Technical Coordinator: A project manager will be hired to oversee the project, to work with the Working Group and Technical Committee's in developing the work plan and subsequently to ensure timely delivery of the components of the work plan. The Project Manager will report to the Project Director.

PROJECT BUDGET

In 2006, the Ministry of Environment provided the Okanagan Basin Water Board with a grant of \$350,000 to undertake Phase 2 of the Okanagan Basin Water Supply and Demand Study and the commitment of staff resources to assist with the project. The Board contributed an additional \$200,000 for a total of \$550,000. Subsequently, in 2007 the Province contributed a further \$250,000 and the Okanagan Basin Water Board \$100,000 bring the available project budget to \$900,000. It is anticipated that additional funds will be required to complete the supply and demand study. The Phase 1 report completed in 2005 estimated the cost to be \$1.1M – \$1.3M. The Phase 2 detailed work plan prepared in May 2007 estimates the budget requirement at \$1.7M. Provided in-kind work is provided by staff from the Province and the Federal government budgeted at \$0.4M, the monetary requirement remains at \$1.3M.

The Working Group will be responsible for preparing the detailed work plan, budget, requests for proposals, contracts and other administrative functions. The work plan and budget will be provided to the Steering Committee and the Okanagan Basin Water Board for approval.

The Okanagan Basin Water Board will be responsible for the projects contractual agreements and the payment of invoices on request of the Working Group. The Okanagan Basin Water Board must consider, and where appropriate approve, all expenditures greater than \$5000 proposed by the Working Group. Expenditures of less than \$5,000 can be made at the discretion of the Working Group.

Okanagan Water Supply & Demand Study Team Structure

